Middlesex Natural Heritage Study Update Project (2013)

Final Project Proposal

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Background:
The Province of Ontario indicates that municipalities are required to develop and implement policies which are consistent with the Provincial Policy Statement, 2005 (PPS).

The PPS stipulates that:

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

The PPS also provides policies for the protection of natural features such as significant woodlands, wildlife habitat, wetlands, fish habitat, and significant portions of the habitat of endangered and threatened species. (PPS, Section 2.3)

The identification of significant natural features in Southwestern Ontario is an important and significant undertaking. In 2004, Environment Canada identified that human activities, such as agriculture, urban development and associated infrastructure, have resulted in the loss or degradation of over 70 per cent of the naturally vegetated areas in Southern Ontario. In some areas this reduction is greater. The remainder of these naturally vegetated areas tend to exist in unconnected patches across the landscape. It has also been found that in addition to the loss of naturally vegetated areas, intensive land use activities have also contributed to degraded water quality conditions in many streams and lakes.

The County of Middlesex has taken steps to identify and protect natural heritage features. The Middlesex Natural Heritage Study (MNHS) was completed in 2003. The project was lead by the Conservation Authorities and completed for the County of Middlesex. Various partners participated in the project. The study has produced a solid information and policy basis to protect and rehabilitate the County's woodland and wetland features and systems. The MNHS (2003) had the following goals:

1. To increase our understanding of the County's natural heritage features and systems (e.g. woodlands, wetlands, aquatic systems such as streams and rivers, threatened or endangered species, etc.).
2. To develop land use planning information and policy, at both the County and local municipal levels, in order to identify, protect and enhance the natural heritage features and systems.
3. To encourage and facilitate private stewardship and public education.
4. To strengthen links between natural areas and protect the relationships between plant and animal communities.

The study was a pilot project for the Carolinian Canada Big Picture Project and the Ministry of Natural Resources Ecological Land Classification System. The study involved assessing existing information and through landowner contact and collection of new information on privately owned land. This information, combined with a detailed review of the ecological literature, lead to the development of a set of landscape criteria which were then modelled using Geographic Information System (GIS) technology. To run the model, existing air photography and satellite imagery was used to create vegetation and watercourse information. The 2003 study provides a baseline for future comparison, a natural heritage systems map with a focus on woodlands, landscape criteria for considering woodland

significance and a policy discussion to assist with implementation. The MNHS, 2003 can be accessed at the following link: http://www.thamesriver.on.ca/MNHS/MNHS.htm

The MNHS (2003) was accepted by Middlesex County Council. The current Middlesex County Official Plan relies on the MNHS (2003) to define significant woodlands and the Conservation Authorities have worked with the County to develop EIS guidelines and patch confirmation criteria to assist with implementation.

The science method developed through the MNHS (2003) has been built on through other natural heritage studies. The Oxford County Natural Heritage Study (ONHS, 2006) followed a similar landscape approach methodology. The ONHS broadens the approach beyond wooded areas to include flood plain meadows and other elements of the natural heritage system. The ONHS was received by the County of Oxford and subjected to a third part peer review. The basic approach was validated through the peer review and minor adjustments were made to some criteria. The County of Huron is nearing completion of a study that builds further on the peer reviewed ONHS. Refinements to the methodology for the Huron study have been made to incorporate the ONHS peer review results and also to refine the vegetation mapping methodology and to incorporate the Lake Huron shoreline and large river valley ecosystems.

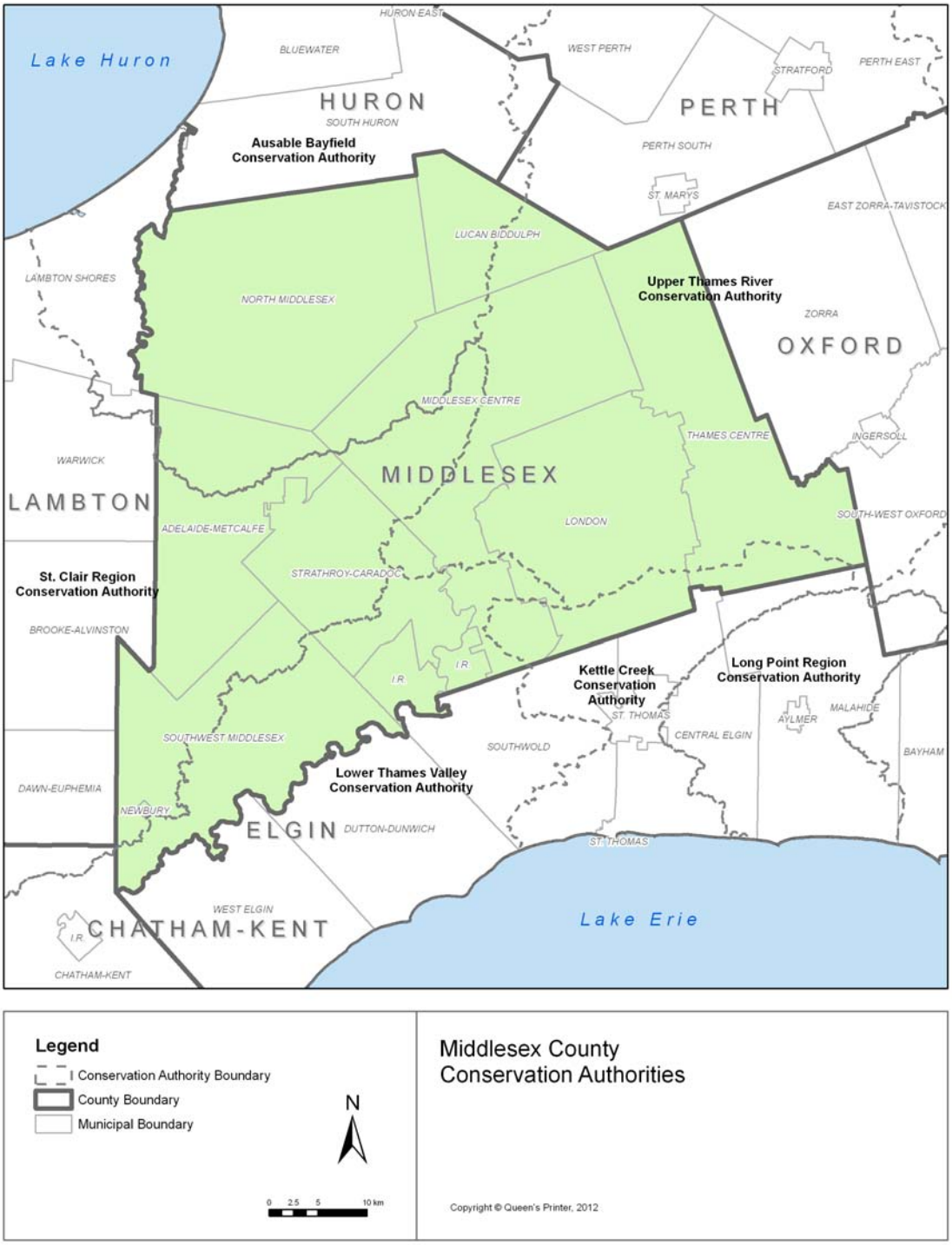
Proposal for MNHS, 2013

The Middlesex County Conservation Authorities are proposing to work with the County to update the 2003MNHS. Map 1 shows the Conservation Authority jurisdictions in the Geographic County of Middlesex.

The highlights of the proposal are as follows:

- The update will follow the method used for the Huron Natural Heritage Study. This will involve a landscape analysis of the natural heritage system rather than just focusing on wooded areas
- The study area includes the corporate County of Middlesex and City of London areas.
- The vegetation layer will be based on the 2010 colour ortho-imagery. The current MNHS (2003) was developed using a patchwork of 2000 black and white ortho-imagery combined with older paper mapping and some satellite imagery for areas not covered by the 2000 air photo.
- MNR will be consulted to obtain the most recent Provincial mapping information.
- Natural heritage features will be reviewed on-screen to see if they have a watercourse associated with them
- Valleyland complexes will be defined following the Huron methodology
- Species at Risk will be reviewed
- The landscape criteria will be developed following the Huron County methodology. A one day workshop will be held with ecological experts to review the Huron Criteria as a starting point and to validate or modify criteria for the updated MNHS.
- A peer review of the landscape model will be undertaken before the model is finalized
- An EIS Guideline will be provided for consideration of the County
- Patch confirmation guidelines will be provided for consideration by the County

- A draft report will be prepared for review by the Steering Committee and a Final Report will be issued based on the input. The final report will be provided to the County to be included on their web-site and the final report may be made available on Conservation Authority websites.



Map 1: Middlesex County Conservation Authorities

Project Governance
The proposal is for an update to the 2003 MNHS and therefore, the methodology is somewhat streamlined. The project will be guided by a Steering Committee with representatives from the following:

- County of Middlesex - 1
- Local Municipalities – 1 or 2
- The City of London – 1
- Ausable Bayfield Conservation Authority -1
- Kettle Creek Conservation Authority - 1
- Lower Thames Valley Conservation Authority - 1
- St. Clair Region Conservation Authority - 1
- Upper Thames River Conservation Authority - 1
- Ministry of Natural Resources -1

The Steering Committee will approve the final project proposal and oversee the fulfillment of project time lines and deliverables. Any significant changes to project methodology or timing will be approved by the Steering Committee. The UTRCA will oversee project coordination.

A Technical Committee will be established to assist with developing the Landscape Criteria for the updated MNHS. The main work of the Technical Committee will be completed through participation in a one day workshop which will involve reviewing the Landscape Criteria developed for the Huron Natural Heritage Study and confirming or adjusting them to be applied to the updated MNHS. Individuals with expertise in ecology, biology, geographic information systems and planning from the following organizations will be invited to participate on the Technical Committee:

- County of Middlesex
- Local Municipalities
- Staff From Neighbouring Counties (Lambton, Oxford and Perth)
- The City of London
- Ausable Bayfield Conservation Authority
- Kettle Creek Conservation Authority
- Lower Thames Valley Conservation Authority
- St. Clair Region Conservation Authority
- Upper Thames River Conservation Authority
- Ministry of Natural Resources
- Carolinian Canada
- Ducks Unlimited Canada
- Nature Conservancy of Canada
- Western University

Project Implementation

The MNHS update will be completed as a background document for the anticipated update to the Middlesex County Official Plan. The study will also provide natural heritage information to support planning and other initiatives in the City of London, local Middlesex County Municipalities and the Conservation Authorities. Policy options to guide implementation will only be generally discussed in the updated MNHS report. It is anticipated that the formative discussion and consideration of policy choices for implementation will occur as part of official plan updates. The UTRCA will take the lead on a collaborative effort with the other Middlesex Conservation Authorities to present the results of the updated MNHS to County Council, City of London Council and the Local Municipalities. The Conservation Authorities will also assist with the delivery of a policy discussion or policy workshop with municipal staff and elected officials if requested.

Project Work Plan – Overview

The MNHS update project is proposed to follow a streamlined methodology which builds on the work completed in the MNHS (2003), THE Oxford Natural Heritage Study (2006) and the Huron Natural Heritage Study (currently under way).

1. Project Initiation

Once the proposal is approved, it is recommended that a Steering Committee be established to oversee the project. It is proposed that the steering committee include representatives from the County and the Conservation Authorities and that the steering committee meet on roughly a monthly basis during the project to oversee the project schedule, budget and make decisions on any adjustments to project timing, project tasks, budget adjustments and so on.

2. Background Data Compilation

The project will involve the implementation of a natural heritage landscape model following the Huron Natural Heritage Study Methodology. This methodology builds on the peer reviewed Oxford Natural Heritage Study methodology. The process primarily involves the use of the best available existing vegetation information and the landscape ecology literature to develop landscape criteria which are then modelled with updated vegetation and watercourse proximity information using a Geographic Information System (GIS).

Significant vegetation information is available in the County of Middlesex through the data collected for the 2003 MNHS and other inventory data. The detailed work plan tasks and costs have been estimated based on our current knowledge of the state of the County's information and assuming the use of compilation and modelling methodologies applied in the Huron and Oxford studies.

Specific tasks are as follows (note that some tasks are grouped together for budget calculation purposes):

1. The available vegetation layers (a compilation of Conservation Authority, OMAF and MNR data) will need to be corrected to reflect the most recent aerial photography (2010). It is proposed that the vegetation be corrected to 2010 photography. For some areas of the County, the vegetation has been corrected to the 2006 photography and in these areas, the comparison between 2006 and 2010 will provide some additional information that may be

useful to this project or other studies that are considering the changing natural heritage landscape. The metadata will reflect the data used. Corrected data will be required to identify interior woodland areas, vegetation types, areas of disturbance etc. Meadow areas will also be mapped.

2. Natural Heritage features will be identified as having a watercourse associated with them using the most current watercourse CA/provincial data. The features will be reviewed on screen to see if they are associated with a watercourse for accuracy as features are being updated. Distance from a watercourse to a feature will need to be verified before correction begins. This eliminates the need to update the watercourse layer.

3. Significant Valley Lands will be identified following the Huron County Natural Heritage Study (currently underway) methodology.

4. The data analysis, literature review and landscape modeling methodology will be lead by a professional ecologist and the team will consist of biologists and other technical experts from the Conservation Authorities and any others that are identified by the Steering Committee.

5. The landscape criteria will be established through a one day technical workshop which will be lead by the project ecologist. The Criteria developed for the Huron Natural Heritage Study will be used as a starting point and the workshop will involve assessing the Huron criteria and identifying any modifications that are appropriate for the Middlesex County landscape. The technical basis and process to arrive at criteria will be documented in a technical appendix of the final report.

6. A peer review will be obtained from a qualified landscape ecologist. This peer review will be undertaken after the landscape criteria have been determined but prior to the running of the geographic information system landscape model. In this way, the peer review will be integrated into the model and the model and final report will reflect the peer reviewed landscape ecology approach.

7. A geographic information system landscape model will be run to highlight patches (ie. combined woodland, meadow and waterbody areas) that meet the identified landscape criteria.

8. A patch validation methodology will be prepared and included in the report.

9. A methodology will be prepared to guide the approach to undertaking Development Assessment Reports (Environmental Impact Studies) where the landscape methodology has been completed.

10. A final report documenting the methodologies used to compile the data and develop and run the landscape model will be prepared.

11. The digital data and supporting mapping will be distributed to the County, the Conservation Authorities and other partners as appropriate.

Project Timelines
It is proposed that the MNHS Update be completed within 6 months of initiation. The following timeline is presented for discussion purposes. Project milestones are in bold.

September/October - Project Initiation

- Formation of Project Steering Committee
- Confirm Final Project Proposal for project including project methodology
- Receive formal adoption from County
- Incorporate City of London into the project
- Recruit Steering Committee members and hold project start up meeting
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October/November - Background Data Compilation

- Acquire and prepare available data
- Initiate digital data correction
- Contract Peer Reviewer

Late October – Conduct Landscape Criteria Workshop

- Coordinate and implement a one day technical workshop to establish landscape criteria

December – Peer Review Step 1

- Obtain peer input from the peer review consultant on the landscape criteria

January – Data Analysis

- configure and run landscape model (GIS)
- review results
- technical appendix on landscape model

Early February – Peer Review Step 2

- Obtain peer input on the model results and the technical appendix

Late February – Review Model Results with Steering Committee

- present the model
- delivery EIS guideline document
- delivery patch confirmation criteria

Early March - Draft Final Report

March – Draft Final Report to County Council

April **–** Final Report

April/May – Potential Policy Workshop

Project Budget

Table 1: Budget – Corporation of the County of Middlesex Portion

Task Description	Total Value	In Kind	Cost to Project
Create 2010 Photo **Vegetation Layer** following Huron County methodology for patch identification and attribute including meadows. Depending on the CA watershed, this involves either updating the 2006 photo to 2010 or creating the information for 2010.	$14,800	$5,400	$9,400
Define **Valley Complex** using Huron County rules	$3,250	$2,025	$1,225
Correct 2006 **Water Layer**	$7,200	$5,000	$2,200
Species at Risk Review	$750	$250	$500
Develop Modeling Criteria • Review of existing projects and other applicable literature • Review specifics of each criteria following methodology applied in Huron Natural Heritage Study and peer reviewed ONHS • Conduct one day technical workshop to confirm criteria • Prepare technical appendix • Submit proposed criteria to Peer Reviewer for confirmation of methodology • Make revisions as per feedback from Peer Reviewer			
Costing Ecologist 7 days @ $300 per day = $2,100	$2,100	$0	$2,100
CA Technical Staff participants in workshop 8 @ $250 /day per	$2,000	$2,000	$0
Peer Review – by an outside contractor	$2,000	$0	$2,000
GIS Data to run model. Coordinate compilation of GIS data layer corrections (vegetation and water layer), set up and run the model. GIS Specialist - 7 days @ $300/day = $ 2,100	$2,100	$0	$2,100
Technical Support Information. Prepare patch validation methodology and EIS Process Guideline for Planning Area with Landscape Model. 1 day @ 300/day = $300	$300	$300	$0
Materials and supplies for printing, meetings etc.	$400		$400
Write Final Report UTRCA Technical Writer 7 days @ $300 per day = $2,100	$2,100		$2,100
Total	$37,000	$14,975	$22,025

Table 2: Incremental Costs to Add City Of London to the Project

Task Description	Total Value	In Kind	Cost to Project
Create 2010 Photo **Vegetation Layer** following Huron County methodology for patch identification and attribute including meadows. Define **Valley Complex** using Huron County rules Identify natural heritage features with a **watercourse** Species at risk review	$2,750	$1,050	$1,700
Additional work to the model to include City of London	$300	$0	$300
Additional costs for Peer Review to add City of London	$300	$0	$300
Totals	$3,350	$1,050	$2,300

Table 3: Total Project Budget

Municipality	Total Value	In Kind	Cost to Project
Corporation of the County of Middlesex	$37,000	$14,975	$22,025
City of London	$3,350	$1,050	$2,300
Totals	$40,350	$16,050	$24,325

Notes to Budget

- No costs included for CA staff to attend County Council, City of London and local municipal county meetings to promote the project and present results
- No mileage costs included
- No charge for optional policy workshop
- No costs for data distribution and training of the County Staff/municipal staff on the data