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# Table of Contents

1. Introduction ................................................................................................................................................. 1

   1.1. Overview of Project Phases .................................................................................................................... 1

   1.2. Review of Consultation ......................................................................................................................... 2

   1.3. Preliminary Natural Heritage System Options .................................................................................... 3

2. Preferred Natural Heritage System ........................................................................................................... 4

   2.1. Vision and Objectives for the County’s NHS ....................................................................................... 4

   2.2. Natural Heritage System Framework .................................................................................................. 5

   2.3. Natural Heritage System Components – Criteria ................................................................................ 6

3. Policy Recommendations ............................................................................................................................. 16

   3.1. Introduction ............................................................................................................................................ 16

   3.2. Existing Official Plan ............................................................................................................................. 16

   3.3. Provincial Policy Considerations .......................................................................................................... 19

   3.4. Updating the NOP ................................................................................................................................ 25

   3.5. Structural Changes to the NOP ............................................................................................................. 30

4. Natural Heritage System – Mapping ......................................................................................................... 31

   4.1. Wetlands ............................................................................................................................................... 32

   4.2. Areas of Natural and Scientific Interest ............................................................................................... 33

   4.3. Woodlands .......................................................................................................................................... 34

   4.4. Watercourses ....................................................................................................................................... 34

   4.5. Conservation Oriented Lands .............................................................................................................. 34

   4.6. Shoreline Areas .................................................................................................................................... 35

   4.7. Linkages ............................................................................................................................................... 35

   4.8. Enhancement Areas ............................................................................................................................... 36

   4.9. Buffers .................................................................................................................................................. 36

   4.10. Growth Plan Natural Heritage System ............................................................................................... 36

   4.11. Not Readily Mappable Components ................................................................................................... 36

5. Summary and Conclusions .......................................................................................................................... 39

   5.1. Next Steps ............................................................................................................................................. 40

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Northumberland Final NHS Report  •  June 2020

North-South Environmental Inc.  •  Specialists in Sustainable Landscape Planning
6. References.........................................................................................................................................47

List of Tables
Table 1. Components of the Natural Heritage System...........................................................................5
Table 2. Summary of Natural Heritage Component Criteria and Mapping.............................................41

List of Appendices
APPENDIX A | Figures.................................................................................................................................49
APPENDIX B | Definitions ............................................................................................................................55
APPENDIX C | Metadata .......................................................................................................................................61
1. Introduction

Provincial policy requires that a natural heritage system (NHS) be identified by municipalities and protected for the long term (PPS 2020). When the Province approved Northumberland County’s Official Plan in July 2015, policies were included in the Official Plan that recognized the requirement to establish a NHS. At the time the Official Plan was approved, there was widespread recognition that the County would identify the NHS and update policies after all outstanding appeals were dealt with and updates to other applicable Provincial Plans (e.g., Growth Plan 2017, revised in 2019) were completed. The County has since undertaken the studies necessary to establish a NHS in consultation with the local municipalities, Conservation Authorities, the Province, stakeholders and the public. The purpose of this Technical Report is to present the County’s preferred NHS through the description of the following components: vision and objectives; NHS framework; component features criteria; policy recommendations; and mapping. These technical aspects will be relied on in the future for proving guidance for the refinement of mapping and may assist in interpreting planning policies at the County and local municipal levels. This Technical Report has also taken into consideration comments received during the previous points of engagement, as described below.

1.1. Overview of Project Phases

The following sections provide an overview of the phases of the NHS Project which form the basis for the identification of the County’s preferred NHS.

1.1.1. Background Review

The identification of a robust NHS, which ensures that the natural heritage in the County is preserved for future generations, requires consideration of existing policies and best practices and, as such, a background review was undertaken during the initial phase of the project. A detailed policy review considered Provincial policies as well as the current County OP. Existing mapping and datasets available for the County were obtained and assembled in a digital data library. Further, a gap analysis was undertaken to identify gaps in representation provided by features identified through existing information sources. Findings from this project phase were presented in the Northumberland NHS Plan Background Report (NSE 2018).

1.1.2. Draft Vision and Objectives

The collaborative development of a vision and objectives is critical to establish a defensible foundation for the NHS. The goals and principles proposed in this project phase were tailored to the values and vision of Northumberland’s Council, local municipalities, other agencies and relevant stakeholders. They represent a foundation for the NHS and subsequent policies and provide guidance for establishing the balance between natural heritage and other policies. These are outlined in Section 2.1 and 2.2.
1.1.3. First Point of Consultation
The first public consultation, Technical Advisory Committee (TAC) review and stakeholder workshop were undertaken following the completion of the background review and drafting of the vision and objectives (see Review of Consultation in Section 1.2).

1.1.4. Identification of Criteria, Rationale and Natural Heritage Features
Following the review and organization of information from earlier project phases and guidance and input from the first round of consultations, a comprehensive review of existing data sources was undertaken to gain an understanding of the significance of identified features. As part of this analysis, criteria were developed, with supporting rationale, for the identification of component features, including ecological linkages, for inclusion in options for the County’s NHS. These criteria were developed with consideration of Provincial requirements and in support of the County’s vision and objectives. Three options were proposed that provided a range of scenarios for mapping the County’s NHS that considered the specific geographic context within the County and the differences in natural heritage cover within the various land use designations. These criteria and options are described in Northumberland County NHS Plan: Criteria and Rationale for the Identification of NHS Components (NSE 2019).

Using digital analysis queries and algorithms based on identification criteria established above, features for inclusion in the NHS were identified and mapped using the existing data.

1.1.5. Second and Third Point of Consultation
The preliminary NHS and policy framework were presented to the public and the TAC for comment and review (see Review of Consultation in Section 1.2).

1.2. Review of Consultation
Public and stakeholder consultation resulted in feedback and comments that informed future phases of the NHS project. Three points of engagement ensured that residents, landowners, and stakeholders were encouraged to participate and provide feedback throughout the development of the NHS.

Northumberland County conducted the first round of public information sessions in November 2018. At these sessions, the County and consultant team presented the background information and rationale for the natural heritage features and areas that were identified for inclusion in the NHS and received public input on other possible areas of interest and considerations for the development of policies related to the NHS. This initial point of engagement was used as a starting point for discussion. Feedback received at this time included public input into NHS components, identified concerns regarding population pressure, and expressed interest in ongoing participation.
The second round of public information sessions were held in November and December of 2019, during which the County and consultant team presented the three NHS options (described briefly in Section 1.3) for further feedback from the public. At this time, there was specific interest from the public about the impacts of the NHS on individual properties. In response and as a third point of engagement, in January 2020, the County developed and presented an interactive map viewer that illustrated each of the County NHS options, Provincial NHS, and airphoto imagery so that landowners could see what the NHS could look like on their individual properties. The feedback period was also extended for members of the public to complete the online feedback form. Feedback received at this time included public input into the preferred NHS option and sought to clarify impacts to landowners.

1.3. Preliminary Natural Heritage System Options

The County is required to identify and map a NHS; and while Provincial plans and guidance documents provided direction with respect to minimum requirements for components of a NHS, there remains flexibility at a municipal level for sizes, areas and additional components to map as part of the County’s NHS. As such, three preliminary NHS options were developed for consideration: Basic NHS (Option 1); Comprehensive NHS (Option 2); and Enhanced NHS (Option 3). Each of the three options increasingly encompassed more area (e.g., through lower size thresholds for significance) and therefore provided an increasingly more robust conservation-based approach to natural heritage protection in order to meet the NHS objectives for each option.

The main differences between the NHS options were the size threshold for significant woodlands, linkage size and location, and criteria for enhancement areas. All three NHS options were comprised mostly of the Provincial NHS from the Growth Plan which accounted for 115,564 hectares (58% cover) in all options. The overlap of the Growth Plan NHS with components of the County’s NHS resulted in the total mapped NHS area within the County for each of the options, as follows:

- Option 1 - 138,418 ha (69.9% cover)
- Option 2 - 138,776 ha (70.1% cover)
- Option 3 - 139,772 ha (70.6% cover)

All of the options would achieve the objectives for the County’s NHS and would be in conformity with Provincial Plans and policies; however, the degree of confidence that the NHS will provide a resilient, interconnected NHS that preserves and enhances natural features, ecological functions and native biodiversity for future generations, increases moving from Option 1 through Option 3.

The preferred option for the County’s NHS was in part determined through public consultation, and stakeholder and agency engagement. Based on the feedback received through this consultation and engagement, it is the opinion of Northumberland County and the consultant team that Option 3 best
fulfills the vision and objectives for the County’s NHS and has therefore been identified as the County’s preferred NHS option. The preferred NHS option is illustrated on Figures 1 through 5 in Appendix A.

2. Preferred Natural Heritage System

2.1. Vision and Objectives for the County’s NHS

The County’s principles, objectives and vision, as well as those of the local municipalities, was reviewed in the *Northumberland County NHS Plan: Criteria and Rationale for the Identification of NHS Components* (NSE 2019) report. Through this review and in consultation with the TAC, the public and stakeholders, the following was identified as the proposed vision for the County’s NHS:

“A resilient, interconnected Natural Heritage System that preserves and enhances natural features, ecological functions and native biodiversity, contributes to healthy watersheds, recognizes the important role the agricultural and rural landscape plays in the system, and maintains the unique natural landscape and geography of the County for future generations”.

In addition, objectives were identified following from the overall County vision and Guiding Principles as well as the objectives for protecting, maintaining, and improving, where possible, the County’s natural heritage for future generations. As such, the following objectives have been identified for the County’s NHS:

1. Maintain, improve and where possible, restore the health, diversity, size and connectivity of natural heritage features and areas, hydrologically sensitive features and related ecological functions.
2. Replace and restore linkages and related functions among ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas.
3. Recognize the role and value of agricultural and rural uses in and adjacent to the natural heritage system and recognize that flexible approaches to existing uses in the natural heritage system are required.
4. Recognize the important role the natural heritage system plays in mitigating the impacts of climate change by protecting and enhancing, where possible, the features and areas, ecological functions, and connections within the system.
5. Ensure that development is appropriately setback and buffered from natural heritage features and areas.
6. Encourage compatible outdoor recreational/educational activities in the natural heritage system provided the features and ecological functions are not adversely impacted.
2.2. Natural Heritage System Framework

Northumberland falls within the Growth Plan for the Greater Golden Horseshoe (Growth Plan) area, encompasses substantial areas of Oak Ridges Moraine Conservation Plan (ORMCP) area and Lake Ontario shoreline, and includes a broad range of land uses including major agricultural areas, rural areas and settlement areas. As such, the NHS was developed to consider the specific geographic context within the County and the differences in natural heritage cover within the various land use designations. Furthermore, the geographic differences in natural heritage feature cover and a desire to direct development to settlement areas have resulted in criteria being developed to ensure the County’s objectives for the NHS can be achieved. There are specific names for features with related policies within the Growth Plan NHS, ORMCP area, and within the remainder of the County; these were considered in the development and identification of the County’s NHS. Table 1 provides an overview of the various components to be included in the County’s NHS as identified for the Growth Plan NHS, ORMCP, and the remainder of the County (i.e., outside of the Growth Plan NHS and ORMCP area).

Table 1. Components of the Natural Heritage System for Northumberland County.

<table>
<thead>
<tr>
<th>Category</th>
<th>Document</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Features and Areas</td>
<td>Natural heritage features and areas as per PPS</td>
<td>• Provincially Significant Wetlands and coastal wetlands</td>
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<tr>
<td></td>
<td></td>
<td>• Significant Woodlands</td>
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<td>• Significant Life ANSI</td>
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<td>• Significant Earth ANSI</td>
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<td></td>
<td></td>
<td>• Fish Habitat</td>
</tr>
<tr>
<td></td>
<td>Key Natural Heritage Features as per Growth Plan and ORMCP</td>
<td>• Wetlands (Provincially and non-Provincially significant)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Significant Woodlands</td>
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<tr>
<td></td>
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<td>• Life Science ANSI</td>
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<td></td>
<td>• Fish Habitat</td>
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<tr>
<td></td>
<td>Key Hydrologic Features as per Growth Plan*</td>
<td>• Wetlands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Watercourses</td>
</tr>
</tbody>
</table>

Northumberland Final NHS Report • June 2020
### Natural Heritage System Components - Criteria

The following section describes the criteria for the identification of NHS components in Northumberland County, as developed in *Northumberland County NHS Plan: Criteria and Rationale for the Identification of NHS Components* (NSE 2019). Definitions for NHS components provided in Appendix B. A summary of NHS component criteria and mapping is provided in Table 2.

As described above, Option 3 (Enhanced) was identified as the preferred NHS option for the County. This option is a conservation-forward NHS option. It incorporates additional criteria and lower thresholds so that a large portion of the existing natural cover is captured within the NHS. The objectives of this option are to:

### Table 2: Natural Heritage System Components

<table>
<thead>
<tr>
<th>Category</th>
<th>Document</th>
<th>Components</th>
</tr>
</thead>
</table>
| As per Northumberland County (outside of Provincial plan areas) | • Provincially Significant Wetlands  
• Regionally Important Wetlands  
• Significant Woodlands  
• Regionally Important Woodlands  
• Life Science ANSI  
• Fish Habitat | • Significant Valleyland  
• Significant Wildlife Habitat  
• Habitat of Threatened and Endangered Species  
• Watercourses |
| Supporting Features and Areas | As per the definition of NHS in the PPS, Growth Plan and ORMCP | • Other Natural Heritage Features and Areas; this could include:  
- Other woodlands (i.e., not meeting the criteria as Significant Woodland)  
- Grassland/meadows not meeting the criteria as SWH that are continuous with Core Features and Areas  
- Non-Provincially Significant Wetlands in settlement areas  
- Other Valleylands  
- Other Wildlife Habitat  
• Lands that have been restored or have the potential to be restored to a natural state  
• Linkages (Large, Medium, Small)  
• Buffers / Vegetation Protection Zones |
| As per Northumberland County (outside of Provincial Plan areas) | • Other Woodlands  
• Other Wetlands  
• Earth Science ANSI  
• Regionally Important Wildlife Habitat (i.e., Other Wildlife Habitat)  
• Other Valleylands | • Conservation Oriented Lands  
• Shoreline Features  
• Enhancement Areas  
• Linkages  
• Buffers / Vegetation Protections Zones |

* Seepage areas, and inland lakes and their littoral zones, also identified as key hydrological features within the Growth Plan have not been included in this list. These are considered components of a Water Resource System, to be identified at a later date.
1. Identify and protect significant features and ecological functions and supporting areas.
2. Ensure connectivity between core areas identifying ‘County-scale’ linkages between large (<100 ha) and medium (>50 ha) size core areas.
3. Maintain and enhance the connectivity between terrestrial and aquatic natural heritage features within the County.
4. Protect and enhance the diversity of flora and fauna, ecosystems, plant communities, and significant landforms in the County by identifying ‘enhancement areas’.
5. Recognize that NHS components, particularly woodlands, will vary in size and form in settlement areas, rural areas, and prime agricultural areas.
6. Protect and enhance the Lake Ontario shoreline and connectivity to core features.

To achieve these objectives, this option:

- Uses lower size-based thresholds for some feature types than other options to identify NHS features;
- Uses larger (i.e., features can be further apart) and/or more proximity threshold(s) to identify NHS features;
- Identifies County-scale linkages between (>100 ha) and medium (>50 ha) size core areas;
- Identifies enhancement areas that focus on connecting features adjacent to one another (<120 m) and improving shape (i.e., filling small holes (<1 ha), bays and inlets (<120 m)).

2.3.1. Wetlands

Wetlands included as Key Features and Areas within Northumberland include both Provincially Significant Wetlands (PSWs) in the County and non-PSWs outside of settlement areas, termed Regionally Important Wetlands. Non-PSW wetlands within settlement areas are considered ‘other wetlands’ and included as a Supporting Feature and Area.

Provincially Significant Wetlands, both coastal and inland, are defined and mapped by the Province. Regionally Important Wetlands and ‘other wetlands’ are defined according to Provincial plans and identified following Provincial protocols (i.e., Ontario Wetland Evaluation System for Southern Ontario).

2.3.2. Areas of Natural and Scientific Interest

Confirmed ANSIs are identified by the Province. They are considered as part of the County’s NHS as follows:

- Confirmed Life Science ANSIs (Provincially and Regionally Significant) are identified as Key Features and Areas;
- Confirmed Earth Science ANSIs (Provincially and Regionally Significant) are identified as Supporting Features and Areas.
Candidate ANSIs (Life or Earth Science) are not included within the County's NHS. Should these features become confirmed ANSIs, they are to be added to the NHS, as appropriate.

**2.3.3. Habitat for Endangered and Threatened Species**

While presence of an assessment of habitat areas may be evaluated through site-specific work completed by industry or agencies, the NHS feature type “Habitat for Endangered and Threatened Species” is defined by and formally mapped and/or approved by the Province based on regulated habitat descriptions as described in the Endangered Species Act and recovery strategies for Species at Risk.

**2.3.4. Wildlife Habitat**

**2.3.4.1. Significant Wildlife Habitat**

The Province’s Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E provides specific criteria for the identification of SWH that should be considered within Northumberland. The criteria set out therein represents geographically based considerations for what should be considered significant with respect to wildlife habitat and in accordance with Provincial policies (e.g. PPS 2020). In accordance with this, the following criteria should be considered:

1. SWH in the County shall be identified in accordance with the Significant Wildlife Habitat Criteria schedules for Ecoregion 6E (MNRF, January 2015) and/or the appropriate provincial guidance document(s) as may be developed or amended from time to time (e.g., Natural Heritage Reference Manual, MNRF 2010).

2. Where any disagreements arise with respect to interpretation of SWH, the County may confer with Ministry of Environment, Conservation and Parks (MECP), however the County’s interpretation shall prevail if it provides equal or greater protection for SWH.

**2.3.4.2. Other Wildlife Habitat**

There are no specific guidelines or documents that provide direction with respect to the identification of other wildlife habitat that may warrant local consideration for inclusion within, or identification as a supporting feature or enhancement to, the NHS. In lieu of provincial direction, criteria have been developed based on technical factors. They have taken into consideration approaches from industry standards and guidance including Ecological Land Classification methods, Natural Heritage Reference Manual (MNRF 2010), Significant Wildlife Habitat Technical Guides (MNRF), and comparable criteria for other feature types (e.g. Woodlands).

Criteria for Regionally Important Wildlife Habitat is to be used for identification of those additional (i.e., ‘Other’) wildlife habitat areas that warrant inclusion within the NHS. Identification of Regionally Important Wildlife Habitat may be achieved through adoption of some, or all, the criteria identified for consideration below into the County’s OP.
Regionally Important Wildlife Habitat is a definable habitat area (e.g. one or more contiguous ELC communities) that:

- Is a minimum 0.5 ha in size and occurs within 30 m of a Key Features and Area; or
- Is a minimum 2 ha in size, occurs within 60 m of a Key Features and Area and meets one of the following criteria:
  - Is within 5 km of Lake Ontario; or
  - Is within 1 km of Rice Lake; or
- Is a minimum 4 ha in size, is within 60 m of a Key Features and Area and meets at least one of the following criteria:
  - Represents a habitat type / vegetation community type that is not well represented in the County’s NHS;
  - Is hydrologically connected to (contributing or receiving) the feature it is adjacent to;
  - Provides habitat for Species of Conservation Concern;
  - Provides habitat for two or more locally rare or uncommon species.

### 2.3.5. Woodlands

#### 2.3.5.1. Significant Woodlands Within the Oak Ridges Moraine Conservation Plan Area

Woodlands are determined to be significant where they:

- Have a minimum average width of 40 m and are:
  - 4 ha or larger in size located in the Countryside or Settlement Areas of the ORMCP; or
  - 0.5 ha or larger in size located in the Natural Core or Natural Linkage Areas of the ORMCP; or
  - 0.5 ha or larger located within or intersecting with a key natural heritage feature or hydrologically sensitive feature or their vegetation protection zone

#### 2.3.5.2. Significant Woodlands Within the NHS for the Growth Plan

Woodlands are determined to be significant where they:

- Have a minimum average width of 40 m and:
  - Are 20 ha or larger in size; or
  - Contain 8 ha or more of interior habitat (where interior habitat is more than 100 m from the edge); or
  - Area 4 ha or larger in size and are within 50 m of a key hydrologic feature or hydrologic area; or
  - Are 0.5 ha in size or larger and:
    - Support unique species composition (i.e., represented by less than 5% overall in woodland area)
    - Represent rare vegetation communities (i.e., ranked as S1-S3)
- Contain rare, uncommon species or species with a restricted habitat preference (e.g., vascular plant species for which the NHIC’s Southern Ontario Coefficient of Conservatism is 8, 9 or 10 – tree species of restricted distribution such as sassafras or rock elm – species existing in only a limited number of sites within the planning area); or
  - Are 4 ha in size or larger and:
    - Have 10 or more trees/ha greater than 100 years old;
    - Have 10 or more trees/ha at least 50 cm in diameter or a basal area of 8 or more m²/ha in trees that are at least 40 cm in diameter.

2.3.5.3. Regionally Important Woodlands Within the NHS for the Growth Plan

The following criteria are provided for Regionally Important Woodlands within the Growth Plan NHS but outside of the ORMCP area. These woodlands are smaller than Significant Woodlands in the Growth Plan NHS.

Woodlands are determined to be Regionally Important where they:

- Have a minimum average width of 40 m and are a minimum of:
  - 1 ha in Settlement Areas; or
  - 4 ha in Agricultural Areas; or
  - 6 ha in Rural Areas; or
  - 4 ha within 5 km of Lake Ontario or the minimum size criteria for the underlying land use, whichever is smaller.

  Or

- Have a minimum average width of 40 m, and are a minimum of
  - 0.5 ha in Settlement Areas; or
  - 2 ha in Agricultural Areas or Rural Areas; or
  - 2 ha within 5 km of Lake Ontario; or
  - 2 ha within 1 km of Rice Lake;

and

  - Occurs within 30 m of a Key Features and Areas as defined in the OP; or
  - Occurs wholly or partially within a Confirmed Earth Science ANSI, Conservation-Oriented Lands or Linkage Area as defined in the OP.

2.3.5.4. Significant Woodlands Outside of the Growth Plan NHS

The same criteria to identify Regionally Important Woodlands within the Growth Plan NHS are to be used to identify Significant Woodlands outside of the Growth Plan NHS.

2.3.5.5. Other Woodlands

Woodlands within the entirety of the County are determined to be ‘other woodlands’ where:
• The woodland length is no more than 3x its width; and
• The woodland is a minimum of 0.5 ha; and
• Dominant portion of woody species are native; and
• Supports, or has the ability to be restored to self-sustaining ecological function(s).

2.3.6. Valleylands

Valleylands are determined to be Significant Valleylands based on the following criteria:

• Is a valley, spillway\(^1\) 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
• Has an average width of 25 m or more, as defined from the point of valley formation downstream to the confluence of the valley being assessed
• Has a minimum average depth of 5 m or more; and
• Meets one or more of the following requirements:
  o Is a minimum of 50 m in length, as defined from the point of valley formation downstream to the confluence of the valley being assessed; and
  o Supports or contains at least one of the following:
    ▪ Active or historic erosion or deposition;
    ▪ Riparian or floodplain wetlands;
    ▪ Areas of groundwater release (seepage, springs, groundwater supported wetlands);
    ▪ 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);
    ▪ >25% natural cover in the valleyland;
    ▪ Riparian vegetation >30 m wide on each side of a surface water feature; or
  o Has an average width of 25 m or more, as defined from the point of valley formation downstream to the confluence of the valley being assessed; or
  o Has a drainage area of >50 ha.

Valleylands are determined to be ‘other valleylands’ based on the following criteria:

• Is a valley, spillway\(^1\) 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
• Has an average width of 15 m or more, as defined from the point of valley formation downstream to the confluence of the valley being assessed
• Has a minimum average depth of 3 m or more; and

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\(^1\) defined as well defined channels created by the concentrated flow of large volumes of water associated with glacial action (ORMCP, Technical Paper 1)

Northumberland Final NHS Report • June 2020
• Supports one or more of the functions listed under significant valleylands.

2.3.7. Fish Habitat
Fish habitat is identified as:

• Any watercourse or waterbody identified by the MNRF, or provided / approved by the Federal Department of Fisheries and Oceans (DFO) or a delegated authority of DFO including Conservation Authorities, as appropriate.

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 Ontario.

Designation as Fish Habitat can only be removed where it can be demonstrated, to the satisfaction of the approval authority under the Planning Act, that the feature does not constitute fish habitat as defined by DFO.

2.3.8. Watercourses
Watercourses includes all permanent and intermittent streams, where intermittent streams are defined 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,” (Growth Plan 2019 and Greenbelt Plan 2017).

2.3.9. Conservation Oriented Lands
Conservation-oriented lands includes lands that are managed in such a way as to support and/or enhance the NHS. Where Key Features and Areas are contained wholly or partly on conservation-oriented lands, these features are subject to the relevant policies of the Official Plan.

Conservation-Oriented Lands include the following:

• County forests;
• Conservation Areas and Conservation Authority Owned Lands;
• Wildlife Areas & Ecological Preserves;
• Land Owned and Managed by Conservation Land Trusts (e.g. NCC, NLT);
• Provincial Parks;
Privately owned natural areas, trail networks, etc. managed in such a way that they support the objectives of the NHS and support the overall form and function of the NHS.

2.3.10. Shoreline Features
The objective of identifying shoreline features is to protect or, where possible, enhance natural shoreline features and functions to support water quality, wildlife habitat and interactions between terrestrial and aquatic environments. Shoreline features may include:

- Natural / naturalized shoreline areas;
- Shoreline areas with restoration potential;
- Natural hazard areas along shoreline(s);
- Natural habitats and landforms, including:
  - Beach (sand, pebble, cobble, etc.);
  - Dunes;
  - Bluffs;
  - Cliffs;
  - Near-shore littoral and shallow aquatic habitats;
  - Shoreline vegetation, woody debris, etc.

Although shoreline features are generally identified as Supporting Features and Areas within the County’s NHS, some features may also be identified as Key Features and Areas (e.g., Significant Wildlife Habitat such as rare vegetation communities); the more restrictive policies would apply. Please note that shorelines are also regulated under the Conservation Authorities Act.

2.3.11. Linkages

2.3.11.1. Landscape- (County-)scale Linkages
Landscape-scale (i.e., County-scale) linkages are intended to provide broad connections between large and medium ‘core’ natural heritage areas. These core areas are composites of woodland, wetland, waterbodies, and potential ‘other wildlife habitat’ as defined through the criteria set out in the OP. Core areas were identified as contiguous areas of Key Features and Areas (excluding watercourses). Core areas were identified with the intent of determining the most appropriate location and widths for linkages. They are not considered a component of the NHS nor are provided a set of policies. The features that make up core areas are included in the NHS and have related policies.

Because these County-scale linkages are intended to provide a landscape scale connection, they are wide and are likely to contain, or encompass portions of Key Features and Areas. These include several widths based on the size of core areas being connected:

- Between Large Core Areas (>100 ha): 300-400 m wide
2.3.11.2. Site-scale (Local) Linkages

Site-scale or local 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.

The following criteria should be used when determining if a site-scale linkage is required:

- Ability of the feature to sustain itself without connection to other features/areas with respect to hydrology, species composition (flora and fauna) and habitat requirements;
- Presence of existing linkages (e.g., hedgerow, watercourse, etc.);
- Landscape matrix (permeability to wildlife/plant movement, NHS compatibility);
- There is reasonable confidence that the linkage will provide an ecologically functional connection;

In establishing a width for a site-scale linkage the following should be considered:

- Site-scale linkages are to be a minimum of 30 m in width at their narrowest point;
- The length to width ratio shall not be less than 3:1;
- The width should be appropriate for the needs and behavioural patterns of the target species for the linkage.
- If the linkage is to contain/support other functions (e.g., stormwater conveyance, utilities, etc.) the width is appropriately adjusted to provide a functional ecological connection.

2.3.12. Enhancement Areas

Enhancement areas are intended to provide a direct functional benefit to the NHS and are therefore typically identified as opportunities to infill, widen and/or connect features to increase the size and resiliency of contiguous core areas. Any area identified as a candidate enhancement area 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; naturalizing these gaps between features will increase the size of contiguous habitat areas and are opportunities to increase connectivity and the resiliency of the NHS.

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 NHS.

The following criteria are applied for the identification of potential enhancement areas:

- All or portions of ‘bays and inlets’ that are <120 m wide; or
- Interior ‘holes’ in features where the hole is <1 ha;
- The gap between features where the gap is <120 m

2.3.13. **Buffers/Vegetation Protection Zones**

Recommended buffers / Vegetation Protection Zones (VPZs) have been developed in consideration of Provincial plans that apply within Northumberland, where applicable. A minimum 30m buffer shall be applied to the following **Key Features and Areas outside of settlement areas**:

- Provincially Significant Wetlands;
- Regionally Important Wetlands;
- Significant Woodlands;
- Regionally Important Woodlands;
- Fish Habitat;
- Watercourses.

Buffers / VPZ’s for the following Key Features and Areas and **Supporting Features and Areas** and within settlement areas shall be determined through an appropriate study (e.g., a Subwatershed Study, EIS, or equivalent):

- Significant Wildlife Habitat
- Significant Valleylands
- Regionally important wildlife habitat;
- Life Science ANSI;
- Earth Science ANSI;
- Other Woodlands;
- Other Valleylands;
- Shoreline Features.

There is no buffer or VPZ applied to habitat for Endangered and Threatened Species.
Where there are overlapping features, the more restrictive buffer / VPZ shall apply. VPZs are generally applied from the edge of the feature (e.g., dripline for woodlands, stable top of bank for valleylands, etc.). For watercourses, the buffer / VPZ applies from the edge the high-water mark or top of bank ( whichever is greater).

3. Policy Recommendations

3.1. Introduction

When the Province approved Northumberland County’s Official Plan (‘NOP’) in July 2015, policies were included in the NOP to require that the County establish a NHS. At the time the NOP was approved, there was widespread recognition that the County would undertake this work after all outstanding appeals were dealt with and updates to other applicable Provincial Plans (e.g., Growth Plan), were completed. It was on this basis that the work leading to the preparation of a NHS was initiated in 2018.

The purpose of this section of the report is to briefly review how the current NOP is structured as it relates to natural heritage, review Provincial policy requirements and provide an overview of the changes required to the NOP to implement the work completed on the NHS.

3.2. Existing Official Plan

It is indicated in Part 1 (The Preamble) to the NOP that the "purpose of the County of Northumberland Official Plan is to provide direction and a policy framework for managing growth and land use decisions over the planning period to 2034."

The NOP is currently organized into six sections, as described below:

Section A (Vision, Guiding Principles and Land Use Concept) contains the vision of the County. This vision is based on an understanding of past and future trends and the wishes of the County’s residents and business owners. The guiding principles that form the basis of the Plan flow from the vision. These guiding principles also establish a framework for the goals, objectives and policies in the Plan. This section of the Plan also describes how it is to be implemented through land use designations.

Section B (Growth Management) contains the objectives and policies that provide the basis for accommodating expected growth in the County to 2034.

Section C (Land Use Designations) sets out the land use designations that apply in the County and the conditions under which development may be permitted within those land use designations.
Section D (Resource Areas and Constraint Areas) contains objectives and policies on natural heritage, water, cultural heritage and archaeology, minerals and petroleum and mineral aggregate resources in the County. Policies on natural and human-made hazards are also included within this part of the Plan.

Section E (General Development Policies) contains objectives and policies that, where appropriate, must be considered as part of the land use planning process.

Section F (Plan Implementation and Administration) describes how the vision, guiding principles, goals, objectives and policies of the Official Plan will be implemented.

The County of Northumberland recognizes the importance of natural heritage in Guiding Principle 10, where these principles are intended to establish the basis for making land use planning decisions in the future: "To protect natural heritage features and areas and their associated ecological functions so that they can be enjoyed by future generations and serve as a legacy to all peoples within the County."

Section D1 of the NOP deals with natural heritage resources and it establishes the following objective in Section D1.1 a): "It is the objective of this Plan to provide the basis for the establishment of a natural heritage system through the preparation of an Official Plan Amendment that is initiated by the County."

The objective above provided the basis for the initiation of the work on identifying a NHS for the County.

The other objectives in the current NOP related to natural heritage from Section D1.1 are below:

"b) Raise the public’s awareness that natural heritage features are important to the County of Northumberland and to its local municipalities and should be protected for future generations;

c) Maintain, improve and where possible, restore the health, diversity, size and connectivity of natural heritage features, hydrologically sensitive features and related ecological functions;

d) Maintain natural stream form and flow characteristics and the integrity and quality of watercourses;

e) Ensure that only land uses that maintain, improve or restore the ecological and hydrological functions of the natural heritage and hydrologic features are permitted;

f) Encourage the acquisition of land that is the site of significant natural heritage features by public authorities for conservation purposes;"
g) Provide the tools to properly assess development applications located in close proximity to natural heritage features;

h) Ensure that development is appropriately setback from significant natural heritage features;

i) Encourage and support the Ministry of Natural Resources and the appropriate Conservation Authority in conducting evaluations of unevaluated wetlands within the County; and,

j) Provide opportunities, where appropriate, for passive outdoor recreational activities."

Section D1.2 then deals with the establishment of a natural heritage system as set out below:

"The County of Northumberland is committed to maintaining and promoting a healthy natural environment and protecting its unique and special natural heritage features for the present generation and all successive generations. On the basis of this, it is a policy of this Plan that a natural heritage system be established, in consultation with the Ministry of Natural Resources and Forestry, resulting in an Official Plan Amendment to identify the system and incorporate appropriate policies. This Amendment will be undertaken within three years of the approval of this Plan."

As a consequence of the above, the current NOP does not map nor include policies that apply to lands within a NHS. This is an important consideration when it comes to considering Planning Act approvals in relation to the Growth Plan, as will be discussed in Section 3.3.2 of this report.

Notwithstanding the above, the NOP does include an Environmental Protection Area (‘EPA’) designation, which is one of 5 mutually exclusive land use designations in the NOP. According to Section C6.2 of the NOP, "the Environmental Protection Area designation is intended to identify and protect Provincially significant wetlands and Areas of Natural and Scientific Interest as classified by the Ministry of Natural Resources, and as identified on Schedule A to this Plan."

Mapping showing the location of Provincially significant wetlands and Areas of Natural and Scientific Interest was provided by the Ministry of Natural Resources and Forestry and incorporated as is on Schedule A of the NOP at the time. Provincially significant wetlands and Areas of Natural and Scientific Interest are also shown on Schedule B of the NOP.

With respect to permitted uses in the EPA designation, Section C6.3 states the following, which was consistent with the Provincial Policy Statement (‘PPS 2014’) at the time:

"Development and site alteration is not permitted in Provincially significant wetlands and shall not be permitted in Areas of Natural and Scientific Interest unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. Permitted uses in the Environmental Protection Area designation are limited to:

Northumberland Final NHS Report • June 2020
a)  *Forestry in the form of reforestation and regeneration, and excluding commercial logging and managed woodlots; and,*

b)  *Uses connected with the conservation of water, soil, wildlife and other natural resources."

While the NOP only including mapping of Provincially Significant Wetlands and Areas of Natural and Scientific Interest in the EPA designation, it does include extensive policies on development and site alteration in Section D1.5, the habitat of endangered and threatened species in Section D1.6 and significant wildlife habitat in Section D1.7. There are also policies on how the significance of features is determined in Section D1.8 and a number of general policies in Section D1.9 on the use of land in private ownership, adjacent lands and environmental impact studies. All of the above policies would have been consistent with the PPS 2014 at the time. Also included in the NOP are a number of natural heritage related definitions, all of which were copied from the PPS 2014.

In addition to the 5 mutually exclusive land use designations in the NOP, the NOP includes another land use category that applies to lands within the Oak Ridges Moraine Conservation Plan (‘ORMCP’). These lands are identified on Schedule A and policies for this area are included in Section C5 of the NOP. These policies essentially defer to the policies of the ORMCP and this approach was taken so there would be no policy duplication, meaning that all Planning Act applications are required to conform to the ORMCP.

### 3.3. Provincial Policy Considerations

#### 3.3.1. Starting with the PPS

The requirement to establish a NHS was first introduced in the 2014 iteration of the PPS, where the following was stated in Section 2.1.3: "Natural heritage systems shall be identified in Ecoregions 6E & 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.” This policy remains unchanged in the PPS 2020.

The above section implies that the ‘size and form’ of a NHS can vary based on land use considerations. Given the use of the words 'size and form', this also implies that the criteria relied upon to determine whether a feature is significant could be different if the feature is in a settlement area, with the selected criteria recognizing that there are a number of other Provincial policies supporting more compact development forms for example. Notwithstanding the above, it is the policies of the Growth Plan discussed below that now have a much more significant bearing on NHS planning in the County.
3.3.2. The Growth Plan

3.3.2.1. Mapping a NHS

The Growth Plan 2017 introduced a new policy on natural heritage in the form of Section 4.2.2.1 below:

"The Province will map a Natural Heritage System for the GGH to support a comprehensive, integrated, and long-term approach to planning for the protection of the region’s natural heritage and biodiversity. The Natural Heritage System mapping will exclude lands within settlement area boundaries that were approved and in effect as of July 1, 2017."

In early 2018, the Province did release such a map. In terms of the implications of this map, Section 4.2.2.5 of the Growth Plan 2017 stated the following:

"The natural heritage systems identified in official plans that are approved and in effect as of July 1, 2017 will continue to be protected in accordance with the relevant official plan until the Natural Heritage System has been issued."

The implication of the above was that the map released by the Province essentially came into effect when it was released, along with a number of new restrictions on development in certain features. In response to a number of concerns about the new policy framework, the Growth Plan was amended in 2019 and Section 4.2.2.1 now states the following:

"A Natural Heritage System for the Growth Plan has been mapped by the Province to support a comprehensive, integrated, and long-term approach to planning for the protection of the region’s natural heritage and biodiversity. The Natural Heritage System for the Growth Plan excludes lands within settlement area boundaries that were approved and in effect as of July 1, 2017."

A new Section 4.2.2.4 replaced the previous Section 4.2.2.5 from the Growth Plan 2017 and it now states the following:

"Provincial mapping of the Natural Heritage System for the Growth Plan does not apply until it has been implemented in the applicable upper- or single-tier official plan. Until that time, the policies in this Plan that refer to the Natural Heritage System for the Growth Plan will apply outside settlement areas to the natural heritage systems identified in official plans that were approved and in effect as of July 1, 2017."

In the case of the County of Northumberland, the above means that the new policies in the Growth Plan 2019 that restrict development in certain features do not apply because the NOP (which is an approved and in effect Official Plan) does not include a NHS. Notwithstanding the above, these restrictive policies in the Growth Plan may apply in one or more of the local municipalities depending
3.3.2.2. Establishing a NHS in Official Plans

Section 4.2.2.2 of the Growth Plan 2019 states the following:

"Municipalities will incorporate the Natural Heritage System for the Growth Plan as an overlay in official plans, and will apply appropriate policies to maintain, restore, or enhance the diversity and connectivity of the system and the long-term ecological or hydrologic functions of the features and areas as set out in the policies in this subsection and the policies in subsections 4.2.3 and 4.2.4."

It is noted that the above policy does not specify what type of municipality is required to identify the NHS as an overlay in their Official Plan - however, incorporating the NHS as an overlay in both upper tier and lower tier Official Plans allows for consistency of approach. It is noted that at a minimum, Section 4.2.10.1 f) requires that upper and single tier municipalities protect this system through the development of policies in their Official Plans. A similar policy requirement also applies to the agricultural land base as well in Section 4.2.10.1 g).

Section 4.2.2.5 also references single- and upper tier municipalities:

"In implementing the Natural Heritage System, upper- and single-tier municipalities may, through a municipal comprehensive review, refine provincial mapping with greater precision in a manner that is consistent with this Plan."

The above means that only upper and single tier municipalities can modify the boundaries of the NHS established by the Province. In addition, once the NHS has been incorporated in Official Plans, only an upper and single tier municipality can consider refinements through the municipal comprehensive review process.

With respect to lands outside of the NHS for the Growth Plan, Section 4.2.2.6 states the following:

"Beyond the NHS for the Growth Plan, including within settlement areas, the municipality:

a) Will continue to protect any other natural heritage features and areas in a manner that is consistent with the PPS; and

b) May continue to protect any other natural heritage system or identify new systems in a manner that is consistent with the PPS."

This implies that there is some discretion by the municipality for how, in what form and where the NHS will be identified outside of the Growth Plan NHS (and including within settlement areas), so long as it is consistent with the PPS. It is also noted that the above policy requires that features and
other natural heritage features and areas will be protected, however, the protection of any other natural heritage system is optional because of the use of the word 'may'. In this regard, there is no requirement to establish a natural heritage system outside of the Growth Plan NHS including within settlement areas as long as features are protected in a manner that is consistent with the PPS 2020.

As mentioned earlier, Section 2.1.3 of the PPS 2020 requires that natural heritage systems be identified. The PPS definition of NHS provides direction for the required components of the system, including:

"Natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems".

The Province has developed the NHS for the Growth Plan that must be incorporated as an overlay in the NOP and has identified a NHS for the ORMCP that comprises the Natural Core Area and Natural Linkage Area designations. Although these two natural heritage systems apply to only a part of the County, it could be interpreted as constituting the required NHS for the County of Northumberland, thus fulfilling Section 2.1.3 of the PPS that requires a NHS be identified. This approach would also recognize that the Growth Plan indicates in Section 4.2.2.6 that municipalities have the option of establishing a NHS outside of the Growth Plan NHS. This is further supported by the statement in the document entitled 'Implementation Procedures for the Agricultural System in the Greater Golden Horseshoe' dated March 2020' that indicates that 'if local natural heritage systems are identified outside of the Provincial natural heritage system for the Growth Plan / Greenbelt Plan natural heritage system.....'

The above means that while features and areas beyond the NHS for the Growth Plan and Greenbelt Plan (which in the case of Northumberland would include lands within the ORMCP) must be protected according to policies of the PPS, there is discretion as to if and how the municipality will identify a local NHS beyond the Growth Plan / Greenbelt Plan NHS. As a result, minimum standards in this case would mean that a local NHS outside of the Growth Plan and Greenbelt Plan NHS’s would not be required. However, only establishing a NHS for a part of the County means that other features and areas, including linkages, would not be included in a system that extended throughout the County.

However, municipalities are permitted to go beyond minimum standards as per the extract below from the PPS 2020:

"The policies of the Provincial Policy Statement represent minimum standards."
Within the framework of the provincial policy-led planning system, planning authorities and decision-makers may go beyond these minimum standards to address matters of importance to a specific community, unless doing so would conflict with any policy of the Provincial Policy Statement.”

This means that the County of Northumberland can identify a NHS outside of the Growth Plan NHS provided that it does not conflict with any other policy in the PPS 2020. Furthermore, the ‘Growth Plan Regional NHS Mapping - Technical Report’ notes the following:

“…that the scale of the NHS is important. Given that NHS mapping for the Growth Plan for the Greater Golden Horseshoe is on a broad, regional scale, it is focused on identifying larger core areas and broad linkages. The mapping was not intended to identify all areas and connect features that may be important to consider at a local or smaller scale…”

This statement acknowledges that there may be other features or connections (i.e., linkages) not identified in the Growth Plan NHS that are important to Northumberland that could be identified as part of the County’s NHS.

### 3.3.3. Implementing the ORMCP in the NOP

As set out in Section 3.2 of this report, the current NOP essentially defers to the ORMCP, and while the NOP does include the boundary of the ORMCP on Schedules A, B and C it is the policies of the ORMCP that are applied to any Planning Act application.

The ORMCP was updated in 2017 and it includes the following in the implementation section of the ORMCP:

"The Oak Ridges Moraine Conservation Act, 2001 directs municipalities to bring their official plans into conformity with the Plan. Municipal planning decisions shall also conform with this Plan, which takes precedence over municipal official plans. Nothing in this Plan is intended to prevent municipalities from adopting official plan policies and zoning by-law provisions that are more restrictive than the policies of this Plan, except where prohibited by this Plan or where it conflicts with other provincial plans."

As a result of the above, municipalities are required to ensure that their Official Plans conform to the ORMCP, but no specific direction is provided on how this should be accomplished and in this regard the ORMCP indicates explicitly that it will take precedence over Official Plans. This is contrasted with Section 5.3 of the Greenbelt Plan that states the following:

“Official plans shall contain policies that reflect the requirements of this Plan together with a map(s) showing the boundaries of the Greenbelt Area, the Protected Countryside, the Natural Heritage System and the agricultural land base. Municipalities shall provide a map showing known key natural
heritage features and key hydrologic features and any associated minimum vegetation protection zones identified in this Plan. The identification of the Natural Heritage System boundary will form the basis for applying the policies of section 3.2.”

The above clearly requires that all Official Plans show the boundary of the Greenbelt Area, the Protected Countryside and the Greenbelt NHS. The section goes further to require the preparation of a map showing ‘known key natural heritage features and key hydrologic features and any associated minimum vegetation protection zones’. There is no similar requirement in the ORMCP and this means that the current approach of the County with respect to the ORMCP can be retained.

3.3.4. The Growth Plan Agricultural System

Section 4.2.6.1 of the Growth Plan 2019 indicates that the Province has also identified an agricultural system, which is in addition to the natural heritage system that has also been identified by the Province. While the Growth Plan indicates that the Growth Plan NHS be shown as an overlay in Official Plans, Section 4.2.6.2 of the Growth Plan 2019 states the following:

"Prime agricultural areas, including specialty crop areas, will be designated in accordance with mapping identified by the Province and these areas will be protected for long-term use for agriculture."

The above means that there is a requirement to designate prime agricultural areas and identify the NHS as an overlay. However, the Growth Plan does not deal specifically with how key natural heritage features should be treated from an Official Plan mapping perspective.

In recognition of the overlap between the Provincial Agricultural System and NHS mapping, the Province has identified four options with respect to mapping in a document entitled 'Implementation Procedures for the Agricultural System in the Greater Golden Horseshoe' dated March 2020. In this regard, the following is stated:

"For clarity and consistency across the GGH, it is recommended that as a best practice, one of four options be used by municipalities for official plan mapping where prime agricultural areas overlap with key natural heritage features and key hydrologic features. In all four options, the Natural Heritage System in the Growth Plan / Greenbelt Plan Natural Heritage System would be an overlay. As well, permissions for new agricultural uses, agriculture-related uses and on-farm diversified uses where features and prime agricultural areas overlap would be restricted by protective policies (i.e., no development or site alteration)."

It is noted as per the above that the NHS would be an overlay in each of the four identified options. However, key natural heritage features and key hydrologic features within the NHS could be designated within a mutually exclusive land use designation in an Official Plan.
With respect to lands outside of the Growth Plan NHS, the above referenced Implementation Procedures document indicates the following:

"If local natural heritage systems are identified outside of the provincial Natural Heritage System for the Growth Plan / Greenbelt Plan Natural Heritage System, they could likewise be shown as an overlay in official plan maps, or other approaches as appropriate, consistent with the Natural Heritage Reference Manual (Ontario Ministry of Natural Resources, 2010). Where natural heritage features and areas and key hydrologic features outside the Natural Heritage System overlap with prime agricultural areas, it would also be useful to designate them in a way that shows where they overlap."

3.4. Updating the NOP

3.4.1. NHS Overlay

On the basis of the work completed to date, it is recommended that a NHS overlay designation be included within the NOP. The NHS overlay would apply to lands outside of the urban areas and rural settlements. It would be comprised of the Growth Plan NHS, the Natural Core Area and Natural Linkage Area designations established by the ORMCP and additional areas that have been identified by the County in accordance with Provincially recommended technical criteria and best practices for the identification of a NHS (see Northumberland County Natural Heritage System Plan - Background Report, July 9, 2018, and the Northumberland County Natural Heritage System Plan - DRAFT Criteria and Rationale for the Identification of Natural Heritage System Components, November 8, 2019). This NHS overlay would 'sit on top' of other designations, including for example the Agricultural Area designation which applies to prime agricultural land.

While the NHS is not proposed to extend into settlement areas, some of the linkages and other supporting features and areas within settlement areas that have been identified through the work completed to date will be included within the Supporting Features and Areas designation discussed in Section 3.4.3 of this report.

3.4.2. Natural Heritage Area Designation

It is also recommended that the current EPA designation be replaced by a Natural Heritage Area (‘NHA’) designation. Below is a discussion of how the NHA will be applied in the:

- Growth Plan NHS;
- Outside of the Growth Plan NHS and outside of settlement areas;
- Within settlement areas; and
- In the ORMCP.
3.4.2.1. The NHA in the Growth Plan NHS

The following features would be identified as key natural heritage features in the Growth Plan NHS as per the definition of key natural heritage feature in the Growth Plan 2019:

- Habitat of Endangered Species and Threatened Species;
- Fish Habitat;
- Wetlands (also considered to be a key hydrologic feature by the Growth Plan - key hydrological features are discussed below);
- Life Science Areas of Natural and Scientific Interest (ANSI);
- Significant Valleylands;
- Significant Woodlands
- Regionally Important Woodlands (while not a key natural heritage feature as defined are also included as discussed below);
- Significant Wildlife Habitat (including habitat of special concern species);
- Sand barrens, savannahs, and tallgrass prairies; and
- Alvars.

Of the above key natural heritage features, wetlands (including Provincially significant wetlands and non-Provincially significant wetlands), life science ANSIs and significant woodlands would be included in the NHA designation. It is anticipated that all of the key natural heritage features that can be mapped would be shown as one designation on one schedule and that the individual features be shown on a separate schedule to assist with interpretation.

As noted above, all wetlands are considered to be key natural heritage features within the Growth Plan NHS, with development and site alteration being prohibited within wetlands. The Growth Plan 2019 also includes the same restrictions on development and site alteration within key hydrologic features both inside and outside of the Growth Plan NHS but outside of settlement areas. In this regard, key hydrologic features include permanent streams, inland lakes and their littoral zones, seepage areas and springs in addition to wetlands. Of these key hydrologic features, wetlands, watercourses and inland lakes and their littoral zones outside of settlement areas will be included in the NHA designation. For seepage areas and springs, their location can usually only be determined through detailed study, if they are not already included within a mapped wetland area.

For those key natural heritage features or key hydrologic features of the Growth Plan that are not included in the NHA designation, policies would be required that ensure that appropriate studies be completed to verify their presence and extent, and to ensure that the policies are applied as necessary. The policies in Section 4.2.2.3 of the Growth Plan that deal with negative impacts, connectivity, the removal of key natural heritage features and key hydrologic features, the amount of disturbed area permitted and agricultural uses within the Growth Plan NHS would be incorporated.
within the NOP as is. The restrictive development and site alteration policies that apply to key natural heritage features and key hydrologic features within the Growth Plan NHS in Section 4.2.3 of the Growth Plan would also be incorporated within the NOP as is.

The restrictive development and site alteration policies that apply to lands within 120 metres of key natural heritage features within the Growth Plan NHS and key hydrologic features both within and outside of the Growth Plan NHS but outside of settlement areas in Section 4.2.4 of the Growth Plan would be incorporated within the NOP as is as well. For key hydrologic features, fish habitat and significant woodlands, a vegetated protection zone (VPZ) of no less than 30 metres, measured from the outside boundary of the key natural heritage feature or key hydrologic feature is required. Other key natural heritage features will require the establishment of a VPZ to be determined through an approved study. The restrictions and exemptions related to development or site alteration in VPZs, as noted in Section 4.2.4.3 of the Growth Plan would apply and these restrictions would also be included in the NOP as is.

With respect to the mapping of VPZs, it is recommended that the required 30-metre VPZ adjacent to significant woodlands within the Growth Plan NHS be included within the NHA designation. It is also recommended that the required 30-metre VPZ adjacent to key hydrologic features both within and outside of the Growth Plan NHS but outside of settlement areas be included in the NHA designation as well (this would apply to wetlands, watercourses and inland lakes and their littoral zones).

In addition to the above, regionally important woodlands within the Growth Plan NHS will be designated NHA. These regionally important woodlands are smaller than the significant woodlands in the Growth Plan NHS and would not be considered as a key natural heritage feature and therefore will not be subject to the restrictive policies on development and site alteration that apply to key natural heritage features. This means as well that there would not be a minimum VPZ requirement of 30 metres for these woodlands either; however, there would be a policy requirement to determine the necessary VPZ width as part of a Planning Act application process.

It is also recommended that the no negative impact test be applied to regionally important woodlands in accordance with Section 2.1.5 of the PPS when dealing with development and site alteration applications involving these woodlands in the Growth Plan NHS.

It is recognized that this approach would exceed the minimum standards set out by the Growth Plan 2019 and for this reason, it is recommended that the policies on regionally important woodlands in the Growth Plan NHS not be applied to new or expanding mineral aggregate operations, agricultural uses, agriculture-related uses and on-farm diversified uses. This means that the policies on regionally important woodlands would only apply to non-farm development such as residential lot creation. In order to differentiate between significant woodlands and regionally important woodlands in the Growth Plan NHS, mapping showing both would be included on a schedule to the NOP.
3.4.2.2. The NHA and Lands Outside of the Growth Plan NHS and Outside of Settlement Areas

On lands that are outside of the Growth Plan NHS and outside of settlement areas, the following features would be identified as natural heritage features and areas and subject to the development and site alteration policies of the PPS 2020:

- Habitat of Endangered Species and Threatened Species;
- Fish Habitat;
- Significant ANSIs;
- Significant Valleylands;
- Significant Woodlands; and
- Significant Wildlife Habitat.

Applying the policies of the PPS 2020 to the above features means that development and site alteration would not be permitted in the habitat of endangered species and threatened species and would not be permitted in the other features listed unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

It is noted that wetlands throughout the County outside of settlement areas are already considered to be key hydrologic features and would be designated NHA as per Section 3.4.2.1 of this report.

Of the above features, significant ANSIs and significant woodlands would be designated NHA. It is anticipated that all of the natural heritage features and areas that can be mapped would be shown as one designation on one schedule and that the individual features be shown on a separate schedule to assist with interpretation.

For those features that are not within the NHA designation, policies would be required that ensure that appropriate studies be completed to verify the presence and extent of these features, and to ensure that the policies are applied as necessary. The restrictive development and site alteration policies that apply to lands within and adjacent to features dealt with by the PPS 2020 in Sections 2.1.4 to 2.1.8 would be incorporated within the NOP as is.

Mandatory VPZ’s of any kind adjacent to natural heritage features and areas would not be identified in the NOP (except for key hydrological features outside of the Growth Plan NHS and outside of settlement areas) although the NOP would require an environmental impact study to support the establishment of a VPZ through a Planning Act process only. Notwithstanding the above, setbacks from features that are regulated by a Conservation Authority in accordance with the Conservation Authorities Act may still be applied from floodplains, watercourses, wetlands and other natural hazards, such as slopes and dynamic beaches.
3.4.2.3. The NHA within Settlement Areas

On lands that are outside of the Growth Plan NHS and within settlement areas, the following features would be identified as natural heritage features and areas and subject to the development and site alteration policies of the PPS 2020:

- Significant Wetlands;
- Habitat of Endangered Species and Threatened Species;
- Fish Habitat;
- Significant ANSIs;
- Significant Valleylands;
- Significant Woodlands; and
- Significant Wildlife Habitat.

Applying the policies of the PPS 2020 to the above features means that development and site alteration would not be permitted in significant wetlands and the habitat of endangered species and threatened species and would not be permitted in the other features listed unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Of the above features, significant wetlands, significant ANSIs and significant woodlands would be designated NHA.

3.4.2.4. The NHA and Lands Inside the ORMCP

While the lands within the Natural Core Area and Natural Linkage Area designations are included within the NHS, they would also be designated NHA in accordance with the ORMCP, which also designates these lands as such.

However, in order to differentiate between the different policies that apply in the ORMCP, two NHA sub-designations would need to be created: NHA - Natural Core Area (ORM) and NHA - Natural Linkage Area (ORM). The policies in the updated NOP would then direct the reader to the policies of the ORMCP for these two designations. It is recognized that this approach is different than in other parts of the County, where the actual features are designated NHA; however, a different approach is required in the ORMCP because of the unique set of policies that apply.

Where key natural heritage features and key hydrologic features have been identified outside of the Natural Core Area and Natural Linkage Area designations in the ORMCP, they would be designated NHA but will be subject to the ORMCP.
3.4.3. Supporting Features and Areas Designation

It is recommended that a Supporting Features and Areas (‘SFA’) overlay designation be added to the NOP. This overlay designation would include the following:

- Other Wetlands (located in settlement areas only);
- Watercourses (located in settlement areas only);
- Earth Science ANSI’s;
- Regionally Important Wildlife Habitat (i.e., Other Wildlife Habitat);
- Other Woodlands;
- Other Valleylands;
- Conservation Oriented Lands;
- Shoreline Features;
- Vegetation Protection Zones;
- Linkages; and
- Enhancement Areas.

Only those areas that could be confidently mapped would be included in the SFA overlay designation and these would include wetlands and watercourses in settlement areas, linkages and enhancement areas throughout the County and other woodlands outside of settlement areas. Linkages and enhancement areas would be shown conceptually on a schedule to the NOP to make it clear that these areas require further study through a Planning Act process. Vegetation protection zones would not be mapped, since their width would be determined through a Planning Act process.

3.5. Structural Changes to the NOP

With the changes recommended above, it is also recommended that a new Section C dealing with natural heritage and water resources be created, with the new policies added and some of the existing policies in former Section D being moved to Section C.

It is also recommended that Schedule A be modified by:

1. Deleting the Environmental Protection Area designation from the map and the legend;
2. Adding a new NHS overlay designation, which would be comprised of the Growth Plan NHS, Natural Core Area and Natural Linkage Area designations in the ORMCP and the NHS outside of settlement areas as one County-wide NHS;
3. Adding a new NHA designation (most likely dark green) to the map and legend;
4. Adding two new NHA sub-designations (NHA - Natural Core Area (ORM) and NHA - Natural Linkage Area (ORM)); and,
5. Adding a new SFA overlay designation (most likely light green border).

It is recognized that as a result of the changes above, there will be a need to apply land use designation(s) to lands within the ORMCP that are not within the NHA or the Rural Settlement Area designations. This is because while the lands within the ORMCP are shown currently on Schedule A to the NOP, the lands that are not in the Environmental Protection designation or the Rural Settlement Area designation are theoretically not designated. In this regard, it is recommended that the remaining lands be designated Countryside (ORM) on Schedule A. Alternatively, carrying forward the current approach and relying upon the ORMCP could also be considered. The designation of the lands within the ORMCP that are not in the NHA or the Rural Settlement Area designations will be re-considered when the Agricultural System is implemented through a future Official Plan Amendment (with the potential result being the division of the Countryside (ORM) designation into the Agricultural and Rural Area designations).

It is also recommended that Schedule B be re-named as Schedule B-2 and modified by deleting the Areas of Natural and Scientific Interest and Provincially Significant Wetlands from the map and legend.

Lastly, it is recommended that a new Schedule B-1 be created and it would be entitled 'Natural Heritage'. This schedule would be an 'information-only' schedule to assist with the interpretation of the policies in the NOP. Included on Schedule B-1 would be any of the individual significant natural heritage features, key natural heritage and key hydrological features that can be mapped. Individual supporting features and areas can also be included on this schedule as well. The standard 'Transportation Network Elements' and 'General Map Elements' included on every schedule would be included on Schedule B-1 as well. If the number of features to be differentiated on the new Schedule B-1 becomes impractical, consideration can be given to creating a Schedule B1-A and B1-B if necessary.

### 4. Natural Heritage System - Mapping

Using GIS queries and algorithms based on identification criteria (Table 2) and analysis, features for inclusion in the County’s NHS were identified and mapped. Metadata has been provided in Appendix C that is fully populated in a format that permits future users the ability to query data sources, methods (algorithms) used to generate themes, data authors and data age, etc. to permit an assessment of data quality.

Mapping is used as a tool to provide a visual representation of the NHS in support of policy implementation. Based on a review of mapping datasets available in Northumberland County (review

**Northumberland Final NHS Report** • June 2020
of age of data, accuracy, and completeness (i.e., representation of the County)), the following components were deemed to be ‘mappable’ and included in the NHS mapping:

- **Key Features and Areas:**
  - Provincially Significant Wetlands
  - Regionally Important Wetlands
  - Life Science Areas of Natural and Scientific Interest (ANSI)
  - Significant Woodlands
  - Regionally Important Woodlands
  - Watercourses

- **Supporting Features and Areas:**
  - Other Wetlands
  - Earth Science ANSI
  - Conservation Oriented Lands
  - Shoreline Areas (Shoreline Features)
  - Linkages
  - Enhancement Areas
  - Buffers

These components are illustrated on Figures in Appendix A. Those components which are not listed above, require site-specific confirmation prior to mapping.

Natural Heritage mapping should be updated periodically to maintain data accuracy by updating source datasets as they become available from dataset administrators (e.g., Land Information Ontario (LIO), Conservation Authorities, etc.) and by integrating the results of detailed or site-specific studies.

### 4.1. **Wetlands**

The Province is the administrator for the PSW dataset; this dataset is used as the source to identify and map, for the purposes of the Official Plan, Provincially Significant Wetlands and Provincially Significant Coastal Wetlands. The dataset is updated periodically as new information becomes available and provided to the Province, as the dataset administrator. Natural Heritage mapping will be updated periodically to ensure current PSW mapping is employed.

Provincial wetland mapping includes wetlands evaluated and determined to be ‘non-PSW’ as well as “Unevaluated” wetlands (i.e. have not been assessed for significance). This dataset, paired with wetland mapping produced and managed by local Conservation Authorities (CA’s) can be used to identify Regionally Important Wetlands and ‘other wetlands’.
Provincially Significant Wetlands (Coastal and Inland) and Regionally Important Wetlands are mapped as Key Features and Areas on OP mapping as part of the NHS. ‘Other wetlands’, i.e., those located within settlement areas that are not Provincially Significant Wetlands, are mapped as a component of Supporting Areas and Features. Where Regionally Important Wetlands extend into settlement areas they have been mapped to ensure they are appropriately identified and protected according to relevant policies.

**4.1.1. Dataset(s)**

The following datasets are considered for identifying and mapping wetland features within the County:

- Land Information Ontario (LIO)
  - Provincially Significant Wetlands
  - ‘Other Wetlands’ (i.e., Evaluated Non-PSW, Unevaluated)
- Conservation Authority Wetland Mapping

It is important to note that there is overlap between the LIO wetland mapping data and Conservation Authority mapping. Conservation Authorities generally provide their mapping to the Province for updating the LIO dataset; however due to update timing or discrepancies between mapping, variability exists and should be addressed through site-specific studies, as appropriate to refine the limits of features.

**4.2. Areas of Natural and Scientific Interest**

The Province is the administrator for the ANSI dataset(s); this dataset is used as the source to identify and map, for the purposes of the OP, Areas of Natural and Scientific Interest (Earth and Life Science). The dataset(s) are updated periodically as new information becomes available and is provided to the Province as the dataset administrator. Natural Heritage mapping will be updated periodically to ensure current ANSI mapping is employed.

Candidate ANSIs are not part of the NHS and are not mapped on OP Schedules / Maps. Candidate ANSI mapping is retained for use in screening and triggering studies to assess potential impacts, as appropriate. Should they be confirmed through appropriate methods, they will be added to the NHS in accordance with the direction above.

**4.2.1. Dataset(s)**

- Areas of Scientific Interest (ANSI) - Life Science (LIO)
- Areas of Scientific Interest (ANSI) - Earth Science (LIO)
4.3. Woodlands

Where Significant Woodlands and Regionally Important Woodlands are identified based on size criteria and/or proximity to other features, they are mapped in the OP. Where other function-based criteria are required to determine significance, they cannot be mapped in the OP. This would be completed through detailed or site-specific studies, as appropriate. The outcome of these studies may confirm significance or determine that some woodlands do not meet the test of significance in accordance with the policies set out in the OP.

4.3.1. Datasets
- MNRF Woodland Mapping (LIO);
- Northumberland County Forest Mapping.
- Ganaraska Region Conservation Authority ELC mapping to identify woodlands (i.e., forest and swamp)

4.4. Watercourses

Existing watercourse dataset(s) are used to map watercourses on Official Plan mapping / Schedules.

4.4.1. Datasets
- MNRF Watercourse Mapping (LIO);
- Conservation Authority Watercourse Mapping.

4.5. Conservation Oriented Lands

Publicly owned lands (e.g., Provincial parks, Conservation Authority Lands) are generally available to the County through LIO or individual agencies (MNRF, Canadian Wildlife Service, Conservation Authorities) and the County’s datasets (e.g., County Forests). Mapping may be available for lands owned by Conservation Land Trusts directly from these organizations. It is recommended that they be consulted to determine if inclusion on OP schedules would be acceptable should the County wish to include these lands on their mapping.

Privately owned lands that may be managed as conservation oriented are not be mapped on OP Schedules / maps, but are retained internally to inform stewardship and restoration activities, as appropriate (e.g., from Land Trusts or other organizations). Where Key Features and Areas are identified on private lands, these are mapped regardless of property ownership.

4.5.1. Dataset(s)
Datasets are available for the following:
• Provincial Parks;
• Conservation Authority Lands;
• Nature Conservancy of Canada owned lands;
• County Forests.

4.6. **Shoreline Areas**

Generally, shoreline features and habitats are not well mapped through existing datasets and may be small in aerial extent making them difficult to map at the County scale. To prompt consideration for/assessment of shoreline areas and features, a 250 m shoreline area along the Lake Ontario shoreline and a 100 m shoreline area from the Rice Lake shoreline has been identified on mapping. These Shoreline Areas are identified as a component of the Supporting Features and Areas within the Northumberland NHS.

4.6.1. **Dataset(s)**

A Shoreline Areas dataset has been created to illustrate the area 250 m from the Lake Ontario shoreline and 100 m from the Rice Lake shoreline.

4.7. **Linkages**

Linkages, as defined by the criteria described in Section 2.4.11 of this Technical Report, were identified as part of the NHS.

4.7.1. **Dataset(s)**

Although there are no existing datasets, a dataset for landscape-scale linkages has been generated through this work program using the set of criteria established herein (Section 2.4.11 and Table 2) using algorithms run through a GIS mapping exercise. This algorithm included the following steps:

1. Identifying Core Areas
   - Core, which are contiguous areas of Key Features and Areas (excluding watercourses).
     a. Large Core Areas (> 100 ha) identified using a GIS algorithm
     b. Medium Core Areas (>50 ha < 100 ha) identified using a GIS algorithm
   2. Identifying Linkages
     a. Locations of Large Linkages, 400m wide, were identified manually to connect large Core Areas along watercourses or the shortest distance between large Core Areas where a watercourse or intervening key feature did not exist.
     b. Locations of Medium Linkages, 200 m wide, were identified manually to connect medium Core Areas along watercourses or the shortest distance between medium Core Areas where a watercourse or intervening key feature did not exist.
Site-scale (local) linkages are identified through site-specific studies and have not been mapped as part of the County NHS.

4.8. Enhancement Areas

Enhancement areas are identified as part of the NHS. Enhancement areas have been mapped to inform development review, stewardship, and land acquisition opportunities (e.g., public or land trusts). It should be noted that additional enhancements areas may be identified through site-specific planning considerations that are outside of those identified on OP mapping / Schedules.

4.8.1. Dataset(s)

There are no existing datasets. A dataset has been generated using GIS algorithms according to criteria described in Section 2.4.12 (and Table 2) of this Technical Report.

4.9. Buffers

Buffers are to be mapped within the ORMCP area and are already mapped as part of the Growth Plan NHS, which is shown as an overlay on County OP mapping / Schedules. For consistency, buffers have also been identified for a subset of Key Features and Areas (see Section 2.3.13) on County OP mapping for areas outside of the Growth Plan NHS and outside of settlement areas.

4.9.1. Dataset(s)

There are no existing datasets. A dataset has been generated using GIS tools for buffering.

4.10. Growth Plan Natural Heritage System

The Growth Plan NHS will be shown as an overlay on the County’s OP Schedules. The Growth Plan NHS has been reviewed as part of the exercise in mapping the County’s NHS to ensure it does not extend into settlement areas.

4.10.1. Dataset(s)

The Province is the administrator for Growth Plan NHS dataset:

- MNRF - Natural Heritage System Areas (LIO)

4.11. Not Readily Mappable Components

4.11.1. Habitat for Endangered and Threatened Species

Habitat for Endangered and Threatened Species is not typically mapped on OP mapping / Schedules. There is limited mapping available for Endangered and Threatened species and what is available is incomplete and unconsolidated. It does not represent all recorded occurrences of
habitat, and due to the method of identification (detailed studies) it does not represent all habitat occupied by a species (i.e., can only document recorded occurrences). These limitations, in addition to the sensitive nature of the information for some species (due to poaching and other potential impacts on the species) makes mapping of habitat for Endangered and Threatened species unfeasible.

If made available from the province and/or through site-specific studies (e.g., Environmental Impact Study), a dataset for the County could be built in-house over time and used as a screening tool. Consideration will be given to adding data for the habitat of endangered and threatened species to internal GIS datasets as it becomes available for use as a screening tool.

4.11.1.1. Dataset(s)
There are no known datasets available for mapped Endangered and Threatened species. Consideration may be given to developing a dataset in-house as this information becomes available through studies (e.g., subwatershed studies, Environmental Impact Studies, etc.).

4.11.2. Wildlife Habitat
Significant Wildlife Habitat (SWH) is not typically mapped on OP mapping / Schedules. Identification and confirmation of SWH generally requires detailed in-field surveys and assessment based on criteria as provided by the province and/or those developed by municipal authorities. While ‘candidate’ SWH can be identified based on community type (e.g., wetlands), this approach encompasses too many areas to be an effective means to mapping this feature type within the NHS at the County-scale. Confirmation is recommended for incorporation into NHS mapping; this should be done through site-specific studies.

It is recommended that a SWH dataset be developed and maintained by the County, as the data becomes available, as part of the overall NHS composite mapping. Areas of confirmed SWH are to be incorporated into the NHS; areas of candidate SWH should be used for screening purposes and should be confirmed where there is potential to impact development considerations (e.g., define the limit of developable area) or could be negatively impacted by development. Generally, an assessment of SWH and SWH mapping is conducted through detailed or site-specific studies such as a subwatershed study, Natural Heritage Evaluation, Environmental Impact Study.

Several significant habitat functions are mapped and managed by the MNRF with respect to deer (overwintering areas, yarding area). No other known SWH mapping is available for the County. Based on a review of available MNRF data for deer overwintering areas and yarding areas, the accuracy of available mapping is low (i.e., based on 1 km squares) and may not be appropriate for defining the limit of the NHS in these areas; site-specific study may be required.
Similar to SWH, regionally significant wildlife habitat is not recommended to be mapped in OP mapping / Schedules. Identification of regionally significant wildlife habitat will generally be completed through detailed and/or site-specific surveys and cannot readily be mapped at the County-scale. SOLRIS land cover mapping, or other mapping (e.g. ELC), may be used for screening and identification of candidate habitat areas to ensure they are screened through individual project processes, as appropriate.

### 4.11.2.1. Dataset(s)
- MNRF habitat mapping, as available:
  - Deer Overwintering Areas (MNRF; LIO);
  - Deer Yarding Areas (MNRF; LIO);
- Project or site-specific SWH mapping, as available;
- Proxy data (e.g. SOLRIS, ELC), could be used for screening of candidate habitat areas (SWH and 'Other Wildlife Habitat'), but may not be appropriate for OP mapping. Limitations of data accuracy / resolution for some datasets (e.g. SOLRIS) should be taken into consideration.

### 4.11.3. Other Woodlands
Identification of other woodlands requires site-specific data confirmed through site-specific study and is therefore not mapped in the OP.

#### 4.11.3.1. Datasets
- MNRF Woodland Mapping (LIO);
- Northumberland County Forest Mapping;
- Ganaraska Region Conservation Authority ELC mapping to identify woodlands (i.e., forest and swamp)

### 4.11.4. Valleylands
Identification of significant valleylands requires site-specific data confirmed through site-specific study and is therefore not mapped in the OP.

Other valleylands are not suitable for mapping in the OP; they also rely on site-specific surveys or studies to be assessed.

#### 4.11.4.1. Dataset(s)
There are no known datasets that map valleylands.

### 4.11.5. Fish Habitat
Watercourse and waterbody data are used as a proxy for fish habitat on OP mapping / Schedules. Confirmation of fish habitat presence/absence is conducted through site-specific studies.
4.11.5.1. Datasets

- Watercourse Mapping (LIO);
- Waterbody Mapping (LIO);
- Conservation Authority Watercourse Mapping.

5. Summary and Conclusions

The identification and protection of NHSs have been shown to be the best way to maintain the long-term viability of ecological systems and to sustain biodiversity. The NHS approach is a planning tool intended to mitigate the impact and stresses associated with existing and future development by establishing a connected system of protected areas consisting of core areas that protect significant features and functions, and functional ecological linkages that accommodate the natural movement patterns of plants and animals. A NHS is the appropriate approach for the protection of natural heritage features and areas because it recognizes that individual areas and features have strong ecological ties to each other, as well as other physical features and areas in the overall landscape.

Three preliminary NHS options were developed for consideration: Basic NHS (Option 1); Comprehensive NHS (Option 2); and Enhanced NHS (Option 3). All three options meet minimum standards for conformity with the PPS and Provincial Plans. The number of components, connections and therefore size of the NHS increased moving from Option 1 through option 3, with increasing confidence that the County’s ecological systems and biodiversity would be maintained for future generations. The preferred option for the County’s NHS was in part determined through public consultation, and stakeholder and agency engagement as well as a review of best practices and analysis of the County’s current mapping of natural features and areas. Option 3 was found to best fulfill the vision and objectives for the County’s NHS and has therefore been identified as the County’s preferred NHS option.

This Technical Report has presented the County’s preferred NHS through the description of the following components: vision and objectives; NHS framework; component features criteria; recommendations for policy and mapping. This Technical Report has also taken into consideration comments received during the previous points of engagement.

The recommendations on potential refinements to Official Plan policies have responded to the direction of Provincial policies and Plans (PPS, Growth Plan and Oak Ridges Moraine Conservation Plan) and seek to promote the protection, maintenance, and where appropriate, enhancement of the NHS. Policy refinements have also considered current and future agricultural uses, development and resource use as well as ensuring continued enjoyment of the natural environment through passive recreation and other tourism uses.
The development of the NHS for Northumberland County has provided a technically sound, defensible natural heritage system and proposed a policy framework for the Official Plan that will conform with the provincial direction and meet the County’s vision and objectives for the Natural Heritage System.

5.1. Next Steps

The County OP is one of a series of policies, guidelines and regulations that direct the actions of the County and shapes growth and development. The natural heritage policies in the currently approved County OP (2014) will be updated through an Official Plan Amendment following approval by County Council. It is anticipated that the preferred option for the County’s NHS will be presented to Council in July 2020.
### Table 2. Summary of Natural Heritage Component Criteria and Mapping

<table>
<thead>
<tr>
<th>Natural Heritage System Component</th>
<th>Criteria Applied</th>
<th>Datasets Used in Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Features and Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ProvinceKally Significant Wetlands</td>
<td>• The wetland is designated as Significant Province (i.e., Provincially Significant Wetlands).</td>
<td>• Provincially Significant Wetlands (LIO)</td>
</tr>
<tr>
<td>Regionally Important Wetlands</td>
<td>• All non-PSW wetlands within the County, outside of settlement areas, are identified as Key Natural Heritage Feature</td>
<td>• ‘Other Wetlands’ (i.e., Evaluated non-PSW, Unevaluated) (LIO)</td>
</tr>
<tr>
<td>Life Science ANSI</td>
<td>• Confirmed Life Science ANSIs (Provincially and Regionally Significant) are identified as Key Natural Heritage Feature</td>
<td>• ANSI - Life Science (LIO)</td>
</tr>
<tr>
<td>Habitat for Endangered and Threatened Species</td>
<td>• MECP mapped habitat for Endangered and Threatened Species;</td>
<td>Component Not Readily Mappable</td>
</tr>
<tr>
<td></td>
<td>• MECP accepted mapping for habitat of Endangered and Threatened Species developed through approved studies (e.g., subwatershed study, EIA/DES, EA, etc.).</td>
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</tr>
<tr>
<td>Significant Wildlife Habitat</td>
<td>• SWH in the County shall be identified in accordance with the Significant Wildlife Habitat Criteria schedules for Ecoregion 6E (MNRF, January 2015) and/or the appropriate provincial guidance document(s) as may be developed or amended from time to time.</td>
<td>Component Not Readily Mappable</td>
</tr>
<tr>
<td></td>
<td>• Where any disagreements arise with respect to interpretation of SWH, the County may confer with MECP, however the County’s interpretation shall prevail if it provides equal or greater protection for significant wildlife habitat.</td>
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</tr>
<tr>
<td>Significant Woodlands (Oak Ridges Moraine Conservation Plan Area)</td>
<td>• Have a minimum average width of 40 m and are: • 4 ha or larger in size located in the Countryside or Settlement Areas of the ORMCP; or • 0.5 ha or larger in size located in the Natural Core or Natural Linkage Areas of the ORMCP; or • 0.5 ha or larger located within or intersecting with a key natural heritage feature or hydrologically sensitive feature or their vegetation protection zone</td>
<td>• MNRF Woodland Mapping (LIO)</td>
</tr>
<tr>
<td></td>
<td>• Significant Woodlands (within Growth Plan NHS, outside of ORMCP area)</td>
<td>• Northumberland County Forest Mapping</td>
</tr>
<tr>
<td></td>
<td>• Have a minimum average width of 40 m and: • are 20 ha or larger in size; or • contain 8 ha or more of interior habitat (where interior habitat is more than 100 m from the edge); or • are 4 ha or larger in size and are within 50 m of a key hydrologic feature or hydrologic area; or • are 0.5 ha in size or larger and: ▪ support unique species composition (i.e., represented by less than 5% overall in woodland area); or ▪ contain rare, uncommon species or species with a restricted habitat preference (e.g., vascular plant species for which the NHIC’s Southern Ontario Coefficient of Conservatism is 8, 9 or 10 - tree species of restricted distribution such as sassafras or rock elm - species existing in only a limited number of sites within the planning area); or • are 4 ha in size or larger and: ▪ have 10 or more trees/ha greater than 100 years old; or ▪ have 10 or more trees/ha at least 50 cm in diameter or a basal area of 8 or more m²/ha in trees that are at least 40 cm in diameter.</td>
<td>• Ganaraska Region Conservation Authority ELC mapping (forest and swamp communities)</td>
</tr>
<tr>
<td></td>
<td>Where Significant Woodlands can be readily identified based on size criteria and/or proximity to other features, they are mapped.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MNRF Woodland Mapping (LIO)</td>
<td>Where other function-based criteria are required to determine significance, they are considered Not Readily Mappable.</td>
</tr>
<tr>
<td>Natural Heritage System Component</td>
<td>Criteria Applied</td>
<td>Datasets Used in Mapping</td>
</tr>
<tr>
<td>----------------------------------</td>
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</tr>
</tbody>
</table>
| Significant Woodlands (outside of Growth Plan NHS) | • Have a minimum average width of 40 m and are a minimum of:  
  o 1 ha in Urban Areas and/or Rural Settlement Areas; or  
  o 4 ha in Agricultural Areas; or  
  o 6 ha in Rural Areas; or  
  o 4 ha within 5km of Lake Ontario or the minimum size criteria for the underlying land use, whichever is smaller; or  
  • Have a minimum average width of 40m and are a minimum of:  
   o 0.5 ha in Urban Areas and/or Rural Settlement Areas; or  
   o 2 ha in Agricultural Areas or Rural Areas; or  
   o 2 ha within 5km of Lake Ontario; or  
   o 2 ha within 1km of Rice Lake;  
   and  
   o Occurs within 30 m of a Key Features and Areas as defined in the OP; or  
   o Occurs wholly or partially within a Confirmed Earth Science ANSI, Conservation-Oriented Lands or Linkage Area as defined in the OP; or  
   • Have a minimum average width of 40 m and are a minimum of:  
    o are 0.5 ha in size or larger and:  
     ▪ support unique species composition (i.e., represented by less than 5% overall in woodland area); or  
     ▪ represent rare vegetation communities (i.e., ranked as S1-S3); or  
     ▪ contain rare, uncommon species or species with a restricted habitat preference (e.g., vascular plant species for which the NHIC’s Southern Ontario Coefficient of Conservatism is 8, 9 or 10 - tree species of restricted distribution such as sassafras or rock elm - species existing in only a limited number of sites within the planning area); or  
    o are 4 ha in size or larger and:  
     ▪ have 10 or more trees/ha greater than 100 years old;  
     ▪ have 10 or more trees/ha at least 50 cm in diameter or a basal area of 8 or more m²/ha in trees that are at least 40 cm in diameter. | Where Significant Woodlands can be readily identified based on size criteria and/or proximity to other features, they are mapped.  
  • MNRF Woodland Mapping (LIO)  
  • Northumberland County Forest Mapping  
  • Ganaraska Region Conservation Authority ELC mapping (forest and swamp communities)  
  Where other function-based criteria are required to determine significance, they are considered Not Readily Mappable. |
| Regionally Important Woodlands (within Growth Plan NHS, but outside of ORMCP area) | • Same criteria as Significant Woodlands (outside of Growth Plan NHS) | Where Regionally Important Woodlands can be readily identified based on size criteria and/or proximity to other features, they are mapped.  
  • MNRF Woodland Mapping (LIO)  
  • Northumberland County Forest Mapping  
  • Ganaraska Region Conservation Authority ELC mapping (forest and swamp communities)  
  Where other function-based criteria are required to determine significance, they are considered Not Readily Mappable. |
### Natural Heritage System Component

<table>
<thead>
<tr>
<th>Significant Valleylands</th>
<th>Criteria Applied</th>
<th>Datasets Used in Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Is a valley, spillway or ravine with defined valley morphology; and</td>
<td>- Contains flowing or standing water for a period of no less than two months in an average year; and</td>
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<tr>
<td>- Has an average width of 25 m or more, as defined from the point of valley formation downstream to the confluence of the valley being assessed</td>
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<tr>
<td>- Has a minimum average depth of 5 m or more; and</td>
<td>- Meets one or more of the following requirements:</td>
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<tr>
<td>- Supports or contains at least two of the following:</td>
<td>- Active or historic erosion or deposition;</td>
<td></td>
</tr>
<tr>
<td>- Riparian or floodplain wetlands;</td>
<td>- Areas of groundwater release (seepage, springs, groundwater supported wetlands);</td>
<td></td>
</tr>
<tr>
<td>- 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);</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &gt;25% natural cover in the valleyland;</td>
<td>- Riparian vegetation &gt;30 m wide on each side of a surface water feature; or</td>
<td></td>
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<tr>
<td>- Has an average width of 25 m or more, as defined from the point of valley formation downstream to the confluence of the valley being assessed; or</td>
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<tr>
<td>- Has a drainage area of &gt;50 ha.</td>
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</tbody>
</table>

### Fish Habitat

- Any watercourse or waterbody identified by the MNRF, or provided / approved by the Federal Department of Fisheries and Oceans (DFO) or a delegated authority of DFO (including Conservation Authorities, as appropriate); 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 Ontario.

### Watercourses

- Watercourses includes all permanent and intermittent streams. Watercourses are identified as [Key Features and Areas](#) within the County’s NHS

### Supporting Features and Areas

- All non-PSW wetlands within settlement areas, are identified as [Supporting Features and Areas](#)

### Other Wetlands

- ‘Other Wetlands’ (i.e., Evaluated non-PSW, Unevaluated) (LIO)
- Conservation Authority Wetland Mapping

---

2 defined as well defined channels created by the concentrated flow of large volumes of water associated with glacial action

Northumberland Final NHS Report  •  June 2020
<table>
<thead>
<tr>
<th>Natural Heritage System Component</th>
<th>Criteria Applied</th>
<th>Datasets Used in Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth Science ANSI</td>
<td>Confirmed Earth Science ANSIs (Provincially and Regionally Significant) are identified as Supporting Features and Areas</td>
<td>ANSI - Earth Science (LIO)</td>
</tr>
<tr>
<td>Regionally Important Wildlife Habitat (i.e., Other Wildlife Habitat)</td>
<td>A definable habitat area (e.g. one or more contiguous ELC communities) that:</td>
<td>Component Not Readily Mappable</td>
</tr>
<tr>
<td></td>
<td>• Is a minimum 0.5 ha in size and occurs within 30 m of a Key Features and Areas; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is a minimum 2 ha in size, occurs within 60 m of a Key Features and Areas and meets one of the following criteria:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is within 5 km of Lake Ontario; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is within 1 km of Rice Lake; or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is a minimum 4 ha in size, is within 60 m of a Key Features and Areas and meets at least one of the following criteria:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Represents a habitat type / vegetation community type that is not well represented in the County’s NHS;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Is hydrologically connected to (contributing or receiving) the feature it is adjacent to;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provides habitat for Species of Conservation Concern;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provides habitat for two or more locally rare or uncommon species.</td>
<td></td>
</tr>
<tr>
<td>Other Woodlands</td>
<td>The woodland length is no more than 3x its width; and</td>
<td>Component Not Readily Mappable</td>
</tr>
<tr>
<td></td>
<td>• The woodland is a minimum of 0.5 ha;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Dominant portion of woody species are native;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Supports, or has the ability to be restored to self-sustaining ecological function(s).</td>
<td></td>
</tr>
<tr>
<td>Other Valleylands</td>
<td>Is a valley, spillway or ravine with defined valley morphology; and</td>
<td>Component Not Readily Mappable</td>
</tr>
<tr>
<td></td>
<td>• Contains flowing or standing water for a period of no less than two months in an average year; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Has an average width of 15 m or more, as defined from the point of valley formation downstream to the confluence of the valley being assessed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Has a minimum average depth of 3 m or more; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Supports one or the functions listed under significant valleylands.</td>
<td></td>
</tr>
<tr>
<td>Conservation Oriented Lands</td>
<td>County forests;</td>
<td>Provincial Parks (LIO)</td>
</tr>
<tr>
<td></td>
<td>Conservation Areas and Conservation Authority Owned Lands;</td>
<td>Conservation Authority Lands</td>
</tr>
<tr>
<td></td>
<td>Wildlife Areas &amp; Ecological Preserves;</td>
<td>Nature Conservancy of Canada lands</td>
</tr>
<tr>
<td></td>
<td>Land Owned and Managed by Conservation Land Trusts (e.g. NCC, NLT).</td>
<td>Northumberland County Forest Mapping</td>
</tr>
</tbody>
</table>
## Natural Heritage System Component

<table>
<thead>
<tr>
<th>Shoreline Features (Shoreline Areas)</th>
<th>Criteria Applied</th>
<th>Datasets Used in Mapping</th>
</tr>
</thead>
</table>
| Shoreline Features (Shoreline Areas) | - Natural / naturalized shoreline areas;  
- Shoreline areas with restoration potential;  
- Natural hazard areas along shoreline(s);  
- Natural habitats and landforms, including:  
  - Beach (sand, pebble, cobble, etc.);  
  - Dunes;  
  - Bluffs;  
  - Cliffs;  
  - Near-shore littoral and shallow aquatic habitats;  
  - Shoreline vegetation, woody debris, etc. | Shoreline Features are Not Readily Mappable.  
To prompt consideration for/assessment of shoreline areas and features, Shoreline Areas were mapped as follows: a 250 m shoreline area along the Lake Ontario shoreline and a 100 m shoreline area from the Rice Lake shoreline has been identified on mapping. |

Shoreline features are generally identified as Supporting Features and Areas within the County’s NHS. Some features may also be identified as Key Features and Areas (e.g., Significant Wildlife Habitat); the more restrictive policies would apply.

## Linkages

| County Scale Linkages:  
- Between Large Core Areas (>100 ha): 300-400 m wide;  
- Between Medium Core areas (>50 ha): 100-200 m wide;  
- The length to width ratio shall not be greater than 3:1 | A dataset has been generated through this work program using the set of criteria described herein through algorithms run through a GIS mapping exercise.  
Site-scale (local) linkages are identified through site-specific studies and have not been mapped as part of the County NHS. |

## Enhancement Areas

| Within existing natural heritage features:  
- All or portions of ‘bays and inlets’ that are <120 m wide; or  
- Interior ‘holes’ in features where the hole is <1 ha;  
- Gaps between features where the gaps are <120 m. | A dataset has been generated through this work program using the set of criteria described herein through algorithms run through a GIS mapping exercise. |
### Natural Heritage System Component

<table>
<thead>
<tr>
<th>Criteria Applied</th>
<th>Datasets Used in Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffers / VPZs</td>
<td>A dataset has been generated through this work program using the set of criteria described herein and using GIS tools for buffering.</td>
</tr>
</tbody>
</table>

#### Criteria Applied

A minimum 30 m buffer to be applied to the following **Key Features and Areas**:

- Provincially Significant Wetlands;
- Regionally Important Wetlands;
- Significant Wildlife Habitat;
- Significant Woodlands;
- Regionally Important Woodlands;
- Significant Valleylands;
- Fish Habitat;
- Watercourses.

Buffers / VPZ’s for the following **Supporting Features and Areas** to be determined through an appropriate study (e.g., a Subwatershed Study, EIS, or equivalent):

- Regionally important wildlife habitat;
- Life Science Areas of Natural and Scientific Interest;
- Earth Science Areas of Natural and Scientific Interest;
- Other Woodlands;
- Other Valleylands;
- Shoreline Features.
6. References


APPENDIX A | Figures
Map 2 | Northumberland Natural Heritage System Preferred Option

Legend
- Northumberland County
- First Nations Territory
- Settlement Areas
- Growth Plan Natural Heritage System
- Provincially Significant Wetlands
- Regionally Important Wetlands
- Other Wetlands
- Waterbodies
- Watercourses
- Roads

Date: 2020-07-08

Map Produced by North South Environmental (NSE) Inc.
This map is proprietary and confidential and must not be duplicated or distributed by any means without permission of NSE.
APPENDIX B | Definitions
Areas of Natural and Scientific Interest (ANSI): means areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. (PPS, 2020)

Buffers: means an area of land located adjacent to Key Natural Features and Areas. The purpose of the buffer is to protect the features and ecological functions of the County’s Natural Heritage System by mitigating impacts of the proposed development or site alteration. The extent of the buffer and activities that may be permitted within it shall be based on the sensitivity and significance of the Key Natural Features and Areas and their contribution to the long term ecological functions of the County’s Natural Heritage System as determined through an appropriate study (e.g., Sub-watershed Study, an Environmental Impact Study or similar studies), as approved by the County.

Coastal wetland: means

a) any wetland that is located on one of the Great Lakes or their connecting channels; or

b) any other wetland that is on a tributary to any of the above-specified water bodies and lies, either wholly or in part, downstream of a line located 2 km upstream of the 1:100 year floodline (plus wave run-up) of the large water body to which the tributary is connected. (PPS, 2020)

Enhancement Area: Means ecologically supporting areas adjacent to Key Features and Areas and/or measures internal to the Key Features and Areas that increase the ecological resilience and function of individual features or groups of features.

Fish: means fish, which are defined in the Fisheries Act, including fish, shellfish, crustaceans, and marine animals, at all stages of their life cycles. (PPS, 2020)

Fish Habitat: as defined by the Fisheries Act, 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. (PPS, 2020)

Growth Plan Natural Heritage System (GP NHS): the natural heritage system mapped and issued by the Province in accordance with the Growth Plan for the Greater Golden Horseshoe (2019).

Habitat for Endangered and Threatened Species: means habitat within the meaning of Section 2 of the Endangered Species Act, 2007. (PPS, 2020)

Key Features and Areas: a sub-category of the County’s natural heritage system components which generally include physically definable features that provide ecological benefits to flora, fauna and people. The following natural heritage system components have been identified as Key Features and Areas in the County’s NHS:

Northumberland Final NHS Report • June 2020
• Provincially Significant Wetlands (PSWs)
• Regionally Important Wetlands
• Life Science ANSI
• Habitat for Endangered and Threatened Species
• Significant Wildlife Habitat (SWH)
• Significant Woodlands
• Regionally Important Woodlands (within Growth Plan NHS, but outside of ORMCP area)
• Significant Valleylands
• Fish Habitat
• Watercourses

**Linkages:** Linkage means an area that provides ecological connectivity between natural heritage features. Linkages support a range of community and ecosystem processes enabling plants and animals to move among natural heritage features, in some cases over multiple generations. Linkages are preferably associated with the presence of existing natural areas/features (e.g., watercourses) and functions and should be established where they will provide an important contribution to the long-term sustainability of the overall NHS.

**Natural Heritage System (NHS):** means a system made up of natural heritage features and areas, and linkages intended to provide connectivity (at the regional or site level) and support natural processes which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species, and ecosystems. The County has developed its natural heritage system in accordance with Provincial direction.

**Significant:** means

a) in regard to wetlands, coastal wetlands and areas of natural and scientific interest, an area identified as provincially significant by the Ontario Ministry of Natural Resources and Forestry (MNRF) using evaluation procedures established by the Province, as amended from time to time;

b) in regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. These are to be identified using criteria described in the County’s OP;

c) in regard to other natural heritage system features and areas, 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. These are to be identified using criteria described in the County’s OP. (as modified from the PPS 2020)

**Significant Wildlife Habitat (SWH):** a *wildlife habitat* that is ecologically important in terms of features such as species representation or amount, and contributing to the quality and diversity of an identifiable geographic area or *natural heritage system*. These are identified using criteria established by the Province. (Growth Plan for the Greater Golden Horseshoe, 2019).

**Supporting Features and Areas:** a sub-category of the County’s *natural heritage system* components which generally includes features or areas that currently contribute (direct or indirect) or have the potential to contribute to the health and resilience of Key Features and Areas. The following *natural heritage system* components have been identified as **Supporting Features and Areas** in the County’s NHS:

- Other Wetlands
- Earth Science ANSI
- Regionally Important Wildlife Habitat
- Other Woodlands
- Other Valleylands
- Conservation Oriented Lands
- Shoreline Features
- Linkages
- Enhancement Areas
- Buffers / Vegetation Protections Zones (VPZs)

**Wetland:** means lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface. In either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic plants or water tolerant plants. The four major types of wetlands are swamps, marshes, bogs and fens.

Periodically soaked or wetlands being used for agricultural purposes which no longer exhibit wetland characteristics are not considered to be wetlands for the purpose of this definition. (PPS, 2020)

**Wildlife Habitat:** means areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species. (PPS, 2020)

**Woodlands:** means 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 and 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. Woodlands may be delineated according to the Forestry Act definition or the Province’s Ecological Land Classification system definition for “forest”. (PPS, 2020)

Valleylands: means 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. (PPS, 2020)

Vegetation Protection Zone (VPZ): means a vegetated buffer area surrounding a key natural heritage feature or key hydrologic feature. (Growth Plan for the Greater Golden Horseshoe, 2019)
APPENDIX C | Metadata
**Provincially Significant Wetlands (PSW)**

**Description:** Wetlands are lands that are seasonally or permanently flooded by shallow water. They also include lands where the water table is close to the surface. Provincially Significant Wetlands, both coastal and inland, are defined and mapped by the Province.

**Summary:** A polygon shapefile illustrating wetlands that are designated as Significant by the Province.

**Credits and Date Created:**
North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Dataset Owner</th>
<th>Type</th>
<th>Date Last Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands</td>
<td>LIO</td>
<td>Polygon</td>
<td>2019</td>
</tr>
</tbody>
</table>

**Criteria Applied:**
The wetland is designated as Significant by the Province.
Regionally Important Wetlands

**Description:** Wetlands are lands that are seasonally or permanently flooded by shallow water. They also include lands where the water table is close to the surface. Regionally Important Wetlands are defined according to Provincial plans and identified following Provincial protocols (i.e., Ontario Wetland Evaluation System for Southern Ontario).

**Summary:** A polygon shapefile illustrating wetlands that are designated as Regionally Important Wetland according to County criteria.

**Credits and Date Created:**

North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Dataset Owner</th>
<th>Type</th>
<th>Date Last Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands</td>
<td>LIO</td>
<td>Polygon</td>
<td>2019</td>
</tr>
</tbody>
</table>

**Criteria Applied:**

All non-PSW wetlands within the County which occur outside of settlement areas are identified as Regionally Important Wetlands.
Other Wetlands

**Description:** Wetlands are lands that are seasonally or permanently flooded by shallow water. They also include lands where the water table is close to the surface. Those wetlands which do not meet the criteria for Significant Wetlands or Regionally Important Wetlands are considered ‘Other Wetlands’ in the County NHS.

**Summary:** A polygon shapefile illustrating wetlands which do not meet the criteria for Significant Wetlands or Regionally Important Wetlands.

**Credits and Date Created:**
North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Dataset Owner</th>
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<tbody>
<tr>
<td>Wetlands</td>
<td>LIO</td>
<td>Polygon</td>
<td>2019</td>
</tr>
</tbody>
</table>

**Criteria Applied:**
Those wetlands which do not meet the criteria for Significant Wetlands or Regionally Important Wetlands.
Areas of Natural and Scientific Interest (ANSI)

Description: ANSI's (Areas of Natural and Scientific Interest) are polygon features that represent lands and waters containing important natural landscapes or features that are important for natural heritage, protection, appreciation, scientific study or education. Information includes Earth, Life and Candidate ANSI and the Provincial/Regional significance.

Summary: A polygon shapefile illustrating ANSIs (Life Science and Earth Science).

Credits and Date Created:

North-South Environmental Inc. and Geosphere Information Services, 2019

Source Datasets Used:

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Dataset Owner</th>
<th>Type</th>
<th>Date Last Updated</th>
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</thead>
<tbody>
<tr>
<td>Areas of Natural and Scientific Interest</td>
<td>LIO</td>
<td>Polygon</td>
<td>2019</td>
</tr>
</tbody>
</table>

Criteria Applied:

The Province is the administrator for the ANSI dataset(s); this dataset is used as the source to identify and map, for the purposes of the Official Plan, Areas of Natural and Scientific Interest (Earth and Life Science).
**Significant Woodlands**

**Description:** Significant Woodlands are woodlands which are ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history.

**Summary:** A polygon shapefile illustrating Significant Woodlands according to Provincial and County criteria described below.

**Credits and Date Created:**
North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Dataset Owner</th>
<th>Type</th>
<th>Date Last Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNRF Woodland Mapping</td>
<td>LIO</td>
<td>Polygon</td>
<td>2018</td>
</tr>
<tr>
<td>Northumberland County Forest Mapping</td>
<td>Northumberland County</td>
<td>Polygon</td>
<td>2014</td>
</tr>
<tr>
<td>Ganaraska Region Conservation Authority ELC Mapping (forest and swamp)</td>
<td>GRCA</td>
<td>Polygon</td>
<td>2017</td>
</tr>
</tbody>
</table>

**Criteria Applied:**

**Significant Woodlands (Oak Ridges Moraine Conservation Plan Area)**

- Have a minimum average width of 40 m and are:
  - 4 ha or larger in size located in the Countryside or Settlement Areas of the ORMCP; or
  - 0.5 ha or larger in size located in the Natural Core or Natural Linkage Areas of the ORMCP; or
  - 0.5 ha or larger located within or intersecting with a key natural heritage feature or hydrologically sensitive feature or their vegetation protection zone
Significant Woodlands (within Growth Plan NHS, outside of ORMCP area)

- Have a minimum average width of 40 m and:
  - are 20 ha or larger in size; or
  - contain 8 ha or more of interior habitat (where interior habitat is more than 100 m from the edge); or
  - area 4 ha or larger in size and are within 50 m of a key hydrologic feature or hydrologic area.

Significant Woodlands (outside of Growth Plan NHS)

- Have a minimum average width of 40 m and are a minimum of:
  - 1 ha in Urban Areas and/or Rural Settlement Areas; or
  - 4 ha in Agricultural Areas; or
  - 6 ha in Rural Areas; or
  - 4 ha within 5km of Lake Ontario or the minimum size criteria for the underlying land use, whichever is smaller; or

- Have a minimum average width of 40m and are a minimum of:
  - 0.5 ha in Urban Areas and/or Rural Settlement Areas; or
  - 2 ha in Agricultural Areas or Rural Areas; or
  - 2 ha within 5km of Lake Ontario; or
  - 2 ha within 1km of Rice Lake;
  - and
  - Occurs within 30 m of a Key Features and Areas as defined in the OP; or
  - Occurs wholly or partially within a Confirmed Earth Science ANSI, Conservation-Oriented Lands or Linkage Area as defined in the OP.
Regionally Important Woodlands

**Description:** Regionally Important Woodlands are identified within the Growth Plan NHS but outside of the ORMCP area, based on size criteria and/or proximity to other features.

**Summary:** A polygon shapefile illustrating Regionally Important Woodlands according to Provincial and County criteria described below.

**Credits and Date Created:**

North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Dataset Owner</th>
<th>Type</th>
<th>Date Last Updated</th>
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</thead>
<tbody>
<tr>
<td>MNRF Woodland Mapping</td>
<td>LIO</td>
<td>Polygon</td>
<td>2018</td>
</tr>
<tr>
<td>Northumberland County Forest Mapping</td>
<td>Northumberland County</td>
<td>Polygon</td>
<td>2014</td>
</tr>
<tr>
<td>Ganaraska Region Conservation Authority ELC Mapping (forest and swamp)</td>
<td>GRCA</td>
<td>Polygon</td>
<td>2017</td>
</tr>
</tbody>
</table>

**Criteria Applied:**

- Have a minimum average width of 40 m and are a minimum of:
  - 1 ha in Urban Areas and/or Rural Settlement Areas; or
  - 4 ha in Agricultural Areas; or
  - 6 ha in Rural Areas; or
  - 4 ha within 5km of Lake Ontario or the minimum size criteria for the underlying land use, whichever is smaller; or

- Have a minimum average width of 40m and are a minimum of:
  - 0.5 ha in Urban Areas and/or Rural Settlement Areas; or
  - 2 ha in Agricultural Areas or Rural Areas; or
  - 2 ha within 5km of Lake Ontario; or
  - 2 ha within 1km of Rice Lake;
  and
  - Occurs within 30 m of a Key Features and Areas as defined in the OP; or
  - Occurs wholly or partially within a Confirmed Earth Science ANSI, Conservation-Oriented Lands or Linkage Area as defined in the OP
**Watercourses**

**Description:** Watercourses are line features – natural or manmade – that represent the location of flowing surface water.

**Summary:** A line shapefile illustrating watercourses in the County.

**Credits and Date Created:**
North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Dataset Owner</th>
<th>Type</th>
<th>Date Last Updated</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNRF Watercourse Mapping</td>
<td>LIO</td>
<td>Line</td>
<td>2020</td>
</tr>
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</table>

**Criteria Applied:**
Not applicable.
Conservation Oriented Lands

**Description:** Conservation-oriented lands includes lands that are managed in such a way as to support and/or enhance the NHS. Identification as Conservation-Oriented Lands does not restrict existing, permitted and future uses that comply with the policies of the Official Plan and applicable zoning bylaws.

Conservation-Oriented Lands include the following:

- County forests;
- Conservation Areas and Conservation Authority Owned Lands;
- Wildlife Areas & Ecological Preserves;
- Land Owned and Managed by Conservation Land Trusts (e.g. NCC, NLT);
- Provincial Parks.

**Summary:** A polygon shapefile illustrating Conservation-Oriented Lands where information is available. Privately owned lands that may be managed as conservation-oriented are not be mapped.

**Credits and Date Created:**
North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
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<th>Dataset</th>
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<tr>
<td>Provincial Parks</td>
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<td>LTRCA Owned Lands</td>
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<tr>
<td>Nature Conservancy of Canada Owned Lands</td>
<td>NCC</td>
<td>Polygon</td>
<td>2019</td>
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<tr>
<td>Northumberland County Forest Mapping</td>
<td>Northumberland County</td>
<td>Polygon</td>
<td>2014</td>
</tr>
</tbody>
</table>

**Criteria Applied:**
Not applicable.
Shoreline Areas

**Description:** Generally, shoreline features and habitats are not well mapped through existing datasets and may be small in aerial extent making them difficult to map at the County scale. To prompt consideration for/assessment of shoreline areas and features, a 250 m shoreline area along the Lake Ontario shoreline and a 100 m shoreline area from the Rice Lake shoreline has been identified on mapping.

**Summary:** A polygon shapefile illustrating a 250 m shoreline area along the Lake Ontario Shoreline and a 100 m shoreline area from Rice Lake.

**Credits and Date Created:**
North-South Environmental Inc. and Geosphere Information Services, 2019

**Source Datasets Used:**

<table>
<thead>
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<th>Dataset Owner</th>
<th>Type</th>
<th>Date Last Updated</th>
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</thead>
<tbody>
<tr>
<td>Waterbodies</td>
<td>LIO</td>
<td>Polygon</td>
<td>2012</td>
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</table>

**Criteria Applied:**

A 250 m shoreline area along the Lake Ontario Shoreline and a 100 m shoreline area from Rice Lake.
Linkages

Description: Landscape-scale (i.e., County-scale) linkages are intended to provide broad connections between large and medium ‘core’ natural heritage areas. Core areas are defined as contiguous areas of Key Features and Areas.

Site-scale (local) linkages are identified through site-specific studies and have not been mapped as part of the County NHS.

Summary: A polygon shapefile illustrating Landscape-scale linkages identified between core areas.

Credits and Date Created:
North-South Environmental Inc. and Geosphere Information Services, 2019

Source Datasets Used:

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<thead>
<tr>
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<th>Dataset Owner</th>
<th>Type</th>
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<td>Polygon</td>
<td>2020</td>
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<tr>
<td>Regionally Important Wetlands*</td>
<td>Northumberland County</td>
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<tr>
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*As mapped for the County NHS.

Criteria Applied:

Core Areas

Core areas are contiguous areas of Key Features and Areas (unbuffered). Key Features and Areas (excluding line features - watercourses) were merged/combined (i.e., where two or more features abut, internal boundaries were eliminated to form continuous features), including:

- Provincially Significant Wetlands;
- Regionally Important Wetlands;
- Life Science Areas of Natural and Scientific Interest;
- Significant Woodlands.

Northumberland Final NHS Report • June 2020
The areas of these merged polygons were calculated (ha). A new attribute column, ‘CoreAreaType’ identified all core areas >100 ha in size as ‘Large’, and those between 50 ha and 100 ha in size as ‘Medium’ (anything <50 ha was ‘n/a’).

**Linkages**

Linkages were identified based on the following criteria:

- Between Large Core Areas (>100 ha): 300-400 m wide
- Between Medium Core Areas (>50 ha): 100-200 m wide
- The length to width ratio shall not be less than 3:1

Based on the width as well as length to width ratio, it could also be said that linkages between Large core areas cannot be longer than 1200 m (3 x 400 m) and linkages between Medium core areas cannot be longer than 600 m (3 x 200 m). As such, a mapping exercise applied buffers of 1200 m and 600 m to Large and Medium core areas, respectively, in order to identify those core areas which should be connected.

While the identification of the exact linkage pathways may be somewhat subjective, certain general parameters were followed, including incorporating existing natural features and/or following the shortest distance.
Enhancement Areas

**Description:** Enhancement areas are intended to provide a direct functional benefit to the natural heritage system and are therefore typically identified as opportunities to infill, widen and/or connect features to increase the size and diversity of contiguous core areas.

**Summary:** A polygon shapefile illustrating Enhancement Areas as identified according to County criteria described below.

**Credits and Date Created:**
North-South Environmental Inc. and Geosphere Information Services, 2019

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*As mapped for the County NHS.

**Criteria Applied:**

Enhancement areas were identified within ‘mappable’ Key Features and Areas including:

- Provincially Significant Wetlands;
- Regionally Important Wetlands;
- Life Science Areas of Natural and Scientific Interest;
- Significant Woodlands.

The following areas were identified as 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.

The following criteria are applied for the identification of Enhancement areas:

- All or portions of ‘bays and inlets’ that are <120 m wide; or
- Interior ‘holes’ in features where the hole is <1 ha;
- The gap between features where the gap is <120 m
Buffers / VPZs

Description: Buffers have been identified for Key Features and Areas of the County NHS.

A minimum 30m buffer shall be applied to the following ‘mappable’ Key Features and Areas:

- Provincially Significant Wetlands;
- Regionally Important Wetlands;
- Significant Woodlands;
- Watercourses.

Summary: A polygon shapefile illustrating Buffers as identified according to County criteria described below.

Credits and Date Created:
North-South Environmental Inc. and Geosphere Information Services, 2019

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<table>
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*As mapped for the County NHS.

Criteria Applied:

A 30 m buffer was applied to the following ‘mappable’ Key Features and Areas:

- Provincially Significant Wetlands;
- Regionally Important Wetlands;
- Significant Woodlands;
- Watercourses.