



# PLAN THE BRUCE: NATURAL LEGACY

## Natural Environment System Options Interim Report

May 2021





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# Indigenous Territorial Acknowledgement

## Saugeen Ojibway Nation

The Natural Legacy Project is being undertaken within the traditional territory of Chippewas of Nawash Unceded First Nation and Saugeen First Nation, collectively Saugeen Ojibway Nation (S.O.N). S.O.N.'s Traditional Territory is bounded on the south by the Maitland River system from Goderich to past Arthur, on the west by the Canada/USA border in the middle of Lake Huron, on the north by a line along the midpoint of the channel between the Saugeen (Bruce) Peninsula and Manitoulin Island, and on the east by a line down the middle of Georgian Bay. The S.O.N. also asserts Aboriginal title over that portion of Lake Huron and Georgian Bay within their Territory.

The people of the Chippewas of Nawash and Saugeen First Nations have lived, fished, hunted, and traded throughout these lands for generations and continue to do so today. They have a deep connection to the lands within their traditional territory. This includes cultural heritage: spiritual and sacred sites, artifacts and archaeological sites, built heritage, and cultural heritage landscapes. It also includes care and protection for the Ancestors and their resting places.





# Indigenous Territorial Acknowledgement

## Historic Saugeen Métis

The Natural Legacy Project is also being undertaken within the settlement, resource gathering, and historic trading areas of the Historic Saugeen Métis (H.S.M.). The Historic Saugeen Métis are descended from unions between European traders and First Nations women. The Historic Saugeen Métis hunt, fish, trap, and harvest the lands and waters of the Bruce Peninsula and Lake Huron. Today, they trace their roots through Grey, Bruce, the western part of Huron, the northern part of Lambton, and parts of Wellington, Dufferin, and Waterloo Counties.

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## Executive Summary

Bruce County is embarking on a process to update the County Official Plan, and an important part of that plan is making sure it guides growth and development in a way that resonates with residents, visitors, business owners, community leaders and other stakeholders, and with the Saugeen Ojibway Nations and the Historic Saugeen Métis

To support this process The County undertook Bruce GPS, a community visioning process that resulted in a Vision Statement and 8 Guiding Principles to inform the new Official Plan. Building on the Guiding Principles, County Council committed to preparing and circulating Discussion Papers. These papers will provide a base for conversations in the community about the next steps needed to bring the Guiding Principles to life in land use policies.

The Plan the Bruce: Natural Legacy project is based on Principle 8: “To manage natural resources wisely for future generations.”

Bruce County is home to excellent landform, natural areas, recreation and shorelines (e.g., the Niagara Escarpment Biosphere Reserve) and features intact natural areas, rare habitats and species uncommon within southern Ontario.

Plan the Bruce: Natural Legacy is focused on managing the natural legacy that we have inherited to ensure a safe, healthy and resilient environment for future generations. Protection of these resources is important for recreation, wise use of resources, and Bruce County’s economy and quality of life.

This management may include a wide range of actions and activities to preserve, enhance and wisely use the natural resources in the County.

One action includes mapping a Natural Environment System (N.E.S) to identify important features and functions on the landscape to support biodiversity, water quality and quantity and ensure that the natural environment is resilient in the long-term.

North-South Environmental, Ecosystem Recovery, and Meridian Planning Consultants have been retained to collaborate with Bruce County to prepare this Interim Report.

This report is a synthesis of work completed to date to establish guidance and requirements for identifying the Natural Environment System (N.E.S.) for Bruce County. It presents options and assessment criteria for public consultation. Following public consultation, and review and consideration of comments and direction received, an evaluation will be completed and a preferred N.E.S. presented in a final report.

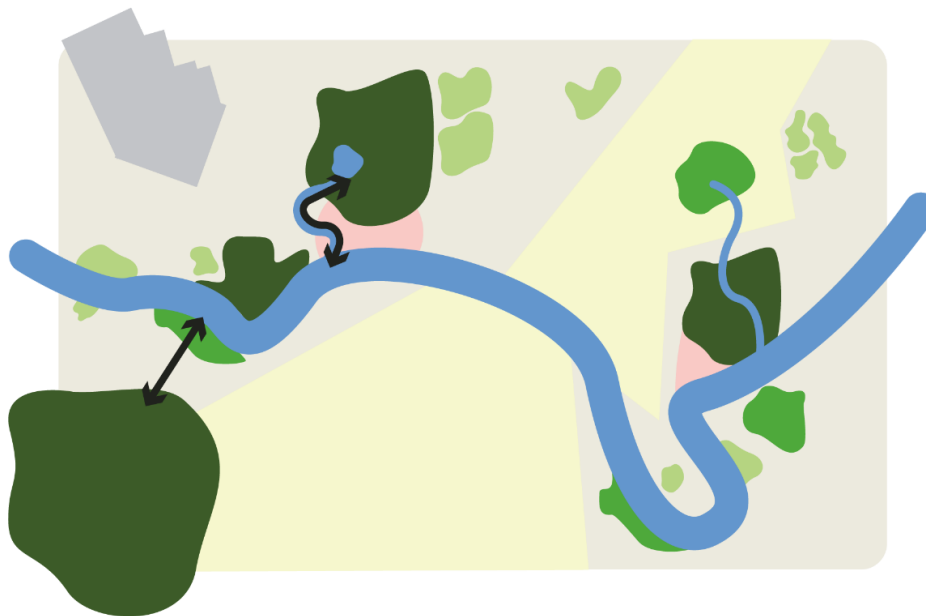
This report discusses:

- **Key Bruce County Documents** that provide direction for land use planning in the County now and through the future.



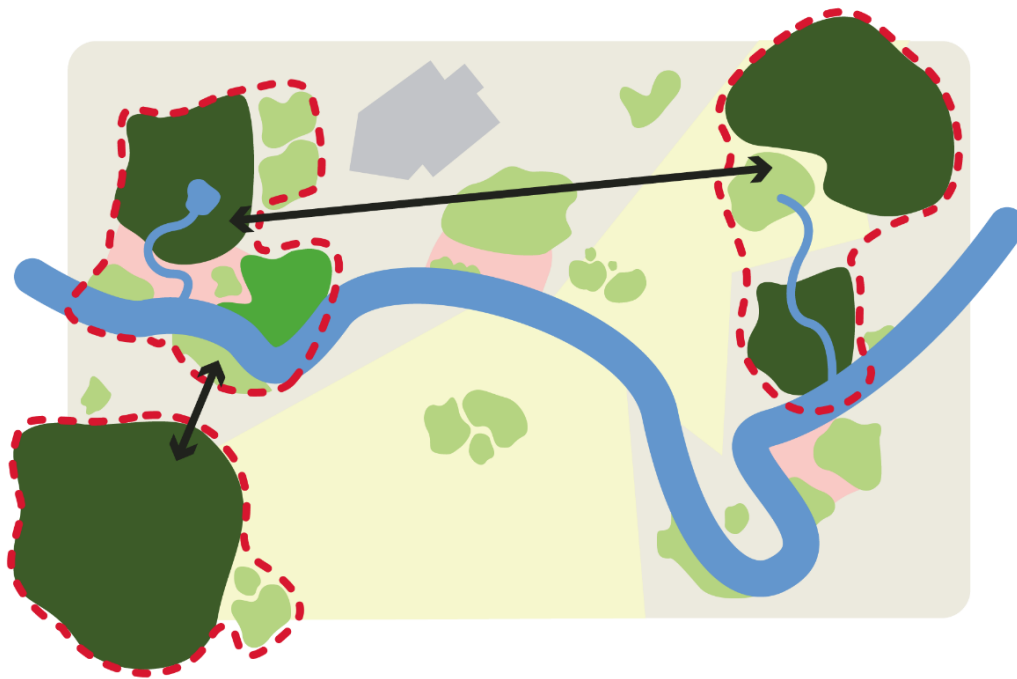
- **Broader Trends Affecting Natural Legacy in Bruce County** including global and national trends and provincial direction for Natural Heritage and Water Resources systems that make up a Natural Environment System
- **Available mapping** for Natural Legacy in Bruce County
- **Ecological Targets** including best practices and guidance documents for quantifying amount of N.E.S. components to be conserved.
- **Existing Conditions** for natural environment features and functions in Bruce County
- **Options** for defining and identifying a Natural Environment System for Bruce County, including both Natural Heritage and Water Resources systems.
- **Criteria for evaluating the options**
- **Initial Policy and Implementation Directions**

The report recommends that a Core Areas System based approach be used to identify the Natural Heritage System for Northern Bruce County (i.e., the Peninsula) where there is a relatively intact natural landscape, and a Features-Based System approach be used for Southern Bruce County where the landscape is predominately agricultural and natural features are more fragmented.



 Natural Feature	 Watercourse / Fish Habitat	 Enhancement Area
 Supporting Feature of the NHS	 Agricultural Land	 Urban Area
 Key Feature of the NHS	 Rural Land	 Linkages

*Conceptual Feature-Based System Approach Recommended for Southern Bruce County*



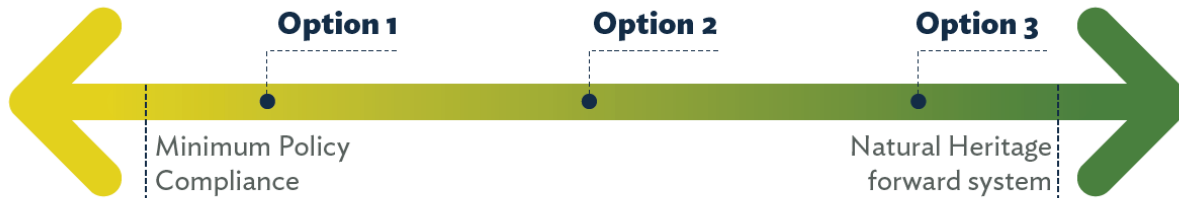
*Conceptual Core Areas-Based System Approach Recommended for Northern Bruce County*

The report outlines three options for identifying the natural heritage system:

- **Option 1** presents a more basic system. It will achieve conformity with Provincial direction and has been informed by analyses of existing land cover in Bruce County.
- **Option 2** builds upon Option 1, with additional Supporting Features and Areas and criteria for features that identifies a greater proportion of them as Key Features for the System.
- **Option 3** builds upon Options 1 and 2 to illustrate a ‘natural heritage forward’ system. It uses criteria that captures an even greater proportion of features as Key Features within the system and/or includes additional Supporting Features and Areas.



### Visual Representation of Options for the Natural Environment System



The Water Resource System (W.R.S) includes areas necessary to protect drinking water supplies, areas of hydrological significance and identification of vulnerable and/or sensitive groundwater and surface water features that should be protected, mitigated, or enhanced in land use planning. The W.R.S. in Bruce County does not have major distinctions in distribution that would influence how it should be managed to meet the P.P.S. objective to protect water quality and quantity.

The report recommends a common approach throughout Bruce County for the Water Resources system aspects of Bruce County’s Natural Legacy.

- **Option 1** includes only Key Hydrologic Features and Key Hydrologic Areas.
- **Option 2** builds upon Option 1 by including ‘other components’, including water-related natural hazards as part of the Water Resource System.

As not all features or options are fully mapped, some components would be mapped and others would be included conceptually in the system.

The report also recommends 9 initial policy directions to support implementation of improved Natural Legacy planning in Bruce County:

Topic	No.	Recommended Direction
Update Environmental Impact Study (EIS) Guidelines	1	Review and update EIS Guidelines to include guidelines for scoping, and standardization of reports to increase consistency of information.
Make it easier to link mapping and policy	2	Tying policy to mapping in a very close and relatable way, through summaries on schedules and in GIS / interactive formats.
Provide essential material in accessible formats	3	Focused writing / policies that provide the essential informational material, even in brochure formats.
Focus policy on overall direction and use guidelines for the details	4	Role of policy to set a basic standard and provide (guidelines) for minimum mitigation measures options / best practices for enhancement.



Topic	No.	Recommended Direction
Consider a community planning development permit system for improved implementation	5	County OP consider policies for a Community Planning Permit system which can provide improved implementation tools.
Use different forestry tools for different areas	6	Forestry tools for different areas (different permit types in different areas of the system) while managing wildland fire risk.
Enhance progressive rehabilitation when aggregate extraction occurs within the Natural Environment System	7	Reduce the duration of disruption to the natural system by requiring best practices in progressive rehabilitation for aggregate extraction within the natural environment system.
Include conceptual natural legacy mapping in settlement areas	8	Identify key features and support the county-scale system while recognizing that local municipalities may develop defined and refined natural legacy mapping.
Encourage planning for sustainable public access to natural legacy features	9	Together with the 'Communities' 'Culture' and 'Business' discussion papers, support development of sustainable opportunities for people to connect to our natural legacy.

The first part of this report provides context and a summary of efforts to date. Consultation will focus on options, evaluation criteria, and initial policy directions.



## 1.0 Introduction

Bruce County is home to excellent landform, natural areas, recreation and shorelines (e.g., the Niagara Escarpment Biosphere Reserve) and features intact natural areas, rare habitats and species uncommon within southern Ontario.

Plan the Bruce: Natural Legacy is focused on managing the natural legacy that we have inherited to ensure a safe, healthy and resilient environment for future generations. Protection of these resources is important for recreation, wise use of resources, and Bruce County's economy and quality of life.

This management may include a wide range of actions and activities to preserve, enhance and wisely use the natural resources in the County.

One action includes mapping a Natural Environment System (N.E.S) to identify important features and functions on the landscape to support biodiversity, water quality and quantity and ensure that the natural environment is resilient in the long-term.

### 1.1 Key Bruce County Documents and Initiatives

This report draws upon a strong base of corporate documents that provide a clear vision for our Natural Legacy in Bruce County.

#### 1.1.1 Current County Official Plan

The Current Bruce County Official Plan was established in 1997 around the principle of sustainable development, with the major principle being to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. The plan directs that the principle of sustainable development be used to resolve land use issues.

Goals of the plan include the protection and preservation of ecologically significant areas in their natural state; restoration to a natural state of abandoned, neglected, or degraded lands; and protection and enhancement to air, land and water quality.

Goals also include protection of mineral resources for future extraction to meet existing and future demands.

Objectives of the plan speak generally to identifying and protecting the County's unique natural resources and environment, as well as listing several specific feature areas or types such as headwaters, natural areas along shorelines and rivers, and habitat of threatened and endangered species.

The plan notes that environmental mapping is based on features, and that not all features are mapped; the plan relies primarily on mapping of environmental hazards, Areas of Natural and Scientific Interest (A.N.S.I.) mapping and wetlands to achieve much of the County's environmental goals and objectives.



The plan describes several types of important natural features within the County and requires studies to support proposals for development within (depending on the feature type) or adjacent to environmentally sensitive areas, whether these are mapped or are described in the Environment (Section 4.3) and/or Hazard (Section 5.8) policies of the plan. The plan provides that studies may be waived if the development is (a) subject to a duplicate or similar environmental process; (b) minor in nature; or (c) an Environmental Impact Study (E.I.S.) would serve no useful purpose for protection of features.

The last major update of the plan was approved by the province in 2010, and pre-dates a shift in provincial guidance towards mapping natural features from a systems-based approach.

### *Environmental Impact Study (EIS) Guidelines*

The current guidelines for completion of an E.I.S. were adopted by County Council in 2009 and outline scoping opportunities, approaches to completing an E.I.S., requirements for investigation, and information to be included in the study.

### **1.1.2 Bruce GPS Public Engagement Related to Natural Legacy**

Bruce GPS was a public engagement visioning campaign designed to establish a complete vision for the future of the County. Community consultations for this project reached over 10,000 people and received input from over 1,800 people.

On our Natural Legacy, the community made it clear that:

- It is important to protect the County's natural resources, including farmland, water quality, natural areas, and scenic views; and
- Bruce County's rich natural resources contribute to our quality of life, economy, and health in the future.

The Guiding Principle discussion also noted:

- Bruce County is rich in natural resources that are part of our landscape: good soil, sand and gravel, groundwater, clean beaches, forests. For these resources to sustain our community in the long term, they need to be managed. This starts with identifying where the most important resources are. Then, we can wisely utilize them and / or enhance and protect them.
- Options for planning to support this can include, depending on the resource, preservation, creating distance between the resource and new development, and managing resources in a way that keeps its value or makes it even more valuable. We need to put the plans in place now to ensure that the combined effects of change preserve our natural assets and positively impact our future.

The Bruce GPS discussions also noted a need to address concerns of property owners regarding how zoning changes may affect development rights and property values.





### 1.1.3 Land Use Service Delivery Review (Official Plan Best Practices)

Completed in October 2020 with municipal modernization funding provided by the Provincial Government, this review included review of current planning documents including the Bruce GPS engagement, interviews with County, Municipal, and Conservation Authority Staff and development community stakeholders, and a comparison of policy approaches between Bruce County and 5 other Counties and leading practices in other jurisdictions.

In the context of Natural Legacy, the review notes (Section 2.2.8) that

“Natural heritage protection is definitely one of the areas where the County’s official plan is excelling.”

The review also recommends:

- Adopting a systems approach, to fully protect the interconnectedness of natural heritage, and increase effectiveness in storm water management, source water protection, and flood prevention as development increases in urban areas;
- Do more to support clean energy innovation, to spur local excellence in environmentally advanced technology and practices, reduce need for waste and wastewater management infrastructure;
- Better integrate source water protection considerations into application pre-screening to reduce delays in processing and direct development to appropriate locations;
- Remembering the need for balance and getting the balance right, including with greater flexibility in settlement areas that are designated for growth to make it easier for the right kind of development to take place.

The review also made recommendations regarding climate change, which has potential to yield significant impacts to natural resources, along with other aspects of life in the County. The review recommended:

- The anticipated impacts of climate change on the County’s local environment should be illustrated in the plan.
- Work with local conservations authorities to identify economic and environmental hazards resulting from climate change.
- Include measurable goals to mitigate and adapt to climate change

The current project to identify a Natural Environment System supports or works to achieve many of the recommendations identified through this review. Identification and sustainable management of the natural environment will support the County’s efforts to plan and manage for climate change but forms one component of what will need to be a multi-faceted approach to addressing this global challenge.



## 1.2 Broader Trends Affecting Natural Legacy in Bruce County

### 1.2.1 Biodiversity - A Global-Scale Issue with Local-Scale Opportunities

Biodiversity is at the core of a healthy and sustainable world and is important at local, provincial, federal, and global scales. Biodiversity is critical for the health of our natural environment, including the extensive range of services and functions critical for our health and economy including oxygen production and carbon sequestration, food production (directly and indirectly), flood attenuation, clean water, medicines, and so much more. Protecting and planning for the long-term health to Bruce County's Natural Legacy supports biodiversity efforts at multiple scales.

Recognition of the critical importance of protecting biodiversity through actions including land protection, sustainable development, and wise use of resources has been and continues to be demonstrated through provincial, national, and international efforts including:

- United Nations Convention on Biological Diversity in 1992 - Canada was the first industrialized nation to ratify the convention.
- The Canadian Biodiversity Strategy: Canada's Response to the Convention on Biological Diversity (Environment Canada 1995)
- Ontario's Biodiversity Strategy (2005)
- United Nations Decade on Biodiversity 2011-2020
- Ontario's Biodiversity Strategy 2011
- Biodiversity: It's in our Nature 2012-2020, Ontario Government Plan to Conserve Biodiversity.
- Canada's Biodiversity Outcomes Framework and 2020 Goals & Targets (2016)
- Protected Planet Report 2016 and ongoing 'live' updates
- One With Nature: A Renewed Approach to Land and Freshwater Conservation in Canada (2018)

These documents and declarations are intended to raise awareness of the critical importance of biodiversity to every aspect of our society, bringing a global concern to a provincial level. Through the guidance and direction provided, and directly applicable provincial policies, municipalities and individual landowners can support efforts to protect and even enhance biodiversity. Through the Natural Legacy project, Bruce County and its residents can participate in this global effort.

Local examples include voluntary Conservation and Stewardship Plans, National Park and Land Trust land acquisition efforts for conservation purposes to support the County's natural legacy and biodiversity.

Bruce County is within the internationally recognized Escarpment World Biosphere Reserve - a designation given to exemplary, globally significant cultural and natural sites or areas.



## 1.2.2 Provincial Direction

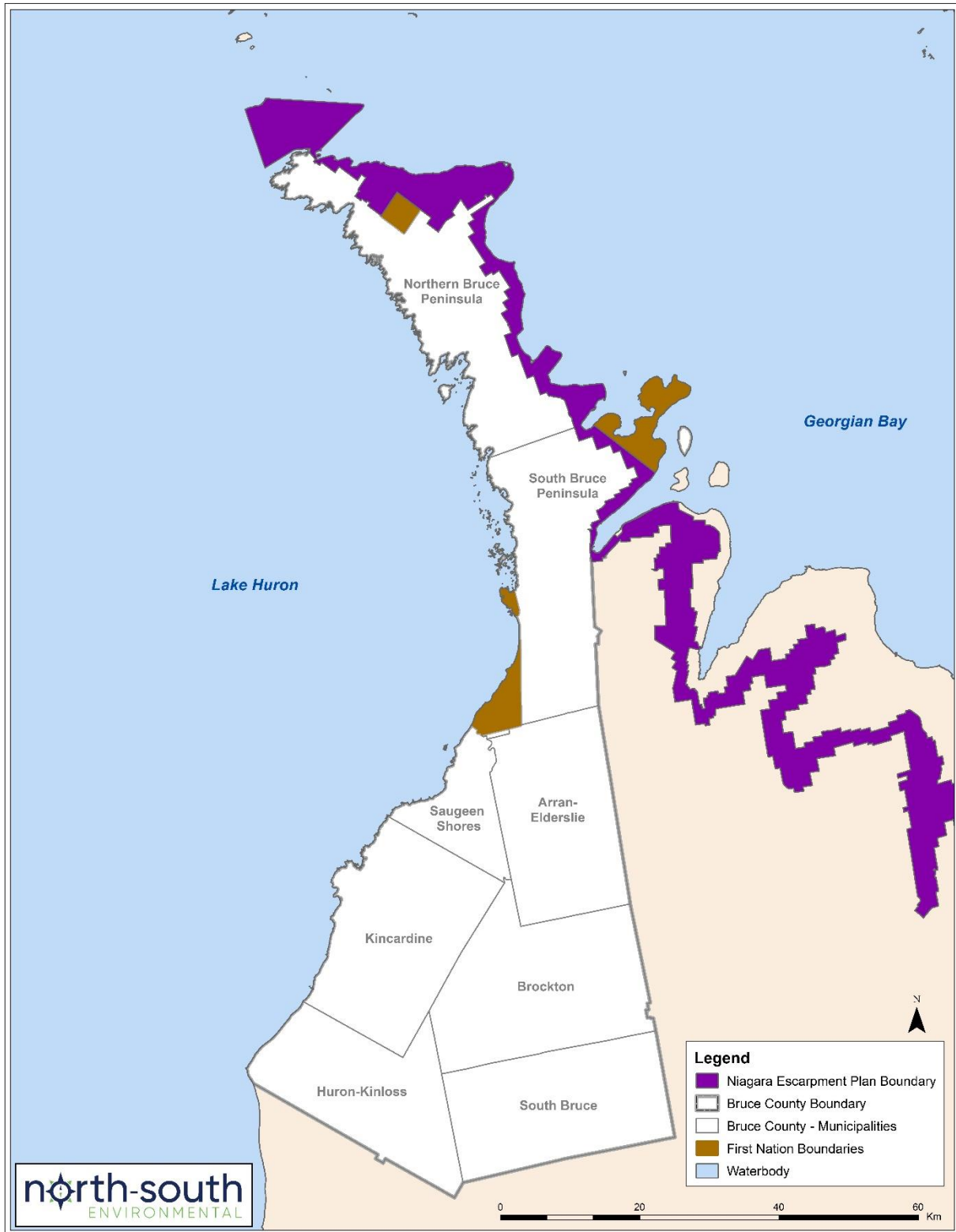
Two key provincial documents apply to Bruce County and provide direction for natural environment planning:

- Provincial Policy Statement (P.P.S) (2020); and
- Niagara Escarpment Plan (2017).

The P.P.S outlines provincial interests when it comes to land use planning to support smart and healthy growth. Section 2 of the P.P.S. sets out policies for the ‘wise use and management of resources’ including natural heritage and water. The P.P.S. directs municipalities to identify a Natural Heritage System (N.H.S) and Water Resource System (W.R.S), providing general direction for what will and/or may be included in these systems.

The N.E.P applies to a narrow, north-south oriented portion of the Niagara Escarpment that extends from north from the community of Wiarton along the east side of the Peninsula and then across to Tobermory and includes adjacent islands.

The Growth Plan for the Greater Golden Horseshoe (Growth Plan; 2020) Provincial Plan area is outside of Bruce County and does not apply. The Greenbelt Plan (2017) Area is generally outside of Bruce County as well, however the Greenbelt includes the Niagara Escarpment Plan area and as such, has application through the Niagara Escarpment Plan within this plan area. Even outside of their directly applicability within the County, they provide definitions and guidance consistent with the P.P.S. and could also be used to inform N.E.S. criteria that support our Natural Legacy.



**Figure 1-1: Niagara Escarpment Plan Area Boundary in Bruce County.**



### Natural Heritage System

The P.P.S. Directs that natural heritage features be protected for the long term (s. 2.1.1). To support this direction, the P.P.S. requires that Natural Heritage System(s) (N.H.S) be identified in southern Ontario (Ecoregions 6E and 7E), recognizing that N.H.S. size and form will vary across settlement, rural, and prime agricultural areas.

Bruce County is within southern Ontario and so is required to identify an N.H.S.

Direction for the N.H.S. is provided by the Province through a definition and policies and is informed by guidance documents (e.g., the Natural Heritage Reference Manual [M.N.R. 2010]). Some features and areas are mandatory and other components are optional.

Within the N.E.P., the ‘Escarpment Natural Area’ and ‘Escarpment Protection Area’ designations effectively capture comparable features to those required for an N.H.S.

**Table 1-1** summarizes components outlined in Provincial policies, and whether they are required or optional. Individual features and areas are discussed in **Section 3**.

**Table 1-1. Features to consider in the Natural Heritage System. R = required, O = optional**

Feature/Area	P.P.S. 2020 / N.E.P 2017
<ul style="list-style-type: none"> <li>• Significant wetlands, significant coastal wetlands, other coastal wetlands</li> <li>• Significant woodlands</li> <li>• Significant valleylands</li> <li>• Significant wildlife habitat</li> <li>• Significant A.N.S.I. (Life Science A.N.S.I. only in Greenbelt Plan)</li> <li>• Fish habitat</li> <li>• Habitat of endangered species and threatened species</li> </ul>	R
Linkages	R
Federal and Provincial parks and conservation reserves	O
Other natural heritage features	O
Lands that have been restored or have the potential to be restored to a natural state; this could include “Enhancement areas”	O
Areas that support hydrologic functions; this could include: <ul style="list-style-type: none"> <li>• Meanderbelt</li> <li>• Floodplain, flooding hazard, floodway</li> <li>• Dynamic beach hazard</li> <li>• Karst</li> </ul>	O



Feature/Area	P.P.S. 2020 / N.E.P 2017
Working landscapes that enable ecological functions to continue	O

*Water Resource System*

Section 2.2.1 of the P.P.S directs that planning authorities protect, improve or restore the quality and quantity of water. The P.P.S identifies the water resource system (W.R.S.) as consisting of surface water features, ground water features, hydrologic functions and shoreline areas, which are necessary for the ecological and hydrological integrity of the watershed.

Planning authorities are to maintain linkages and functions among these components of the W.R.S. to sustain healthy aquatic and terrestrial ecosystems, human water consumption, and industries including agriculture and agri-food. However, there is no specific definition or further direction for components of the W.R.S provided in the P.P.S. The Niagara Escarpment Plan also provides some definitions of features.

As with the N.H.S., some components are required and others are optional. These are summarized in Table 1-2 below and discussed further in Appendix 1.

**Table 1-2. Features to consider in the Water Resource System. R = required, O = optional**

Feature/Area	P.P.S. 2020 / N.E.P 2017
Surface Water Features <ul style="list-style-type: none"> <li>• Permanent streams and intermittent streams</li> <li>• Inland lakes and their littoral zones</li> <li>• Seepage areas and springs</li> <li>• Wetlands</li> <li>• Headwaters</li> <li>• Recharge/discharge areas</li> <li>• Associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics</li> </ul>	R
Ground water features <ul style="list-style-type: none"> <li>• Recharge/discharge areas</li> <li>• Water tables</li> <li>• Aquifers and unsaturated zones</li> </ul>	R
Hydrologic functions	R
Shoreline areas	R



Flooding Hazard and/or erosion hazards adjacent to a river, stream and small inland lakes	0
Dynamic Beach Hazard (great lakes and large inland lakes)	0
Hazardous Sites - Unstable Bedrock (Karst), Unstable Soils (Leda Clay, Organic Soils)	0

Key resources are the Assessment Reports and Drinking Water Source Protection Plans arising from the Clean Water Act (2006). While this program is driven by protection of municipal drinking water supplies, many of the functions/areas which comprise components for a W.R.S., such as highly vulnerable aquifers, have been identified. This work forms a base to build upon to identify and map a W.R.S. and any subsequent municipal policies to achieve the objectives of the P.P.S for protection of water resources.

A potential resource is the Growth Plan (2020). While Bruce County is outside the Growth Plan area, the definition and more detailed direction for a W.R.S. in the Growth Plan may offer guidance. The Growth Plan also provides perspective on protection of W.R.S. components from development which may be useful for planning in Bruce County.

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## 2.0 Foundations for Identifying the Natural Environment System

A Mapping Discussion Paper and a Targets Discussion Paper were prepared to support development of criteria for identifying features, functions and areas that make up the N.E.S and to consider how it can be mapped. This section summarizes these papers.

### 2.1 Stakeholder Meeting

A meeting was held in November 2019 to engage with stakeholders regarding the Natural Legacy Project. A presentation illustrated the purpose of the project including the need to identify a Natural Environment System, the work plan and project timeline, and an introduction to natural legacy features which are captured in the system. A request was made to participants for datasets / information which could be used to identify natural legacy features on the landscape.

Following the presentation, participants divided into groups to answer a series of questions with the intent of identifying participants' objectives and concerns surrounding the Natural Legacy Project. Responses reflected the desire to protect the County's natural features and their functions. However, there were also concerns of property owners regarding how zoning changes may affect development rights and property values. The resulting discussion reflected the need for a balanced approach which protects natural legacy while still ensuring individual and economic opportunities.

### 2.2 Mapping Discussion Paper

The purpose of the Mapping Discussion Paper was to:

- Review relevant provincial guidance for natural environment mapping;
- Review the County's existing mapping data;
- Identify possible mapping options to meet Provincial requirements; and
- Review common mapping practices that should be considered in the County. The key outcomes, recommendation and conclusions are summarized below.

In accordance with provincial direction, N.E.S. mapping and mapping of key natural heritage and water resource features and functions must be developed for Bruce County. Collectively referred to as the Natural Environment System (N.E.S.), the N.H.S. and W.R.S. should be identified, defined and mapped as separate systems to provide clarity and to support implementation.

Not all features and functions should or can be readily mapped. There is variability within data and some data is not available. These limitations should be recognized in policies and criteria for identifying and managing system features to ensure site-specific study can also guide planning and decision-making.





Mapping analysis considered sources, accuracy, and quality of mapping data to identify the best available data and key data gaps. The majority of the natural environment datasets are suitable for the intended County-scale use. Some minor revisions to address known issues or combining multiple datasets to ensure ‘best available data’ is used, were appropriate. Since not all components of the N.E.S may be mapped, mapping will be based on data availability and common mapping practices. Existing data will be used to map most feature types identified as required to meet the provincial requirements. A summary of Mapping datasets and gaps is provided in Appendix 3.

Known gaps include Significant Woodlands and Linkages datasets which will be produced through the N.E.S. project.

Long-term data management is influenced by updates to source information and, as such, N.E.S. and feature mapping is considered a living / changing component that should be periodically revised based on newly available data.

Features, functions, and their boundaries on the landscape are to be confirmed or refined through site-specific study to ensure that land planning is reflective of ‘on-the-ground’ conditions. This may not be required where features can be generally avoided.

Mapping datasets reflect available mapping for specific features or components of the N.E.S and do not necessarily represent the system for Bruce County. Work completed through subsequent reports (Targets Discussion Paper and the current Options Report) provide analyses and direction for identifying the system.

Through data collection and the preparation of the Mapping Discussion Paper consultation and engagement with local municipalities, the Saugeen Ojibway Nation, and stakeholders was achieved through two Technical Committees: The Planning Advisory Committee and the Natural Legacy Advisory Committee, and through Natural Legacy Stakeholder Meetings. Their input was used to identify and inform key concerns and interests in the development of a N.E.S. for Bruce County. Advisory Committees were important sources of information, including mapping data, provided perspective, review and comments on draft direction and reporting and are reflected in the final technical report.

Mapping datasets that were suitable for use (including amalgamated datasets) were used in analyses and development of targets and system options presented in this Options Report. Additionally, datasets and direction provided through the Mapping Discussion Paper will be used to map the preferred Option for the N.H.S. and W.R.S. that will be the outcome of this work.

Review of available mapping and consultation with stakeholders and advisory committees also served to identify several opportunities and recommendations for implementation.



## 2.3 Targets Discussion Paper

The purpose of the Targets Discussion Paper was to present a review of best practices and guidance to inform the development of targets for the N.H.S. and W.R.S.

Targets are explicit goals that quantify the amount of a N.E.S. component to be conserved and targets are one of the major tasks of modern conservation (Carwardine et al. 2009). As a fundamental component of developing a N.E.S., criteria to identify component features should be designed to ensure conservation targets are achieved, where targets can reasonably be established. Targets provide an opportunity to measure or ‘test’ proposed criteria for N.H.S and W.R.S.

Preliminary recommendations for Targets in Bruce County’s N.E.S. were developed from a jurisdictional scan and review of best-practices technical and guidance documents, including “How Much Habitat is Enough,” and a draft copy of “How Much Disturbance is Too Much”. These recommendations are summarized in Table 4-1 below. Direction for the identification of numerical targets is not readily available for some feature types or components of the N.E.S.; in these cases, consideration was given to Provincial Plans and the general objectives and goals set out in the Bruce County Official Plan. The federal government recently committed to placing 30% of the country’s lands and water within protected areas (CBC 2020, High Ambition Coalition 2020) to help combat climate change and biodiversity collapse. While this goal is focused on protected spaces such as national parks, wildlife reserves, marine reserves, indigenous protected and conserved areas, etc. the underlying direction to protect and conserve terrestrial and aquatic areas for our long-term health and wellbeing can inform the targets for Bruce County’s N.E.S.

Direction for and a review of draft targets and reporting was provided through the two Natural Legacy Committees: The Planning Advisory Committee and the Natural Legacy Advisory Committee. These committees, which include representatives from local municipalities, the Saugeen Ojibway Nation and local stakeholders were important sources of information and local knowledge and provided perspective, review and comments on draft direction and reporting.

Recommendations summarized in Table 4-1 are preliminary targets to support criteria for identifying and mapping the N.E.S. Targets may be refined through future stages of work as informed by the process of mapping and defining the N.E.S. on the landscape.

Identifying a feature type as a component for consideration does not mean that the final N.E.S. will include all features within a feature type and does not restrict existing uses (e.g., agriculture and regular farm practices).



**Table 2-1. Summary of Natural Heritage System Targets**

Natural Environment Feature	Policy Context	Recommended Target	Additional Considerations for Identification in N.E.S.
Woodlands	Significant woodlands protected by Policy 2.1.5., P.P.S.	<p><b>No net loss of woodland cover.</b></p> <p>Existing woodland cover in Bruce County is approximately 37%. This places the County close to the ‘moderate’ risk category in accordance with recommended cover targets.</p>	<p>Geographic distribution of woodlands should be considered to inform significance criteria.</p> <p>Patch size and shape, pattern of distribution, woodland quality should inform identification of significant woodlands.</p>
Wetlands	<p>Significant wetlands, significant coastal wetlands and other coastal wetlands protected by Policy 2.1.4 and 2.1.5, P.P.S.</p> <p>Wetlands protected by the N.E.P. (exceptions per sections 2.6 and 2.7 of the Plan)</p>	<p><b>No net loss of wetland cover.</b></p> <p>Existing wetland cover in Bruce County is approximately 13%.</p>	<p>Geographic distribution of wetlands should be considered to inform significance criteria. Strive for 10% of each major watershed and 6% of each subwatershed wetland coverage (protected and / or restored).</p> <p>Location in watershed, native adjacent vegetation, wetland area, shape and diversity, and wetland proximity to each other / other natural features.</p>



Natural Environment Feature	Policy Context	Recommended Target	Additional Considerations for Identification in N.E.S.
Linkages	Identified in the P.P.S.	<p><b>Connect habitat blocks or areas identified as significant in the County with landscape-level linkages.</b></p> <p><b>Connect other significant features / areas with local-level linkages.</b></p> <p>Targets are not set for site-scale linkages and would be determined as appropriate and based on site-specific conditions., if / as required.</p>	<p>Linkage routes should minimize route length between habitat areas, maximize natural cover, and avoid road crossings.</p> <p>Linkage width should consider distance, type of feature(s) being connected and their role in the N.E.S.</p> <p>Landscape linkages should be a minimum of 200m in width to support movement of plants and animals.</p> <p>Local-level linkages should be a minimum 50m in width.</p>



Natural Environment Feature	Policy Context	Recommended Target	Additional Considerations for Identification in N.E.S.
Restoration / Enhancement Areas	<p>Greenbelt Plan Oak Ridges Moraine Conservation Plan (O.R.M.C.P)</p> <p>Note: The O.R.M.C.P does not apply to Bruce County and the Greenbelt Plan applies only within the Niagara Escarpment Plan area. They are used as examples of policy direction from the Province that could support natural legacy planning in Bruce County.</p>	<p><b>Identify restoration / enhancement areas that improve the form and / or function of the N.E.S.</b></p>	<p>Geographic areas may be defined to assist in focusing or refining application of a restoration target.</p> <p>Enhancement areas assist in achieving targets set for other natural heritage features (e.g., by increasing patch size or species diversity). The type of restoration (e.g., forest, grassland) is determined through analysis of the N.H.S. composition or based on needs and knowledge as it arises (e.g., species-specific habitats).</p> <p>Restoration / enhancement should consider opportunities to support or improve fish habitat.</p>
Buffers	<p>Vegetation Protection Zone identified in N.E.P.</p>	<p>N/A</p>	<p>Numerical targets do not apply as buffers are not a distinct feature type. Buffers are applied through land use planning implementation processes.</p> <p>Buffers should be wide enough to protect important natural features from impacts of site alteration / development</p>



Natural Environment Feature	Policy Context	Recommended Target	Additional Considerations for Identification in N.E.S.
Riparian Areas	Significant valleylands protected by Policy 2.1.5., P.P.S.	<p><b>No net loss of natural riparian cover.</b> For areas with high natural cover.</p> <p>Increase natural riparian cover. For areas with low natural cover.</p>	<p>Riparian areas may not be mapped in the N.E.S.</p> <p>Criteria for identification and inclusion of riparian areas should be considered based on geographic differences in cover. Function and maintenance of agricultural drains should be considered in criteria development.</p>
Shoreline Areas	<p>Significant coastal wetlands and other coastal wetlands protected by Policy 2.1.4 and 2.1.5, P.P.S.</p> <p>Wetlands protected by the N.E.P. (exceptions per sections 2.6 and 2.7 of the Plan)</p> <p>Rare Vegetation Communities include some shoreline habitat types as Significant Wildlife Habitat (e.g., beaches, dunes)</p>	No net loss of natural shoreline areas.	<p>Areas of naturalized shoreline that connect to terrestrial systems are important for protection and persistence of shoreline species, movement of flora and fauna and contributions to aquatic systems.</p> <p>Criteria should be developed that assist in identifying shoreline areas that support the N.E.S.</p>



Natural Environment Feature	Policy Context	Recommended Target	Additional Considerations for Identification in N.E.S.
Aquatic Community / Fish Habitat	Fish habitat protected by Policy 2.1.6., P.P.S.	<b>Protect all fish habitat.</b> Maintain existing fish communities and diversity (e.g., thermal regime, species composition, etc.).	The underlying characteristics of the stream / (sub-) watershed, and current and historical fish communities.
Significant Wildlife Habitat (S.W.H)	Protected by Policy 2.1.5., P.P.S.	Protect all S.W.H.	Many S.W.H. categories cannot be readily mapped or identified at the County scale. Where information is available (e.g., Rare Vegetation Communities - Alvars) these should be captured.
Grassland Habitats	Not specifically identified.	Maintain grassland habitat on the landscape with sufficient patch sizes to support species diversity.	Criteria should consider patch size, proximity to other habitat types, target species, and geographic distribution.  Opportunities to incorporate grassland habitat into restoration areas.



**Table 2-2. Summary of Water Resource System Targets**

Feature	Policy Context	Recommended Target	Additional Considerations for Identification in N.E.S.
Water Resource Features	Protected by Policy 2.2, P.P.S.	There is insufficient knowledge and literature to set targets for water resource features.	Water budget modelling, water quality assessments, (sub-)watershed planning, linkages, related N.H.S. targets may be required to inform mapping of the W.R.S.
Impermeable Surfaces	<p>Greenbelt Plan</p> <p>Oak Ridges Moraine Conservation Plan</p> <p><b>Note: The O.R.M.C.P does not apply to Bruce County and the Greenbelt Plan applies only within the Niagara Escarpment Plan area. They are used as examples of policy direction from the Province that could support natural legacy planning in Bruce County.</b></p>	<p>N/A</p> <p>Impermeable surface targets cannot readily be applied to the W.R.S. as it incorporates a range of land use types (settlement, rural, agricultural).</p>	<p>Consideration may be given to recommendations for impermeable surfaces within the N.H.S.</p>





## 3.0 Profile of the Natural Environment in Bruce County

Understanding the presence and distribution of features, areas and their functions is important to planning a N.E.S. This section defines components of the system (that were outlined in Section 1.2.2) and uses the best available mapping / data (as discussed in the Mapping Discussion Paper) to summarize existing conditions at the landscape scale in Bruce County.

### 3.1 Natural Heritage System Features & Areas

Bruce County has an exceptional Natural Legacy. It boasts the Escarpment World Biosphere Reserve, important areas for birds and bird migration, the largest remaining wooded wetland in southern Ontario (Greenock Swamp) hosts some of the best examples of and greatest number of globally rare communities (e.g., alvars, freshwater coastal dunes) and some of the last relatively intact natural areas in southern Ontario. These areas and specialized and rare habitats host a high degree of biodiversity - greater than 2000 species call Bruce County home. This exceptional biodiversity includes Species at Risk (e.g., Lakeside daisy, Hill's Thistle, Massasauga Rattlesnake), a great diversity of orchid species, a black-bear population, and many species endemic (i.e., don't occur elsewhere) to the Bruce Peninsula or the Great Lakes. These areas and species are under pressure and it is important that the County's Natural Legacy capture and reflect these world class features and areas.

#### 3.1.1 Wetlands

Wetlands are 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 (growing in water) plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens.

##### *Existing Conditions*

Wetlands can be readily mapped using available datasets. Accuracy limitations are discussed in the Mapping Discussion Paper; however, available datasets are considered appropriate for County-scale mapping. Refinement to wetland boundaries is addressed through more detailed level of study when required.

Table 3-1 presents wetland cover for each local municipality and a total for Bruce County. 1650\*

Approximately 12.8% of the total land area of Bruce County is wetland and ranges between 8.5% (Municipality of Kincardine) and 21.3% (Municipality of Brockton) across local municipalities.



Fifty-three (53) Provincially Significant Wetland (P.S.W) complexes have been identified within Bruce County and cover about 5.8% of the County’s land area. The largest of these is the Greenock Swamp. It is located primarily within the Municipality of Brockton, comprises a total of 8,910 ha and represents 36% of all P.S.W. area within the County. The Municipalities of Northern Bruce Peninsula and South Bruce Peninsula have the next highest occurrence of P.S.W. complexes.

The balance of wetlands within the County (7.0% of Bruce County’s land area) have either not yet been evaluated for significance or were evaluated but did not meet criteria for provincial significance (i.e., “evaluated - other”). Land area covered by unevaluated or non-provincially significant wetlands ranges across local municipalities between 4.9% (Township of Huron-Kinloss) and 10.3% (Municipality of South Bruce).

**Table 3-1. Wetland cover within Bruce County and each Local Area Municipality.**

Municipality <sup>1</sup>	Provincially Significant Wetland (% cover)	Other Wetlands (% cover)	Total Wetland Cover (%)
Municipality of Arran-Elderslie	4.0	6.7	10.7
Municipality of Brockton	12.7	8.6	21.3
Municipality of Kincardine	1.1	7.4	8.5
Municipality of South Bruce	5.5	10.3	15.8
Town of Saugeen Shores	1.2	7.9	9.1
Township of Huron-Kinloss	4.9	4.9	9.8
Municipality of Northern Bruce Peninsula	4.0	5.2	9.2
Town of South Bruce Peninsula	10.2	5.7	15.9
<b>Total for Bruce County</b>	<b>5.8</b>	<b>7.0</b>	<b>12.8</b>



<sup>1</sup> ‘Northern Bruce County’ is comprised of the Municipality of Northern Bruce Peninsula and Town of south Bruce Peninsula. All other municipalities are considered part of ‘Southern Bruce County’ for the purposes of this report.

### 3.1.2 Fish Habitat

Fish habitat means “spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes” (Fisheries Act, R.S.C., 1985, c. F-14). This definition has been adopted across Provincial Plans. The definition does not stipulate that the watercourse or waterbody have fish residing in it (i.e., be direct fish habitat) to be considered fish habitat under the Fisheries Act or in the plans that have adopted the definition.

Where detailed fish habitat mapping is not available, all waterbodies, including permanent or intermittent streams, headwaters, seasonally flooded areas, municipal or agricultural surface drains, lakes and ponds (excluding human-made “off-line” ponds such as stormwater management ponds), should initially be used as a proxy for fish habitat unless and until it is demonstrated to the satisfaction of the regulatory authority that the feature(s) do not meet the definition of Fish Habitat (per the Fisheries Act).

#### *Existing Conditions*

As watercourses and waterbodies are used as proxies for fish habitat, a summary of existing conditions for these feature types across Bruce County is found under the Water Resource System, **Section 3.2**.

Aquatic habitats associated with Lake Huron and Georgian Bay include many areas of critical and / or important fish habitat. Changes to conditions on land, including shoreline development, shoreline alteration and hardening / loss of natural shorelines, removal or loss of natural areas which support hydrologic and allochthonous inputs (organic and inorganic inputs important to support aquatic habitats) can affect the form, function and availability of fish habitat. Bruce County has extensive shorelines and so it is important to consider shorelines and their role in protecting fish habitat within the N.E.S.

### 3.1.3 Woodlands

Woodlands are treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air, the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels (P.P.S. 2020).



### Existing Conditions

Woodlands can be readily mapped using available datasets. Accuracy limitations are discussed in the Mapping Discussion Paper, but overall available datasets are appropriate for County-scale mapping and individual feature limits can be refined through field review or more detailed study when needed.

Bruce County’s woodland cover is 36% overall but varies widely between local municipalities, ranging between 15% and 72% (Table 3-2). As previously discussed, Bruce County has a pronounced distinction between north and south in terms of land cover types and characteristics. This is particularly evident for woodland cover: Southern Bruce County is predominantly agricultural with more fragmented natural heritage like much of south-western Ontario, while Northern Bruce County is more consistent with central Ontario and has a relatively intact natural heritage landscape.

To facilitate assessment, local municipalities have been grouped based on this distinction into two groups: ‘Northern Bruce County’ and ‘Southern Bruce County’. Analyses below review basic woodland characteristics within each of these areas.

Woodlands <0.2 ha have been excluded from these analyses; this serves to ‘clean’ the data by removing areas such as small tree groupings on residential properties, small hedgerows and other mapping artifacts that would not meet the definition of a woodland and could skew the assessment.

**Table 3-2. Woodland cover within Bruce County and each Local Area Municipality.**

Municipality	Land Area (ha)	Woodland Area (ha)	Woodland Cover (%)
<b>SOUTHERN BRUCE COUNTY</b>	<b>267,892</b>	<b>55,146</b>	<b>20.6</b>
Municipality of Arran-Elderslie	46,615	7,598	16.3
Municipality of Brockton	56,972	16,206	28.5
Municipality of Kincardine	53,819	9,125	17.0
Municipality of South Bruce	48,877	11,094	22.7
Town of Saugeen Shores	17,345	4,572	26.4
Township of Huron-Kinloss	44,265	6,535	14.8
<b>NORTHERN BRUCE COUNTY</b>	<b>134,623</b>	<b>88,827</b>	<b>66.0</b>
Municipality of Northern Bruce Peninsula	78,842	56,766	72.0
Town of South Bruce Peninsula	55,780	32,074	57.5
<b>Total for Bruce County</b>	<b>402,513</b>	<b>143,697</b>	<b>35.7</b>



## ***Southern Bruce County***

A total of 2,174 woodland units were identified as wholly or partially within Southern Bruce County<sup>1</sup>. Total woodland cover within Southern Bruce County is 20.6% (55,146 ha). Average woodland size is 25.4 ha, however there are a few very large woodlands that substantially influence average size. As such, the median or mid-point is a more meaningful measure. The median woodland size is 2.6 ha, which means that 50% of woodlands in Southern Bruce are larger than 2.6 ha and 50% are smaller.

Approximately 18% of woodland cover in Southern Bruce County (10,149 ha) is contained within a what is (functionally<sup>2</sup>) a single woodland and 40.5% of all woodland cover is found within 8 woodlands. The majority of these large woodland patches occur within the Municipality of Brockton and the Municipality of South Bruce.

However, these 8 woodlands represent only 0.4% of the number of woodlands on the landscape as individual features. This illustrates the role of smaller woodlands across the landscape as the predominant woodland form.

Interior habitat is used as a way to assess potential habitat function. It represents areas away from impacts of edges and/or adjacent land uses. It also serves to identify areas which may support species that require larger habitat areas to carry out their life processes (e.g., area-sensitive bird species). Several distances from the forest edge are used to illustrate differences in the extent of interior habitat: >100m (Interior Habitat), >200m (Deep Interior Habitat), >300m (Very Deep Interior Habitat). Interior habitat >100m from the edge is a metric set out in the N.H.R.M. Deep interior >200m is used in identifying Significant Wildlife Habitat. Very deep interior (>300m) has been added as an additional measure to assist in identifying potential key patches due to the size and extent of features within Bruce County. A summary of interior habitat is provided in Table 3-3 below.

A fairly high proportion of woodlands in Southern Bruce County support interior (>100m from edge) woodland habitat. As expected, due to the distribution, the presence of deep interior and very deep interior drops substantially.

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<sup>1</sup> Where woodlands cross municipal boundaries: Woodland cover uses only the woodland area within the municipality to ensure accurate representation of land cover. For woodland characteristic analyses, the entire woodland is considered as a functional unit and includes areas within and beyond the municipal boundary.

<sup>2</sup> Woodlands are considered 'functionally' connected when their canopies (i.e., the spread of the tree branches) is separated by <20m. This is a common practice set out in the Natural Heritage Reference Manual (N.H.R.M).



**Table 3-3 – Woodland Interior Habitat Analysis - Southern Bruce County**

Interior Habitat	Woodlands with Interior Habitat (count/% all woodlands)	Total Interior Habitat (ha)	Average Habitat Size (ha)
<b>Interior</b> (>100m from edge)	597 (27%)	14,113	6.5
<b>Deep Interior</b> (>200m from edge)	111 (5%)	5,894	2.7
<b>Very Deep Interior</b> (>300m from edge)	18 (0.8%)	3,569	1.6

### **Northern Bruce County**

A total of 1,853 woodland units identified as wholly or partially occurring in Northern Bruce County<sup>3</sup>. Total woodland cover within Northern Bruce County is 66% (94,603 ha). Average woodland size is 51.1 ha, however there are a few very large woodlands that substantially influence the average size. As such, the median or mid-point is a more meaningful measure. The median woodland size is 1.3 ha, meaning that 50% of woodlands in Northern Bruce are larger than 1.3 ha and 50% are smaller.

As noted above, woodlands are considered functionally connected where their canopy is separated by less than 20 m. Applied to Northern Bruce County, 95% of woodland cover became a “single” woodland. As this would not allow for differentiation to inform useful criteria, an analysis was re-run that considered each woodland as discrete (unconnected) units. The contiguous nature of woodlands through Northern Bruce County indicates a high degree of habitat connectivity across the planning area and is a positive factor in natural heritage planning.

When considered by area, 14% of woodland cover in Northern Bruce County (12,309 ha) is contained within a single contiguous woodland and 42% of all woodland cover is captured within the top 10 woodlands by size. The majority of large woodlands occur along the eastern edge of the Municipality of Northern Bruce Peninsula and the north-eastern extent of the Town of South Bruce Peninsula.

<sup>3</sup> Where woodlands cross jurisdictional boundaries: Woodland cover uses only those portions of the woodland which occurs within the jurisdictional area to ensure accurate representation of land cover. For woodland characteristic analyses, the entire woodland is considered as a functional unit and includes areas within and extending beyond the jurisdictional boundary.



When considered by count this represents 5% of woodlands by count, a substantially larger proportion than for Southern Bruce County. This indicates that large woodlands are a predominant form, but that smaller woodlands are still prevalent on the landscape.

Much of the woodland cover within Northern Bruce County is captured within very large, contiguous units with smaller woodlands dotting the landscape. This pattern is reflected in the interior habitat assessment (Table 3-4). Northern Bruce supports a large amount of interior habitat with large average habitat size corresponding to these large woodland units. There are also far more and larger areas of Deep interior and very deep interior habitat. The influence of small woodlands can be seen in the percent of woodlands with interior habitat (15%) with the fewer, large woodlands providing the large majority of this habitat.

**Table 3-4 – Woodland Interior Habitat Analysis - Northern Bruce**

Interior Habitat	Woodlands with Interior Habitat (count/% all woodlands)	Total Interior Habitat (ha)	Average Habitat Size (ha)
Interior (>100m from edge)	319 (17%)	88,827	47.9
Deep Interior (>200m from edge)	134 (7%)	45,312	24.5
Very Deep Interior (>300m from edge)	87 (5%)	~24,645	13.3

### *Woodlands in the Current Official Plan*

Under the current Official Plan, Significant woodlands are not mapped. Policies (S. 4.3.2.6) identify woodlands >40 ha as being significant where total woodland cover is <30% within a given Township. This would apply to the 6 local area municipalities currently grouped together as ‘Southern Bruce County’:

Arran-Elderslie (16.3%), Brockton (28.5%), Kincardine (17.0%), South Bruce (22.7%), Saugeen Shores (26.4%) and Huron-Kinloss (14.8%). In these municipalities all woodlands >40ha are considered significant.

No criteria are provided for Municipalities with >30% woodland cover (i.e., ‘Northern Bruce County’), consisting of Northern Bruce Peninsula (72.0%) and Southern Bruce Peninsula (57.5%). Policies focus on the scale of impact to any woodland as a measure for considering negative impacts.



### 3.1.4 Valleylands

Valleylands are landform features generally associated with and formed by watercourses. Often, because of their topography (e.g., deep valleys, steep slopes, often wooded, sometimes containing seepage areas, etc.) they have some of the most prominent and enduring natural features on the landscape in southern Ontario. Other features, such as forests and wetlands, have more frequently been removed or filled over the course of settlement, agriculture and development.

In the P.P.S. (2020), valleylands are defined as:

“... a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year.”

#### *Existing Conditions*

Valleylands are not mapped in Bruce County. Mapping of valleylands may be approximated using stable top of bank, or similar data. These datasets are not available across the County and as such, this feature type is not mapped.

Comparable to other areas, valleylands will generally be associated with watercourses, with larger, higher order watercourses generally being associated with larger (broader and/or deeper) valley systems.

Based on a visual review of aerial imagery and contour lines (M.N.R.F.), it may be inferred that the largest valleyland systems occur within the southern portion of Bruce County (i.e., off the peninsula) and are associated with the main watercourses in the County, including Saugeen River, Teeswater River and Sauble River.

### 3.1.5 Habitat of Endangered and Threatened Species

Habitat for Endangered Species and Threatened species is defined through the Endangered Species Act (2007) and is confirmed and managed by the province through their administration of the Endangered Species Act (2007). Habitat of Endangered and Threatened species is generally identified through a variety of project processes (e.g., a subwatershed study) where survey information has confirmed presence of habitat for these species. It is important to note that habitat mapping is different than occurrence mapping; habitat mapping represents the protected area of habitat associated with a species that is protected under the Endangered Species Act (2007) while occurrence mapping represents where the species was observed.

Access to habitat mapping is generally restricted by the province based on species sensitivity and potential risk to the species should its location be known. Habitat mapping for Endangered and Threatened species is incomplete and will change over time as surveys are completed and/or as species designations change (e.g., new species are listed or de-listed as Endangered or Threatened).

#### *Existing Conditions*

Mapping of Habitat of Endangered and Threatened Species is not available across the County and mapping of this feature type is not recommended due to sensitivity of the





data. Where species occurrence and habitat data are available, it will be used to inform and/or validate preparation of the N.H.S, but it is not recommended to be a mapped component of the N.H.S.

Bruce County is known to provide habitat to many Endangered and Threatened Species including (but not limited to):

- Eastern Massasauga Rattlesnake
- Queensnake
- Whip-poor-will
- Bobolink
- Eastern Meadowlark
- Piping Plover
- Bats (Little Brown Myotis, Northern Myotis)
- Eastern Prairie Fringed Orchid
- Hill's Thistle
- Lakeside Daisy

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### 3.1.6 Significant Wildlife Habitat

Significant Wildlife Habitat (S.W.H.) is generally identified as areas of ecological importance for supporting and providing specialized wildlife habitat form and/or function. They represent the best quality examples of these habitat types available on the landscape. The province prepared Significant Wildlife Habitat Criteria Ecoregion Schedules (O.M.N.R.F. 2015) to provide geographically-based guidance for identifying significant habitat. Although Municipalities can identify equally or more restrictive criteria for identifying S.W.H., the S.W.H. Criteria Schedules are generally used as the basis for identification of S.W.H. at the municipal level. The Ecoregion 6E Criteria Schedule applies to Bruce County.

#### *Existing Conditions*

S.W.H. Mapping is not available as a comprehensive dataset for Bruce County. This lack of mapping is common across municipalities due to the general need for site-specific surveys. However, two S.W.H. types are mapped for Bruce County:

- Deer overwintering areas are mapped by M.N.R.F. with most large habitat areas occurring on the peninsula (approx. 21,000 ha). Two large habitat areas occur south of the peninsula: along the shore of Lake Huron spanning the municipalities of Kincardine and Saugeen Shores (approx. 3,000 ha), and associated with Greenock Swamp Wetland Complex which spans four municipalities near the south of the County (approx. 8,000 ha). Additional smaller habitat areas are scattered throughout Bruce County.
- Alvars are known to occur in Bruce County and represent a substantial proportion of this rare vegetation community in Ontario. Alvar mapping is available for the Bruce Peninsula (primarily, but not exclusively within Parks Canada lands) and represents a good dataset for known sites. Additional alvars beyond those mapped are anticipated to occur and site-specific work can continue to build this mapping dataset.

Other important areas of wildlife habitat and rare or uncommon habitats within Bruce County include:

- Cabot Head Important Bird Area
- Huron Fringe including shoreline and natural areas along and in proximity to the shoreline are important for bird migration;
- Great Lakes coastal dune systems (e.g., Inverhuron, Saugeen Shores, Sauble Beach, Singing Sands);

Areas of confirmed S.W.H should be developed on an ongoing basis as detailed and/or site-specific studies and projects (e.g., subwatershed study, Environmental Impact Study, Natural Heritage Evaluation, etc.) occur.



### 3.1.7 Areas of Natural and Scientific Interest (A.N.S.I.)

Life Science A.N.S.I.s are identified as being high quality example(s) of ecological form and function in each Ecodistrict in the province (provincially significant) and the Region (regionally significant) and are generally defined by natural heritage features (e.g., a woodland, valley top of bank, etc.) and generally exclude anthropogenic land uses (e.g., residential areas / properties).

Earth Science A.N.S.I.s represent the best examples of geologic and geomorphic landforms and areas (e.g., a moraine) in each Ecodistrict in the province (provincially significant) and the Region (regionally significant). They may include a single feature or a group of related features (e.g., a drumlin field). As geologic / geomorphic landforms, the overlying land use may include natural and anthropogenic uses (e.g., woodland, agricultural, rural residential, etc.).

The M.N.R.F. identifies A.N.S.I.s and provides available mapping to municipalities.

#### *Existing Conditions*

A total of 46 A.N.S.I.s occur in Bruce County, including:

- 26 Provincially Significant Life Science A.N.S.I.s (33,566 ha);
- 13 Provincially Significant Earth Science A.N.S.I.s (6,105 ha); and
- 7 Regionally Significant Life Science A.N.S.I.s (1,697 ha).

Of these, 29 A.N.S.I.s are in the Municipality of Northern Bruce Peninsula and another 7 are in the Town of South Bruce Peninsula. The remaining ten A.N.S.I.s are in five southern municipalities, and there are no A.N.S.I.s within the Town of Saugeen Shores.

### 3.1.8 Conservation-Oriented Lands

#### *Federal and Provincial Parks*

Federal and Provincial Parks are protected spaces and may form components of a Natural Heritage System. Conservation Reserves include lands protected for conservation purposes and may also be considered for inclusion within a Natural Heritage System. These lands may include properties owned and managed by Conservation Authorities and Land Trusts.

There are two Federal (National) Parks, Fathom Five National Marine Park and Bruce Peninsula National Park of Canada in Bruce County; both are located within the Municipality of Northern Bruce Peninsula.

There are eleven Provincial Parks occur within Bruce County. Eight of these, including the largest (Cabot Head Provincial Park, at, 4,514 ha) are within the Municipality of Northern Bruce Peninsula. (see Table 3-5). The second largest, MacGregor Point Provincial Park (1,227 ha), is in the Town of Saugeen Shores.



### Conservation Authority-owned Lands

Conservation Authority-owned Lands are present within all local area municipalities except for the Municipality of Northern Bruce Peninsula. The majority of these lands occur within the Municipality of Brockton and are associated with the Greenock Swamp. A breakdown is presented in the Table 3-5 below. Some Conservation Authority lands are managed actively for timber production.

### County Forests

The County of Bruce owns and stewards 4,881 ha of County Forests, with the majority located in the Lindsay Tract (Municipality of Northern Bruce Peninsula) and the Amabel Tract (Town of South Bruce Peninsula). These lands are managed for conservation, recreation, sustainable forestry, and climate change mitigation.

**Table 3-5. Summary of Conservation-Oriented Lands by Local Municipality**

Municipality	Provincial Parks (ha)	Federal Parks (ha)	Conservation Authority-owned Lands (ha)	County Forests	Total (%)
Municipality of Northern Bruce Peninsula	7,659	26,920	-	2,954	47.6%
Town of South Bruce Peninsula	19	-	2,382	914	5.9%
Municipality of Arran-Elderslie	-	-	256	-	0.5%
Municipality of Brockton	-	-	3,557	426	7.0%
Municipality of Kincardine	283	-	194	-	0.9%
Municipality of South Bruce	-	-	356	305	1.4%
Town of Saugeen Shores	1,227	-	120	-	7.8%
Township of Huron-Kinloss	-	-	42	282	0.7%
<b>Total for Bruce County</b>	<b>9,188</b>	<b>26,920</b>	<b>6,906</b>	<b>4,881</b>	<b>11.9%</b>



### *Land Trusts*

There are seven conservation land trusts active within Bruce County:

- Federation of Ontario Naturalists (4 reserves, 399 ha)
- Bruce Trail Conservancy (3 reserves, approx. 1,500 ha)
- Escarpment Biosphere Conservancy (26 reserves, >1,400 ha)
- Nature Conservancy of Canada (1,700 ha)
- Ontario Nature (6 reserves, approx. 870 ha)
- Ontario Heritage Trust (1 reserve, 45ha)
- North American Native Plant Society (1 reserve, 5ha)

Lands held by these organizations are protected for the purpose of conserving and protecting features and functions. Within Bruce County, approximately 5,920 ha or 1.4% of land area is owned by land trusts. The majority of these occur in Northern Bruce County. Collectively, they represent important land holdings for conservation and protection of natural features and functions.

### **3.1.9 Enhancement Areas**

This component provides an opportunity to identify existing restored areas (e.g., restoration or enhancement projects or initiatives) and / or areas which provide opportunities to strengthen the system through a defined N.H.S. and is an optional component for the N.H.S.

#### *Existing Conditions*

Alternative Land Use Services (A.L.U.S.) is a program that works with farmers to implement good land stewardship focused on developing ecosystem services and supporting ecological function on agricultural lands. Through it, farmers can access grants and other supports to restore or establish natural areas to support biodiversity and improve water quality and quantity. A.L.U.S. sites can be recognized within the N.H.S. for their contributions to building a resilient environment. Work completed by the A.L.U.S. program has a strong focus on ecological restoration / enhancement along watercourses. Properties on which A.L.U.S. operates are supported to continue as working landscapes (i.e., active, productive agriculture).

Grey Sauble Conservation offers stewardship services in partnership with other environmental organizations, municipalities within their watershed, and landowners. Stewardship actions are supported throughout their watershed through grant funding, providing technical advice for projects, and developing resources to support stewardship activities.

Saugeen Conservation Authority also supports stewardship activities and actions through a range of partnerships, services and projects. Projects and partnerships include a wide range activities from tree planting and forestry management to water quality and well improvement programs.



### 3.1.10 Areas That Support Hydrologic Functions

Hydrologic Functions are “the functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water’s interaction with the environment including its relation to living things.” (P.P.S. 2020). This definition includes every potential component of water as it relates to N.H.S. and W.R.S.

Whereas other components of the N.E.S. provide more clear direction relating to definitions and potential criteria, there are no specific criteria for identifying areas that support hydrologic functions. Some features/ functions/ areas that support hydrologic functions have not been specifically included in other components of the natural environment system. These include:

- Meanderbelt;
- Floodplain, flooding hazard, floodway;
- Dynamic beach hazard; and
- Karst.

These features/areas could be considered as part of this optional component and are discussed in Sections 3.2.3 and 3.2.4. This component also recognizes interactions between natural heritage and water resource features.

## 3.2 Water Resource System Features & Areas

The Mapping Discussion Paper and Targets Discussion Paper reviewed components recommended for inclusion in the W.R.S. This section builds on those reviews with further discussion of the components, definitions, and discussion of existing or needed criteria for identifying W.R.S. components. The components of the water resource system and how they relate to Bruce County is also presented. Where possible, a statistical review of current GIS datasets, provided by the County, and/or a review of background information for Bruce County is presented to demonstrate relevance. This section sets-up and informs options and criteria for identifying features.

### 3.2.1 Surface Water Features

Surface water features are “water-related features on the earth’s surface, including headwaters, rivers, stream channels, inland lakes, seepage areas, recharge/discharge areas, springs, wetlands, and associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics.” (P.P.S. 2020).

#### *Permanent and Intermittent Streams*

Permanent and intermittent streams contain water for a sufficient period in an average year to develop defined channel form and morphology. Intermittent streams may be dry during parts of the year. The N.E.P. defines intermittent streams as: “Stream-related watercourses that contain water or are dry at times of the year that



are more or less predictable, generally flowing during wet seasons of the year but not the entire year, and where the water table is above the stream bottom during parts of the year." (N.E.P. 2017)

Permanent and intermittent streams are commonly, yet indirectly, mapped through watercourse feature mapping. Permanent streams are generally mapped and intermittent streams are sometimes mapped. Differentiation between permanent and intermittent streams may not occur in the mapping layer; classification of ‘intermittent’ streams requires enhanced feature knowledge regarding the flow regime which can be inferred based on stream order and field verification.

### Existing Conditions

Within Southern Bruce County, 17,000 watercourses have been identified with a total length of 3,600 km. Within Northern Bruce County, 5,300 watercourses have been identified with a total length of 1,900 km.

A few permanent streams (major tributaries) are located in Southern Bruce County. The total length of these major tributaries is 534 km. Major tributary networks are provided in the Table 3-6 below.

**Table 3-6. Major tributaries within Bruce County**

River Name	Length (km)	Class
Saugeen River - North	24	Cold Water
Saugeen River - South	45	Cold Water
Sauble River	75	Transitional
Saugeen River - Main	200	Transitional
Saugeen River - North	15	Transitional
Teeswater River	83	Transitional
Saugeen River - North	31	Warm Water
Saugeen River - South	61	Warm Water

### *Inland Lakes and Their Littoral Zones*

The N.E.P. (2017) defines inland lakes as “any inland body of standing water, usually fresh water, larger than a pool or pond or a body of water filling a depression in the earth’s surface”. The littoral zone of a lake refers to the area near shore where light



penetrates to the lakebed making this zone the most ecologically productive area in a lake.

The P.P.S. (2020) refers to large inland lakes “as those waterbodies having a surface area of equal to or greater than 100 km<sup>2</sup> where there is not a measurable or predictable response to a single runoff event.”

### **Existing Conditions**

Within Southern Bruce County, 3,699 inland lakes have been identified with a total surface area of 21.2 km<sup>2</sup>. Within Northern Bruce County, 1,943 inland lakes have been identified with a total surface area of 69 km<sup>2</sup> (GSC, 2018). No large inland lakes (>100 km<sup>2</sup>) occur anywhere in the County. Inland lakes are typically indirectly mapped through line and polygon water features or waterbodies; littoral zones are not typically mapped as a distinct feature class since it requires consideration. Approximation of the littoral zone can occur based on set-backs from the water line.

### *Seepage Areas and Springs*

While the P.P.S. (2020) does not provide a definition for seepage areas and springs, the N.E.P. (2017) defines seepage areas and springs as “sites of emergence of groundwater where the water table is present at the ground surface”.

### **Existing Conditions**

While numerous seepage areas and springs are likely present in Bruce County, these features are difficult to identify in large scale, may shift location within a year, and are not easily mapped. Seepage areas and springs are indirectly identified through the N.H.S., as they are often associated with terrestrial and/or aquatic habitat features such as wetlands and cool water systems. Mapping of seepage areas and springs requires site specific studies (secondary plan, site plan, EIS), that may be undertaken during watershed or subwatershed studies.

### *Wetlands*

Wetlands are discussed as a component of the N.H.S. (Section 3.1). Wetlands are considered components of both the N.H.S. and the W.R.S. and are to be mapped as a component of each.

### *Headwaters*

Headwaters are identified, but not defined, in the P.P.S. (2020). The Evaluation, Classification and Management of Headwater Drainage Features Guideline prepared by the Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC) (2014) defines headwaters as “non-permanently flowing drainage features that may not have defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales and connected headwater wetlands, but do not include rills or furrows”. While some headwater features may be mapped as part of





the drainage network, they are not classified as such; many headwater features are not mapped.

The TRCA and CVC (2014) guideline document provides criteria for identifying and classifying headwater drainage features for the purpose of recommending an approach to management. Management recommendations are provided based on the classification of the feature, and include:

- Protection (important functions);
- Conservation (valued functions);
- Mitigation (contributing functions);
- Recharge Protection (recharge functions);
- Maintain or Replicate Terrestrial Linkage (terrestrial functions); and
- No Management Required (limited functions).

### Existing Conditions

Within Bruce County, headwaters are visible from aerial photography in agricultural areas, but more difficult to observe in the remainder of the County. Headwaters are not commonly mapped at the watershed level, and therefore are usually limited to detailed assessments completed at the sub-watershed or site scale. The value of headwater drainage features as a component of the WRS, a link to the NHS and as providing hydrological function is increasingly recognized. Delineation of headwater drainage features is therefore relevant for the purpose of land use planning.

### *Recharge/discharge Areas*

This is defined under Ground Water Features below.

### *Water Quality*

The PPS (2020) suggests that water quality “is measured by indicators associated with hydrologic function such as minimum base flow, depth to water table, aquifer pressure, oxygen levels, suspended solids, temperature, bacteria, nutrients and hazardous contaminants, and hydrologic regime.”

### Existing Conditions

Water quality monitoring in Bruce County occurs at 14 stations that are part of the Provincial Water Quality Monitoring network. Additional monitoring may occur as part of separate initiatives undertaken by conservation authorities. Results of water quality monitoring are frequently summarized in ‘watershed report cards’ that are prepared by the conservation authorities and used to classify conditions and review trends over time. The report cards indicate the impact of land-use activities on water quality which can be used to inform management decisions to protect, restore or enhance surface water resources. Water quality conditions are not typically mapped.

Surface water quality for Bruce County is discussed in the Source Protection Plans for the area, including wellhead protection areas (for groundwater wells) and intake protection zones (for surface water intakes).



Intake protection zones are areas - both on land and water - where run-off from (e.g., from watercourses, overland, etc.) and the movement of currents in lakes and rivers has potential to have a direct impact on the source water at surface water municipal intakes for drinking water.

Wellhead protection areas include the areas around a municipal wellhead (i.e., groundwater drinking water source) where land use activities had the potential to affect the quality or quantity of water that flows into the well and therefore affect the drinking water resource.

### *Associated Riparian Lands*

The Targets Discussion Paper provided a comprehensive review of the definition of Riparian vegetation. Riparian areas are located next to streams, lakes, or wetlands. Vegetated riparian areas prevent bank erosion, reduce sediment entrainment, filter sediment and nutrients, and enhance aquatic resources such as providing shade, shelter, and food for fish. Riparian zones are the ecotone or interface between a watercourse and the terrestrial vegetation community and are characterized by hydrophilic plants.

According to P.P.S., 2020 riparian lands can be defined by their soil moisture, soil type, vegetation or topographic characteristics.

Associated riparian lands may include floodplain areas and/or lands immediately adjacent to a watercourse or waterbody that directly support the watercourse / waterbody.

### **Existing Conditions**

Riparian areas are not mapped within Bruce County. Watercourses (River, Streams, etc.) across Bruce County vary in the presence, extent and nature of riparian features and areas present. The interface between watercourses and adjacent terrestrial areas varies from non-natural condition (e.g., ploughed or managed to edge of watercourse banks) through to fully natural areas. Planning policies and zoning provisions generally direct buildings and structures away from riparian areas by applying 15-30 metre setbacks.

### *Shoreline Areas*

Shorelines are the interface between terrestrial and aquatic environments, allowing for interactions between them, and providing specialized habitats (e.g., natural beach, overhanging cover, bird stopover or nesting, etc.), natural cover, areas of shoreline erosion or accretion, nutrient and sediment filtration / buffering, shading, foraging opportunities, etc. Naturalized shorelines also allow for natural shoreline processes, provide filtering / buffering and assist in protecting and maintaining water quality. The form and function of natural shorelines and shoreline features are important components of a connected and dynamic natural environment system.



According to the P.P.S. (2020) the shoreline area is “necessary for the ecological and hydrological integrity of the watershed”.

Shorelines are identified as natural hazard areas, including shoreline and dynamic beach hazard (See Section 3.2.4)

### Existing Conditions

The Targets Discussion Paper provided a review of Shorelines. Shorelines are often focal areas for development (e.g., transportation, settlements, cottages), because of their aesthetic and recreational appeal and economic opportunities. Bruce County has extensive shoreline areas along Georgian Bay and Lake Huron and inland lakes. However, it is often unclear how Shoreline areas are defined. Furthermore, shoreline areas as a feature type are not mapped for Bruce County. Shorelines have also been subject to change with the rapid and significant change in Georgian Bay / Lake Huron water levels from record lows in 2014 to near record highs in 2020.

### 3.2.2 Ground Water Features

The P.P.S. (2020) refers to ground water features as “water-related features in the earth’s subsurface, including recharge/discharge areas, water tables, aquifers and unsaturated zones that can be defined by surface and subsurface hydrogeologic investigations.” Source Water Protection Area studies provide the most comprehensive characterization of groundwater features within Bruce County, with a specific focus on those attributes that are relevant to drinking water.

Ground water feature components included in the P.P.S. (2020) are identified in several Provincial Plans which, while not be directly applicable to the County, would support watershed-based planning within the County.

#### *Recharge/Discharge Areas*

A recharge area is an area where rain or snow seeps into the ground and flows to an aquifer. Recharge areas tend to be areas that are characterized by permeable soils, such as sand or gravel, which allow the water to seep easily into the ground. Significant Groundwater Recharge Areas are areas that have implications for specific ecological functions or drinking water as defined in the next subsection.

Discharge areas are locations where groundwater transitions to the surface through springs or seeps, often into wetland features or watercourses.

### Existing Conditions

For Northern Bruce County, groundwater generally flows away from the crest of the Niagara Escarpment and follows a generally west to southwesterly flow path towards Lake Huron or east and north towards Georgian Bay. Groundwater levels indicate that most of the groundwater originates within the study area (S.V.C.A. et al. 2015)



For Southern Bruce County, groundwater flow follows a generally west to southwesterly flow path towards Lake Huron and north towards Georgian Bay. Most of the groundwater flow originates within the area and discharges to the south toward Maitland Valley Conservation Authority area (S.V.C.A. et al. 2015).

Currently, recharge values are estimated using a physical based approach that considers the geology, topography, land use, and land cover in each of the Source Protected Areas. Recharge values have also been further refined using a water budget approach and in the delineation of significant groundwater recharge areas (S.V.C.A. et al. 2015). Discharge areas are inferred using cold-water fisheries as they are indicative of areas where significant discharge from shallow overburden aquifers is occurring (S.V.C.A. et al. 2015).

Groundwater recharge and discharge areas are typically inferred and mapped based on detailed assessments such as those completed in support of the Source Water Protection Area studies.

### *Significant Groundwater Recharge Areas (S.G.R.A.)*

An important delineation of groundwater recharge areas is those that are relevant for drinking water. The Source Protection Plan defines a significant groundwater recharge area (S.G.R.A.) as an aquifer that is replenished through the infiltration of rainfall and snowmelt and the seepage from lakes, streams and wetlands (S.V.C.A. et al. 2015). A recharge area is considered **significant** when it helps to maintain the water level in an aquifer that supports a community with drinking water.

The Growth Plan defines a S.G.R.A. as follows:

- a) “an area that has been identified: as a significant groundwater recharge area by any public body for the purposes of implementing the P.P.S. 2020;
- b) as a significant groundwater recharge area in the assessment report required under the Water Act, 2006; or
- c) as an ecologically significant groundwater recharge area delineated in a subwatershed plan or equivalent in accordance with provincial guidelines.

For the purposes of this definition, ecologically significant groundwater recharge areas are areas of land that are responsible for replenishing groundwater systems that directly support sensitive areas like cold water streams and wetlands. (Greenbelt Plan)

### **Existing Conditions**

Within Bruce County, 4,602 SGRAs have been identified with a total surface area of 848 km<sup>2</sup>. The majority of these areas have been identified in the far southeastern portion of Bruce County due to suitable geological conditions. Many SGRA have already been mapped based on prior hydrogeological studies that define / delineate them; however, additional hydrogeological studies may be needed to identify / map new areas and/or to confirm recharge rates.



Significant groundwater recharge areas are most often identified and mapped through source protection studies, subwatershed studies, and hydrogeological investigations. Identification of SGRA areas informs development and/or site alternation with respect to maintaining recharge rates.

### *Water Table*

The water table refers to the upper surface or elevation of the saturated zone in an aquifer (i.e., the soil that is saturated with groundwater). This elevation or location of the water table can vary substantially over time and in spatial location.

### **Existing Conditions**

Within Bruce County, water table depth is known at Provincial Groundwater Monitoring Network well locations. There are approximately fourteen well locations, throughout the County, primarily in the southern portion of the County. Otherwise, water table depth is often inferred from geology, topography, land use, and land cover. Groundwater table elevations collected at monitoring wells are not typically projected across a larger geographic area unless the subsurface geology is known.

### *Aquifers and Unsaturated Zones*

An aquifer is the underground storage of groundwater within permeable rock or unconsolidated sediment. Water can be extracted from, or enter, an aquifer with relative ease. Unconfined aquifers are those in which surface water can enter directly. Confined aquifers located between impermeable layers of stone or sediment. Aquifers may exist at shallow depths close to watercourses or may be found at much greater depths. The unsaturated zone of an aquifer refers to the porous underground area that is above the water table. Saturated zones refer to the underground area in which water occupies all pores and fractures.

### **Existing Conditions**

Bruce County has bedrock aquifers underlying numerous overburden aquifers. Locally, these bedrock and overburden aquifers are important sources of drinking water and are essential for their contribution to surface water and recharge of the bedrock aquifers, discharge areas, seeps and springs. For the most part, overburden aquifers are unconfined and are generally much more susceptible to contamination from surface water than bedrock aquifers. Little information exists on the overburden aquifers. Highly Vulnerable Aquifers have been mapped in Bruce County, and other aquifers have been identified. Currently unsaturated zones have not been mapped or identified.

### *Highly Vulnerable Aquifers*

Both the Growth Plan (2019) and Greenbelt Plan (2017) define a highly vulnerable aquifer (H.V.A.) as: "aquifers, including lands above the aquifers, on which external sources have or are likely to have a significant adverse effect". H.V.A.s typically



consist of granular aquifer materials or fractured rock that have a high permeability, are exposed near the ground surface, and have a relatively shallow water table.

H.V.A.s are vulnerable especially when water is withdrawn for human use; H.V.A. areas are particularly susceptible to contamination as water moves from the surface into the groundwater.

### Existing Conditions

H.V.A.s are mapped within Bruce County; 188 areas have been identified spanning a total area of 1,590 km<sup>2</sup>. Mapping of H.V.A.s is relevant since the protection and potential land development activities are informed by policies intended to protect municipal groundwater used for municipal drinking water supply. Delineation of H.V.A.s has progressed through source water protection work and site-specific hydrogeological investigations.

### Water Quality

The P.P.S. (2020) suggests that quality of water “is measured by indicators associated with hydrologic function such as minimum base flow, depth to water table, aquifer pressure, oxygen levels, suspended solids, temperature, bacteria, nutrients and hazardous contaminants, and hydrologic regime.”

### Existing Conditions

Groundwater quality for Bruce County is discussed at length in each of the Source Protection Plans for the area including vulnerability of significant drinking water systems that use groundwater, vulnerability of significant groundwater recharge areas, and vulnerability of highly vulnerable aquifers. Notable for Bruce County, water quality for the overburden aquifers and karst is poorly understood (S.G.N.S.P.C., 2015a,b,c). As water quality can change seasonally and through time, regular updates are required to accurately reflect existing conditions. As such water quality is not commonly mapped.

## 3.2.3 Hydrologic Functions

As noted in Section 1.2, the intent of the W.R.S. is to provide long-term protection for the functions associated with Key Hydrologic Features and Key Hydrologic Areas:

“The functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water’s interaction with the environment including its relation to living things. (P.P.S., 2020)”

Elements that could be mapped to protect hydrological function include meander belts, floodplains, karst, and significant surface water contribution areas, discussed below.



### Meander belt

The meander belt of a watercourse refers to the area that a watercourse occupies now, or may be expected to occupy in the future, through its natural meander migration or development tendencies. The meander belt essentially defines the watercourse-associated ecological functions. Delineation of a meander belt is typically undertaken at a high level to support watershed planning and then refined during secondary site planning. Provincial guidance for the delineation of a meander belt is provided in M.N.R. (2002) and in T.R.C.A. (2004).

All watercourses, theoretically, have a meander belt. High level meander belt mapping along the drainage network of regulated watercourses is typically developed by conservation authorities.

#### Existing Conditions

Meander belt delineation has not currently been completed for Bruce County. Meander belts can be mapped for a drainage network or study area using GIS analyses, but requires focused assessment following the T.R.C.A. (2004) guidelines to inform delineation of erosion hazards and/or for land development purposes.

### Floodplain

The P.P.S. (2020) defines floodplains for all river, stream and small inland lake systems, as the area, usually lowlands adjoining a watercourse, which has been or may be subject to flooding hazards.

Also notable, the P.P.S. (2020) defines floodways: for *river, stream and small inland lake systems*, means the portion of the *floodplain* where *development and site alteration* would cause a danger to public health and safety or property damage. Where the one zone concept is applied, the *floodway* is the entire contiguous *floodplain*. Where the *two zone concept* is applied, the *floodway* is the contiguous inner portion of the *floodplain*, representing that area required for the safe passage of flood flow and/or that area where flood depths and/or velocities are considered to be such that they pose a potential threat to life and/or property damage.

#### Existing Conditions

Within Bruce County, 914 km<sup>2</sup> floodplains have been mapped at a high level surrounding most watercourses throughout Bruce County. Floodplains can be mapped but require hydrologic and hydraulic modeling. Regulatory floodplain mapping is typically completed by conservation authorities.

### Karst Features

Karst landscapes form due to the dissolution of soluble rocks such as limestone and dolomite. The resultant geology includes underground drainage systems such as sinkholes, caves, and rivers. The surface of karstic terrain is marked by dissolution features referred to as karren and is bare/rocky or supports a shallow overburden of



soil that could support unique ecological communities. Generalized mapping of karstic terrain is available from the Ontario Geological Survey and is typically refined based on site-specific observations. The Ontario Geological Survey classifies, and maps karst areas as known, inferred, or potential occurrence.

Karst features serve as links within the W.R.S. and between the W.R.S. and N.H.S.; identifying areas of probable karst may be undertaken as part of watershed or subwatershed planning stages. Confirmation of karst and defining implications for land development occurs at the master plan or site development level.

In addition to being a component of the W.R.S. and supporting hydrological functions and linkages, the P.P.S. (2020) mentions karst within the hazardous sites definition. See further discussion in **Section 3.2.4**.

### **Existing Conditions**

The Niagara Escarpment is an area of known karst and karstic features; its presence as a north-south landform feature through Bruce County indicate potential for Karst within this geographic region. Some existing Karst mapping is available for the northern portion of Bruce County, showing 948 karst areas with a total surface area of 106 km<sup>2</sup>. The known presence of these features and potential for other areas and features to occur, indicate that karst serves an important hydrologic function within Bruce County. Available karst mapping is not considered to be complete; it is anticipated that additional areas and karstic features may be identified through site-specific (or similar) studies.

### *Significant Surface Water Contribution Areas*

While significant surface water contribution areas are not directly noted in the P.P.S. 2020, significant surface water contribution areas are considered a component of key hydrologic areas that are necessary for the ecological and hydrologic integrity of a watershed (Greenbelt Plan, M.M.A.H., 2017a). These areas should be considered and further assessed during planning to determine whether they present constraints to development.

The Growth Plan (M.M.A.H. 2019) defines these areas as follows: "Areas, generally associated with headwater catchments, that contribute to baseflow volumes which are significant to the overall surface water flow volumes within a watershed. (Greenbelt Plan 2017)"

Significant surface water contribution areas may be identified and mapped through subwatershed studies, hydrogeological investigations, or topographic delineation. Generally, this feature represents headwater drainage catchments and are not typically mapped.





### 3.2.4 Natural Hazards

Hazards can be natural or human-made conditions that present risks to public health or safety or property damage. Section 3.0 of the P.P.S. (M.M.A.H., 2020) indicates that “development shall be directed away from areas of natural or human-made hazards where there is an unacceptable risk to public health or safety or of property damage, and not create new or aggravate existing hazards. Mitigating potential risk to public health or safety or of property damage from natural hazards, including the risks that may be associated with the impacts of a changing climate, will require the Province, planning authorities, and conservation authorities to work together”.

Policy 3.1.1 in the P.P.S. (M.M.A.H., 2020) clarifies that natural hazards include “lands adjacent to the shorelines of the Great Lakes and large inland lakes that are impacted by flooding hazards, erosion hazards and/or dynamic beach hazards; lands adjacent to river, stream and small inland lake systems which are impacted by flooding hazards and/or erosion hazards; and hazardous sites.”

The P.P.S. (2020) defines hazardous sites as “property or lands that could be unsafe for development and site alteration due to naturally occurring hazards. These may include unstable soils (sensitive marine clays [Leda], organic soils) or unstable bedrock (karst topography).

For planning purposes, development and site alteration are not permitted within the “dynamic beach hazard or areas that would be rendered inaccessible to people and vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards, unless it has been demonstrated that the site has safe access appropriate for the nature of the development and the natural hazard; and a floodway regardless of whether the area of inundation contains high points of land not subject to flooding.” Mapping of natural hazards is therefore relevant to land use planning, to protect public health and safety.

The following natural hazards are discussed below: flooding hazards including 100-year floodline, meander belt, wave uprush, and ice jam, ice piling; and erosion hazards / hazardous sites including stable slopes, Leda clay, organic soils, karst, shoreline hazards, and dynamic beach hazards

The Ministry of Natural Resources (M.N.R., 2001) provides technical guideline documents that define natural hazards and provide direction for hazard delineation.

#### *Rivers, Streams and Small Inland Lakes - Flood Hazards*

Within the P.P.S. (2020) flooding hazards, have been defined as... “ the inundation, under the conditions specified below, of areas adjacent to a shoreline or a river or stream system and not ordinarily covered by water.



b) along river, stream and small inland lake systems, the flooding hazard limit is the greater of:

1. the flood resulting from the rainfall actually experienced during a major storm such as the Hurricane Hazel storm (1954) or the Timmins storm (1961), transposed over a specific watershed and combined with the local conditions, where evidence suggests that the storm event could have potentially occurred over watersheds in the general area;
2. the one hundred year flood; and
3. a flood which is greater than 1 or 2 which was actually experienced in a particular watershed or portion thereof as a result of ice jams and which has been approved as the standard for that specific area by the Minister of Natural Resources and Forestry; except where the use of the one hundred year flood or the actually experienced event has been approved by the Minister of Natural Resources and Forestry as the standard for a specific watershed (where the past history of flooding supports the lowering of the standard).

The P.P.S. (2020) defines the one-hundred-year flood for river, stream and small inland lake systems, as that flood, based on an analysis of precipitation, snow melt, or a combination thereof, having a return period of 100 years on average, or having a 1% chance of occurring or being exceeded in any given year.

One-hundred-year flood level is also defined in the P.P.S. (2020):

- c) for large inland lakes, lake levels and wind setups that have a 1% chance of being equalled or exceeded in any given year, except that, where sufficient water level records do not exist, the one-hundred-year flood level is based on the highest known water level and wind setups.

According to M.N.R. (2001a) the one-hundred-year flood is the minimum design flood criteria standard in Ontario. Regional storm events which exceeded the 100-year design flood, such as Hurricane Hazel, are also used. The regulatory floodline is based on engineered study. Mapping of the regulatory floodline is typically undertaken by Conservation Authorities.

There is increasing discussion that planning for the 100-year flood / high water cycles may not be adequate in the context of climate change which is anticipated to bring larger and potentially more frequent storms.

### Existing Conditions

One-hundred-year flood elevations are not consistently identified for inland lakes and river systems in the County.



Within Bruce County, the Timmins Storm is used to inform flood limits north of Saugeen and Hurricane Hazel is used to inform flood limits for Saugeen and south.

### *Rivers Streams - Erosion Hazard - Meander Belt, Stable Slopes*

Erosion hazard is defined in the P.P.S. 2020 as the loss of land, due to human or natural processes, that poses a threat to life and property. The erosion hazard limit is determined using considerations that include the one-hundred-year erosion rate (the average annual rate of recession extended over a one hundred year time span), an allowance for slope stability, and an erosion/erosion access allowance.

#### Meander Belt

While meander belt is not directly noted in the P.P.S. 2020, meander belt is used to quantify the erosion hazard. Meander belt corridors within unconfined valley settings are sometimes estimated based on high level assessments as prescribed in MNRF (2002); actual meander belt erosion hazards require individual study/assessment and therefore are omitted from regulated mapping in many areas.

#### Stable Slopes

M.N.R., 2002, suggests that “the stable slope allowance is an important component of the erosion hazard limit for confined river and stream systems”.

Slope stability is governed by the interrelationships between a number of variables associated with surface and subsurface conditions. These include, but are not limited to, soil composition, slope steepness or incline, water content and movement through and over the slope, load or pressures on the slope, and the presence or proximity of flowing water.

The M.N.R. (2002) provides guidance for identifying the stable slope, based on proximity of a watercourse and a conservative stable slope. Some Conservation Authorities map the stable slope limits through high level GIS analyses. Site specific investigations are necessary to refine the stable slope allowance to inform land use planning.

#### Erosion Access Allowance

The erosion access allowance is generally defined as 6 m in guidance documents such as MNR (2002). This can be plotted as a buffer on high level mapping.

### *Shoreline Hazard*

Policy 3.1.1 in the P.P.S. (M.M.A.H., 2020) clarifies that natural hazards include “lands adjacent to the shorelines of the Great Lakes and large inland lakes that are impacted by flooding hazards, erosion hazards and/or dynamic beach hazards.



Shorelines are regulated according to the Conservation Authorities Act and through policies of the various Conservation Authorities (S.V.C.A. and G.S.C.A. in Bruce County). The regulated area is typically identified as 30 metres (98 feet) from the limits of the shoreline flood hazard. This regulated area should be considered when developing criteria for Shoreline Areas in addition to direction provided in watershed planning reports.

### Existing Conditions

Shoreline area is an important aspect of Bruce County due to the location adjacent to the Georgian Bay and Lake Huron. The shoreline hazard is identified as an elevation and associated setback and is typically identified through site specific topographic surveys as development is proposed.

#### *Shoreline - Flooding Hazard - Wave uprush / Ice Jam / Ice Pilling*

Within the P.P.S. (2020) flooding hazards, have been defined as... “the inundation, under the conditions specified below, of areas adjacent to a shoreline or a river or stream system and not ordinarily covered by water:

- a) along the shorelines of the Great Lakes - St. Lawrence River System and large inland lakes, the flooding hazard limit is based on the one-hundred-year flood level plus an allowance for wave uprush and other water-related hazards;

The one-hundred-year flood level is defined in the P.P.S. (2020):

- a) for the shorelines of the Great Lakes, the peak instantaneous stillwater level, resulting from combinations of mean monthly lake levels and wind setups, which has a 1% chance of being equalled or exceeded in any given year;
- c) for large inland lakes, lake levels and wind setups that have a 1% chance of being equalled or exceeded in any given year, except that, where sufficient water level records do not exist, the one-hundred-year flood level is based on the highest known water level and wind setups.

The P.P.S. (2020) defines wave uprush as “the rush of water up onto a shoreline or structure following the breaking of a wave; the limit of wave uprush is the point of furthest landward rush of water onto the shoreline.”

Along shorelines that are subject to wave action, winds can drive water farther inland, beyond the 100-year flood level limit. Planning authorities must add the area covered by wave uprush to the area covered by the 100-year flood. Along irregular shorelines, or where there are docks, protection structures or other structures, planners also have to take into account the effect of waves hitting vertical surfaces and sending spray inland. They also have to calculate the area affected when



particularly strong waves overtop breakwalls, bluffs or other shoreline structures that act as barriers. (M.N.R., 2002).

Also defined in the P.P.S. (2020): Other water-related hazards, which means water-associated phenomena other than flooding hazards and wave uprush which act on shorelines. This includes but is not limited to ice piling and ice jamming.

Planning authorities also must take into account other water related factors that can magnify flood destruction. They include these and other influences:

- Ice piling: Ice pushed up onto the shore can tear out banks and other natural protection, destroy buildings. In some cases, ice has piled up more than five metres high and pushed 45 metres inland.
- Ice jamming: The build-up of large chunks of ice where lakes flow into connecting channels and rivers flow into lakes can scour the shore, destroy buildings and threaten lives. The jamming can also block water flow and raise water levels, sometimes rapidly, causing flooding.
- According to MNR, 2002, the province suggests using the following allowances for wave uprush and other water related hazards - measured horizontally from the 100-year flood level.
  - Great Lakes-St. Lawrence River system (lakes Superior, Huron St. Clair and Ontario): 15 m,
  - Connecting channels: 5 m,
  - Large inland lakes: 5 m.

### Existing Conditions

One-hundred-year flood elevations have been identified for the Lake Huron and Georgian Bay shoreline but have not been consistently mapped within Bruce County. Locations are typically identified on properties through site-specific survey when development is proposed.

Shoreline flooding hazards apply from the authority's offshore boundary, to the one-hundred-year flood elevation, plus the allowance for wave uprush. The regulated shoreline area is the shoreline flooding hazard, plus an additional 15 m allowance (G.S.C.A., 2020). The shoreline of the Municipality of Northern Bruce Peninsula is not regulated by a Conservation Authority.

Shoreline flooding hazards may be mapped by the Conservation Authorities (G.S.C.A., 2020). Due to the amount of shoreline surrounding the County, these flood hazards may be important and should be reviewed to guide development along the shoreline.

### *Shoreline - Erosion Hazard*

Erosion hazard is defined in the P.P.S. 2020 as the loss of land, due to human or natural processes, that poses a threat to life and property. The erosion hazard limit is determined using considerations that include the one-hundred-year erosion rate (the



average annual rate of recession extended over a one hundred year time span), an allowance for slope stability, and an erosion/erosion access allowance.

Shorelines are regulated according to the Conservation Authorities Act and through policies of the various Conservation Authorities (S.V.C.A., G.S.C.A. and M.V.C.A. in Bruce County). Guidance with respect to delineating the shoreline erosion hazard is provided by Conservation Authorities. The regulated shoreline area is the shoreline erosion hazard plus an additional 15 m allowance.

### Existing Conditions

Within Bruce County shoreline erosion processes are quite active in some areas such as along Lake Huron during high lake levels and/or during strong winds. In many areas, active erosion and shoreline processes may be limited by bedrock shoreline and offshore rock outcrops. The 100-year instantaneous flood elevation for Lake Huron and Georgian Bay have been identified by O.M.N.R. (O.M.N.R. 1989). The shoreline erosion hazard may be mapped by the Conservation Authorities (G.S.C.A., 2020).

#### *Shoreline - Dynamic Beach Hazards*

The P.P.S. (2020) refers to the dynamic beach hazard as “areas of inherently unstable accumulations of shoreline sediments along the *Great Lakes - St. Lawrence River System* and *large inland lakes*, as identified by provincial standards, as amended from time to time.”

The M.N.R. (2001) states “The dynamic beach hazard limit is the combined flooding hazard limit, (the 100-year flood level plus an allowance for wave uprush and other water related hazards), plus the dynamic beach allowance of 30 metres on the Great Lakes- St. Lawrence River system (or 15 metres on large inland lakes).” If the dynamic beach is subject to erosion or is receding, the flooding hazard limit is added to the horizontal distance representing 100 times the average annual recession rate, plus dynamic beach allowance of 30 metres on the Great Lakes-St. Lawrence River system or 15 metres on large inland lakes.

Because a dynamic beach moves, and because the elevation of any point along a beach changes in time, it is not possible to define the hazard limit of a dynamic beach in terms of a single elevation as would be possible for a stable shoreline. Delineation of the dynamic beach hazard requires detailed study and assessment. Therefore, dynamic beach hazards are only mapped where relevant assessments have been undertaken; these typically are initiated in areas of proposed shoreline development. Once delineated, they should be included on mapping to guide land use planning.

Dynamic beaches within Bruce County include areas of globally rare Great Lakes coastal dune habitats / systems which host many rare flora and fauna (e.g., Inverhuron, Saugeen Shores, Sauble Beach, Singing Sands). The dynamic nature of



these areas is affected by numerous processes (e.g., natural erosion and deposition and long-shore waves) critical to their form and function. These areas also face pressure from recreational use (e.g., beach users).

### Existing Conditions

Mapping of dynamic beach hazards in Bruce County is limited. Currently, 12 km of dynamic beach hazard has been mapped around the Point Clark and Lurgan Beach areas within Bruce County. Other dynamic beach hazard locations may be mapped by the Conservation Authorities (G.S.C.A., 2020).

#### *Hazardous Sites - Unstable Soils - Leda Clay*

Sensitive marine clays were deposited as sediment during the Pleistocene-area in the Champlain Sea. Undisturbed clays can appear to be stable, but when disturbed by excessive vibration, shock or saturation with water can turn to liquid. Leda clay failures have the 2<sup>nd</sup> highest rate of slope failures in Canada and Leda clays dominate substantial portions of southeastern Ontario (M.N.R., 2002).

Conservation Authorities have extensive Leda clay deposits in their watershed and have mapped many of the areas where they occur. Planning authorities should be concerned about sensitive marine clay areas everywhere, not just along rivers and streams.

### Existing Conditions

Currently, Leda Clay has not been identified in Bruce County. However, information on sensitive marine clays is available on maps from the Geological Survey of Canada, or information from conservation authorities.

#### *Hazardous Sites - Unstable Soils - Organic Soils*

Organic and peat soils are formed by humification, the decomposition of vegetative and organic materials into humus. This rotting process can release various humic acids to the ground water system and create methane gas. Peat soils are the most common organic soil type. An estimated 25% of Ontario's landscape is covered with peat soils. The problem with peat soils and other organic soils is they lack structure, erode easily and compress so much that they usually cannot support structures (M.N.R., 2002).

### Existing Conditions

Currently, organic soils have not been identified within Bruce County. However, information about organic soils can be found on maps available at the Ministry of Northern Development and Mines or the Geologic Survey of Canada.



### *Hazardous Sites - Unstable Bedrock - Karst*

As noted in Section 3.2.3 above, karst may form in areas where water flows over and through limestone and dolomite bedrock deposits (soluble rock formations), such as the Niagara Escarpment. Areas of karst formation are considered natural hazards due to the potential presence of undetected sinkholes, trenches, and caverns which may become unstable over time due to natural processes or exacerbated by anthropogenic activities. Human activities can disrupt the flow and movement of water through karst systems, altering the movement of water through these systems (e.g., fracturing rock altering sub-surface flows).

#### **Existing Conditions**

Areas of mapped karst in Bruce County are discussed in Section 3.2.3; not all features are readily mapped, and additional areas of karst and karstic features may be identified through site-specific (or comparable) studies at future planning stages. As much of the geology of Northern Bruce County is associated with soluble rock formations, potential for karst across the area should be considered through site-specific planning.

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## 4.0 Options for the Natural Heritage System

This section reviews components of the N.H.S. and two approaches to identifying a N.H.S.: A Features-based approach and a Core Areas-based approach and recommends areas of application based on the Bruce County landscape.

It then presents three options for the N.H.S. which consider:

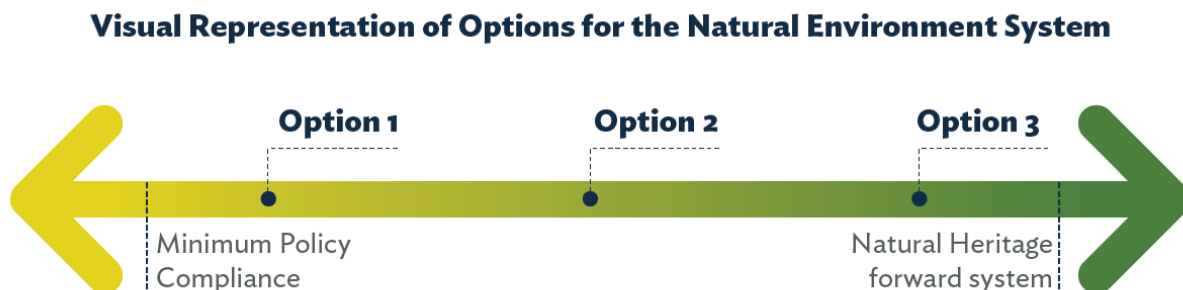
- Provincial policies and requirements
- Provincial and other Guidance Documents
- Targets for the N.H.S. (per the Targets Discussion Paper)
- Landscape analyses (see Section 3)
- Guidance and input received through engagement and advisory groups (e.g., for target species: Black Bear, Massasauga Rattlesnake)
- Existing precedents or jurisdictional examples

These options present distinct scenarios and illustrate a range of possible system outcomes. The recommended system may include elements from multiple options or select a position between options to best fit the needs and most appropriate direction for Bruce County.

A brief description of the options is provided below. Detailed criteria and components of each option is presented Sections 5.2 through 5.13.

- **Option 1** presents a basic system that is consistent with the P.P.S and has been informed by analyses of cover in Bruce County.
- **Option 2** builds on Option 1, with additional Supporting Features and Areas and criteria for features that identifies a greater proportion of them as Key Features for the System.
- **Option 3** builds on Options 1 and 2 to illustrate a ‘natural heritage forward’ system. Criteria for this option include a greater proportion of features as Key Features and/or include additional Supporting Features and Areas.

Figure 4-1: Visual representation of Options



A brief introduction for each system component is followed by a table detailing the criteria for each Option. Per recommendations made in Section 3, specific criteria are



provided for Northern Bruce County and Southern Bruce County, where appropriate. Criteria for each option have been prepared based on policy direction and informed by N.H.S. targets for Bruce County and landscape analyses. Supporting rationale is provided in Appendix 2.

Where policy and guidance documents provide flexibility, inclusion of feature types within both Key and Supporting Feature types has been considered to provide clear direction for policies and implementation.

None of the options limit existing agricultural uses or normal farm practices. Recommendations for the N.H.S. are focused on maintaining existing form and function in concert with other important land-based needs. Implementation of the N.H.S. occurs through policy. Policy is generally triggered through a proposed change, such as a change in land use (e.g., from rural to settlement uses).

## 4.1 Components

All natural heritage features contribute to the health and resilience of the natural environment in Bruce County. Some natural features and areas are considered essential for their support of natural processes which maintain biological and geological diversity, natural functions, viable populations of native species, and ecosystems. Other features and areas contribute or have the potential to contribute to the health and resilience of the system. In recognition of this, two feature categories have been identified for the N.H.S:

- Key Features and Areas
- Supporting Features and Areas

These two categories generally follow the P.P.S. (2020) and Niagara Escarpment Plan (2017) policies for ‘required’ and ‘optional’ features (see Table 1-1 in Section 1.2.2.). ‘Required’ features are generally included as ‘Key Features and Areas’ and ‘optional’ features are generally identified as ‘Supporting Features and Areas’. Linkages and enhancement areas are stand-alone categories. For Bruce County, features are categorized as follows:

**Key Features and Areas** include features identified as ‘significant’ by the province (e.g., P.S.W., A.N.S.I.s) or by the County (e.g., Significant Woodlands). Some features which are not *significant* in accordance with the P.P.S may be identified as Key Features to meet targets or objectives set out by the County. Identification of Key Features is accomplished through the application of consistent criteria (**Section 4.0**). Key Features and Areas for Bruce County include:

- Provincially Significant Wetlands (P.S.W.) (including Significant Coastal Wetlands)
- Other wetlands based on County-specific criteria
- Fish Habitat
- Significant Woodlands
- Significant Valleylands
- Habitat for Endangered and Threatened Species



- Significant Wildlife Habitat (S.W.H)
- Alvars (S.W.H.)
- A.N.S.I
- The following Conservation Oriented Lands:
  - Federal and Provincial Parks
  - Land Trust Lands within Conservation Land Tax Incentive Program (C.L.T.I.P.)
  - Conservation Authority Lands within C.L.T.I.P.
  - County Forest areas that are identified as ‘high conservation value’ (H.C.V.)

**Supporting Features and Areas** either do not meet the threshold for identification as Key Features or are other lands which provide a supportive function that should be recognized.

- The following Conservation Oriented Lands (subset that are not ‘Key Features’):
  - Land Trust Lands not within C.L.T.I.P.
  - Conservation Authority Lands not within C.L.T.I.P.
  - County Forests that are not identified as H.C.V.
- Other Natural Heritage Features:
  - Other Wetlands
  - Other Woodlands
  - Other Valleylands
- Working landscapes that enable ecological functions to continue.

**Linkages** are a distinct component of the N.H.S. They represent a function on the landscape and as such may or may not align with existing features or conditions. Policies for linkages should reflect that they are implemented ‘on the ground’ through voluntary action or when land use changes significantly (requiring a planning application).

**Enhancement Areas** include lands that have been restored or have the potential to be restored to a natural state. They represent opportunities to enhance the N.H.S. to support a biodiverse and resilient system for the long-term. Similar to linkages, these represent a potential function or feature and as such, policies for enhancement areas should reflect that they are implemented through voluntary action or when land use changes significantly (requiring a planning application).

#### 4.1.1 Approaches to Identification and Mapping

Two approaches to N.H.S. identification and mapping are:

1. **A Feature-Based System** uses features on the landscape to define the ‘edges’ of the system. These are then connected through linkages and improved through identification of enhancement areas.
2. **A Core Areas-Based System** selects a sub-set of features on the landscape to define the ‘edges’ of the system. These are then connected through linkages. Enhancements are not mapped but are incorporated into the system.



Both are defensible approaches which have been applied elsewhere in the Province, and must meet or exceed the minimum requirements for protection of significant features in accordance with the P.P.S. and N.E.P. (where applicable). Both represent a ‘systems-based approach’ to natural heritage planning. Assessment of a feature’s significance, potential impacts to a feature, etc. are done in consideration of the **feature as a whole** and in the context of the **system**, not at the property level. For example, if a woodland or wetland extends across multiple properties, the entirety of the feature and its role within the broader system is assessed to inform planning decisions. These approaches are discussed and illustrated below.

### *Features-Based System Approach*

**This approach is recommended for Southern Bruce County to reflect the landscape context in this area.**

The Features-based approach uses Key and Supporting features and areas, enhancement areas and linkages as the building blocks for the N.H.S.

System-level planning and supporting analyses are used to inform features of the system. Features and areas included in the N.H.S. must meet or exceed provincial policies.

Criteria for these system components are developed using direction from provincial guidance documents, local conditions, and municipal interests to inform the identification of Key and Supporting Features, linkages and enhancement areas. Linkages are defined at one or more scales (e.g., landscape, local) to support the long-term function and connectivity of the system. Criteria for enhancements are generally used to identify discrete areas that will benefit the system through restoration.

This approach is most used in areas of lower natural cover and/or where natural features are more fragmented across the landscape (e.g., southwestern Ontario).

### *Core Areas-Based System Approach*

**This approach is recommended for Northern Bruce County to reflect the landscape context in this area.**

In this approach, Core Areas are the building blocks of the N.H.S. They are connected by linkages to ensure a connected system that will function in the long-term. Core Areas are intended to capture areas of the landscape where Key Features and Areas are concentrated or to capture representative or significant portions of natural areas where there is a largely intact natural landscape. Key and Supporting Features and Areas are identified in a manner consistent with the Features-Delineated Approach, however they may reside both within and outside of these Core Areas. Settlement Areas are excluded from Core Areas.

A set of criteria or considerations is used to select Core Areas, and may include:

- A minimum natural cover (e.g. at least 75% of Core Area must be natural cover);



- Critical habitat needs for keystone species (e.g. total area, habitat matrix);
- Land ownership;
- All or a specified proportion of a feature type (e.g. of A.N.S.I.s, or Alvars);
- A minimum or cumulative Core Area size to support a resilient, self-sustaining ecosystem and/or informed by species range requirements, where appropriate.
- Shape (to support interior habitat functions);
- Habitat and species diversity;
- Presence of features identified as Significant (e.g., A.N.S.I.s)
- Presence of rare habitats and rare species (e.g., Alvars);
- Presence of and requirements for critical habitat functions of keystone species (e.g., Black Bears, Massasauga Rattlesnake);
- Presence of sensitive natural communities; and / or
- Presence of natural communities not well represented in the landscape (O.M.N.R. 2010)

A Core Area does not need to include everything in this list; but areas that include more of these items have a higher relative value for inclusion in a Core Area than areas with fewer items. The first two criteria: percent natural cover and core area size are primary factors used to differentiate between the three Options for the N.H.S. The rationale for these criteria is discussed in more detail in **Appendix 2**.

Linkages are defined to connect Core Areas and ensure their continued connectivity on the landscape for the long-term.

Enhancement areas and opportunities are identified similarly to the Features-Delineated Approach. Broader objectives of supporting a permeable landscape within Core Areas are supported through policies applicable to lands within the Core Areas.

The Core Areas approach is best applied where there is substantial natural cover on the landscape, or where an N.H.S is being defined for a very broad geographic scale. It allows municipalities to differentiate policy or other implementation tools within and outside of these areas, providing additional flexibility for protection of natural heritage balanced with other objectives and needs (e.g., growth and development).

Existing land uses are not affected by inclusion within a Core Area. Core Areas policies encourage landowners to continue to protect and manage these lands in an environmentally sustainable manner, including for farming and recreational purposes.

Development and site alteration are not prohibited within Core Areas, however policies or criteria may be applied to ensure activities align with the objectives of the system - i.e., to maintain landscape permeability and feature function, and where possible to enhance the system.

Policies applicable to lands within Core Areas will apply to proposed changes in land use and would apply to Northern Bruce County only.

For all options, each Core Area would:

- a) Be comprised of, at a minimum, 75% Key Features and Supporting Features



- b) Exclude Settlement Areas
- c) Be a minimum size of 1,000 ha

Option 1	Option 2	Option 3
Identify at least 30% of Northern Bruce County as Core Area(s).	Identify at least 40% of Northern Bruce County as Core Area(s).	Identify at least 50% of Northern Bruce County as Core Area(s).

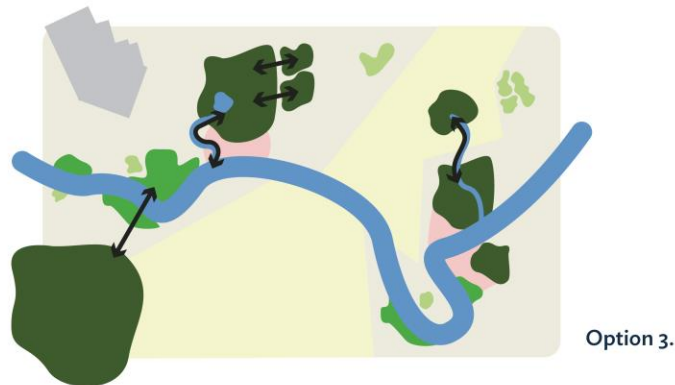
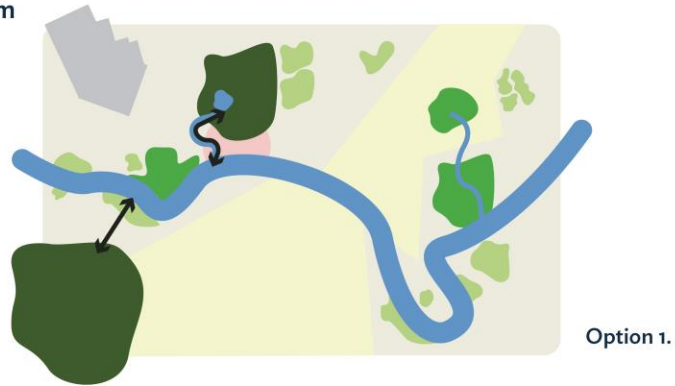
*N.H.S. Approach and Option Illustrations*

These illustrations are conceptual visualization purposes. They do not represent any specific area within Bruce County and are not reflective of a spatial application of criteria presented in the sections below. They are intended to illustrate the general concepts of the approaches - Core-Areas Based and Features-Based Systems, and incremental differences between the Options.

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Figure 4-1: : Conceptual Illustration of Feature Based System Approach Options

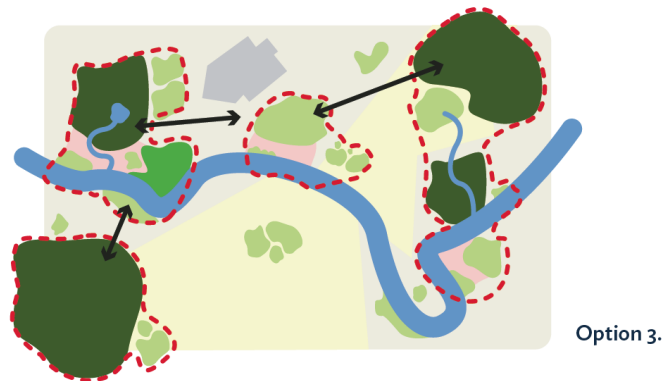
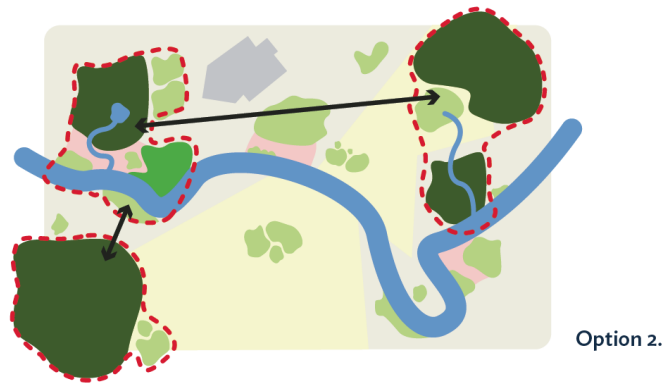
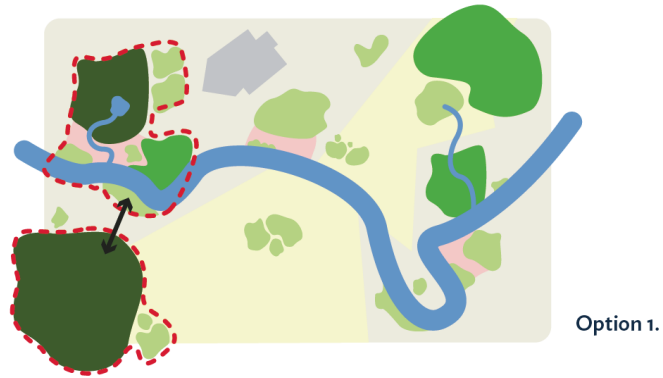
Feature Based System



Natural Feature	Watercourse / Fish Habitat	Enhancement Area
Supporting Feature of the NHS	Agricultural Land	Urban Area
Key Feature of the NHS	Rural Land	Linkages

Figure 4-2: Conceptual Illustration of Core Area System Approach Options

Core Area System







## 4.2 Wetlands

Wetlands are important components of the N.H.S. and the W.R.S. They support hydrologic functions and a diverse range of plant and animal species (biodiversity) and ecological habitat functions. Wetlands are also important resources and areas to the S.O.N. and Métis communities both spiritually and as sources of foods, materials and medicines.

While these features will be a mapped component of the N.H.S., limits of features and presence on the landscape (e.g., identification of currently unmapped features and vice versa) is to be confirmed as more detailed information is available (e.g., through detailed or site-specific study, when required). Wetlands are considered part of the N.H.S. in accordance with the selected direction regardless of mapped status.

**Recommendation: Include wetlands as Key and Supporting Features of the N.H.S.**

### 4.2.1 Key Features

Provincially Significant Wetlands (P.S.W) are a required component of the N.H.S. There is flexibility regarding inclusion of non-P.S.W. wetlands as “Key Features” to support system targets and achieve the vision for Bruce County’s Natural Legacy. Criteria are consistent for both Northern Bruce County and Southern Bruce County.

Option 1	Option 2	Option 3
All P.S.W (including significant Coastal Wetlands)	All P.S.W (including significant Coastal Wetlands); and All ‘unevaluated’ and ‘evaluated, non-P.S.W wetlands >4ha	All P.S.W (including significant Coastal Wetlands); and All ‘unevaluated’ and ‘evaluated, non-P.S.W wetlands >2ha

### 4.2.2 Supporting Features

Criteria are consistent for both Northern Bruce County and Southern Bruce County. Options for supporting feature wetlands are largely consistent across the options for most of the County. Differences in options are included for small wetlands which occur in association with linkages. Retaining small features through linkages provides important ‘stepping stone’ habitat and refuge for animals moving across the landscape. Supporting features would include wetlands as per the table below:



Option 1	Option 2	Option 3
<p>All ‘unevaluated’ or ‘evaluated, not significant’ wetlands &gt;4 ha and not identified as Key Feature(s).</p> <p>All ‘unevaluated’ or ‘evaluated, not significant’ wetlands &gt;1 ha and not identified as Key Feature(s) and which occurs wholly or partially within a linkage.</p>	<p>All ‘unevaluated’ or ‘evaluated, not significant’ wetlands &gt;2 ha and not identified as Key Feature(s).</p> <p>All ‘unevaluated’ or ‘evaluated, not significant’ wetlands &gt;0.5 ha and not identified as Key Feature(s) and which occurs wholly or partially within a linkage.</p>	<p>All ‘unevaluated’ or ‘evaluated, not significant’ wetlands &gt;1ha and not identified a Key Feature(s).</p> <p>All ‘unevaluated’ or ‘evaluated, not significant’ wetlands of any size and not identified as Key Feature(s) and which occurs wholly or partially within a linkage.</p>

### 4.3 Woodlands

Woodlands provide a broad range of ecological services including biodiversity support, habitat functions, carbon sequestration, oxygen production, nutrient cycling, etc. They also support important human activities including economic and recreational opportunities.

**Recommendation: Include Significant Woodlands as ‘Key Features’ and other woodlands as ‘Supporting Features’ of the N.H.S.**

#### 4.3.1 Key Features

Significant Woodlands must be included in an N.H.S. There is some flexibility in the criteria for identifying Significant Woodlands. Criteria must meet or exceed provincial guidance to support system targets and the vision for Bruce County’s Natural Legacy.

Criteria for identifying Significant Woodlands are distinct for Northern Bruce County and Southern Bruce County and are proposed as follows:



### Northern Bruce County

Option 1	Option 2	Option 3
<p>Woodland(s) which have:</p> <ul style="list-style-type: none"> <li>• An average minimum width of 40 m; and</li> <li>• A minimum area of <b>150 ha</b>; or</li> <li>• At least <b>20 ha</b> of interior habitat (&gt;100 m from edge); or</li> <li>• At least <b>10 ha</b> of deep interior habitat (&gt;200 m from edge).</li> </ul>	<p>Woodland(s) which have:</p> <ul style="list-style-type: none"> <li>• An average minimum width of 40 m; and</li> <li>• A minimum area of <b>100 ha</b>; or</li> <li>• At least <b>15 ha</b> of interior habitat (&gt;100 m from edge); or</li> <li>• <b>Any</b> deep interior habitat (&gt;200 m from edge).</li> </ul>	<p>Woodland(s) which have:</p> <ul style="list-style-type: none"> <li>• An average minimum width of 40 m; and</li> <li>• A minimum area of <b>50 ha</b>; or</li> <li>• At least <b>10 ha</b> of interior habitat (&gt;100 m from edge); or</li> <li>• <b>Any</b> deep interior habitat (&gt;200 m from edge).</li> </ul>

### Southern Bruce County

Option 1	Option 2	Option 3
<p>Woodland(s) which have:</p> <ul style="list-style-type: none"> <li>• An average minimum width of 40 m; and</li> <li>• A minimum area of <b>20 ha</b>; or</li> <li>• At least <b>8 ha</b> of interior habitat (&gt;100 m from edge)</li> </ul> <p>A woodland &gt;<b>2 ha</b>, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.</p>	<p>Woodland(s) which have:</p> <ul style="list-style-type: none"> <li>• An average minimum width of 40 m; and</li> <li>• A minimum area of <b>20 ha</b>; or</li> <li>• <b>Any</b> interior habitat (&gt;100 m from edge)</li> </ul> <p>A woodland &gt;<b>1 ha</b>, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.</p>	<p>Woodland(s) which have:</p> <ul style="list-style-type: none"> <li>• An average minimum width of 40 m; and</li> <li>• A minimum area of <b>4 ha</b>; or</li> <li>• <b>Any</b> interior habitat (&gt;100 m from edge)</li> </ul> <p>A woodland &gt;<b>0.5 ha</b>, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.</p>



### 4.3.2 Supporting Features

Including ‘other’ woodlands as supporting features of the N.H.S. is not required by provincial policy. They have been included in the N.H.S options to support the woodland target, while providing flexibility for land use planning and management.

Options for supporting feature woodlands are largely consistent across the options for most of northern and southern Bruce County. Differences in options are included for small woodlands which occur in association with linkages. Retaining small features through linkages provides important ‘stepping stone’ habitat and refuge for animals moving across the landscape.

#### Northern Bruce County

Option 1	Option 2	Option 3
All woodlands >4ha that do not meet criteria as Significant Woodlands.	All woodlands >4ha that do not meet criteria as Significant Woodlands.	All woodlands >4ha that do not meet criteria as Significant Woodlands.
A woodland >2 ha, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.	A woodland >1 ha, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.	A woodland >0.5 ha, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.

#### Southern Bruce County

Option 1	Option 2	Option 3
All woodlands >2ha that do not meet criteria as Significant Woodlands.	All woodlands >2ha that do not meet criteria as Significant Woodlands.	Same as Option 2.
A woodland >1 ha, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.	A woodland >0.5 ha, not identified as Key Feature(s), and which occurs wholly or partially within a linkage.	



## 4.4 Valleylands

Valleylands are generally associated with current or historic flow of water. Their slopes may intersect various surficial geology or bedrock layers, resulting in contact of groundwater with the surface (e.g., seeps and springs). Valleys are often natural movement corridors for wildlife, providing movement and transfer of materials and species. As landforms, they may constrain land uses and so often contain natural features (e.g., woodlands, wetlands). Valleylands are also important for the W.R.S, supporting water quality and quantity (vegetated valleys) and supporting natural flood attenuation and flow (e.g., a naturally valley form with a meandering stream).

**Recommendation: Include Significant Valleylands in the N.H.S as Key Feature(s) and consider including ‘other’ valleylands as Supporting Features.**

### 4.4.1 Key Features

Significant Valleylands are a required component of an N.H.S. Criteria are to be developed that meet or exceeds provincial guidance. Criteria for identifying Significant Valleylands are **the same for all options and for both Northern and Southern Bruce County.**

A Significant Valleyland:

- Is a valley, spillway<sup>4</sup> or ravine with defined valley morphology; and
- Contains flowing or standing water for a period of no less than two months in an average year; and
- Meets one or more of the following requirements:
  - a) Has a drainage area >50 ha;
  - b) Has an average width of 25m or more, as defined from the point of valley formation downstream to the confluence of the valley being assessed; or
  - c) Supports or contains at least one of the following:
    - i) Active or historic erosion or deposition;
    - ii) Riparian or floodplain wetlands;
    - iii) Areas of groundwater release (seepage, springs, groundwater supported wetlands);

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<sup>4</sup> defined as well defined channels created by the concentrated flow of large volumes of water associated with glacial action



- iv) Distinctive landform(s) - processes, features, quality or rarity (e.g. oxbows, bottomlands, terraces, deltas, exposed soil strata or eroding slopes along riverbanks or valley walls);
- d) >25% natural cover in the valleyland;
- e) Riparian vegetation >30m wide on each side of a surface water feature

#### 4.4.2 Supporting Features

Other valleylands are not required to be included in an N.H.S. As they often represent a physical constraint and have potential functional benefits to both the N.H.S. and the W.R.S, options for including other valleylands as supporting features are presented:

Options are consistent across Northern and Southern Bruce County.

Option 1	Option 2	Option 3
Other valleylands are not included as Supporting Features.	‘Supporting Feature’ valleyland(s) include: Valleys, spillways or ravine with defined valley morphology that contain flowing or standing water for a period of no less than two months in an average year but do not meet the additional criteria for ‘significant’ valleylands.	Same as Option 2.



## 4.5 Significant Wildlife Habitat

**Wildlife habitat** includes any area which is used by wildlife (wild mammals, birds, reptiles, amphibians, fish, invertebrates, etc.) to carry out their life processes. These areas are needed for wildlife to find adequate food, shelter and space to sustain their populations.

**Significant Wildlife Habitat (S.W.H)** is “ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system” (P.P.S. 2020).

Significant Wildlife Habitat (S.W.H) must be included in the N.H.S. Criteria for identifying S.W.H is recommended by the Province in the **Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E**. This document provides geographically based considerations for what should be considered significant wildlife habitat in accordance the P.P.S. 2020.

**Recommendation: Include all Significant Wildlife Habitat (S.W.H) as a Key Feature(s) of the N.H.S.**

### 4.5.1 Key Features

**Consistent across all Options and for both Northern and Southern Bruce County, all areas of confirmed S.W.H. are identified as Key Features as follows:**

#### Options 1, 2, & 3

Identify S.W.H. in accordance with the S.W.H. Criteria schedules for Ecoregion 6E (M.N.R.F., January 2015) and / or the appropriate provincial guidance document(s) as may be developed or amended from time to time.

Where disagreements arise with respect to interpretation of S.W.H., the County may confer with M.E.C.P., however the County’s interpretation prevails if it provides equal or greater protection for S.W.H.

Special note should be made regarding **Mast Producing Areas**. Per the Ecoregion Criteria Schedule: “The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bears”. Habitat needs for bears have also informed sizing of Core Areas for Northern Bruce County (**Appendix 2**).



## 4.6 Alvars

Alvars are an extremely rare biological community which can occur on calcareous bedrock pavements or where there is thin layer of soil over calcareous bedrocks. Alvars support a range of habitat functions and provide habitat for a diverse range of plant and animal species. Many of the plant species which occur in alvars are unique to these habitat types and are rare due. Similarly, wildlife species who utilize these are include many rare or uncommon species. Bruce County contains a large proportion of the alvars present in Ontario. Protection of these habitats within the County is important for this habitat type at the provincial, federal and global scale.

Some alvars are captured under Significant Wildlife Habitat, however because of their extreme rarity and the role Bruce County can play in the protection of these areas, they are identified as an independent feature type to ensure they are preserved and protected in the long-term.

**Recommendation: Include all alvars as Key Features within the N.H.S.**

### 4.6.1 Key Features

Same for all Options for both Northern and Southern Bruce County:

Options 1, 2, & 3

All alvars are identified as Key Features.





## 4.7 Fish Habitat

Fish habitat is a required component of the N.H.S and is identified in accordance with the definition under the Fisheries Act where “**Fish habitat means** water frequented by fish and any other areas on which **fish** depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas”.

Where no, or insufficient habitat mapping is available, Fish Habitat is identified as:

- Any permanent or intermittent watercourse or waterbody excluding constructed and actively managed offline ponds (e.g. stormwater ponds, active farm irrigation ponds); or
- Ephemeral watercourses or Headwater Drainage Features that provide contributions in terms of baseflow, material (e.g. substrates) or allochthonous inputs that are important to the maintenance of downstream fish habitat.
- Shoreline features that provide contributions in terms of material (e.g. substrates) or allochthonous inputs that are important to the maintenance of fish habitat in Lake Huron and Georgian Bay.

Where mapping of fish habitat has been done through proxy, classification as fish habitat can be removed where it has been demonstrated, to the satisfaction of the approval authority, that the feature does is not fish habitat as defined under the Fisheries Act.

**Recommendation: Include all fish habitat as a Key Feature(s) within the N.H.S.**

### 4.7.1 Key Feature

Same for all Options for both Northern and Southern Bruce County:

Options 1, 2, & 3

All fish habitat included as a Key Feature(s) within the N.H.S.



## 4.8 Habitat for Endangered and Threatened Species

Habitat for Endangered and Threatened Species is a required component of the N.H.S. Habitat for Endangered and Threatened Species is identified in accordance with **General Habitat Descriptions**, **Habitat Regulations**, or identified by the regulating provincial ministry. The Ministry of Environment, Conservation and Parks is the regulating ministry at the time of report preparation.

Criteria for Habitat for Endangered and Threatened Species are:

- Mapped or defined habitat for Endangered and Threatened Species prepared by the Province;
- Mapped or defined habitat prepared through approved studies (e.g., subwatershed study, Environmental Impact Study, etc.) or other comparable processes and accepted by the Province.

**Recommendation: Include Habitat for Endangered and Threatened Species as a Key Feature(s) within the N.H.S (un-mapped).**

### 4.8.1 Key Feature

Same for all Options for both Northern and Southern Bruce County:

#### Options 1, 2, & 3

Habitat for Endangered and Threatened Species included as a Key (though typically unmapped) Feature(s) within the N.H.S.



## 4.9 Areas of Natural or Scientific Interest

Inclusion of Provincially Significant A.N.S.I's (both Life Science and Earth Science) in the N.H.S. is required. Inclusion of Regionally Significant A.N.S.I's is optional.

**Recommendation: Include provincial A.N.S.I's as Key Features of the N.H.S. and Regional A.N.S.I's as Supporting Features or as Key Features of the N.H.S.**

Candidate A.N.S.I.s (Life or Earth Science) are not recommended to be included within the County's N.H.S. Should these features become confirmed A.N.S.I.s, they are to be added to the N.H.S., as appropriate.

### 4.9.1 Key Features

**Consistent across Northern and Southern Bruce County.** Options for A.N.S.I's as Key Features within the N.H.S for Bruce County are outlined below.

Option 1	Option 2	Option 3
All Provincially Significant Life Science and Earth Science A.N.S.I.	All Provincially Significant Life Science and Earth Science A.N.S.I.	All Provincially and Regionally Significant Life Science and Earth Science A.N.S.I.

### 4.9.2 Supporting Features

**Consistent across Northern and Southern Bruce County.** Options for A.N.S.I's as Supporting Features within the N.H.S for Bruce County are outlined below.

Option 1	Option 2	Option 3
N/A - Regionally Significant A.N.S.I's are not included in the N.H.S.	All Regionally Significant Life Science and Earth Science A.N.S.I.	N/A - Regionally Significant A.N.S.I's are included as Key Features.



## 4.10 Conservation Oriented Lands

Conservation-Oriented Lands are an optional component of the N.H.S and can include a range of land types from National and Provincial Parks through to Land Trust Lands or managed forests. As the management goals or operational practices for these lands support natural heritage features and functions these lands are an important component of the N.H.S. for Bruce County.

**Recommendation: Include Conservation Oriented Lands as Key Features and Supporting Features using ownership, registered management practice(s), and/or anticipated long-term management criteria.**

### 4.10.1 Key Features

Consistent across all Options and for both Northern and Southern Bruce County, Conservation-Oriented Lands recommended for inclusion as Key Features include:

Options 1, 2, & 3
County forest areas identified as ‘high conservation value’ (H.C.V.); Conservation Areas and Conservation Authority Owned Lands within the Conservation Land Tax Incentive Program (C.L.T.I.P); Wildlife Areas & Ecological Preserves / Reserves; Land Owned and Managed by Conservation Land Trusts within C.L.T.I.P; and Federal and Provincial Parks.

### 4.10.2 Supporting Features

Consistent for both Northern and Southern Bruce County, options for including Conservation-Oriented Lands as Supporting Features include:

Option 1	Option 2	Option 3
N/A Additional Conservation Oriented Lands are not included in the N.H.S.	Conservation Areas and Conservation Authority Owned Lands not within C.L.T.I.P.; County forest areas not identified as H.C.V; and Land Owned and Managed by Conservation Land Trusts not within C.L.T.I.P.	Areas identified in Option 2; and Other Privately owned lands within C.L.T.I.P. managed to support objectives and overall form and function of the N.H.S.



## 4.11 Areas That Support Hydrologic Function

Areas that Support Hydrologic Function are optional components of an N.H.S. Through the identification of a Water Resource System (W.R.S.), water quality and water quantity are addressed at the landscape scale. However, some areas where direction relationship and benefits occur between the W.R.S. and the N.H.S. occur may warrant inclusion within the N.H.S.

Shorelines are the interface between terrestrial and aquatic environments, allowing for interactions between them. Naturalized shorelines are important for water quality, and offer direct, indirect and contributing habitat for a range of terrestrial and aquatic biota. Shorelines can provide specialized habitat and important foraging opportunities. Opportunities to return shorelines to a natural state are identified in section 4.13 (Enhancement Areas).

**Recommendation:** That shorelines, outside of built-up areas and within 30m of the high water mark or as identified through a watershed, subwatershed or site-specific study, be included in the N.H.S as Supporting Features.

**Recommendation:** That shorelines be given specific consideration as opportunities for enhancement through redevelopment or voluntary stewardship actions.

**Note:** inclusion of shorelines in the N.H.S recognizes the interactions between terrestrial and aquatic systems. Shoreline hazards are considered through the W.R.S in Section 5.3.5.

Floodplains may also be considered for inclusion as areas that support hydrologic function under the N.H.S. These areas may be included in the N.H.S based on their direct and indirect benefits to hydrologic form and function. These areas are likewise important for their ecological value as fish and wildlife habitat, water quality, erosion prevention and flood prevention functions which contribute to human health and safety. In areas where floodplains are not in a natural state, they provide opportunities to enhance the system through naturalization. These enhancements provide direct benefits to both the N.H.S and the W.R.S. Enhancement of these areas is discussed in section 3.13 (Enhancement Areas).

Floodplains and Shorelines in areas under jurisdiction of a Conservation Authority are regulated areas; inclusion or exclusion from the N.H.S does not alter or change in their regulation and the requirements for complying with applicable regulations.

**Recommendation:** That floodplains be addressed through the W.R.S.



### 4.11.1 Supporting Features

Options for including these features in the N.H.S. are outlined for northern and southern Bruce County.

#### *Northern Bruce County*

Option 1	Option 2	Option 3
N/A Shorelines and Floodplains are not included in the N.H.S.	Shoreline areas, defined as within 30m of the high-water mark.	Same as Option 2.

Floodplains are not included in Northern Bruce County due to limited available mapping and extent of existing natural cover.

#### *Southern Bruce County*

Option 1	Option 2	Option 3
N/A Shorelines and Floodplains are not included in the N.H.S.	Shoreline areas, defined as within 30m of the high-water mark. Floodplains	Same as Option 2.



## 4.12 Linkages

Movement of plants, animals and materials is necessary for biodiversity conservation and the long-term viability of ecological systems. The N.H.S. must include linkages in order to maintain these movement patterns on the landscape. Linkages are applied in both the Core Areas-Delineated (northern Bruce County) and Feature-Delineated System (southern Bruce County) approaches.

Linkages within the N.H.S. for Bruce County will include several scales:

**County Scale Linkages** form major movement corridors within the landscape and connect major blocks of habitat to ensure long term mobility of plants and animals across the landscape. Because these County-scale linkages are intended to provide a landscape scale connection, they are very wide and are likely to contain portions of natural heritage features.

**Local-Landscape Scale Linkages** are important connections between habitat areas. Specifically, they are intended to connect major blocks, but are less focused on broad-scale / county-wide movement. Local-Landscape corridors are of moderate width; they may connect multiple natural heritage features. Most often, these are associated with watercourses or other existing features on the landscape.

**Site-Scale Linkages** are small connections between features. These are important for movement of species with small habitat ranges, and/or that require multiple habitat types to complete their lifecycle process within a small geographic area (e.g., amphibians that need water to breed and upland areas or forests for foraging).

It is important to note that linkages are conceptual at the time of identification. There is no immediate change to existing land uses where linkages are identified. Implementation / establishment of linkages (e.g., establishment of self-sustaining vegetation) is undertaken through voluntary actions (e.g., enhancement or restoration opportunities), voluntary land acquisition, or through land planning processes where a significant change in land use is proposed (and triggers a planning act application). Retaining or creating natural cover (e.g., woodland, wetland, meadow, etc.) is encouraged above and beyond the requirements of the system. Providing natural cover as ‘stepping stone’ habitat, and ideally throughout the length of the linkage(s) is important to support movement of a range of species (plants and animals) across the landscape. Opportunity to focus stewardship activities within linkages should be explored to support their form and function on the landscape.

Based on the discussion / rationale presented in **Appendix 1**, the following options for linkages have been prepared.



### Northern Bruce County

#### County-Scale Linkages

Option 1	Option 2	Option 3
Minimum 400m width, comprised of: <ul style="list-style-type: none"> <li>• Minimum 200 m core vegetated width; and</li> <li>• 200 m permeable edge.</li> </ul>	Minimum 400m width, comprised of: <ul style="list-style-type: none"> <li>• Minimum 300 m core vegetated width; and</li> <li>• 100 m permeable edge.</li> </ul>	Minimum 400m width, comprised of: <ul style="list-style-type: none"> <li>• Minimum 300 m core vegetated width; and</li> <li>• 100 m permeable edge.</li> </ul>

#### Site Scale Linkages

Options 1, 2, & 3
<ul style="list-style-type: none"> <li>• Minimum 30 m width at their narrowest point;</li> <li>• No more than 3 times as long as they are wide unless ‘stepping stones’ provide suitable refuge habitat to support a narrowed width;</li> <li>• Have a width appropriate for the needs and behavioural patterns of the target species for the linkage.</li> <li>• Adjust width to maintain a functional ecological connection where the linkage is to also provide non-ecological functions (e.g., stormwater conveyance, utilities, etc.).</li> </ul>

### Southern Bruce County

#### County-Scale Linkages

Option 1	Option 2	Option 3
Minimum vegetated width of 300 m.	Minimum vegetated width of 350 m	Minimum vegetated width of 400 m





### Local-Landscape Scale Linkages:

#### Options 1, 2, & 3

- Minimum vegetated width of 60 m at their narrowest point;
- No more than 3 times as long as they are wide;
- Informed by site-specific conditions to identify target species or functions;
- Width appropriate for the needs and behavioural patterns of the target species for the linkage.

### Site-scale linkages:

#### Options 1, 2, & 3

- Minimum 30 m width at their narrowest point;
- No more than 3 times as long as they are wide unless 'stepping stones' provide suitable refuge habitat to support a narrowed width;
- Have a width appropriate for the needs and behavioural patterns of the target species for the linkage.
- Adjust width to maintain a functional ecological connection where the linkage is to also provide non-ecological functions (e.g., stormwater conveyance, utilities, etc.).



## 4.13 Enhancement Areas

Enhancement Areas include lands that have been restored or have the potential to be restored to a natural state. They represent opportunities to enhance the N.H.S. to support a biodiverse and resilient system for the long-term. Identification of Enhancement Areas is optional for an N.H.S, however the P.P.S states that opportunities natural heritage systems should be ‘maintained, restored or, where possible enhanced’ indicating that there is an expectation to support actions that restore and enhance the system. It is good natural heritage planning practice to identify or provide direction for enhancements to support goals and targets for robust and healthy natural systems (e.g., habitat diversity), and to address existing issues (e.g., shoreline erosion and water quality).

Similar to linkages, Enhancement Areas represent a **potential** function or feature and as such, are identified primarily on lands that are not existing features (i.e., are not already a woodland, wetland, etc.). Policies for this system component should reflect that these are implemented / established through voluntary action (e.g., the A.L.U.S. program), voluntary land acquisition (e.g., land trusts), or through land planning processes where a significant change in land use is proposed (and triggers a planning act application) which then requires the identification and establishment of an enhancement area to the system. There is no immediate change to existing land uses where enhancement areas are identified.

**Recommendation: Include Enhancement Areas in the N.H.S and identify criteria to provide direction for minimum enhancements.**

**Recommendation: That Enhancement Areas include shoreline enhancement opportunities, particularly within the Huron Fringe.**

**Recommendation: That enhancement opportunities be identified (primarily through site-specific study) to support or improve conditions within and around important features (e.g., Greenock Swamp, Biosphere Reserve) and habitat for keystone, endemic, rare and uncommon species, including Species at Risk.**

**Recommendation: That opportunities to establish natural cover within linkages or that provide connectivity within the system be encouraged through policies.**

**Recommendation: That stewardship programs and funding consider targeted efforts to support enhancements identified for the N.H.S.**

Options and criteria for the identification of Enhancement Areas are presented below and are the same for both Northern and Southern Bruce County. Identifying Enhancement Areas is associated with orientation and proximity of features. This applies to Key and/or Supporting Features and may be within or outside of Core Areas in Northern Bruce. Supporting rationale is discussed in **Appendix 1**.



Option 1	Option 2	Option 3
<p>All or portions of ‘bays and inlets’ in <b>Key Features</b> that are &lt;30m wide;</p> <p>Interior ‘holes’ in <b>Key Features</b> where the hole is &lt;0.25ha;</p> <p>Gaps between <b>Key Features</b> where the gap is &lt;30m;</p> <p>All or portions of <b>riparian areas, shoreline areas and floodplains</b> as determined through site-specific planning.</p> <p>Areas that support or improve conditions within and around important features and habitat for keystone, endemic, rare and uncommon species, including Species at Risk, as identified through detailed study.</p>	<p>All or portions of ‘bays and inlets’ in <b>Key Features</b> that are &lt;60m wide;</p> <p>Interior ‘holes’ in <b>Key Features</b> where the hole is &lt;0.5ha;</p> <p>Gaps between <b>Key Features</b> where the gap is &lt;60m;</p> <p>All or portions of <b>riparian areas, shoreline areas and floodplains</b> as determined through site-specific planning.</p> <p>Areas that support or improve conditions within and around important features and habitat for keystone, endemic, rare and uncommon species, including Species at Risk, as identified through detailed study.</p>	<p>All or portions of ‘bays and inlets’ in <b>Key Features</b> that are &lt;120m wide;</p> <p>Interior ‘holes’ in <b>Key Features</b> where the hole is &lt;1ha;</p> <p>Gaps between <b>Key Features</b> where the gap is &lt;120m;</p> <p>All or portions of <b>riparian areas, shoreline areas and floodplains</b> as determined through site-specific planning.</p> <p>Areas that support or improve conditions within and around important features and habitat for keystone, endemic, rare and uncommon species, including Species at Risk, as identified through detailed study.</p>

Criteria presented are in no way intended to limit landowners from pursuing enhancement or restoration opportunities of greater scope or scale than those identified here. Additional restoration or enhancement may be identified through pre-development studies such as a watershed or sub-watershed study or comparable study, as appropriate to support system targets and objectives.



## 5.0 Options for the Water Resource System

### 5.1 Components

Water is a defining feature for Bruce County. The Bruce Peninsula is one of the most well-known geologic features and areas in Ontario and includes significant shoreline areas along Lake Huron and Georgian Bay. Lake Huron is also the westerly limit of the County along its length. Shorelines and access points to these bodies of water present beautiful views, recreational and economic opportunities valued by residents and visitors to the County as expressed through the Bruce GPS engagement

Across Bruce County water has shaped the landscape. Interactions between the physical environment (bedrock and surficial geology, soils) and water have created karst (e.g., through the Niagara Escarpment), valleys, and shoreline features; water continues to be an active component at both the surface (e.g., watercourses, wetlands) and groundwater (e.g., karst, aquifers). The features, functions and interactions between surface and ground water, lakes and waterbodies and natural heritage are easily observed and form critical components to Bruce County's Natural Legacy.

Water also plays a crucial role in other pillars important to the County - Agriculture, Homes, Communities, Business and Good Growth. Water quality and quantity are important in supporting these pillars as well as being part of the County's Natural Legacy.

While the policies of the Province's Growth Plan do not apply to Bruce County, definitions and direction in the plan for the identifying of a W.R.S are recommended. The Growth Plan provides more refined definitions and direction for identification of a W.R.S. than is provided through the P.P.S. In this approach, Key Hydrologic Features and Key Hydrologic Areas will be identified as the building blocks of the W.R.S.

The following are **Key Hydrologic Features** in the W.R.S.:

- Permanent intermittent streams (watercourse);
- Inland lakes and their littoral zones;
- Seepage areas and springs; and
- Wetlands.

The following are **Key Hydrologic Areas** in the W.R.S.:

- Significant groundwater recharge areas (S.G.R.A.);
- Highly vulnerable aquifers (H.V.A.); and
- Significant surface water contribution areas.



Additionally, the following components may be included as part of the W.R.S, where they are “necessary for the ecological and hydrological integrity of the watershed” (P.P.S. 2.2.1).

- Ground Water Features:
  - recharge/discharge areas;
  - water tables; and
  - aquifers and unsaturated zones.
- Surface Water Features:
  - headwaters;
  - recharge/discharge areas; and
  - associated riparian lands that can be defined by their soil moisture, soil type, vegetation or topographic characteristics.
- Hydrologic Functions;
- Shoreline Areas; and
- Natural Hazards.

Consideration is given to inclusion of these optional elements through **Section 5.3**.

### 5.1.1 Identification and Mapping

Identification of a W.R.S. was first introduced in the 2014 P.P.S. (M.M.A.H., 2014) and therefore is relatively new in Provincial planning. There is limited guidance or existing examples from other jurisdictions that provide a reference to define best practices.

The Water Resource System (W.R.S) includes areas necessary to protect drinking water supplies, areas of hydrological significance and identification of vulnerable and/or sensitive groundwater and surface water features that should be protected, mitigated, or enhanced in land use planning. However, there is no specific definition or further direction for components of the W.R.S provided in the P.P.S.

The W.R.S. is comprised of features and areas which occur across the County and/or are present across the county without major distinctions in distribution that would influence how it should be managed to meet the P.P.S. objective to protect water quality and quantity.

**Recommendation: Apply a consistent approach to identifying the W.R.S. across the County.**

Additional features or areas may be included within a W.R.S for Bruce County in accordance with the broader direction of the P.P.S (section 2.2.1) where they are “necessary for the ecological and hydrological integrity of the watershed.” These additional groundwater and surface water features may not be mapped at this time. They may require a more detailed level of information than is available at the County-scale or require site-specific assessment to inform their inclusion. Consideration is given to these in the Options to provide potential direction for their inclusion within a W.R.S for Bruce County.



Two Options for the County’s W.R.S. have been prepared:

- **Option 1** includes only Key Hydrologic Features and Key Hydrologic Areas.
- **Option 2** builds upon Option 1 by including ‘other components’, including natural hazards.

Unlike the N.H.S., language pertaining to features and areas that comprise the W.R.S. is inclusive. For example, the W.R.S. is to include wetlands, indicating that all wetlands, not a subset of them (e.g., Provincially Significant), are to be included in the system. As a result, there are limited ways in which additional options could be prepared.

It is important to note that while the W.R.S. is identified to a more broadly defined list of features and areas, in implementation and policy, provincial policies applicable to Bruce County are less prescriptive for the W.R.S. than the N.H.S. and it is through the policies that the County can focus on how the system is managed in the context of land use planning.

The following section provides draft criteria for the identification of W.R.S. components in Bruce County. The criteria presented herein are provided for consideration; some or all of the criteria presented for each feature type may be used in the preferred W.R.S. for the County.

Options for the Water Resource System are presented below; supporting rationale and discussions are presented **Appendix 2**.

## 5.2 Key Hydrologic Features and Areas

Hydrologic features and areas that comprise these groups are identified as those required to meet policy requirements for the W.R.S.

Features identified here are consistent between and included in both Options 1 and 2 for the W.R.S.

### 5.2.1 Key Hydrologic Features

**Inclusion of these features is consistent across Bruce County and for both Options.**

#### *Permanent and Intermittent Streams*

Permanent and intermittent streams contain water for a sufficient period in an average year to develop defined channel form and morphology. Where required, confirmation of status should follow protocols established by the Province, such as the Ontario Stream Assessment Protocol.

**Recommendation: All permanent and intermittent streams are K.H.F.**



### *Inland Lakes and their Littoral Zones*

Inland lakes are naturally occurring bodies of standing or very slow-moving water. Inland lakes can be different in terms of size, water depth, alkalinity, biota, and water sources (e.g., surface drainage, groundwater, etc.).

The littoral zone of a lake refers to the area near shore where the light penetrates to the lakebed making this zone the most ecologically productive area in a lake and which supports rooting aquatic vegetation. Identification of the littoral zone for an inland lake should be informed based on site-specific condition.

Constructed ponds (e.g., stormwater ponds, irrigation ponds) are not considered natural and are excluded from this component of the W.R.S.

**Recommendation: All inland lakes and their littoral zones are K.H.F.**

### *Seepage Areas and Springs*

Seepage areas and springs are sites of emergence of groundwater at the surface where the water table presents at the ground surface. Seepage areas and springs can occur in a range of habitats and terrains and may be intermittent, seasonal or permanent expressions of groundwater at the ground surface. Identification of seepage areas and springs generally requires site-specific information or study.

**Recommendation: All seepage areas and springs are K.H.F.**

### *Wetlands*

Wetlands are discussed within the N.H.S. in Section 4.2.

**Recommendation: All wetlands are K.H.F.**

## **5.2.2 Key Hydrologic Areas**

**Inclusion of these areas is consistent across Bruce County and for both Options.**

### *Significant Groundwater Recharge Areas*

Significant Groundwater Recharge Areas (S.G.R.A) are areas that allow a high volume of water to infiltrate into the surface at a higher than average rate for the watershed. S.G.R.A's are identified through source protection studies, subwatershed studies, and hydrogeological investigations.

**Recommendation: All Significant Groundwater Recharge Areas are K.H.A.**

### *Highly Vulnerable Aquifers*

Highly Vulnerable Aquifers (H.V.A) are defined as subsurface formations which provide drinking water and have a higher potential to be impacted by the activities (e.g.,



release of polluting substances) at the ground surface. Vulnerability is based on material, depth to the aquifer and the water table, overlying soil, etc. Highly Vulnerable Aquifers are identified through assessment reporting required under the Water Act (2006) through Source Water Protection Programs. H.V.A's are identified through source protection studies, subwatershed studies, and hydrogeological investigations.

**Recommendation: All Highly Vulnerable Aquifers are K.H.A.**

*Significant Surface Water Contribution Areas.*

Significant Surface Water Contribution Areas are generally associated with headwater catchments and contribute to baseflow volumes which are important to the overall quantity of water within a watershed. These areas may be identified and mapped through subwatershed studies, or a combination of technical studies (topographic delineation plus field verification).

**Recommendation: All identified Significant Surface Water Contribution Areas are K.H.A.**

### 5.3 Other Hydrologic Features and Areas

While Key Features of the W.R.S. capture critical features and areas, movement of water and management of its quality and quantity is not restricted to areas. Our landscape - both surface and sub-surface features, areas and functions, and at both broad and discrete scales - contribute to the system. To recognize these interactions across our landscape with water and its influence on and functions provided to human health, economy, etc. the W.R.S. may include additional hydrologic features and areas. Generally, policies pertaining to these 'other' features will differ from those that apply to Key Features of the W.R.S.

Inclusion of 'other hydrologic features and areas' is optional. Option 1 for the W.R.S does not include any of these optional features. Option 2 for the W.R.S considers the potential to include these 'other hydrologic features and areas.' Recommendations provided are based on their potential inclusion in the W.R.S; however, a **final W.R.S may include none, some, or all** of these features and areas.





### 5.3.1 Groundwater Features

Option 1	Option 2
No features	Other groundwater features may include: <ul style="list-style-type: none"> <li>• Recharge / discharge areas</li> <li>• Water tables</li> <li>• Aquifers and unsaturated zones</li> </ul>

Recharge and discharge areas important to areas at more refined scales (e.g., subwatershed or local municipal scale) should be identified as part of the W.R.S. These areas directly influence groundwater or, through bringing groundwater to the surface, support surface water functions and ecological processes. Recognizing and managing for their continued function is important to both the N.H.S and the W.R.S.

Water tables, aquifers and unsaturated zones are broadly defined and may not be mapped. They should be considered a component of the W.R.S. in a conceptual manner in that they are key landscape-scale elements. At a more discrete level, consideration of sensitivities or areas where interactions between land-based activities and these features / areas may occur (e.g., areas where the water table is close to the surface or where aquifers are close to the surface and could be impacted by things like excavation) should be identified and managed in a way that protects both water quality and quantity.

Function of these features and areas should be considered in the preparation of policy and guidance for land planning within the County to support a healthy water resource system for the long-term.

**Recommendation:** Consider the water table, aquifers, and unsaturated zone to be part of the W.R.S. as conceptual components (i.e., not mapped) to recognize the landscape-scale importance of these areas.

**Recommendation:** Identify recharge and/or discharge areas of local importance through watershed studies, subwatershed studies, and hydrogeological investigations / studies and include them in the W.R.S.



### 5.3.2 Surface Water Features

Option 1	Option 2
No features	Other surface water features may include: <ul style="list-style-type: none"> <li>• Headwaters</li> <li>• Recharge / discharge areas</li> <li>• Associated riparian lands that can be defined by soil moisture, soil type, vegetation or topographic characteristics.</li> </ul>

#### *Headwaters*

Headwaters are the areas or points of origin for watercourses. They define the upper portions of subwatersheds and watersheds and are critical components of water quantity (e.g., maintaining baseflow, reducing downstream flooding) and quality (e.g., via healthy riparian areas which remove excess nutrients, or cool the water). Headwater drainage features (H.D.F) are where water being contributed to these areas coalesces and moves downstream. Protection and/or good management of these features is important for overall health of the system - in both the upper reaches and all the way downstream through the system.

**Recommendation:** That headwater areas be considered conceptually as part of the W.R.S..

**Recommendation:** Identify and classify headwater drainage features (H.D.Fs) in accordance with current assessment protocols (TRCA and CVC 2014) based on their form and function through appropriate studies (e.g., subwatershed study, site-specific studies).

**Recommendation:** That H.D.Fs identified as ‘Protection’ or ‘Conservation’ through the above are identified as discrete features of the W.R.S. and protected through policy.

#### *Recharge / Discharge Areas*

Recharge / discharge areas are recognized as both groundwater and surface water features due to the interaction between these two components or functions. Section 5.3.1 provided recommended direction for these features/areas.

#### *Associated Riparian Lands*

Riparian lands occur at the interface between watercourses and upland areas. Naturalized riparian lands provide important water quality services by removing sediments, slowing flows, and supporting direct, indirect and contributing habitat for



a range of biota. Lands unsuitable for providing natural and hydrologic functions associated with riparian lands (e.g., an existing impermeable surface) are generally excluded.

**Recommendation:** Include riparian lands, defined as 15m from a permanent or intermittent watercourse, or as determined through further study such as a watershed, subwatershed or site-specific study (e.g., an Environmental Impact study) in the W.R.S.

### 5.3.3 Hydrologic Functions

Hydrologic functions can include a broad range of features and areas and there is substantial overlap with other component groups (e.g., natural hazards). Two features / areas that do not have clear overlap with other categories are included here.

Option 1	Option 2
No features	Hydrologic functions may include features and areas such as: <ul style="list-style-type: none"> <li>• Meanderbelt</li> <li>• Karst (underground drainage systems)</li> </ul>

#### *Meanderbelt*

The meanderbelt is the area that a watercourse occupies now, or may be expected to occupy in the future, through its natural meander migration or development tendencies. These areas support the natural form and function of watercourses.

**Recommendation:** Include meanderbelt(s), as identified through a watershed, subwatershed or comparable study and in accordance with current standards and practices for their identification, in the W.R.S.

#### *Karst*

Karst geology includes underground drainage systems such as sinkholes, caves, and rivers. The surface of karstic terrain is marked by dissolution features referred to as karren and is bare/rocky or supports a shallow overburden of soil that could support unique ecological communities (e.g., Alvars). Karst features can create a complex network of surface and subsurface features. Interference with underground karst features (surface and underground) can influence the movement and flow of water and may result in significant changes to ‘downstream’ areas. Karst is known to frequently occur in Bruce County in areas associated with calcareous (limestone, dolostone) bedrock formation.



**Recommendation: Include areas of known karst in the W.R.S. and include areas of karst potential conceptually (i.e. not mapped) in the W.R.S.**

Karst areas may be identified via available mapping or be identified through watershed studies, subwatershed studies or site-specific study.

### 5.3.4 Shoreline Areas

Shoreline areas are an optional component of both the N.H.S and W.R.S as there are strong interactions between hydrology and ecology at these interfaces. Naturalized shorelines are important for protection from erosion, reducing sedimentation and supporting other water quality functions (e.g., nutrient management). These interactions are captured through discussion of shorelines under the N.H.S (Section 5.11). Consideration of shorelines as a natural hazard and component of the W.R.S is discussed in Section 5.3.5. Naturalized shorelines, particularly those associated with the Huron Fringe are important for bird migration and movement of animals along this natural corridor. Shorelines also have potential to play an increasingly important role in hazard management in the face of climate change.

Option 1	Option 2
No features	Include Shoreline areas in the W.R.S.

### 5.3.5 Natural Hazards

Flood hazard areas and shoreline area hazards may be considered for inclusion within the W.R.S. Other natural hazards (e.g., unstable soils or bedrock, erosion hazard areas) are not considered for inclusion within the W.R.S.

Option 1	Option 2
No features	Natural hazards may include: <ul style="list-style-type: none"> <li>• Flood hazards</li> <li>• Shoreline hazards</li> </ul>

#### *Flood Hazards*

Flood hazards are generally defined as the inundation of areas adjacent to a shoreline or a river or stream system which are not ordinarily covered by water. Floodplains and shoreline hazard areas are intended to capture areas prone to, or with potential to, experience flooding.

A floodplain is identified as the area, usually low lands adjoining a watercourse, which has been or may be subject to flooding hazards. Protection of floodplain



functions supports natural system functions and reduces potential for downstream flooding impacts as well as permitting natural processes to occur.

**Recommendation: That floodplains be included in the W.R.S.**

Floodplain delineation may be completed by regulating agencies (e.g., Conservation Authorities) or through watershed, subwatershed or comparable studies. Floodplains are regulated areas; inclusion or exclusion from the W.R.S in no way alters their regulation.

### *Shoreline Hazards*

Shorelines may be prone to flooding, but also prone to additional hazards such as wave uprush, ice jamming / piling, erosion, or other shoreline hazards. These hazards are natural functions of these areas and of the broader hydrologic functions.

Shoreline hazards are regulated according to the Conservation Authorities Act and through policies of the various Conservation Authorities (S.V.C.A. G.S.C.A. and M.V.C.A. in Bruce County), and through the zoning by-law alone in the Municipality of Northern Bruce Peninsula. The regulated area is typically identified as 30 metres (98 feet) from the limits of the shoreline flood hazard.

**Recommendation: That shoreline hazard areas, defined as 30m from the limits of the shoreline flood hazard, be identified as a component of the W.R.S.**



## 6.0 Evaluation Criteria

Selection of a preferred Natural Environment System will be informed by an evaluation of, and consultation on, the options. Based on the outcomes of the evaluation process and input received from consultation, preferred systems will be identified. The preferred system may include elements from any of the options, ultimately being a fusion of the options presented to identify a system that best fits needs and vision for the County’s Natural Legacy.

System options will be evaluated against a set of criteria intended to assess key outcomes at the system and County scale. Generally, this is intended to identify a preferred system that:

- Achieves the intent of the Provincial Policy Statement (P.P.S).
- Reflects the vision for Bruce County’s Natural Legacy.
- Provides opportunities for balance with other Bruce GPS pillars to ensure a healthy and vibrant County.
- Can be implemented effectively through the Official Plan and other mechanisms.
- Supports broader County efforts to plan for and mitigate for climate change.

In assessing the options and to inform the identification of a preferred system, criteria have been developed under several themes. Themes, criteria and measures are presented below.

Themes 1 through 3 will be presented to the public for comment. Theme 4 (Implementation) may be completed after initial system refinement to allow the County to work in identifying anticipated mechanisms, policy direction, etc. This theme may be primarily used to refine the system.

### THEME 1 | Supporting a resilient and connected Natural Heritage System with opportunities for enhancement

**Criteria 1-1** | The system reflects Bruce County’s Natural Legacy, interests and direction

**Measure** | Strongly Aligned / Aligned / Not Aligned

**Criteria 1-2** | The system supports keystone species (i.e., Black bear, Massasauga Rattlesnake) and Species at Risk.

**Measure** | Highly Effective / Moderately Effective / Inadequately Addressed / Not Addressed



**Criteria 1-3** | The option provides opportunities to enhance the system

**Measure** | Highly Effective / Moderately Effective / Inadequately Addressed / Not Addressed

**Criteria 1-4** | The option supports Bruce County in achieving the Natural Heritage Targets for:

- Woodlands
- Wetlands
- Linkages
- Enhancement and Restoration
- Riparian Areas
- Shoreline Areas
- Aquatic Community / Fish Habitat
- Significant Wildlife Habitat
- Grassland Habitats

**Measure** | (applicable to each above) Strongly Supports / Moderately Supports / Limited Support / Does not Support

## THEME 2 | Supporting ecological systems, human health and the economy by protecting water quality and quantity in the Water Resource System

**Criteria 2-1** | The option identifies important hydrologic features and areas that will maintain movement and quantity of water on the landscape in the long-term.

**Measure** | Highly Effective / Moderately Effective / Inadequately Addressed / Not Addressed

**Criteria 2-2** | The option identifies features and opportunities which support and have potential to improve water quality in the long-term.

**Measure** | Highly Effective / Moderately Effective / Inadequately Addressed / Not Addressed

**Criteria 2-3** | The option reflects the interactions and interdependencies between water resource features and areas and ecological features and functions.

**Measure** | Highly Effective / Moderately Effective / Inadequately Addressed / Not Addressed



**THEME 3 | Ensuring the systems are consistent with the Bruce GPS guiding principles and direction for the County’s future**

**Criteria 3-1 |** The option is consistent / aligned with Bruce GPS Guiding Principles: Agriculture; Homes; Communities; Business; Good Growth; Natural Legacy; Connecting; Heritage

**Measure |** Strongly Aligned / Aligned / Not Aligned

**Criteria 3-2 |** The option provides flexibility to achieve balanced land use planning.

**Measure |** Good flexibility / Limited Flexibility / Insufficient Flexibility

**Criteria 3-3 |** The option supports resilience and adaptation to climate change.

**Measure |** Highly Effective / Moderately Effective / Not Effective

Through planned consultation on the Options, stakeholders and the public will have an opportunity to comment on options as well as the proposed evaluation criteria for Themes 1-3.

**THEME 4 | Implementation**

**Criteria 4-1 |** Appropriate tools and methods are available to the County to implement the option.

**Measure |** Evaluated based existing tools and identification of tools that can be developed and implemented by the County.

**Criteria 3-2 |** The option provides flexibility to achieve balanced land use planning.

**Measure |** Evaluated based on anticipated policy needs and options.

**Criteria 3-3 |** The option supports resilience and adaptation to climate change.

**Measure |** Evaluated based on potential % cover and targets.

Weighting of various themes or criteria has not been considered at this time. This may be considered through the final report.





## 7.0 Initial Policy Directions

The Natural Legacy System will form a key part of environmental planning policy updates for the New Official Plan. Key Policy updates can also be applied to support the Natural Environment System. Seven high-level opportunities to improve the way that natural legacy planning is implemented in Bruce County are outlined below. Additional opportunities may be identified through consultations, including through Theme 4 (identified in Section 6 above) and during the development of the Official Plan.

### 7.1 Update Environmental Impact Study (E.I.S.) Guidelines

**Recommended Direction:** Review and update E.I.S. Guidelines to include guidelines for scoping, and standardization of reports to increase consistency of information.

Completion of an E.I.S. requires expertise, field effort, analysis, and documentation to confirm that the analysis is adequate and the conclusions are justified. Some information in an E.I.S. may be sensitive, for example species that are threatened or endangered or culturally significant.

Value can be realized if studies are appropriately scoped to focus efforts on the features or functions of the system that may be at risk from development.

Agencies and stakeholders can more readily determine if E.I.S. reports contain all the required information if reports are completed in a standard layout and structure.

#### **What is required:**

Provincial policy directs that natural features and areas be protected for the long term.

In some features, such as provincially significant wetlands and coastal wetlands, development is not permitted. Adjacent to these features, and in some other features, development may be permitted provided “it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.” In still other features, such as fish habitat and habitat of endangered species and threatened species, development is not permitted except in accordance with provincial and federal requirements.

The Planning Act (Section 3) permits a council to require information it may need to evaluate a proposal if the information requirements are outlined in the Plan.

#### **Current County Plan Policy:**

The Official Plan outlines types of features where an EIS may be required, guidelines for scoping studies, and information requirements for studies. These guidelines were adopted in 2009.



**Opportunity for Improvement:**

E.I.S. Guidelines should be updated to align with policy updates that include, where applicable, impacts of development to the natural environment system (rather than a focus on specific features). They could also specify requirements for evaluation and mitigation of wildland fire risks, where these occur.

Preparing a standard E.I.S. Template for completion by consultants could:

- Reduce review time required to determine if all required information is included in the E.I.S.
- Increase accessibility of documents for readers with disabilities
- Better address security of sensitive species information

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## 7.2 Make it easier to link mapping and policy

*Recommended Direction: Tie policy to mapping in a very close and relatable way, through summaries on schedules and in Geographic Information System (G.I.S.)/ interactive formats*

Providing information on maps supports transparency in land use information that can help make informed and effective decisions. However, not all mapping information is relevant to all cases; for example:

- Some features may be mapped at a resolution that works at the landscape scale to understand system function but should not be used as a prescriptive line at the property-scale.
- Areas that provide natural heritage feature/function protection should be able to be identified separately from areas where development needs to be directed away from natural hazards (floodplains, steep slopes, etc.)

Integrating descriptions or summaries into schedules and interactive mapping experiences can help people access information and understand if it is relevant to their questions.

### What is required:

The Planning Act requires that adequate information and material made available to the public. Mapping and text tools provide an enhanced opportunity for public awareness and understanding of plans and their meaning.

### Current County Plan Policy:

The Official Plan includes Schedules with some notes included. ‘Schedule C- Constraints’ identifies many natural heritage features within the plan area.

### Opportunity for Improvement:

Map the Natural Environment System in a manner that allows it to be viewed as a single system, or as its component parts, so that the public can understand the role particular areas play within the system. Provide context using legends, text and notes within print/pdf schedules and interactive mapping tools.

### What others are doing

*Grey County* has a schedule that identifies ‘Core Areas’ (Schedule C); individual features, where mapping is available, are included on Schedule ‘A’.

*Simcoe County* has a consolidated schedule of the ‘Greenlands’ and acknowledges that it is approximate and can be interpreted in light of more detailed information.

*Huron County* is proposing a ‘Natural Environment Resource Map’ consisting of natural environment features.



## 7.3 Provide essential material in accessible formats

**Recommended Direction:** *Focused writing / policies that provide the essential informational material, even in brochure formats.*

The diversity of our natural legacy within Bruce County can be difficult to describe. However, successful management and stewardship of our natural legacy for present needs and future generations requires policies that provide clear direction that can be readily understood and applied.

### **What is required:**

The P.P.S. requires Planning Authorities to protect natural features and areas for the long term.

### **Current County Plan Policy:**

The Official Plan provides policies for the environment and within various land use categories, which require studies and information for several circumstances, but does not offer as clear direction for implementation of policy objectives through land use planning tools.

### **Opportunities for Improvement:**

The Official Plan Best Practices Review (s.3.8) speaks to the need to create an accessible, inspiring document, with a focus on plain language, descriptive sections, and glossaries of terms if needed.

As a companion to the plan, brochures or other resources may help to connect policy objectives of the plan to implementation tools in local zoning by-laws, to help landowners understand why certain practices are required to sustain our natural legacy, how to plan projects to align with these requirements, and how to proceed through the review and approval process.



## 7.4 Focus policy on overall direction and use guidelines for the details

**Recommended Direction:** Role of policy to set a basic standard and provide (guidelines) for minimum mitigation measures options / best practices for enhancement

There has been a trend towards increasing levels of detail in Official Plans, leading to a policy framework that is unable to adapt to new information or resources.

Policies may be more effective if they establish a common standard and then provide an opportunity for guidelines which establish more detailed requirements and best practices.

### **What is required:**

The P.P.S. requires Planning Authorities to protect natural features and areas for the long term and provides guidelines for various aspects of natural features and areas such as identifying significant wildlife habitat.

### **Current County Plan Policy:**

The Official Plan provides some policies which are general, and others which are overly prescriptive; for example, requirements for large inland lake lot areas (where smaller areas can increasingly be justified through advanced wastewater treatment technologies) and having each lot within a development pass groundwater quality studies, even where there are no groundwater wells used for drinking water within the site.

### **Opportunity for Improvement:**

Focus development policies as they relate to natural environment and servicing at the level of detail required to support the work. Servicing considerations intended to support the water resource system may intersect with the Plan the Bruce - Homes and Plan the Bruce - Good Growth projects.



## 7.5 Consider a community planning development permit system for improved implementation

*Recommended Direction: County Official Plan consider policies for a Community Planning Permit system which can provide improved implementation tools*

Risks to natural legacy Features within the County occur in areas of significant pressure for growth and development along the shoreline and within forested areas which can fragment the natural system. In large part this risk is in association with residential building forms. In many cases, impacts from development may be able to be mitigated through common and best-practice mitigation measures focused on managing scale of disturbance, planting native species, and managing risks including wildland fire risk in areas where coniferous trees are dominant.

Current regulatory tools are limited to a forest conservation by-law that applies to larger scale woodlands, conservation authority regulations which are focused on managing flooding risks, and holding provisions, development or site plan agreements that may be applied to proposals that involve lot creation or other planning act applications.

A Community Planning Permit System (C.P.P.S.) provides an opportunity to manage site alteration, for example to maintain large/ mature trees, and provide requirements for natural heritage conservation such as limits on total shoreline alterations or forest removal, dark sky lighting, erosion/sediment controls and use of native species for landscaping. A C.P.P.S. also provides an opportunity to combine zoning-level performance standards with delegated approvals of minor changes or variations, in less time and with lower appeal risk than typically required to process minor variances. The Official Plan Best Practices Review (S 3.6) Recommends a ‘Made in Bruce’ permit system that provides an opportunity for county-local municipal cooperation on finer-grained planning matters.

### **What is required:**

Communities may establish a C.P.P.S. through a Municipal by-law provided the Official Plan identifies:

- the area proposed as a planning permit area,
- details for delegation of approvals of permits, including variations from standards (if Council intends to delegate them, for example to staff),
- goals, objectives and policies and criteria that may be included in the by-law for determining if development types or land uses may be permitted, and
- types of conditions that may be applied (which must be in accordance with goals, objectives, and policies).

### **Current County Plan Policy:**

The Official Plan does not contain policies for C.P.P.S.



**Opportunity for Improvement:**

A C.P.P.S. can support greater neighbourhood stability by managing site alteration, building placement, and naturalization, including restoration of previously altered lands if/when new development is proposed.

The C.P.P.S. supports applicants with a faster turnaround time (maximum 45 days) for variances to the by-law, vs. the typical 30 days plus 20-day appeal period for a minor variance application; delegated approvals also do not need to wait for a committee agenda. In addition, because of the focus and detail required to set up the C.P.P.S. system, only the applicant can appeal C.P.P.S. permit decisions.

The County Official Plan could include goals, objectives, policies, and criteria for a CPPS, as outlined above; this would provide the opportunity for local municipalities to establish a C.P.P.S. by-law that is focused on their specific needs. We would suggest a pilot project with a willing municipality.

**What others are doing**

Innisfill and Muskoka Lakes use CPPS to manage development in shoreline areas.

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## 7.6 Use different forestry tools for different areas

**Recommended Direction:** *Forestry tools for different areas (different permit types in different areas of the system) while managing wildland fire risk*

Bruce County has many public and private lands that are managed for forestry purposes.

The Provincial Government has a program to support sustainable forestry through a “Managed Forest Tax Incentive Program” (M.F.T.I.P.) which provides property tax relief. This is similar in concept to reduced property tax classifications for agricultural uses, except it requires the owner to establish and follow an approved forest plan.

Bruce County regulates private forests as a resource through the [Forest Conservation By-law](#) which applies to woodlands that are equal to and greater than 1 hectare in size. The bylaw does not apply to publicly owned land (municipal, provincial, or federal), and Bruce County leads by example and manages its own properties through the principles of Good Forestry Practices.

The forest conservation by-law encourages the use of “Good Forestry Practices” to improve the overall health of a forest through single-tree selection timber harvesting. By prioritizing the removal of diseased and damaged trees and retaining residual stems of the highest quality, it is a practice consistent with MFTIP forestry planning, and will ensure healthy and ecologically diverse forests for many generations.

However, the forest conservation by-law also allows “Circumference Harvesting”, which is a form of commercial high grading also known as *diameter limit cutting*. This is a regulatory practice that sets a lower size limit on logs (19 inches for example) to prevent a wide scale removal of timber from a forest. Circumference limits are useful because they are easy to enforce, but they inadvertently result in the removal of the best quality timber and leave behind the poorest growing stock, leading to an overall decline of forest health over time. The Ontario Professional Foresters Association and the Ontario Ministry of Natural Resources Tree Marking Certification have designated circumference harvesting as a prohibited practice, as it is not considered a sustainable forest management practice by the forestry community.

In Bruce County, circumference harvest is most common in deciduous woodlands in the southern municipalities which already have lower forest cover. These harvests are often within smaller woodlands that form parts of farms. As noted above, farms are assessed at a lower property tax rate, similar to the tax rate available to a forested property that is within the MFTIP program and following good forestry practices. MPAC also provides a “farm forest exemption” which exempts taxes from 1 acre of forested land per 10 acres of farmland, with a maximum of 20 acres in any municipality, as long as the land is not part of the MFTIP or CLTIP program.

Where forests are within the Core Areas of the Natural Legacy System, requiring timber harvesting to be consistent with Good Forestry Practices can use existing and





familiar tools to support forestry and conservation of our natural legacy in a manner that is consistent with a reduced tax rate available to these properties, whether they are agricultural properties or managed forests.

**What is required:**

Forestry is regulated through the Forest Conservation By-law. Revisions to the Forest Conservation By-law permit eligibility would be required to support this planning objective.

**Current County Plan Policy:**

The Official Plan permits forestry as a use in Agricultural and Rural areas. The Official Plan also speaks to the protection of significant woodlands.

**Opportunity for Improvement:**

Provide additional high-level detail with respect to good forestry practices in Core Areas or Key Feature Areas and amend Forest Conservation By-law to include a schedule showing locations of Core Areas and Key Features where permit applications would need to be consistent with Good Forestry Practices.

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## 7.7 Enhance progressive rehabilitation when aggregate extraction occurs within the Natural Environment System

**Recommended Direction:** Reduce the duration of disruption to the natural system by requiring best practices in progressive rehabilitation for aggregate extraction within the natural environment system.

Aggregate or Mineral Resources form an important part of our natural legacy, as they occur in distinct locations on the landscape through ancient processes. Mineral or Aggregate Resources are considered non-renewable resources and are essential to the development and maintenance of communities, homes, and infrastructure. Although extraction operations may continue for many years until a resource is depleted, Mineral Resource extraction is ultimately considered to be a temporary land use. In areas of extensive deposits, single or multiple licenses may create large areas of disturbance for lengthy periods of time.

### What is required:

The P.P.S. requires encourage comprehensive rehabilitation planning for clusters of aggregate resources.

The province regulates aggregate extraction operations through licenses issued under the Aggregate Resources Act. These licenses and operations require rehabilitation plans to be developed.

There are specific requirements for consultation with indigenous peoples such as S.O.N. and H.S.M. under the Aggregate Resources Act.

The province has assigned Municipalities responsibility for identification and protection of natural heritage features for the long term through the Provincial Policy Statement.

### Current County Plan Policy:

The Official Plan sets out policies and criteria for aggregate operations.

### Opportunity for Improvement:

The Official Plan could specify enhanced phasing and progressive rehabilitation planning for pit and quarry operations within the natural legacy system that meet criteria which may include size of extraction area, expected duration of operations (based on amount of resource divided by annual tonnage), and/or number of licenses in an area. Consultation with Provincial and industry stakeholders would be appropriate to ensure that criteria support the objective of managing total disturbed areas while supporting viable extraction operations.

### Example

A cluster of quarries have developed in the Hope Bay area. A single proposal to license an additional 120 ha (300 acres) for extraction, with a potential lifespan of 150 years, would have resulted in 8 quarries and +/-520 ha (1300 acres) licensed for



extraction. Planning and S.O.N. staff and M.N.R.F. worked with the applicant to establish quarry plans which divide the total licensed area into several phases and sub-phases with ongoing rehabilitation requirements. Together with specific mitigation this plan is designed to maintain woodland function over the life of the operation, support black bears which are a significant clan animal for the SON, and reduce risks from invasive species.

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## 7.8 Include conceptual natural legacy mapping in settlement areas

**Recommended Direction:** *identify key features and support the county-scale system while recognizing that local municipalities may develop defined and refined natural legacy mapping.*

The Current County Plan provides high-level guidance and direction, with official plans providing a more detailed policy framework that supports planning for local contexts in settlement areas where the majority of growth in the County is encouraged. Settlement areas generally have or are planned to provide infrastructure and amenities to support growth and development, and may also include natural heritage features.

### **What is required:**

The P.P.S. requires (Section 2.1.3) requires that “Natural heritage systems shall be identified [...], recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.”

The Planning Act requires that local official Plans conform to County Official Plans.

### **Current County Plan Policy:**

The Official Plan does not include natural heritage systems. The plan directs that where plans conflict, the County Official Plan, as an upper-tier plan, prevails.

### **Opportunity for Improvement:**

The Official Plan could identify conceptual natural legacy mapping in settlement areas, particularly where these areas include key features. Settlement areas may identify additional features that are significant within the community and may include a finer level of detail regarding feature limits in settlement areas.

Local Natural legacy systems could take customized approaches that meet provincial requirements and the direction outlined in the County Official Plan.



## 7.9 Encourage planning for sustainable public access to natural legacy features

*Recommended Direction: Together with the ‘Communities’ ‘Culture’ and ‘Business’ discussion papers, support development of sustainable opportunities for people to connect to our natural legacy.*

Access to Nature is increasingly identified as important to health and wellbeing. The Bruce GPS project identified the contribution of rich natural resources in Bruce County to important to quality of life, and the importance of protecting natural resources including natural areas and scenic views, including wise use and conservation. Many people appreciate and value nature through spending time in natural settings. The Niagara Escarpment Biosphere Reserve and Niagara Escarpment Plan recognize opportunities for compatible human activities and nature, including as an example the Bruce Trail which runs the length of the largest contiguous stretch of primarily forested land in south-central Ontario.

### **What is required:**

The P.P.S. (Section 1.5) includes policies for promoting healthy and active communities including a full range of publicly accessible built and natural settings for recreation that include open space areas, trails and linkages, and, where practical, water-based resources; the P.P.S. also recognizes provincial parks, conservation reserves, and other protected areas, with direction to minimize negative impacts on these areas.

### **Current County Plan Policy:**

The Official Plan outlines a vision for sustainable development. Planning objectives include provision of recreational facilities and strengthening tourism which is vital and largely nature-based.

Policies permit conservation and open space uses in most designations, recognize existing public recreation uses in environmentally sensitive areas, and make access to natural environment features and waterfront a requirement for new developments, particularly in Rural Recreation areas. The Plan also includes a major open space designation.

### **Opportunity for Improvement:**

Many of the places where the public access nature are managed by Provincial and Federal governments and are not subject to County plans or local land use controls. High levels of visitation at these and other sites can have adverse impacts. The plan could recognize the need to work with all levels of government and public organizations to manage public access to natural areas throughout Bruce County.



## 8.0 Next Steps

This Interim Report is intended to provide a foundation for discussion of options and policy directions for managing natural resources wisely for future generations. Now that the stage is set, the County will lay out a road map for the community engagement process on the Options and Recommended Directions. This process will culminate in a final Natural Legacy Discussion Paper to be integrated into the County's new Official Plan.

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## Appendix 1: Provincial Definitions and Direction for Water Resource System

Under the Growth Plan (2020), a W.R.S. is defined as:

*“A system consisting of ground water features and areas and surface water features (including shoreline areas), and hydrologic functions, which provide the water resources necessary to sustain healthy aquatic and terrestrial ecosystems and human water consumption. The water resource system will comprise key hydrologic features and key hydrologic areas.”*

The Growth Plan identifies Key Hydrologic Feature and Key Hydrologic Areas as comprising the W.R.S. These are defined in the Growth Plan (2020):

**Key hydrologic features** include *“permanent streams, intermittent streams, inland lakes and their littoral zones, seepage areas and springs, and wetlands.”*

**Key hydrologic areas** include *“significant groundwater recharge areas, highly vulnerable aquifers, and significant surface water contribution areas that are necessary for the ecological and hydrologic integrity of a watershed.”*

Key hydrologic features are also identified as components of the N.H.S. as defined under the P.P.S. Including hydrologic features in both the water resource and natural heritage systems recognizes the benefit of integrating both natural heritage and water resources systems to sustain ecological function and maintain biodiversity, while supporting the agricultural system.

The N.E.P. also provides direction with respect to key hydrologic features. Per Section 2.6.1 of the N.E.P. (2017), key hydrologic features include:

- Permanent and intermittent streams;
- Lakes (and their littoral zones);
- Seepage areas and springs; and
- Wetlands.

The above-listed W.R.S. components are described in more detail in Section 3.

In addition to these components, natural hazards may be considered as optional components of the N.E.S., including flooding hazards and/or erosion hazards adjacent to a river, stream or small inland lake system, dynamic beach hazards, and karst.

Protection of public health and safety from natural hazards is explicitly identified in the PPS (section 3.1.1). This requires development to be directed outside of hazard areas and prohibits development from occurring within (section 3.1.2):

- The dynamic beach hazard;
- Defined portions of the flooding hazard along connecting channels (the St. Marys, St. Clair, Detroit, Niagara and St. Lawrence Rivers);



- Areas that would be rendered inaccessible to people and vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards, unless it has been demonstrated that the site has safe access appropriate for the nature of the development and the natural hazard; and
- A floodway regardless of whether the area of inundation contains high points of land not subject to flooding.

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## Appendix 2: Rationale for N.H.S. Options

### Introduction

This appendix provides additional supporting rationale for options or criteria where analyses or more detailed review of conditions and objectives was used to inform them. Not every feature type has a section. For example, fish habitat is defined by the Fisheries Act and all fish habitat is protected under the P.P.S as such, no further analyses were required to inform the options for this feature type.

### Core Areas

Core Areas are intended to protect critical functions such as biodiversity, movement of species and materials, habitat needs for keystone species (e.g., Bears) and/or capture representative features or areas. To achieve this, the identification of Core Areas considers:

- Percent of natural cover (degree of naturalness);
- Size of Core Area to achieve target functions;
- Shape (to support interior habitat functions);
- Habitat and species diversity;
- Presence of features identified as Significant (e.g., A.N.S.I.s)
- Presence of rare habitats and rare species (e.g, Alvars);
- Presence of and requirements for critical habitat functions of keystone species (e.g., Black Bears, Massasauga Rattlesnake);
- Presence of sensitive natural communities; and / or
- Presence of natural communities not well represented in the landscape (O.M.N.R. 2010)

A Core Area does not need to include everything in the list; but areas where more of these items are present have a higher relative importance for inclusion in a Core Area than areas with fewer items. The first two criteria: percent natural cover and Core Area size are primary factors and are further discussed below.

### Percent of Natural Cover

When combinations of natural features are being considered for inclusion in a Core Area, the Natural Heritage Reference Manual recommends setting a criteria for minimum percent natural cover (O.M.N.R. 2010). For Provincial Plans in the Greater Golden Horseshoe Area (i.e., the Greenbelt Plan, Oak Ridges Moraine Conservation Plan, and the Growth Plan), a criterion of a minimum 50% natural cover and/or public lands was identified. Given that northern Bruce County is a relatively intact natural heritage landscape, a higher minimum percent natural cover and/or public lands is warranted in order to identify areas with the most natural cover.



Rural and agricultural lands (i.e., permeable / working landscapes) between natural heritage features and areas can be captured within Core Areas. Settlement Areas are to be excluded from Core Areas.

## Core Area Patch Size

Minimum patch size depends on the extent of natural cover and fragmentation, on any focal species being considered, the quality of available habitat, and the landscape context.

For comparison, the Greenbelt Plan identified a minimum Core Area threshold of 1,000 ha for areas north of the Oak Ridges Moraine and east of the Niagara Escarpment. In the Oak Ridges Moraine Conservation Plan, 500 ha was used as a minimum area threshold, although most core areas were much larger (average 2,570 ha; maximum 17,000 ha; as referenced in O.M.N.R.F. 2018). Both Provincial Plan areas represent a more fragmented landscape than northern Bruce County.

The Bruce Peninsula supports a geographically and genetically isolated population Black Bear, which requires large tracts of intact habitat mosaics to remain viable. Recent data from M.N.R.F., Parks Canada and S.O.N. collaborative monitoring efforts, show statistically significant ongoing decline of this population. Protection of this species is considered an important consideration for identifying Core Areas for Northern Bruce County. Home ranges of adult female Black Bears average 1,500 - 2,500 ha, while home ranges of adult males being up to 10 times this size; home ranges of many bears can overlap (O.M.N.R. 2009).

The Massasauga is a rattlesnake species with a genetically distinct sub-population within Bruce County (O.M.N.R.F. 2016). This species is identified as Threatened by Ontario's Endangered Species Act (2007). Critical habitat for the species is categorized based on sensitivity to disturbance. Category 1 habitat, which has the lowest level of tolerance to alteration is identified as the area within 30 m of gestation sites and 100 m of hibernacula. Category 2 and 3 habitat which, although considered to have a moderate tolerance to disturbance, is likewise identified as critical habitat, occurs within 1.2 km of an occurrence of the species; this translates to an area of 450 ha. The Massasauga Rattlesnake is considered a keystone species for identifying Core Areas both due to the unique population in Bruce County and also as a Species at Risk which requires large tracts of habitat, which are present in Northern Bruce County, to support its continued presence on the landscape.

## Wetlands

Wetlands are recommended as a **mapped** component of the N.H.S. Wetlands within Bruce County will be included as both **Key and Supporting Features** within the N.H.S. based on designation and/or size. Size-based criteria were developed using an assessment of existing cover and the 'no net loss' wetland target for the N.H.S.



As there is no clear distinction in wetland cover between North Bruce and South Bruce, one set of options has been proposed for application across Bruce County.

It is recognized that there are inaccuracies in available wetland mapping. Criteria and guidance for wetlands applies to the N.H.S. Refinements to mapping (e.g., revision to boundaries, identification of additional features or confirmation that some are not present that are mapped), is achieved through detailed study with field assessments.

## Key Features

Provincially Significant Wetlands (P.S.W.s) (coastal and inland) are determined using the Ontario Wetland Evaluation System (O.W.E.S.). The Province is the administrator of these assessments, makes determinations in this regard and houses the analyses and dataset from wetland evaluations.

All P.S.W's are to form a component of the N.H.S. and are identified as part of **Key Features and Areas**. This represents the minimum requirement under the P.P.S and is consistent across all three options.

To support the 'no net loss' target, Options 2 and 3 for the N.H.S. include a subset of Other Wetlands as Key Features and Areas within the N.H.S. Consideration for inclusion of 'unevaluated' or 'evaluated - not P.S.W' wetlands as Key Features is informed by an assessment what proportion of all wetlands will be included based on a specified size threshold (Table 1).

**Table 1. Potential Capture Rate based on Size Threshold Criteria<sup>5</sup>**

Potential Size Thresholds	Northern Bruce County (% Wetland Area Captured)	Southern Bruce County (% Wetland Area Captured)
16 ha	37%	47%
8 ha	53%	63%
4 ha	69%	75%
2 ha	80%	86%
1 ha	89%	94%

<sup>5</sup> Mapping accuracy of dataset(s) used may influence wetland statistics. Wetlands within forested areas are more difficult to accurately map through interpretation of aerial imagery. Accuracy is deemed suitable for the purposes of County-scale mapping. Refinement of feature limits can be undertaken through future studies such as subwatershed or site-specific assessment(s), as appropriate.



Key Features of the N.H.S. generally have greater policies restrictions. As such, inclusion as Key or Other features under the N.H.S. should seek to balance potential restrictions and targets for the N.H.S.

## Supporting Features

Wetlands are identified as supporting features where they do not meet the criteria for identification as Key Features, and meet secondary criteria associated with Supporting Feature(s). Supporting Feature wetlands is an optional component of the N.H.S. and can include a subset of non- Provincially significant, as well as unevaluated wetlands occurring within the County. Inclusion of these features supports the ‘No Net Loss’ wetland target for the N.H.S., and recognizes the services and ecological functions provided by these features on the landscape.

As with Key Feature wetlands, capture rate by size threshold is used to identify Supporting Feature wetlands as part of the N.H.S. For the purposes of assessing options, thresholds one ‘level’ below those identified for Key Features as considered.

## Woodlands

Woodlands are recommended as a **mapped** component of the N.H.S. Within the N.H.S. woodlands will be included within both Key and Supporting Feature Categories. Generally, Key Feature woodlands are those which meet criteria developed for Bruce County to be considered *significant*; Supporting Feature woodlands include a subset of those that do not meet these criteria but are recognized for their contribution to the form and function of the landscape and in meeting the ‘no net loss’ woodland target for the N.H.S.

Criteria for assessing woodlands have been developed in consideration of key guidance documents and the ‘no net loss’ target identified for the N.H.S.

- How Much Habitat is Enough (Environment Canada 2013) - Southern Bruce County
- How Much Disturbance is Too Much (draft) (Beacon Environmental 2012) - Northern Bruce County
- Natural Heritage Reference Manual (M.N.R.F. 2010)

## Criteria for Significant Woodlands

The Natural Heritage Reference Manual provides recommended criteria for identification of significant woodlands in four areas, each of which are briefly described and assessed for the Bruce County below:

- Woodland size
- Ecological functions
- Uncommon characteristics
- Economic and social functional values



One or more of these criteria may be applied to identify Significant Woodlands.

### *Woodland Size*

Woodland size can be used as both an individual criterion and as threshold for consideration of additional criteria discussed herein (i.e. ecological function, uncommon characteristics, economic and social functional values). As an individual criterion, woodlands above a specified size threshold are identified as significant without further assessment (i.e., does not need to meet additional criteria). As a paired criterion, a secondary size threshold, lower than the individual criterion is identified must be met *and* the woodland must meet one or more additional criteria to be identified as significant.

Southern Bruce County has 21% woodland cover and based on the Natural Heritage Reference Manual, falls within the 15-30% significance size criterion which considers all woodlands 20 ha in size or larger as significant. However, the Natural Heritage Reference Manual also notes that “the size threshold should be reduced in the absence of information for the other three criteria” (O.M.N.R. 2010, p. 68); with other criteria referenced including: ecological functions criteria, uncommon characteristics criteria, and economic and social functional values criteria. In this case, woodlands 4 ha in size or larger would be considered significant.

Woodland cover in Northern Bruce County is 66%. The Natural Heritage Reference Manual does not suggest a size criterion at this cover level. Other factors play an important role in significance. Based on an assessment of woodland cover for Bruce County, size thresholds have been prepared for the N.H.S Options.

### *Ecological Function*

Ecological function criteria are generally used in combination with a size criterion. Ecological functions criteria include:

- Woodland interior
- Proximity to other woodlands and other habitats
- Linkages
- Water protection, and
- Woodland diversity

**Woodland Interior:** per the Natural Heritage Reference Manual, where woodland cover is 15-30% (in Southern Bruce County), it is recommended that woodlands with 2 ha or more interior habitat (defined as >100 m from woodland edge) be identified as significant. Areas of interior habitat greater than 20ha are recommended for identification as significant for Northern Bruce County (i.e., >60% woodland cover).

Deep interior habitat (>200 m from woodland edge) is an indicator of significant wildlife habitat (S.W.H.). As such, consideration should be given to this as an additional criterion for ecological function. There are no set size thresholds in the N.H.R.M. Size thresholds have been identified based on an assessment of deep interior woodland cover with the County.





**Proximity to other significant features:** acts as a proxy for identifying potential interactions that support or enhance existing ecological functions. Interactions may include:

- Hydrological connectivity (recharge or discharge / input or outlet / source support or receiver);
- Direct and indirect inputs (e.g. allochthonous inputs to watercourses, nutrients, etc.)
- Complex habitat needs (e.g. overwintering raptors that require meadow/field and forest complexes);
- Behavioral / physiological / biological requirements (e.g. stopover habitat near Lake Huron - birds, butterflies).

Maintaining these interactions may be critical in supporting a resilient system and ensuring their continued function on the landscape.

The Natural Heritage Reference Manual (O.M.N.R. 2010) recommends woodlands can be considered significant if “located within a specified distance (e.g., 30 m) of a significant natural feature or fish habitat likely receiving ecological benefit from the woodland and the entire woodland meets the minimum area threshold.”

**Water Protection:** the Natural Heritage Reference Manual (O.M.N.R. 2010) provides the following recommendation regarding identifying significant woodlands that play a role in water protection:

“Woodlands should be considered significant if they are located within a sensitive or threatened watershed or a specified distance (e.g., 50 m or top of valley bank if greater) of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and meet minimum area thresholds (e.g., 0.5-10 ha, depending on circumstance)”.

Retaining natural cover in areas of groundwater sensitivity (recharge or discharge) may assist in protecting water quality and / or quantity for natural features and functions. Consideration for proximity to, or occurrence within identified areas of groundwater sensitivity can be considered.

With the requirement from Provincial policy to identify a W.R.S., proximity of woodlands to some components of the W.R.S. can be considered for criteria developed to identify significant woodlands.

**Woodland diversity:** may be associated with community and species composition and/or landform. Consideration may be given to diversity within a single woodland, or representation of that woodland type within the County or land use type (e.g., urban, rural).

### *Uncommon Characteristics*

Special consideration should be given to woodlands that demonstrate uncommon characteristics. This ensures that specialized habitats, habitat for species of conservation concern (e.g. S-Rank 1-3 species), etc. are captured through the



assessment process. Per the Natural Heritage Reference Manual, uncommon characteristics may include:

- Uncommon community type or species composition
- Locally rare or uncommon species
- Species with high Coefficient of Conservatism<sup>6</sup> (i.e., 8, 9 or 10)

This criterion requires information generally obtained through site-level field studies.

It should be noted that the Natural Heritage Reference Manual lists other uncommon characteristics, including Habitat for Species of Conservation Concern (species with provincial ranking of S1, S2, or S3) and old growth or large tree size. Both vegetation characteristics predate the Ontario Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (O.M.N.R.F. 2015) which considers these as types of S.W.H. Therefore, consideration of these vegetation characteristics is included in the category of S.W.H., rather than Significant Woodland.

### ***Economic and Social Functional Values***

Economic and social functional values may be used to inform woodland significance assessment when paired with a minimum size threshold. Three primary measures are identified in the Natural Heritage Reference Manual:

- High production of economically valuable products;
- A high value in special services (e.g., air quality or sustainable recreation);
- Important appreciation, education, cultural or historical value.

All potential options for significance criteria for woodlands include a size-based component for overall woodland size and, in some options, also a consideration of area of interior forest habitat. A range of minimum sizes may be considered based on the analyses presented in Section 3. In order to support the ‘No Net Loss’ target for woodland cover, capture ranges for woodlands as *significant* of between ~85% and ~95% woodland capture are presented; however, a more restrictive (i.e., smaller) minimum size criteria can be used than those presented.

As previously discussed, Bruce County has a diverse landscape with a rather pronounced distinction between north and south. Southern Bruce County is predominantly agricultural with more fragmented natural heritage while the Northern Bruce County is a relatively intact natural heritage landscape. This geographic distinction is an important component to defining the N.E.S. for Bruce County and may warrant the application of two different sets of criteria.

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<sup>6</sup> A numerical value of 1-10, assigned to native flora that indicates the degree of tolerance to disturbance, and degree of fidelity to a specific habitat. The higher the value, the more restricted the species range of tolerance to disturbance and higher fidelity to a habitat type.



## Linkages

In the context of N.H.S planning, linkages are areas that provide ecological connectivity between natural heritage features or areas. As such, linkages are important to both the Core Areas-Based and Feature-Based System approaches to N.H.S. mapping. They are designed to accommodate the natural movement pattern of plants and animals because movement is necessary for biodiversity conservation and the long-term viability of ecological systems (O.M.N.R. 2010).

### Guidance for Linkage Identification

Section 2.1.2 of the 2020 P.P.S. sets the context for which linkages play a role in natural environment identification and protection, as follows:

“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 in areas, surface water features and ground water features.”

Linkages should be identified and planned based on multiple factors. These are summarized below.

#### Location, Orientation and Configuration

- Preferably associated linkages with existing natural areas and functions. For example, along a watercourse with riparian cover, a wide hedgerow, where there are small features which form ‘stepping stones’, etc.
- System linkages will not consist entirely of natural features; they will overlap with some agricultural and rural lands (other permeable landscapes)
- Avoid major roads, built areas and settlement areas as these represent existing barriers or areas with designations unsuitable to maintaining movement in the long-term.
- To the extent possible, plan for and establish north-south and east-west connections.
- To the extent possible, plan for redundancy in linkages to ensure the system retains its overall connectivity and ecological integrity for the long-term (O.M.N.R. 2010).

#### Function

- Identify target species or groups for movement through or residence within the linkage.



- Consider residency time of target species - how long a given species will reside within the linkage and its sensitivity to disturbance will inform cover types and needs.
- Design and plan for the most sensitive species (e.g., species prone to predation or averse to openings, or species that move very slowly).

### Width

- Generally, the wider the corridor the greater the number of species that will successfully use them to move across the landscape and the greater the potential for flow of genetic material.
- A minimum width of 200 m would support movement of forest interior species, but wider corridor width can be expected to perform better. Generally, as body size or mobility increases, corridor width recommendations increase. Large mammals, and large predators in particular (e.g., bears), prefer wider linkages.
  - The Natural Heritage Reference Manual recommends that local corridors have widths of 50-200m and regional corridors have widths of 300-400m (O.M.N.R. 2010).
  - The Growth Plan N.H.S Technical Report directs that corridors should at least three times as wide as measurable edge effects. For forested corridors this results in a minimum linkage width of 300m.
- Longer linkages should be wider to accommodate longer periods of time required for movement between core areas.

### Linkages for Bruce County

Based on the discussion presented in the Targets Discussion Paper, guidance for the identification of linkages, and the proposed approach to N.H.S identification (Core Areas Based and Features-Based), options for linkages have been prepared.

Linkages within the N.H.S. for Bruce County may include several scales, depending on the approach:

**County Scale Linkages** form the major movement corridors within the landscape and connect these major blocks of habitat to ensure long term mobility of plants and animals across the landscape. Because these County-scale linkages are intended to provide a landscape scale connection, they are very wide and are likely to contain, or encompass portions of natural heritage features.

**Local-Landscape Scale Linkages** are important connections between habitat areas. Specifically, they are intended to connect major blocks, but are less focused on broad-scale / county-wide movement. Local-Landscape corridors are of moderate width; they may connect multiple natural heritage features. Most often, these are associated with watercourses or other existing features on the landscape.



**Site-Scale Linkages** are small connections between features. These are important for movement of species with small habitat ranges, and/or that require multiple habitat types to complete their lifecycle process within a small geographic area (e.g., amphibians which require water to breed and use upland areas or forests for foraging).

Redundancy in linkages increases resilience and may be achieved through local-landscape and site-scale linkages.

It is important to note that linkages are conceptual at the time of identification. There is no immediate change to existing land uses where linkages are identified. Implementation of linkages (e.g., establishment of self-sustaining vegetation) is undertaken through voluntary enhancement or restoration opportunities, voluntary land acquisition, or through land planning processes where a change in land use is proposed (e.g., from rural to settlement).

### *Northern Bruce County*

Under the Core Areas-Based approach to N.H.S. identification, the primary connection to be maintained is between Core Areas through ‘County-Scale Linkages’. Between Core Areas, County-Scale Linkages have been defined as two composite elements:

- **Central, vegetated core.** A consistent and contiguous vegetated ‘core’ to a linkage provides continuous cover. It is to have a minimum width sufficient to support the target species for the linkage. The minimum width for this is 200m. Options for the N.H.S. can include increased core widths.
- **Permeable edge.** In recognition of the target species for Northern Bruce County (bears, Massasauga Rattlesnake), it is recommended that a permeable edge be added to the linkages to increase the functional width of the linkage. Within this area, land uses are to be permeable, and to the extent feasible, provide supportive elements for wildlife. Land uses suitable for these areas include agriculture, naturally designed stormwater facilities, plantations, etc. There is no minimum width for the permeable edge.

The minimum total linkage width is 400 m but may be larger to enhance the overall function of these areas. This approach provides an opportunity to maintain overall movement across the landscape, while recognizing conventional survey boundaries and balancing long-term growth through land-based opportunities for the County.

Final, implemented widths will vary based on land cover (e.g., existing features), but shall not be less than the minimum widths at any point along its length.

Site-scale linkages are to be identified through subsequent levels of land use planning (e.g., an Environmental Impact Study), as required to ensure functional connections between features are maintained. These are not a mapped component of the N.H.S.



Guidance is provided to ensure consistent identification and is consistent across all Options. In assessing for site-scale linkages:

- 1) Requirement for a site-scale linkage shall be considered where Key Features are  $\leq 240$  m apart.
- 2) Where a functional connection is identified, target species shall be identified to inform linkage width.

### *Southern Bruce County*

Under the Features-Based Approach in Southern Bruce County, linkages are identified at all three scales: County-scale, local-landscape scale and site-scale. Options and approach for each is described below.

County-scale linkages are a minimum width of 300-400 m. These are a mapped component of the N.H.S. Final, implemented widths will vary based conditions at the time of implementation, but shall not be less than the minimum widths at any point along its length.

Local landscape-scale linkages are a mapped component of the N.H.S. They are important secondary connections which provide movement opportunities for a range of species. Width is recommended to range between 60-100 m as based on target species for movement. Final, implemented widths will vary based on land cover (e.g., existing features), but shall not be less than the minimum widths at any point along its length.

Site-scale linkages are identified through site-specific (e.g., an Environmental Impact Study) and pre-planning studies (e.g., a subwatershed study) and are based on the form, function(s) and needs of the plants and wildlife present on and adjacent to the area being assessed. They are important components of the broader NHS as they ensure connectivity and viability of significant features on the landscape.

### **Enhancement Areas**

Lands which provide opportunities to improve an N.H.S (i.e., enhancement areas) are recognized through this 'Enhancement Areas' as an N.H.S component. Enhancement Areas provide an opportunity to recognize existing restored areas (e.g., restoration or enhancement projects or initiatives) and / or areas which provide opportunities to strengthen the system. There are no set requirements for enhancement areas. Enhancement areas identified through the current project are recommendations; they do not trigger specific changes in land cover and are to be confirmed or refined through subsequent levels of study and based on site-specific information. They are intended to, at a landscape-level, provide direction for supporting and/or enhancing the N.H.S.

Enhancement opportunities within an N.H.S may be identified to:



- Maintain or increase natural cover;
- Support system-level targets (e.g., no net loss of wetlands);
- Create larger contiguous natural areas to increase resilience of the system; and
- Improve habitat patch shape to reduce edge habitat and increase interior habitat.

To achieve the above, Enhancement Areas should be comprised of land use(s) that have the potential to be restored to a natural state but may not currently be in a natural state (e.g., agricultural field, golf course). The following areas are typically identified as candidate or potential enhancement areas:

- **Bays and Inlets:** areas of intrusion into existing natural heritage features. Restoring these areas improves the ‘edge to interior’ ratio of the core area and provides larger contiguous habitat areas.
- **Holes:** Some natural heritage features may have ‘donut holes’ or other internal gaps. Infilling these areas may increase opportunities for area-sensitive species and for interior habitat.
- **Gaps:** areas between two or more features that are in close proximity but are separated by a non-natural land use (distance can be defined through a GIS algorithm); closing these gaps between features will increase the size of contiguous habitat areas and are opportunities to increase diversity and connectivity.

Generally, the areas above can be identified using a GIS algorithm. Other opportunities may be identified based on stewardship activities, land trusts, etc. and should be considered based on the opportunities they provide to enhance the N.H.S. A preliminary set of enhancement opportunities are identified through the current project; additional opportunities based on land ownership, funding opportunities, etc. can be explored as an ongoing effort to support the N.H.S.

Floodplains and shorelines provide restoration and enhancement opportunities which have direct and indirect benefits to both ecological and hydrologic form and function. These areas are important for their ecological value as fish and wildlife habitat, as well as water quality, erosion prevention and flood prevention functions which contribute to human health and safety. Opportunities to enhance and restore floodplains and / shorelines should be explored through site specific studies.

Opportunities to support specific species (e.g., Species at Risk) or ecological functions (e.g., catchments for seepage areas) cannot be readily identified at the County Scale. These should be identified through more detailed levels of planning and be informed by site specific conditions. These are not identified or mapped through the current work, but could be explored by local municipalities, as appropriate.



## Appendix 3 Data Availability and Gaps

This appendix reviews minimum provincial Natural Environment System (Natural Heritage and Water Resource Systems) mapping requirements and data gap assessment.

### Natural Heritage System

Feature / Area	Data Availability / Gap
Provincially Significant Wetlands (including Significant Coastal Wetlands)	Suitable data available from the Province.
Other Wetlands	Suitable data available from the Province.
Significant Woodlands	Not available. Suitable base layer (Woodlands) available from the Province. Dataset requires minor cleaning prior to use. Significant woodland layer will be an outcome of the N.E.S. project.
Linkages	Not available. Linkage layer will be an outcome of the N.E.S. project. These may be mapped conceptually, supported by criteria, or as 'features'.
Life Science A.N.S.I	Suitable data available from the Province. Consideration for use of Regional A.N.S.I. dataset to be discussed.
Earth Science A.N.S.I	Suitable data available from the Province. Consideration for use of Regional A.N.S.I. dataset to be discussed.
Permanent and Intermittent Streams	Suitable data available. Three datasets to be combined for use. Datasets also used as a proxy for Fish Habitat as it is not commonly mapped.





## Water Resource System

Feature / Area	Data Availability / Gap
Provincially Significant Wetlands (including Significant Coastal Wetlands)	Suitable data available from the Province.
Other Wetlands	Suitable data available from the Province.
Waterbodies	Suitable data available. Three datasets to be combined for use. Datasets may also used as a proxy for Fish Habitat as it is not commonly mapped.
Permanent and Intermittent Streams	Suitable data available. Three datasets to be combined for use. Datasets also used as a proxy for Fish Habitat as it is not commonly mapped.
Rivers	Captured through waterbodies and watercourse mapping.
Important / significant recharge / discharge areas	Suitable data available from the province.
Highly vulnerable aquifers	Suitable data available from the province.

Other features are recognized through the O.P., but are not mapped / identified, including:

- Significant valleylands;
- River and stream corridors;
- Significant woodlands;
- Significant portions of threatened and endangered species habitat;
- Significant fish habitat;
- Significant wildlife habitats.

Some exceptions may apply where data is available with coverage suitable to the County (e.g., Deer Wintering Areas / Deer Yards under Significant Wildlife Habitat).