

**A.6**  
**CORRESPONDENCE**  
**WITH PARKS ONTARIO**

**From:** [Marchand, Tim \(MNRF\)](#)  
**To:** [Bergman, Stephanie](#)  
**Cc:** [Card, Rhonda \(MNRF\)](#); [Oliveira, Nelson](#); [Emery, Nick](#)  
**Subject:** Class EA for Provincial Parks and Conservation Reserves  
**Date:** Friday, November 16, 2018 12:01:10 PM  
**Attachments:** [image001.png](#)  
[Class\\_EA-PPCR.pdf](#)  
[RoS\\_ClassEA-PPCR\\_Modified-with-Instruction-for-Proponents.docx](#)

---

Hello Stephanie,

Thank you again for our meeting yesterday. As promised, please find attached a copy of the Class EA-PPCR along with Word versions of the record of screening and associated screening tables.

Please let me know if you have any questions or require any additional information.

Talk to you soon,

Tim

**Tim Marchand** | Senior Park Planner  
659 Exeter Road, London, Ontario, N6E 1L3  
**P:** 519-873-4618 **F:** 519-873-4645 **W:** OntarioParks.com



Please note: As part of providing [accessible customer service](#), please let me know if you have any accommodation needs or require communication supports or alternate formats.

**From:** [Marchand, Tim \(MNRF\)](#)  
**To:** [Bergman, Stephanie](#)  
**Cc:** [Oliveira, Nelson](#); [Emery, Nick](#); ["Brian Lima"](#); [Card, Rhonda \(MNRF\)](#)  
**Subject:** RE: Middlesex Centre SWM Master Plan  
**Date:** Wednesday, November 7, 2018 3:06:32 PM  
**Attachments:** [Komoka Final LSI \(with figures\) reduced.pdf](#)

---

Hi Stephanie,

Attached is the 2003 update.

Cheers,

Tim

---

**From:** Marchand, Tim (MNRF)  
**Sent:** November 7, 2018 3:03 PM  
**To:** Bergman, Stephanie <[Stephanie.Bergman@stantec.com](mailto:Stephanie.Bergman@stantec.com)>; Brian Lima <[lima@middlesexcentre.on.ca](mailto:lima@middlesexcentre.on.ca)>; Card, Rhonda (MNRF) <[Rhonda.Card@ontario.ca](mailto:Rhonda.Card@ontario.ca)>  
**Cc:** Oliveira, Nelson <[nelson.oliveira@stantec.com](mailto:nelson.oliveira@stantec.com)>; Emery, Nick <[nick.emery@stantec.com](mailto:nick.emery@stantec.com)>  
**Subject:** RE: Middlesex Centre SWM Master Plan

Hi Stephanie,

Thursday works best for me at this point in time. I have attached a copy of the park's original life science inventory. I will send along the 2003 update under separate cover.

Talk to you soon,

Tim

---

**From:** Bergman, Stephanie <[Stephanie.Bergman@stantec.com](mailto:Stephanie.Bergman@stantec.com)>  
**Sent:** November 7, 2018 2:55 PM  
**To:** Brian Lima <[lima@middlesexcentre.on.ca](mailto:lima@middlesexcentre.on.ca)>; Card, Rhonda (MNRF) <[Rhonda.Card@ontario.ca](mailto:Rhonda.Card@ontario.ca)>; Marchand, Tim (MNRF) <[tim.marchand@ontario.ca](mailto:tim.marchand@ontario.ca)>  
**Cc:** Oliveira, Nelson <[nelson.oliveira@stantec.com](mailto:nelson.oliveira@stantec.com)>; Emery, Nick <[nick.emery@stantec.com](mailto:nick.emery@stantec.com)>  
**Subject:** Middlesex Centre SWM Master Plan

Hi all,

I wanted to reach out to you all regarding the Middlesex Centre SWM Master Plan – I know there's been some discussions of different options involving the Ontario Parks lands in Komoka, and it would be great if we could all meet to discuss the details. I'm looking at the following dates:

- Wednesday November 14<sup>th</sup>, after 1:30pm
- Thursday November 15<sup>th</sup>, any time;

Let me know if either of those days will work for you all and I'll send out a meeting request.

Also, we are currently undertaking some environmental reviews, and I'd like to request any natural heritage information that Ontario Parks may have relating to the Komoka ponds and surrounding area. Any aquatic or terrestrial information you may have would be very helpful!

Thanks,

**Stephanie L. Bergman** MA, ENV SP  
Planner

Direct: 519-675-6614

Cell: 519-852-8945

Fax: 519-645-6575

[stephanie.bergman@stantec.com](mailto:stephanie.bergman@stantec.com)

Stantec

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

**From:** [Smith, Chelsea \(MECP\)](#)  
**To:** [Bergman, Stephanie](#)  
**Cc:** [Kelly, Rita \(IO\)](#)  
**Subject:** IO contacts from call today  
**Date:** Thursday, August 1, 2019 11:45:56 AM  
**Attachments:** [image001.png](#)

---

Hi Stephanie,

Here are the folks on the call this morning and their e-mail addresses:

Rita Kelly ([rita.kelly@infrastructureontario.ca](mailto:rita.kelly@infrastructureontario.ca))  
Cory Ostrowka ([cory.ostrowka@infrastructureontario.ca](mailto:cory.ostrowka@infrastructureontario.ca))  
Kaye Boucher ([kaye.boucher@infrastructureontario.ca](mailto:kaye.boucher@infrastructureontario.ca))

**Rita** – please ensure Ontario Parks is circulated on any ToR related to the easement / disposition. This project may impact provincially-significant wetlands and other features in which Ontario Parks has direct interest.

Thank you!  
Chelsea

**Chelsea Smith** | Protected Areas Lands Technical Specialist – Southwest Zone  
659 Exeter Road, London N6E 1L3  
**P:** 519-873-4001 **W:** OntarioParks.com



Ministry of the Environment, Conservation and Parks

**Please note:** As part of providing [accessible customer service](#), please let me know if you have any accommodation needs or require communication supports or alternate formats.

**From:** [Marchand, Tim \(MECP\)](#)  
**To:** [Bergman, Stephanie](#)  
**Cc:** [Smith, Chelsea \(MECP\)](#); [Card, Rhonda \(MECP\)](#); [Dan Anderson](#); [Emery, Nick](#); [Diemer, Kristen \(MECP\)](#)  
**Subject:** RE: To discuss recommendations for Komoka - SWM MP  
**Date:** Tuesday, July 16, 2019 1:44:29 PM

---

Hello Stephanie,

Thank you for arranging the teleconference last Tuesday to discuss the SWMP for Komoka. Ontario Parks understands that Alternative 6 is currently assessed as the preferred option. Kristen, Chelsea and I had an opportunity after the call to re-review the options presented in light of the Class EA-PPCR and Infrastructure Ontario (IO) due diligence requirements discussed and were thinking that the evaluation summary should be updated to better reflect the additional considerations associated with options that include the park. Specifically:

- Extended timeline to review and evaluate the proposal per the Class EA-PPCR
  - Ontario Parks staff would review the draft Record of Screening (RoS) which would likely also require technical review by our Operations and Development Section in Peterborough.
  - Review may require that additional investigations be undertaken to confirm potential effects of the proposal. Completion of any additional investigations would be the responsibility of the Municipality. The draft RoS would then be updated to incorporate any required changes and/or results of said investigations.
  - For example, please be aware that receiving waterbody in Alternatives 2, 5, and 6 is considered Provincially Significant Wetland as part of the Komoka Park Wetland Complex UT1. Further, the subject lands contain species and habitat at risk protected under the *Endangered Species Act, 2007*. This includes, but may not be limited to, species at risk and provincially rare snakes, turtles, and grassland birds, and provincially rare plant species, which must be considered and addressed by the proponent through Class EA-PPCR process.
  - Approval of the finalized RoS by our Zone Manager is not guaranteed; the scope of the proposal, required mitigation etc. may need to be adjusted or the proposal in it's entirety may not be approved.
- If the RoS is approved, consultation will be required based on the Category the project is assigned to (Cat B, C or D). Consultation could take 3-6 months depending on category and input received.
- IO will require surveys of the inlet and outlet areas to accompany the easement. Costs associated with the surveys and registration of the easement would be the responsibility of the Municipality.

Detailed timelines for review and approval and any costs associated with a park option are difficult to approximate this time. The call with IO scheduled for August 1<sup>st</sup> will hopefully provide additional detail regarding IO's due diligence requirements and

potential timelines associated with their requirements.

In light of these additional requirements and costs, would a 'non-park' alternative such as Alternative 2, be easier to implement? It is unclear how Alternative 6 has been assessed relative to Alternative 2. Please be aware that the Class EA-PPCR process requires clear demonstration of the consideration of alternatives that avoid and/or minimize impacts to park lands and values.

For all options involving additional inputs to the drainage infrastructure within the park (e.g., Alternatives 2, 5, 6), Ontario Parks would like to work with Middlesex Centre to develop an outflow agreement to formalize roles and responsibilities associated with the existing outlet as storm and ground water currently drains southward from Komoka into the park pond and drains through the outflow to the Thames River. Ontario Parks also requests that potential upgrade requirements to the outflow infrastructure within the park are identified and assessed with respect to the alternatives, as the scope of potential upgrades to the outlet to secure long-term drainage have yet to be determined and would be relevant to the overall project scope.

Talk to you soon,

Tim

-----Original Appointment-----

**From:** Bergman, Stephanie <Stephanie.Bergman@stantec.com>

**Sent:** July 2, 2019 11:03 AM

**To:** Bergman, Stephanie; Marchand, Tim (MECP); Card, Rhonda (MNRF); Dan Anderson; Emery, Nick

**Cc:** Smith, Chelsea (MECP)

**Subject:** To discuss recommendations for Komoka - SWM MP

**When:** July 9, 2019 3:30 PM-4:30 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** Skype Meeting

Call in number:

Local: (226) 213-4157

Non-Local: (888) 256-7209

Conference ID: 47467785

.....  
[Join Skype Meeting](#)

Trouble Joining? [Try Skype Web App](#)

Join by phone

.,,47467785# ((Conferencing))

English (United States)

[Find a local number](#)

Conference ID: 47467785

[Forgot your dial-in PIN?](#) | [Help](#)







ONTARIO  
PARKS



# A Class Environmental Assessment

## for Provincial Parks and Conservation Reserves





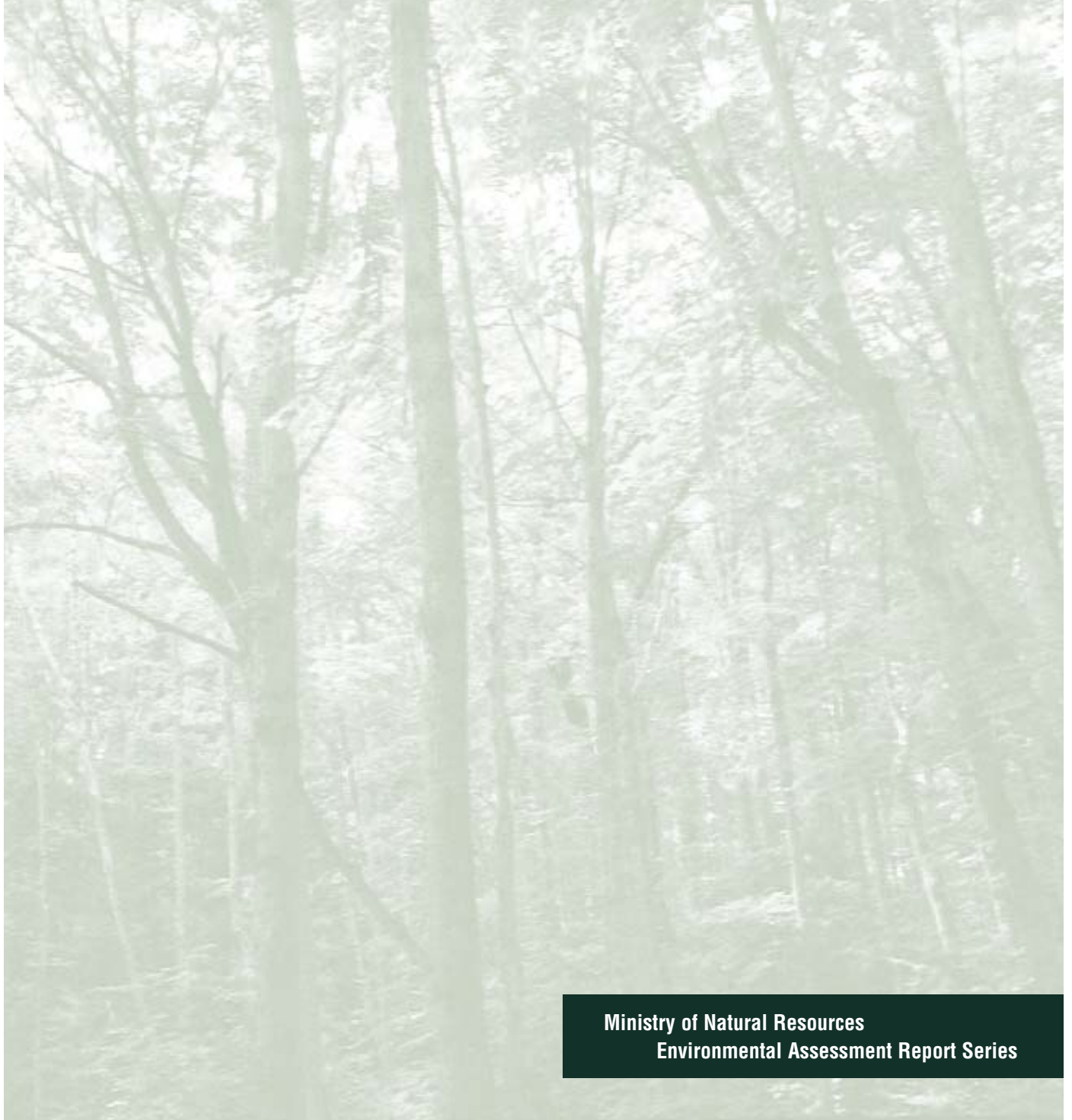


ONTARIO  
PARKS



# A Class Environmental Assessment

## for Provincial Parks and Conservation Reserves



Ministry of Natural Resources  
Environmental Assessment Report Series

Approved September 23, 2004  
Amended December 31, 2004

© 2005, Queen's Printer for Ontario  
Printed in Ontario, Canada

Paid for by the Government of Ontario

Cette publication hautement spécialisée A Class Environmental Assessment for Provincial Parks and Conservation Reserves n'est disponible qu'en anglais en vertu du Règlement 411/97, qui en exempte l'application de la Loi sur les services en français. Pour obtenir de l'aide en français, veuillez communiquer avec le Ministère des Richesses naturelle de l'Ontario au 1-800-667-1840.

51428  
(1.0 k P.R., 01 18 05)  
ISBN 0-7794-3848-5



Printed on recycled paper

# Table of Contents

<b>PREFACE</b> .....	vii
<b>1.0 INTRODUCTION</b> .....	1
1.1 Purpose of the Class EA .....	1
1.2 Reasons for Using a Class EA .....	1
1.3 Structure of the Class EA .....	2
<b>2.0 PROVINCIAL CONTEXT</b> .....	5
<b>3.0 PROJECTS SUBJECT TO THIS CLASS EA</b> .....	9
3.1 The Class of Undertakings .....	9
3.1.1 Establishing, Amending and Rescinding Boundary Regulations .....	9
3.1.2 Acquiring and Disposing of Land .....	9
3.1.3 Managing Provincial Parks and Conservation Reserves .....	10
3.1.4 Similarities and Differences Among the Undertakings .....	11
3.2 Area of the Undertaking .....	11
3.3 The Environment Affected and the Expected Range of Effects .....	12
3.4 Partnerships and Disposition Applicants .....	12
3.4.1 Partnerships .....	12
3.4.2 Disposition Applicants .....	13
3.5 Integration with Other Environmental Assessment Processes .....	14
3.5.1 Other MNR EA Mechanisms .....	14
3.5.2 EA Mechanisms Used by Other Agencies and Sectors .....	15
3.5.3 Access for Mineral Exploration and Development .....	16
3.6 Relationship of Class EA to Other Legislation and Policy .....	17
<b>4.0 CLASS EA CATEGORIES AND THE SCREENING PROCESS</b> .....	19
4.1 Planning Categories .....	19
4.1.1 Category A – Potential for low net negative environmental effects and/or public or agency concern .....	19
4.1.2 Category B – Potential for low to medium net negative environmental effects and/or public or agency concern .....	20
4.1.3 Category C – Potential for medium to high net negative environmental effects and/or public or agency concern .....	20
4.1.4 Category D – Potential for high net negative environmental effects and/or public or agency concern .....	20

<b>4.2</b>	<b>The Screening Process</b> .....	21
	Step 1: Assess Project Against List of Projects (Appendix 2) .....	21
	Step 2: Prepare Project Description .....	22
	Step 3: Assess Against Screening Criteria (Table 4.1) .....	22
	Step 4: Assign Project to Appropriate Category .....	22
	Step 5: MNR Manager Confirms or Modifies Category .....	22
	Step 6: Proceed with Evaluation and Consultation Process .....	22
<b>4.3</b>	<b>Assigning High, Medium and Low Effects in the Screening Process</b> .....	24
<b>4.4</b>	<b>Criteria for Assigning Projects to Categories A, B, C, or D</b> .....	27
<b>5.0</b>	<b>PROJECT EVALUATION AND CONSULTATION PROCESSES FOR CATEGORY B AND C PROJECTS</b> .....	29
<b>5.1</b>	<b>Category B Project Evaluation and Consultation Process</b> .....	29
	Step 1: Scoping .....	29
	Step 2: Public Notice .....	29
	Step 3: Project Evaluation .....	30
	Step 4: Notice of Completion .....	31
	Step 5: Statement of Completion, Implement Project .....	31
<b>5.2</b>	<b>Category C Project Evaluation and Consultation Process</b> .....	33
	Step 1: Scoping .....	33
	Step 2: Initial Public Notice for Category C Projects .....	33
	Step 3: Project Evaluation and Preparation of a Draft Environmental Study Report (ESR) .....	34
	Step 4: Notice of Opportunity to Inspect the Draft Environmental Study Report .....	35
	Step 5: Completion of the Final Environmental Study Report .....	35
	Step 6: Notice of Completion, Opportunity to Inspect the Final Environmental Study Report .....	35
	Step 7: Statement of Completion, Implement Project .....	36
<b>5.3</b>	<b>Mitigation</b> .....	36
5.3.1	Typical Mitigation Measures .....	37
5.3.2	Mitigation During Project Implementation .....	37
<b>5.4</b>	<b>Project Monitoring, Evaluation and Reporting</b> .....	38
<b>6.0</b>	<b>CLASS EA ADMINISTRATIVE PRACTICES AND PROCEDURES</b> .....	39
<b>6.1</b>	<b>Monitoring the Implementation of this Class EA</b> .....	39
<b>6.2</b>	<b>Amendments to this Class EA</b> .....	40
6.2.1	Minor Amendments .....	40
6.2.2	Major Amendments .....	41
<b>6.3</b>	<b>Review of the Class EA</b> .....	41
<b>6.4</b>	<b>Emergency Provisions</b> .....	41
<b>6.5</b>	<b>Transitional Provisions</b> .....	42
<b>6.6</b>	<b>Part II Order Provisions</b> .....	42
6.6.1	Submission of Request for a Part II Order .....	43
6.6.2	Attempt Early Resolution .....	43
6.6.3	MOE Consideration of the Request .....	44
6.6.4	Minister's Decision .....	44
<b>6.7</b>	<b>Proceeding with Projects after the Statement of Completion</b> .....	46
<b>6.8</b>	<b>Modifications to Project Files and Environmental Study Reports (ESRs)</b> .....	46
6.8.1	Recurring Projects .....	47

## **APPENDICES**

<b>Appendix 1: Glossary of Terms and Acronyms</b> .....	50
<b>Appendix 2: List of Projects</b> .....	54
Table 1: Establishing, Amending and Rescinding Boundary Regulations. ....	55
Table 2: Acquiring or Disposing of Land. ....	57
Table 3: Managing a Provincial Park or Conservation Reserve .....	58
a. Resource Stewardship. ....	58
b. Development and Related Operations .....	62
c. General Operations .....	66
<b>Appendix 3: Policies, Procedures, Guidelines, Standards, Manuals</b> .....	68
3.1 Provincial Park Policies, Procedures, Bulletins, Manuals and Standards .....	68
3.2 Conservation Reserve Policy, Procedures, Bulletins and Manuals .....	71
3.3 Other MNR Manuals and Guidelines That May Be Used for Provincial Parks and Conservation Reserves .....	71
3.4 Other Agencies .....	73
<b>Appendix 4: Provincial Context</b> .....	75
4.1 Corporate Strategy .....	75
4.2 Land Use Direction .....	79
4.3 Management Direction .....	82
4.4 Implementation .....	85
4.5 References Cited in this Appendix .....	85
<b>Appendix 5: Assessing the Significance of Environmental Effects</b> .....	86
5.1 Factors for the Assessment of Significance. ....	86
5.2 Other Considerations .....	87
5.3 Comparing Alternatives .....	88
<b>Appendix 6: Government and Other Agencies</b> .....	89
<b>Appendix 7: Other Relevant Federal and Provincial Legislation</b> .....	90
7.1 Federal Legislation .....	90
7.2 Provincial Legislation .....	96
<b>Appendix 8: Notification and Consultation</b> .....	100
8.1 Introduction .....	100
8.2 Parties to Consultation .....	100
8.3 Conducting Public and Agency Consultation. ....	100
8.4 Consultation with Aboriginal Communities. ....	101
8.5 Notification and Consultation Techniques. ....	103
<b>Appendix 9: Sample Notices and Forms</b> .....	105

## **LIST of FIGURES**

<b>Figure 1.</b> Structure of the Class EA for Provincial Parks and Conservation Reserves . . . . .	4
<b>Figure 2.</b> The Class EA for Provincial Parks and Conservation Reserves in the Context of MNR's Planning System . . . . .	7
<b>Figure 3.</b> The Screening Process. . . . .	23
<b>Figure 4.</b> Project Evaluation and Consultation Processes for Category B and C Projects. . . . .	32
<b>Figure 5.</b> Procedure for Requesting a Part II Order . . . . .	45

## **LIST of TABLES**

<b>Table 4.1.</b> Screening Criteria . . . . .	25
<b>Table 4.2.</b> Considerations for Assigning Projects to Categories . . . . .	28



# Preface

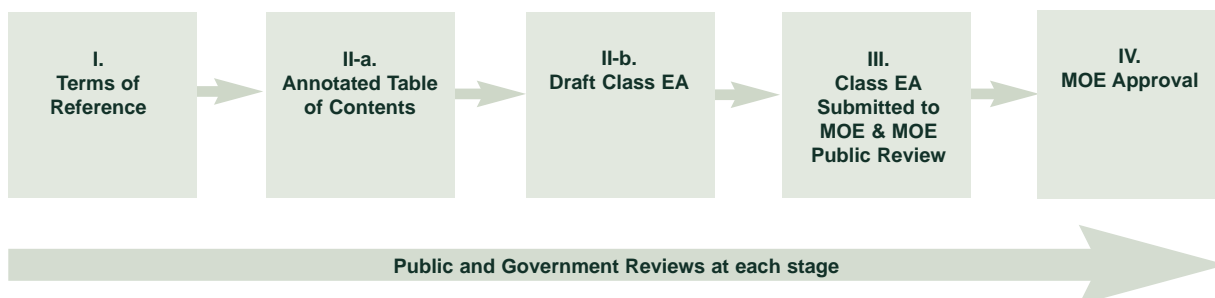
The Ontario Ministry of Natural Resources prepared this Class Environmental Assessment (Class EA) for Provincial Parks and Conservation Reserves through a multi-stage public planning process between 1999-2004. It has been prepared on the basis of consultation with government agencies, Aboriginal organizations, non-government organizations, the natural resources sector and the general public.

This Class EA planning process comprised four main phases, as illustrated below. Phase I was completed with the approval of the Terms of Reference in April 2000. Phase II-a consisted of a review of the Annotated Table of Contents report (referred to as an Outline in the Terms of Reference) during the fall of 2000. Phase II-b consisted of the preparation and review of the Draft Class EA during spring of 2001. Public response provided important guidance for the MNR project team during the preparation of the Class EA document that was submitted to the Ministry of the Environment (MOE) in October 2001 as part of Phase III. A summary of input and MNR responses for each phase was prepared and made available to interested persons. The Phase III review involved a government and public review of the Submitted Class EA during the fall of 2001, conducted

by MOE. This review resulted in additional input that was reviewed and responded to by MNR, and presented by MOE in its document Review Under the Environmental Assessment Act-A Class EA for Provincial Parks and Conservation Reserves, which was published March 8, 2002 and made available for public and agency inspection. At the same time, MOE also issued its Notice of Completion of Review, which specified that the agency and public comment period was to end April 12, 2002. Due to the public service strike, MOE extended the comment period to June 21, 2002 on May 17, 2002. During April 2004, MOE requested various agencies and ministries to identify any policy or legislative changes since 2002 that may need to be reflected in the Class EA. This represented the final stage prior to approval by the Minister of the Environment.

For more information about this Class EA, please contact: Barton Feilders, Manager, Planning & Research Section, Ontario Parks, Telephone: (705) 755-1730, or Dan Paleczny, Class EA Project Manager, Ontario Parks, Telephone: (705) 755-1745. Copies of the approved Class EA and related documents are available from MNR, or at: <http://ontarioparks.com>.

## Phases in Planning the Class EA for Provincial Parks and Conservation Reserves





# 1.0 Introduction

The Ministry of Natural Resources (MNR) must comply with the *Environmental Assessment Act* (*EA Act*), which provides for the protection, conservation and wise management of the environment in Ontario. Part II.1 of the *EA Act* sets out requirements for the approval of class environmental assessments (Class EAs). An approved Class EA permits a group of projects and activities (which are referred to in the *EA Act* as “undertakings” and are hereafter collectively referred to as “projects”) in a defined class to proceed in accordance with the approved Class EA without having to fulfill the full requirements of an individual EA under Part II of the act for each project.

## 1.1 Purpose of the Class EA

The purpose of this Class EA is:

- To describe the range of projects that are conducted in or for provincial parks and conservation reserves, and to identify those that are subject to this Class EA and those that are subject to other environmental approval requirements.
- For those projects subject to this Class EA, describe efficient and effective processes for:
  - i. Assignment of projects to categories based on their potential for negative environmental effects and public concern, and;
  - ii. Evaluation and consultation for project categories that are not required to meet the requirements of an individual environmental assessment (Part II of the *EA Act*).

- To ensure that projects subject to this Class EA are implemented so that:
  - iii. Provincial park and conservation reserve values are considered, and;
  - iv. Negative effects on the natural, social, economic and cultural environments are minimized.
- To provide monitoring and review requirements to ensure that the Class EA remains current, relevant and effective.

## 1.2 Reasons for Using a Class EA

A class environmental assessment is an efficient and effective approach that is applied to a group or “class” of projects that have common attributes, qualities, or characteristics (see sub-section 1(2), (3), and (4) of the *EA Act*). It can provide the flexibility to assess projects according to their similar scale, potential environmental effects, and/or level of public concern.

Provincial park and conservation reserve projects meet the *EA Act* definition because:

- All of the projects take place within or for Ontario provincial parks and conservation reserves, which are components of a province-wide system of protected areas. The goals, objectives, and principles of the provincial parks and conservation reserves systems, set limits on the type and scale of projects that can occur.
- An extensive set of acts, regulations, policies, procedures, guidelines and standards set additional limitations on projects for provincial parks and conservation reserves, and ensure consistency with the system.

This Class EA also identifies other projects that may take place in provincial parks and conservation reserves, that:

- For various reasons, will be evaluated and approved under other class or individual environmental assessments or declaration orders.
- May be evaluated and approved under individual environmental assessments, because of the greater scale of their effects and the greater difficulty of mitigating them.

Although in these cases the Class EA may simply direct the reader elsewhere, it still aims to provide a one-stop catalogue of how the projects that can occur in a park or conservation reserve are dealt with.

Prior to the approval of the Class EA, projects in provincial parks and recommended provincial parks were covered by specific exemption and declaration orders. Exemption Order MNR-59/2, first approved in 1992, dealt with the ongoing management, operations and development of provincial parks. Three later Orders dealt with a specific group of new parks or reserves that were being recommended for establishment at around the same time, as follows:

- Exemption Order MNR-61 dealt with parks and reserves recommended to be created in 1994.
- Declaration Order MNR-63 dealt with parks and reserves recommended to be created in 1997.
- Declaration Order MNR-65 dealt with parks and reserves recommended to be created as a result of the Ontario's Living Legacy Land Use Strategy announced in 1999.

These four Orders all recognized the need for longer-term *EA Act* coverage for both provincial parks and conservation reserves.

The Class EA replaces the various processes conducted under the previous exemptions and other *EA Act* requirements with a uniform and more rigorous and comprehensive process, described in a single document, that applies to all provincial park and conservation reserve projects that fall within the defined class. It is intended to provide a good understanding among MNR staff, government agencies, Aboriginal organizations, First Nations,

non-government organizations, stakeholders and the public, of the requirements for each type of project.

The Class EA approach affords considerable efficiencies to the proponent, partners, agencies, and the public by grouping projects with similar characteristics, and by following a pre-approved, predictable process. The Class EA establishes criteria for screening projects to determine an appropriate category for each project, and an evaluation and consultation process to be applied to each project as appropriate. The process that is implemented through approval of the Class EA ensures that the intent of the *EA Act* is met by providing for the identification of issues and concerns and the preferred means of addressing them, with regard to environmental management, protection, minimizing effects, and adopting appropriate mitigation measures.

### 1.3 Structure of the Class EA

This Class EA document is organized as follows (refer to Figure 1):

- **Section 1** introduces the Class EA in terms of its purpose and rationale.
- **Section 2** provides information on background context with respect to MNR's planning system and the relationship between the different levels of planning.
- **Section 3** defines what this Class EA applies to, where it applies, and how it relates to other *EA Act* processes.
- **Section 4** outlines four categories within which projects fall, ranging from approval to proceed without further evaluation or consultation (Category A) to individual environmental assessment (Category D). The section explains how each project will be assigned to one of these four categories through a screening process. The process is based on the potential for significant negative environmental effects and the potential for public and agency concern.
- **Section 5** describes the planning processes to be followed for Category B and C projects. Once a project has been assigned to Category D, it becomes subject to the individual environmental assessment requirements of the *EA Act*.

- **Section 6** describes administrative requirements for monitoring and maintaining the Class EA, including procedures related to amendments and Part II Orders (formerly known as bump ups – see glossary).
- **Appendix 1** is a Glossary of Terms.
- **Appendix 2** contains tables describing individual projects and how they are categorized under this Class EA or covered under other EA Act processes.
- **Appendix 3** lists related policies, procedures, bulletins, manuals and standards.
- **Appendix 4** is a description of MNR’s planning system.
- **Appendix 5** provides background information to assist in assessing the significance of environmental effects.
- **Appendix 6** is a list of government and other agencies.
- **Appendix 7** describes relevant federal and provincial legislation.
- **Appendix 8** provides background information about notification and consultation practices.
- **Appendix 9** provides a series of sample notices and forms to assist in implementing the Class EA.

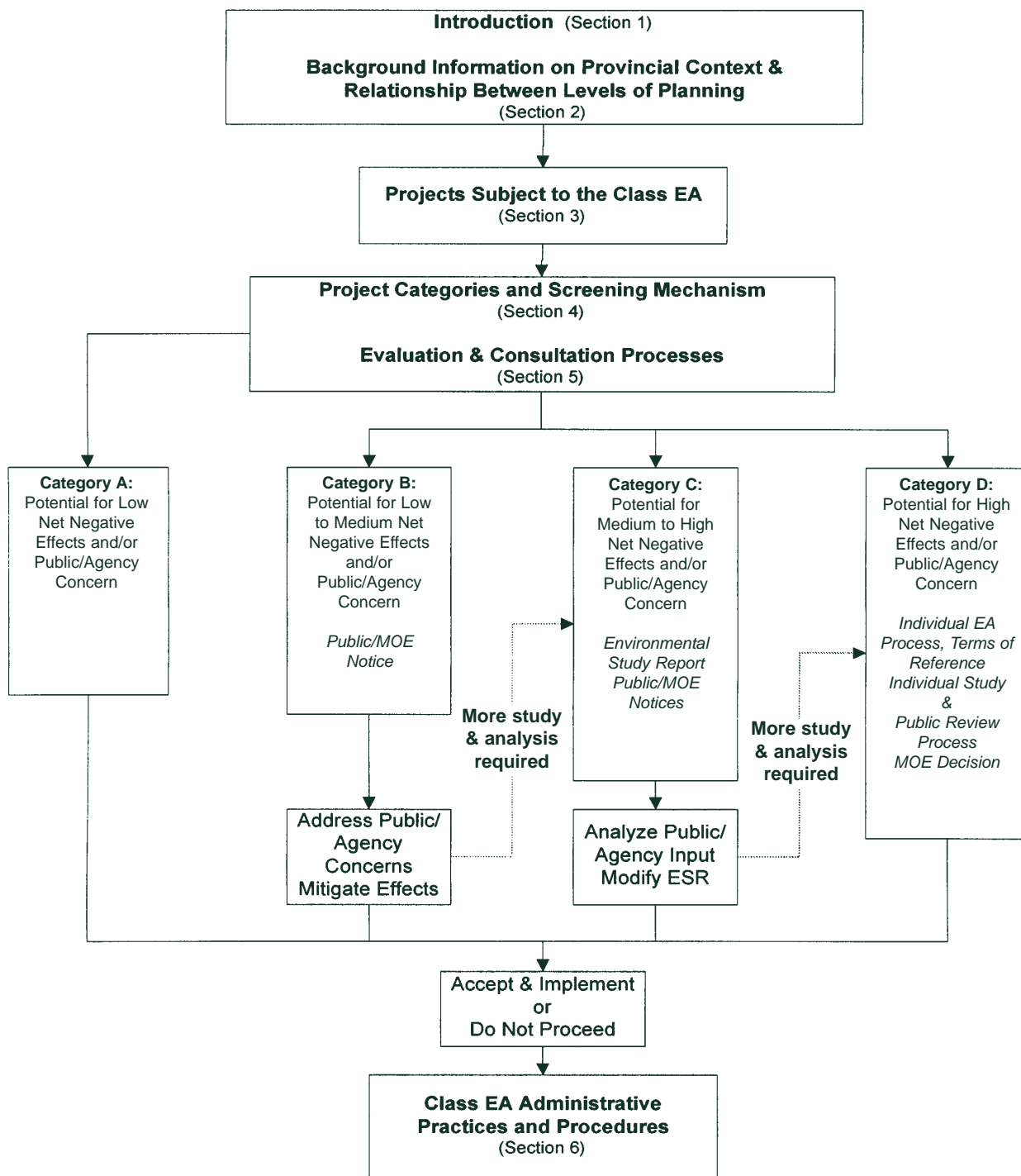
Sections 1 through 6 and Appendices 1 and 2 comprise this Class EA. The remaining appendices are included in the document for reference background information only. Reference in the text to Appendices 3-9 are intended to assist the reader and are not requirements of this Class EA.



## **Public**

**In Figure 1 and elsewhere in this Class EA, the terms “public” and “parties” are used interchangeably as a short form for all potentially affected government agencies, Aboriginal organizations, First Nations, non-government organizations, stakeholders and publics.**

**Figure 1: Structure of the Class EA for Provincial Parks and Conservation Reserves**



## 2.0 Provincial Context

The Ministry of Natural Resources (MNR) administers Ontario’s provincial parks through Ontario Parks, and conservation reserves through the district and regional offices of the Field Services Division. The description of MNR’s planning system (Appendix 4) and the following description of the relationship of both land use direction and management direction to this Class EA is provided as background information for context to the Class EA undertakings described in Section 3.

### Management Direction Defined

**“Management Direction” means an interim management statement (IMS) for a provincial park, a statement of conservation interest (SCI) for a conservation reserve, or a management plan. As described in Appendix 4 (part 4.3), these planning documents provide direction in keeping with their purpose and different information standards.**

MNR’s planning system has four levels as illustrated in Figure 2, which result in progressively more detailed and specific decisions. Appendix 4 presents a summary of each level. This Class EA is concerned with the fourth level, implementation.

MNR seeks to integrate its planning processes where it is practical and appropriate to do so. For example, referring to Figure 2:

- Broad public planning processes for determining land use direction (level 2) may be undertaken in conjunction with management planning processes (level 3). Similarly, the project evaluation and consultation requirements of this Class EA (level 4) may be conducted through a process to develop land use direction (level 2) (e.g., establishing, amending or rescinding boundaries, acquiring or disposing of land).
- Management direction (level 3) for provincial parks or conservation reserves may be planned in conjunction with other MNR management planning processes such as forest, fire or fisheries management plans, or in the case of specific projects, through these other relevant MNR planning processes. In these cases, explicit recognition and consideration of protected area values will be demonstrated in the respective public planning process.
- Management planning processes (level 3) may overlap with project evaluation processes that are the subject of this Class EA (level 4). To avoid duplication, the project evaluation and consultation process to be conducted under this Class EA will take into consideration the planning and consultation steps that have already been completed. Sections 4 and 5 in this Class EA account for this.

If the Class EA requirements are being satisfied through a public planning process to develop land use direction or management direction (as noted above), then all notices required by this Class EA will need to be provided.

MNR aims to adhere to the following planning principles:

- All projects must conform to approved relevant MNR policies for protected areas, the relevant land use direction and the appropriate type of management direction.

Appendix 2 identifies projects (denoted by a footnote 2) that are normally first approved in the following types of documents that have been developed through a public consultation process: (1) a management plan, or (2) a Statement of Conservation Interest (SCI), or (3) land use direction. In a limited number of situations, MNR may proceed without this requirement, in order to consider important benefits. In such limited cases, a minimum of a Category C evaluation and consultation process will be undertaken, as described in Section 5, with a full consideration of alternatives to and alternative methods of carrying out the project. While this mechanism provides needed flexibility to manage the protected area systems, for clarity, it is MNR's aim to address significant, permanent developments through the normal management planning process described in Appendix 4.

- All significant developments or activities must be planned through an open and rigorous public process, as described in this Class EA.
- All decisions regarding the type, extent and location of significant facilities need to be supported by appropriate levels of information (e.g., resource inventories).
- All development will be carried out in accordance with relevant MNR standards and guidelines for protected areas, and in conformance with relevant federal, provincial and municipal statutes.

MNR shall apply the conservation reserve policies and procedures and Ontario's Living Legacy Land Use Strategy (1999), as amended from time to time, to the

planning and management of existing and recommended conservation reserves.

MNR shall apply the direction provided in the approved version of following documents (as amended from time to time) to the planning and management of existing and recommended provincial parks:

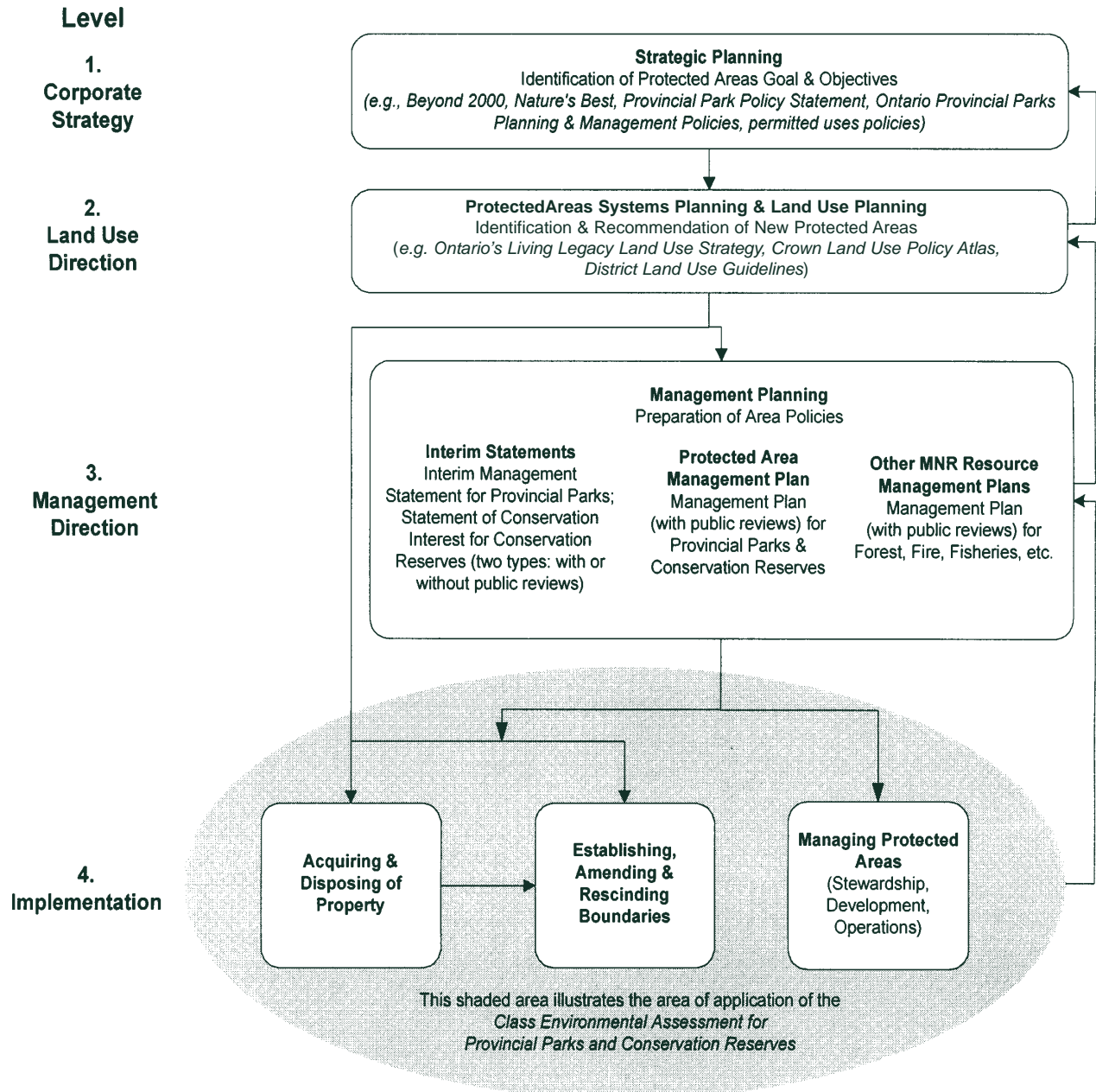
- Ontario's Living Legacy Land Use Strategy (1999).
- Ontario Provincial Parks Policy (1992).
- Ontario Provincial Parks Planning and Management Policies (1992).
- Ontario Provincial Parks Directives (policies, procedures, bulletins, manuals, standards).

New or amended policies and guidelines will continue to be forwarded to the Director of the Environmental Assessment and Approvals Branch (EAA Branch) of the Ministry of the Environment (MOE) and will be available for public inspection upon request. Significant policy changes are posted on the *Environmental Bill of Rights* environmental registry. For purposes of greater certainty, please note that matters in Levels 1, 2 and 3 of Figure 2 are not subject to this Class EA or its approval and, therefore, proposals for amendments or additions to matters in Levels 1, 2 and 3 do not require that the amending procedure for modifying this Class EA be followed.

However, if MNR wishes to proceed with a project which was previously prohibited in provincial parks or conservation reserves but which, through a change in MNR's permitted uses policy, is changed to a permitted use, MNR will complete a screening and categorize the project as Category B, C, or D. For projects which are determined to be Category B, newspaper notice during Step 2 of the process set forth in Section 5.1 of this Class EA is mandatory, unless the Class EA is amended to reflect the specific description of the new project type. In accordance with Sections 6.1 and 6.3, MNR shall document the implementation of any new projects previously prohibited in MNR's permitted uses policy in the annual report required to be prepared for this Class EA. Also, with respect to changes in MNR's permitted uses policy, MNR will also determine if it intends to prepare any requests for amendments to the Class EA to improve its implementation. MNR will include this determination in the annual report required to be prepared under this Class EA. Any amendment requests made by MNR will be considered by MOE in accordance with Section 6.2.



**Figure 2: The Class EA for Provincial Parks and Conservation Reserves in the Context of MNR's Planning System** (see Appendix 4)





# 3.0 Projects Subject to this Class EA

## 3.1 The Class of Undertakings

The projects that are subject to this Class EA fall within the following groups:

- Establishing, amending and rescinding boundary regulations for a new or existing provincial park or conservation reserve, including areas recommended in an approved land use direction document (e.g., Ontario's Living Legacy Land Use Strategy, 1999).
- Acquiring and disposing of land for a new or existing provincial park or conservation reserve.
- Managing existing and recommended provincial parks or conservation reserves.

These groups of projects are described in more detail below, and specific projects are listed in Appendix 2.

### 3.1.1 Establishing, Amending and Rescinding Boundary Regulations

The Lieutenant Governor in Council establishes, amends, and in some cases rescinds boundary regulations for provincial parks under the *Provincial Parks Act*, and for conservation reserves under the *Public Lands Act*. For example, the Ontario's Living Legacy Land Use Strategy (1999) identifies 332 recommended new protected areas and 46 recommended additions to protected areas that are established through regulations.

While provincial park lands are usually owned by the Crown, in some cases, privately owned lands are purchased for or by, or leased to, MNR and either included within a park's regulated boundaries or established as a new park.

Appendix 4 explains how provincial parks and conservation reserves are selected through land use planning processes. Land use policy and planning processes that identify and recommend new parks and reserves are not the subject of this Class EA. It is only after the land use planning recommendations have been made that this Class EA applies with respect to boundary regulations. Through the Class EA process, the generalized boundary for the recommended provincial park or conservation reserve is refined and regulated.

### 3.1.2 Acquiring and Disposing of Land

MNR acquires private lands and lands owned by other public agencies to protect natural and cultural heritage and provide recreational opportunities in support of the ministry's vision and mission (see Appendix 4). Examples of mechanisms used include:

- Purchase (including projects that comprise the purchase, severance and sale of surplus parts of a purchased property).
- Donations.
- Land exchanges.
- Other approaches (leases, easements, etc. with private landowners).

MNR also disposes of lands (e.g., sale of surplus lands, land exchanges, etc.) from time to time. These acquisition and disposition transactions are generally conducted through the Ontario Realty Corporation (ORC) or in co-operation with non-government partners with goals complementary to MNR's, such as the Ontario Parks Legacy 2000 partnership with the Nature Conservancy of Canada. (Note: other types of dispositions, such as land dispositions related to issuing a work permit, land use permit or lease, and resource disposition, such as

issuing permits to use resources, are included in Section 3.1.3 and Appendix 2, table 3 c.)

The requirements of this Class EA for Provincial Parks and Conservation Reserves will be followed when ORC acquires lands for provincial parks or conservation reserves or disposes of lands associated with provincial parks or conservation reserves. Once a property is acquired, the Class EA needs associated with Section 3.1.1 will apply with respect to regulating the acquired land as a provincial park or conservation reserve. However, although acquisition is a Category A project, per Appendix 2, MNR will take the precautionary step of completing Table 4.1 (screening) prior to acquisition, to identify potential issues that may warrant a more in depth consideration. Among all of the considerations, dispositions will include the consideration of any potential impacts on cultural heritage resources and any needed mitigation.

### **3.1.3 Managing Provincial Parks and Conservation Reserves**

Many types of projects occur in, or for, regulated and, to a much lesser extent, recommended provincial parks and conservation reserves, including projects to protect resource values, manage uses and activities, develop new facilities, and implement the following:

- Management direction (Management Plan, Statement of Conservation Interest, Interim Management Statement).
- Plans and strategies for resource management, facility development, or operations.
- Site plans.
- Construction projects, including sewage and water systems.
- Routine operational activities.

Some of these projects occur in only one or a few parks or conservation reserves, while others are widespread across the protected areas system. For example, most conservation reserves do not have intensive development. Projects are usually identified in the appropriate type of management direction (that is, a management plan, interim management

statement or statement of conservation interest) before they can proceed to be implemented through the procedures in this Class EA. Where exceptions are provided for, projects must still conform with an approved land use direction such as Ontario's Living Legacy Land Use Strategy (1999), Ontario Provincial Parks Planning and Management Policies, or MNR's conservation reserves policies. The projects in this category apply to parks and conservation reserves established through regulation as well as those that have not yet been established in regulation but have been recommended in an approved land use direction or acquired for the purpose of establishing the area in regulation.

#### ***Resource Stewardship***

Projects involving the stewardship of the significant natural and cultural resources found in provincial parks and conservation reserves are listed in Appendix 2. In some cases, little or no active intervention is required. In other cases, where past and ongoing human and natural changes influence the ecosystems and values that parks or reserves were established to protect, both passive and active management may be required. For example, under the direction of a fire management plan, managed natural fire or prescribed burning may be used to promote natural succession or to mimic natural processes.

#### ***Development***

Development includes the design and construction of buildings, structures, roads, trails or other works to support resource stewardship (such as erosion control), recreation, and tourism for provincial park or conservation reserve operations. Appendix 2 identifies the normal range of development projects. In provincial parks, development projects are generally undertaken to implement a management plan or replace/maintain existing facilities, with the support of site plans, building and construction plans and codes, and MNR policies, procedures, bulletins, manuals, and standards (see Appendix 3.1 and 3.2). Similarly, development in conservation reserves will use these MNR policies, procedures, bulletins, manuals and standards, as appropriate, to guide implementation activities if specific policy tools are not available for conservation reserves.

It is MNR's practice to discourage development in areas of known cultural significance, and to encourage further study in areas expected to have potential for cultural resources. Assessments may be carried out by a licensed archaeologist to ensure that any potential archaeological resources are identified. If archaeological resources are unexpectedly found during a project (e.g., unearthed), the project will stop until appropriate mitigation has been established.

### ***Operations***

Operations include the maintenance, operation, and decommissioning of facilities, the provision and administration of services, and the authorization of uses. Again, the normal range of operations projects is identified in Appendix 2. Human health and safety is a priority. In provincial parks, operations are generally undertaken within the context of MNR policies, procedures, bulletins, manuals, and standards (see Appendix 3.1 and 3.2). Similarly, operations in conservation reserves will use these MNR policies, procedures, bulletins, manuals and standards, as appropriate, to guide implementation activities if specific policy tools are not available for conservation reserves.

#### **3.1.4 Similarities and Differences Among the Undertakings**

In terms of similarities, every undertaking under this Class EA is intended to help achieve MNR's vision of sustainable development and mission of ecological sustainability as well as the objectives of the provincial parks and conservation reserves systems (see Appendix 4). The most important similarity among the undertakings is their common purpose and their location on, or for, lands protected by specific statute, regulation, and policy.

In terms of differences, while most Class EAs deal with a narrow range of related projects (such as road projects, flood control projects, etc.), this one deals with a variety of projects under different circumstances. As of early 2001, protected areas accounted for nearly nine per cent of the entire area of Ontario, and range from enormous wilderness

areas like Polar Bear Provincial Park on Hudson and James Bays, to small pockets of intensive recreational use like Sibbald Point Provincial Park on Lake Simcoe. Consequently, projects in protected areas vary enormously in type, magnitude, duration, and extent, as demonstrated by the list of projects in Appendix 2.

### **3.2 Area of the Undertaking**

Projects described in this Class EA are usually carried out in the following areas:

- All provincial parks in regulation under the *Provincial Parks Act*, and conservation reserves in regulation under the *Public Lands Act*. This includes private lands that are, through agreement, regulated as a provincial park.
- All recommended provincial parks and conservation reserves, that is, not yet in regulation but confirmed in an approved land use direction. (This does not include Forest Reserves, in which projects are covered under existing exemption/declaration orders and the Class EA for MNR Resource Stewardship and Facility Development Projects).
- Other areas outside of recommended or regulated provincial parks or conservation reserves where MNR proposes to carry out projects related to the goals and objectives for these protected areas (e.g., sewage and water works, access roads, land acquisition).

### 3.3 The Environment Affected and the Expected Range of Effects

Section 1 of the *EA Act* defines “environment” to include not only the natural environment, but also social, economic, and cultural conditions, human-made works, and the relationships among all of these. The projects described in Section 3.1 and Appendix 2 may affect an individual provincial park or conservation reserve, nearby lands, waters, and resources, or nearby communities. As described in Appendix 4, consideration of the environment and consultation with the public often occurs at several levels in the MNR planning system before the project planning and implementation covered by this Class EA.

For example, inventories and studies are often undertaken in support of park or conservation reserve management planning and project planning processes to understand:

- The location and significance of natural and cultural heritage values.
- Economic effects of planning options and decisions.
- Social and cultural preferences of resource users and the general public.

These inventories and studies aid in zoning (i.e., setting aside) areas for protection, access, and development. This helps ensure that projects are planned and located in a manner that will minimize negative effects, maximize positive effects on provincial park or conservation reserve environments, and neighbouring communities, even before the requirements of this Class EA come into play.

Regarding “the expected range of environmental effects that may result from proceeding with the undertakings in the class”, Section 3.1.4 notes the diversity of Ontario’s protected areas and the undertakings within them. As a result, potential environmental effects may vary enormously. More detail on the range of effects that can be anticipated is provided in the discussion of screening in Section 4.

### 3.4 Partnerships and Disposition Applicants

#### 3.4.1 Partnerships

MNR’s methods of conducting business continue to evolve, and many management activities traditionally carried out by ministry staff are now carried out through partnerships. In provincial parks and conservation reserves, partnerships generally are of two types:

- Partnerships with non-profit, non-government groups, or First Nations. Examples include Ontario Parks Legacy 2000 with the Nature Conservancy of Canada, the Friends organizations in place in many parks, and the Community Fisheries and Wildlife Involvement Program. The purpose of the partnerships is to directly involve these groups in resource stewardship, development and some aspects of provincial park or conservation reserve operations, such as natural heritage education, as a means to more effectively undertake these activities.
- Partnerships with business. Examples at the individual provincial park or conservation reserve level include entering into concession agreements with tourism and visitor service businesses, to more effectively provide recreational and tourism services.

In all such cases, MNR as the proponent of the class of undertakings subject to this Class EA, first reviews the proposal and determines if it is reasonable, appropriate and consistent with management objectives for the provincial park or conservation reserve before entering into an agreement. For partnerships involving an agreement, once MNR has executed a written agreement, the requirements of this Class EA will then apply to projects arising from the agreement. Where necessary, the agreement would specify that it is dependent upon achieving the requirements of the *EA Act* for the projects.

MNR will fulfill all applicable requirements of Sections 4 and 5 of this Class EA to the project, or require the partner to fulfil some or all requirements themselves, as determined by MNR, and report to the ministry. This would mean that the partner would be accountable to MNR for the completion of some or all requirements in accordance with this Class EA. Freedom of Information and Protection of Personal Privacy Act (FIPP Act) concerns may limit the partner's ability to conduct direct mailings as required under Section 5, in which case, MNR will need to conduct the mailings. For clarity, opportunities for Part II Order requests apply to partnership projects.

### 3.4.2 Disposition Applicants

MNR often receives applications for the disposition of certain or all rights to a Crown resource in a provincial park or conservation reserve for a variety of proposals. In these cases, the disposition is the undertaking that is subject to this Class EA, not the project that the proponent may be proposing which requires the disposition.

MNR requires information from the applicant to make a decision on the disposition application. Therefore, it is MNR practice that in most cases the applicant would be requested to follow some or all provisions of this Class EA, as determined by MNR, such as preparing an Environmental Study Report or consulting with the public as outlined in Sections 4 and 5.

Where the applicant's proposed project is placed in Category D (at any stage), the result may be a letter from MNR to the Ministry of the Environment advising of the activity so that the Minister could decide whether to seek designation of that project as a major commercial or business activity to which the *EA Act* applies, or to take other steps as may be appropriate. In the event that the Minister (MOE) advises that he or she does not intend to seek designation or to take other appropriate steps, MNR has no obligation to proceed with the disposition. However, MNR may consider a revised proposal submitted by the applicant for a new screening. MNR can then apply the requirements of Section 5

of this Class EA to the proposal, or request the disposition applicant to follow the requirements themselves and report to the ministry. This would mean that the disposition applicant would be accountable to MNR for the completion of certain requirements in accordance with this Class EA. FIPP Act concerns may limit the applicant's ability to conduct direct mailings as required under Section 5, in which case, MNR will need to conduct the mailings.

If the applicant does not comply with MNR's request that the applicant carry out certain or all provisions set forth by this Class EA, MNR has no obligation under this Class EA to continue processing the disposition application and relevant dispositions cannot be granted. The applicant remains entirely accountable to MNR for the completion of the requirements of this Class EA, and MNR remains responsible for all decision-making and approvals. Although not anticipated, MNR may choose to share responsibility for meeting the requirements of this Class EA with the applicant.

For clarity, only the disposition, and not the project authorized by the disposition, is subject to provisions of a Part II Order request. Where the public has an outstanding concern regarding a disposition applicant's proposed project, and that they consider has not been adequately addressed through this Class EA procedure, they may write to the Minister of the Environment with a request for designation of the applicant's proposed project as an undertaking to which Section 5 of the EA Act applies.

### 3.5 Integration With Other Environmental Assessment Processes

This section describes two types of situations in which the processes required by this Class EA may be integrated with other environmental assessment processes:

- Other EA mechanisms used by MNR that may be applied to provincial parks or conservation reserves in certain circumstances.
- EA mechanisms used by other agencies.

#### 3.5.1 Other MNR EA Mechanisms

A single project for which MNR is the proponent is sometimes located in a provincial park and/or a conservation reserve and partially on adjacent Crown land or waters. In such cases, MNR staff may carry out a single evaluation and consultation process. This situation applies to the many types of projects that are covered by this Class EA when they occur in a provincial park or conservation reserve (as listed in Appendix 2), and the Class EA for MNR Resource Stewardship and Facility Development Projects when they occur on Crown land (including forest reserves).

Examples described below relate to canoe routes, snowmobile crossings, and forest access road crossings.

#### *Canoe Routes and Snowmobile Crossings*

In the case of a canoe route or a snowmobile trail crossing through a provincial park or conservation reserve, the project evaluation and consultation requirements of this Class EA will be applied, or incorporated into another process (e.g., projects under the Class EA for MNR Resource Stewardship and Facility Development Projects). Where there is a difference between the two processes, the higher evaluation and consultation standards, as identified by MNR, will be adopted to ensure that protected area values and stakeholder concerns are fully considered.

Final approval for a project in a provincial park will be required by the responsible Ontario Parks Zone Manager, and for conservation reserves by the responsible District Manager.

#### *Forest Access Roads and Water Crossings*

Three scenarios related to forest access roads and water crossings may be permitted, as follows:

- Existing forest access roads and water crossings that pass through existing or recommended provincial parks or conservation reserves.
- Future proposed crossings of waterway provincial parks that may be considered in accordance with the Ontario Provincial Parks Planning and Management Policies (1992), as provided for in a management plan.
- New crossings in accordance with article 20 of the Ontario Forest Accord (1999), and/or Ontario's Living Legacy Land Use Strategy (1999).

Project evaluation and consultation requirements for such roads and crossings will be undertaken in accordance with the requirements of the *EA Act* approval regarding MNR's Class EA Approval for Forest Management on Crown Lands in Ontario, 2003, and as may be amended and extended from time to time (Class EA for Forest Management), including the application of the Forest Management Planning Manual and relevant guidelines such as the Environmental Guidelines for Access Roads and Water Crossings. Where there is a difference between the requirements of the Class EA for Forest Management (2003) and the requirements of this Class EA, the higher evaluation and consultation standards, as identified by MNR, will be adopted to ensure that protected area values and stakeholder concerns are fully considered. For example, the Ontario Parks mandatory distribution list and local mailing lists for a provincial park or conservation reserve will be used to provide assurance that relevant Aboriginal groups, interested parties and interest groups are informed.



In addition, as a means to identify any specific concerns that may require special consideration and to ensure protection of values, MNR will:

- Complete a review of the screening criteria in Table 4.1 (in this case the screening will be used as a tool to identify concerns, not to categorize projects into a category).
- Examine available inventory reports to identify values in the area of the project, and if necessary, complete an evaluation of the area.
- Specify any required monitoring.
- Ensure that the project is consistent with the appropriate type of management direction for the park or reserve where this is available. If necessary, the management direction may be amended as part of the public consultation process being carried out for a Forest Management Plan.

Final approval for a forest access road or water crossing in a provincial park will be required by the responsible Ontario Parks Zone Manager, and for conservation reserves by the responsible District Manager.

#### ***Additional MNR Mechanisms***

Appendix 2 includes examples of projects that may be subject to other existing MNR EA mechanisms, as opposed to this Class EA. Projects that have not been listed in Appendix 2 and are not the subject of this Class EA may be considered in a provincial park or conservation reserve through another MNR Class EA, exemption/declaration order, or an individual EA, if in accordance with policy.

#### **3.5.2 EA Mechanisms Used by Other Agencies and Sectors**

Two kinds of EA mechanisms that are used by other agencies and sectors are described in this section:

- EA mechanisms used by another agency for an MNR project.
- EA mechanisms used by another agency or a sector that are not for an MNR project.

#### ***Projects for MNR***

Occasionally, MNR projects are proposed for a protected area that also are the subject of another agency's EA requirements. In such cases, this Class EA for Provincial Parks and Conservation Reserves shall apply, and where appropriate may be co-ordinated with other EA approaches. For example:

- This Class EA will apply when the Ontario Realty Corporation carries out land acquisition on behalf of MNR.
- If a municipal sewage or water project is proposed that will serve the needs of the municipality and the provincial park or conservation reserve, the requirements of this Class EA will need to be implemented. These requirements may be co-ordinated with the respective municipality in a manner that MNR determines will meet the needs of this Class EA.

#### ***Projects by Other Proponents Not for the Protected Area Objectives***

Some projects are recognized in provincial park or conservation reserve policy and occur in provincial parks and conservation reserves even though they are not intended to meet protected area program goals and objectives. Examples of projects that are proposed to cross a provincial park or conservation reserve, include public highways, transmission lines or pipelines. Such projects are not subject to this Class EA, and are dealt with through other environmental assessment mechanisms, such as:

- The appropriate Class EA:
  - for highway development, Class EA for Provincial Transportation Facilities.
  - for municipal road or municipal services development, Municipal Class EA.
  - for a hydro transmission line and associated facilities 115 kV or over and less than 500 kV, Class EA for Minor Transmission Facilities.
- An individual EA or Declaration Order.
- For an oil or gas pipeline, Ontario Energy Board's Environmental Guidelines for the Location, Construction, and Operation of Hydrocarbon Pipelines and Facilities in Ontario.
- A process under the *Canadian Environmental Assessment Act*.

The following types of electricity projects either exist now or may be expected to arise in the future:

- *Existing* waterpower facilities and associated infrastructure (e.g., transformer stations, transmission lines, access roads) within a protected area may undergo maintenance or modification of the facility from time to time, for example to improve efficiency.
- Where a binding commitment by the Crown was made prior to the release of the Proposed Ontario's Living Legacy Land Use Strategy on March 29, 1999, to permit the development of a *new* waterpower facility (any requests to confirm commitments will be examined on a case-by-case basis).
- Maintenance and modification of *existing* electricity transmission line corridors.
- Development and maintenance of *new* electricity transmission line corridors.

In April 2001 the Ministry of the Environment filed the *Electricity Projects Regulation* that applies environmental assessment requirements to electricity sector projects, including for example, various methods of electricity generation, transmission lines, and transformer stations. Electricity projects in provincial parks and conservation reserves that may be permitted in accordance with policy (as noted in the above list) may be subject to the environmental screening process described in the MOE publication "Guide to Environmental Assessment Requirements for Electricity Projects" (March 2001 as amended from time to time) (O. Reg. 116/01).

Where proposed projects, such as those described in this section, are not for the purpose of the protected area but may be permitted in accordance with provincial policy, MNR will participate in the required environmental assessment process, or, where no process is required, may impose requirements to ensure that protected area values are properly identified and considered.

For example, when commenting on proposals or processes for these types of projects and/or where a permit or disposition would be required, MNR may identify situations when applicants need to:

- Apply the screening criteria in Table 4.1 as a means to identify issues and protected area values that require special consideration. This is not intended to necessarily require that a project evaluation and consultation process, as described in Section 5, be carried out.
- Undertake additional studies or consultation to verify potential effects, or to modify practices or approaches in order to mitigate potential negative effects. This may include monitoring needs.
- Examine alternatives to and alternative methods for carrying out the project.

Such needs may be administered as a pre-condition for the decision on whether to issue a permit or disposition (per Appendix 2). Proponents will be advised to consult with MNR early in the project planning process.

In the case of new hydroelectric facilities and some significant modifications to hydroelectric facilities, proponents will be required to meet MNR's Waterpower Program Guidelines (WPPG) as well as any requirements under the MOE's Electricity Projects Regulation. MNR may impose additional requirements through the WPPG process as set out above.

### 3.5.3 Access for Mineral Exploration and Development

Policy established by the Ontario's Living Legacy Land Use Strategy (1999) allows the mining industry to access existing mining lands enclosed in the new OLL protected areas, with appropriate consideration for the protection of park or conservation reserve values. Accordingly, providing a disposition to allow this access has been included in the list of projects in Appendix 2. This provision pertains to:

- Mining claims or leases (and mining patents that result from these claims and leases) that are in existing or previously designated Forest Reserves (wholly or partially enclosed by, or adjoining an OLL protected area).

- Mining patents that were enclosed by an OLL protected area at the time when the OLL Land Use Strategy was approved (July 1999).

This provision to consider access does not guarantee that access to partially enclosed or adjoining Forest Reserves will actually be through the new protected area where alternatives may exist; however, it enables consideration of alternatives which could result in access through the protected area.

Permit requirements may vary depending upon the land use designation (park, reserve), status of the designation (recommended, regulated), the type of mining lands (claim, lease, patent), and the provision of tenure (surface, sub-surface or both). For example, in certain circumstances, a land use permit may be required under the *Provincial Parks Act* for a regulated park. A work permit may be required under the *Public Lands Act* for a recommended park or conservation reserve, or a regulated conservation reserve. Staff should consult with MNR land use planning and EA specialists to seek advice on a case by case basis. MNR will work with MNDRM to develop best practice guidelines for establishing trails in a manner that recognizes park or reserve values.

In the case of provincial parks that were established prior to the Ontario's Living Legacy Land Use Strategy (1999) and/or lie outside of the OLL planning area, MNR has no general policy provisions governing approvals or dispositions for access within a provincial park (i.e., to permit or prohibit) for the purpose of carrying out work on an existing mining claim, lease or patent. Few situations such as this exist. Should a situation arise that requires MNR to provide a disposition for access, the screening process (Section 4) will be applied and the appropriate project evaluation (Section 5) carried out. No mining lands are known to exist in conservation reserves that were established prior to the approval of the OLL Land Use Strategy.

### 3.6 Relationship of Class EA to Other Legislation and Policy

MNR complies with a wide array of federal and provincial legislation and government policy, as well as have regard for the Provincial Policy Statement under the *Planning Act*, and municipal plans and by-laws that are associated with the management of natural resources (Appendix 7). However, for clarity, the *Provincial Parks Act* and *Public Lands Act* are the primary pieces of legislation that apply to provincial parks and conservation reserves, respectively.

The Class EA process does not replace or exempt the formal processes of other applicable federal, provincial or municipal legislation or bylaws, such as permits or approvals and the specific public and agency consultation that they may require. MNR takes these other acts and policies into consideration when planning and evaluating projects and seeks approvals or permits as required. Appropriate agencies are also included as part of consultation processes (Appendix 6).

For example, consideration of the following acts is required to ensure that activities are not in conflict with those acts:

- The *Canadian Environmental Assessment Act*, which may apply to projects related to fish, fish habitat and navigable waters. Appendix 7 describes the situations when these requirements may apply.
- The *Niagara Escarpment Planning and Development Act*.
- The federal *Fisheries Act*, as it applies to the protection of fish and fish habitat for works in or near water.
- The federal *Navigable Water Protection Act*, as it pertains to the protection of the public right to navigation.

MNR will aim to contact relevant agencies early in the project evaluation so that consideration can be given to the required processes that are to be integrated and co-ordinated with this Class EA, to the extent appropriate.

There are potential overlaps between the *Ontario Environmental Assessment Act (EA Act)* and the *Canadian Environmental Assessment Act (CEA Act)*. Some projects may be subject to the requirements of the *CEA Act*. Generally, the *CEA Act* will apply if the project or component of the project requires the provision of federal land, is partially or wholly funded by the federal government, or requires a federal permit or authorization that is included in the *CEA Act* Law List Regulation. Refer to Appendix 7. A determination under the *CEA Act* does not meet obligations under the *EA Act* and dispositions associated with *CEA Act* approved projects for which a *CEA Act* determination of “no likely significant effects” has been reached will be subject to the requirements of this Class EA. Conversely, authorization to proceed under this Class EA does not meet obligations under the *CEA Act*.

Should an agreement on coordinating federal-provincial EA processes be established in the future, MNR will consider how the results can be integrated with this Class EA.

# 4.0 Class EA Categories and the Screening Process

MNR has considerable experience over several decades in planning and implementing the range of projects that are the subject of this Class EA. Since the *EA Act* came into force, MNR has also developed and implemented two other Class EAs, and the conditions associated with numerous declaration orders. A variety of policies, procedures, guidelines and support tools have been developed to implement projects, in accordance with these requirements (see Appendix 3). Drawing upon this experience, this section presents:

- Four planning categories that recognize potential for varying degrees of net negative or positive environmental effects and public and agency concern.
- A screening process and criteria to be used to identify potential net negative and positive effects, and to assign projects to categories. As noted in Appendix 5, an environmental effect is any change to the environment, positive or negative, that could occur as a result of a project.

## Overview

**The screening process enables projects to be assigned to one of four categories. The categories determine the level of detail and consultation required to evaluate projects.**

## 4.1 Planning Categories

This Class EA assigns projects within the class to categories in order to:

- Expedite planning and implementation for the majority of projects that have potential for low negative environmental effects or public and agency concern (Category A).
- Focus on addressing public concerns and mitigation for a minority of projects that have potential for medium to high net negative environmental effects and public and agency concern.
- Enable the appropriate planning process to be followed for Categories B and C.
- Identify projects that will require an individual EA (Category D).

### 4.1.1 Category A – Potential for low net negative environmental effects and/or public or agency concern

These projects consist of minor or routine, low intensity facility development, and routine resource stewardship and operations activities. In MNR's experience these projects have low potential for low net negative environmental effects (social, economic, cultural or natural environment) or agency or public concern. Planning and implementation of these projects is allowed to proceed in accordance with relevant MNR policies, procedures, bulletins, manuals and standards, in most cases without further public review or evaluation under the processes of this Class EA. In a few cases additional requirements have been specified (e.g., public notice for boundary amendments in Table 1 of Appendix 2, and the use of the screening table to assess land for acquisition in Section 3.1.2).

An MNR manager has the option of subjecting a Category A project to screening if it presents some potential for concern or negative impact. Appendix 2 lists Category A projects that can proceed if they are identified in the appropriate type of land use or management direction document, and other Category A projects that do not need to be specified in a land use or management direction document. Some projects are included in Category A if they are being evaluated through another Class EA process as described in Section 3.5.

Where a project involves ground disturbance in an area with archaeological potential, the project will be considered for impacts to archaeological resources. Where a project may impact on structures or cultural heritage landscapes, the project will be considered for potential effects to cultural heritage resources and appropriate mitigation measures will be considered. If a project involves unavoidable disturbance to known or potential cultural heritage resources, MNR will appropriately mitigate any impacts. Staff will consult the cultural heritage guidelines that will be prepared in consultation with Ministry of Culture.

#### **4.1.2 Category B – Potential for low to medium net negative environmental effects and/or public or agency concern**

Sufficient environmental controls and guidelines are in place for these projects to proceed with appropriate mitigation, but some potential for net negative environmental effects or public concern may warrant a public notice. Projects listed in Appendix 2 that are not Category A proceed through the screening process described in Section 4.2. Where a project is determined to be in Category B, the planning and consultation process described in Section 5.1 will be carried out.

Appendix 2 also indicates that “other” projects, not foreseen and listed in the appendix, could fall into any of the four categories. If screening determines that the “other” project has low potential for environmental effects and/or public concern and does not qualify for Category B, it will be assigned to Category A.

#### **4.1.3 Category C – Potential for medium to high net negative environmental effects and/or public or agency concern**

These projects may have a greater potential for net negative environmental effects or public concern and require much more information and analysis and a more comprehensive public and agency review process than Category B projects. Projects that the screening process assigns to Category C will proceed through the planning and consultation process described in Section 5.2, including preparation of an Environmental Study Report.

#### **4.1.4 Category D – Potential for high net negative environmental effects and/or public or agency concern**

Some projects may be determined to lie outside the scope of Categories A, B or C, and should instead be subject to the requirements for an individual EA under Part II of the *EA Act*. These projects would have potential for high net negative effects, and would require public and agency input to attempt to resolve concerns and assist in making decisions. These will include:

- Large scale facilities (e.g., hotel/lodge/resort and conference centres) not intended to meet the objectives of the provincial park or conservation reserve.
- Stocking of a fish or wildlife species not present in Ontario (exotic) (i.e., other than native or naturalized species).
- Restoration of fisheries through water body reclamation.
- Golf courses.
- New marinas. (i.e., where associated services, dredging, shoreline alteration, or other activities may be required to support the activity, as opposed to individual docks or a series of docks with no services).
- Alpine ski resorts.

MNR may decide to assign other projects to Category D based on its own conclusions arising out of the screening process, or as a result of concern expressed by Aboriginal groups, agencies, interest groups or individuals. A project may also be required to undergo an individual EA under a Part II Order by the Minister of the Environment, as described in Section 6.6, following the project evaluation and consultation process described in Section 5.

## 4.2 The Screening Process

Screening is a common method used to identify potential negative and positive environmental effects associated with projects. Screening is a way to confirm our understanding of potential effects and the need for remedial effort, and to ensure that all aspects have been or will be considered. An understanding of the many interrelationships among the social, economic and environmental aspects is important in order to achieve an ecosystem approach to planning.

This section presents the screening process and criteria that would be used to confirm the placement of a project in the appropriate category. The screening process will be conducted in six steps, as described below and as illustrated in Figure 3.

A record of the screening process including the project description, the completed screening table and any supporting rationale will be retained on the project file as part of the public record for an appropriate period of time. A sample template for a record of a screening process is provided in Appendix 9.

### *Step 1: Assess Project Against List of Projects (Appendix 2)*

MNR staff ensure the proposed project may be permitted in accordance with permitted uses policies and directives<sup>1</sup>, and, using Appendix 2, determine whether the project:

- Falls into Category A or D.
- Requires screening to determine whether it falls into Category B, C or D.
- Is not listed in Appendix 2 and requires screening to determine whether it falls into Category A, B, C or D.
- Is not subject to this Class EA but should instead be dealt with as indicated in Appendix 2.

As described in Section 4.1.1, projects determined to be in Category A may proceed without further screening or public review. Note that application of the screening criteria or a public notice may be required for certain projects, as specified in Appendix 2, or in additional situations as deemed necessary by the responsible manager. Implementation is subject to all relevant legislation as well as MNR policies, procedures, manuals and guidelines.

### **Project**

**A project may comprise one or more discrete components. It is usually desirable to evaluate the aggregate effects of all related components. In such cases, the project description will describe all associated components to be screened and evaluated. In more complex situations, these related components are described in an implementation plan (see Appendix 4, part 4.4 for more detail), such as a resource stewardship plan for ecosystems, vegetation, fire, wildlife, erosion control, etc. The project description required in Step 2 will identify the range of actions to be included within such a plan, and the anticipated duration (i.e., one time or recurring).**

<sup>1</sup> If MNR wishes to proceed with a project which was previously prohibited in provincial parks or conservation reserves but which, through a change in MNR's permitted uses policy, is changed to a permitted use, MNR will complete a screening and categorize the project as Category B, C, or D. Refer to Section 2 for more information.

### ***Step 2: Prepare Project Description***

A project that requires further screening continues through the screening process. MNR staff open a project file and prepare a project description (refer to template in Appendix 9). The description should include:

- The purpose and rationale, the problem to be addressed or the opportunity to be pursued in implementing the project.
- Details of the project, including its location, the study area and duration (i.e., one time or recurring). Project effects may extend outside a provincial park or conservation reserve boundary, for example, where there are potential effects on nearby communities.
- Alternatives to the project and alternative methods of carrying out the project, including the null (do nothing) alternative. An explanation should be provided if no alternatives are being considered or are available.
- Preliminary evaluation (cost, feasibility, effectiveness, and potential effects).
- Applicable policies, procedures, manuals and guidelines, and other permits or approvals required to undertake the project (see Appendices 3 and 7).
- Appropriate mitigation features that would be integral to the design of the project. Such mitigation techniques are often found in relevant MNR policies, procedures, manuals and guidelines.

### ***Step 3: Assess Against Screening Criteria (Table 4.1)***

MNR staff consult available resource inventories and review the potential net effects of the project (i.e., with appropriate mitigation techniques in place), against the screening criteria in Table 4.1. Each of the significance factors and considerations described in Appendix 5, “Assessing the Significance of Environmental Effects”, should be considered when assigning a rating under each of the screening criteria. The ratings are described in Section 4.3.

Where a potential negative effect is identified under a screening criterion, MNR staff provide a brief rationale for the assigned rating, either in the table

or, where appropriate, in separate supporting documentation. Any requirement for additional information gathering, research, evaluation, or monitoring should be identified.

Since the assignment of projects to categories is based primarily on identified negative effects under particular criteria, positive effects identified under other criteria would not usually change the assigned category. However, in some cases, as noted in Table 4.2, high negative and positive concerns may suggest a complex and polarized situation and may affect the placement of a project in a category.

### ***Step 4: Assign Project to Appropriate Category***

MNR staff use the ratings from Step 3 and the criteria in Section 4.4 to assign the project to Category B, C, or D. As described in Section 4.1.2, an unforeseen “other” project that is not identified in Appendix 2 may also be assigned to Category A at this time, provided this assignment can be clearly justified and documented. Projects listed in Appendix 2 that require screening may not be assigned to Category A.

### ***Step 5: MNR Manager Confirms or Modifies Category***

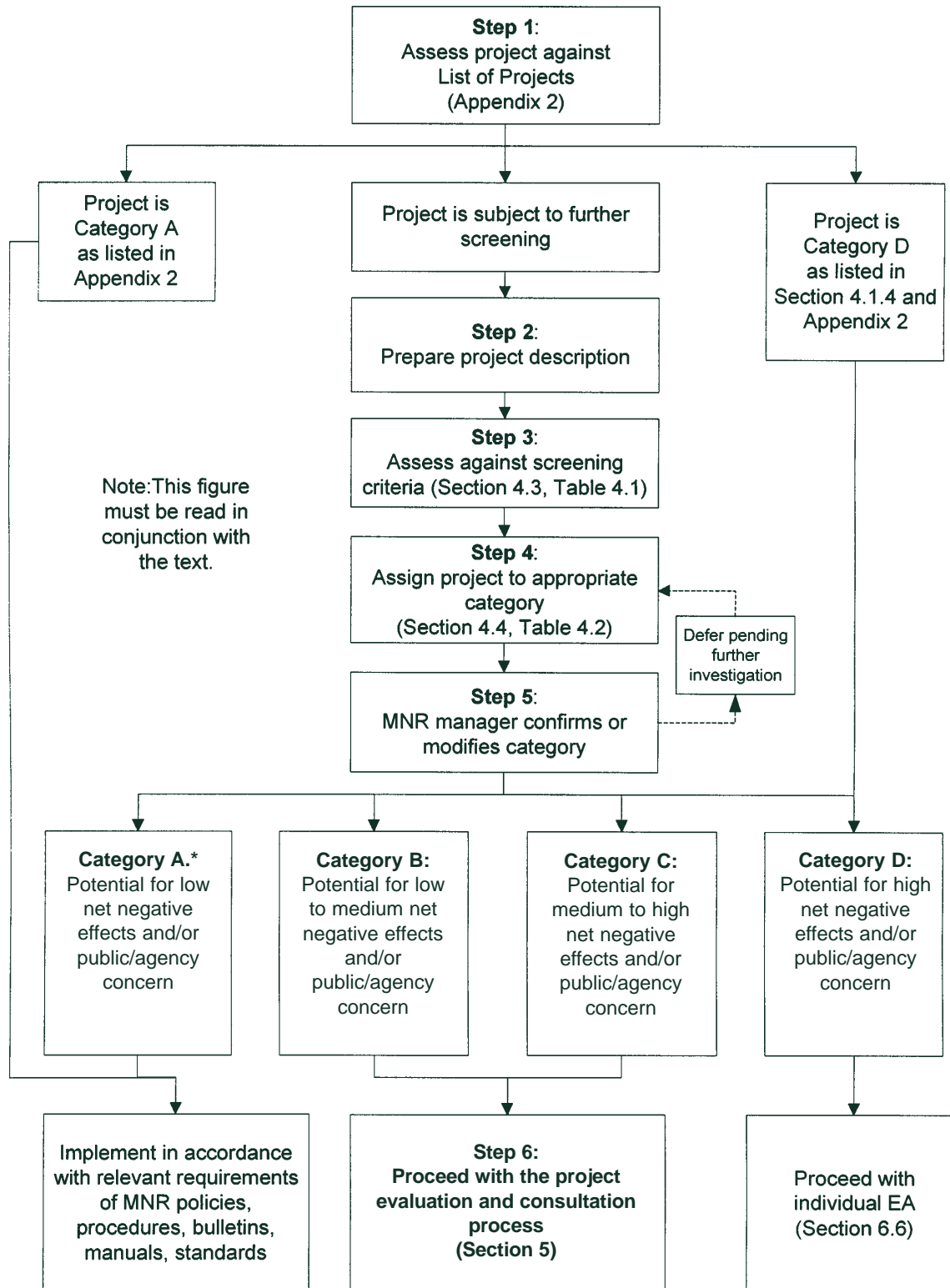
The appropriate MNR manager (the zone manager for a provincial park, or the district manager for a conservation reserve) reviews the assessment, requests additional information where necessary, and confirms or modifies the staff determination of the category. If the manager changes the category, then documentation of this decision is required, including the rationale for the change. The manager may also defer confirmation of a category until such time as further information is available.

### ***Step 6: Proceed with Evaluation and Consultation Process***

For projects assigned to Categories B or C, MNR staff proceed with the project evaluation and consultation process described in Section 5. Projects assigned to Category D are subject to the requirements of Part II of the *EA Act*, in which case, MNR field staff should consult MNR’s EA specialists for further direction.



**Figure 3: The Screening Process**



\*Screening to Category A is only available for projects identified in Appendix 2 as "other projects not listed"

### 4.3 Assigning High, Medium and Low Effects in the Screening Process

The following guidance explains the intended meaning of each of the rating categories in Table 4.1 when applying the screening criteria in Step 3, Section 4.2:

- A “nil” effect would be assigned where a criterion clearly does not apply.
- A “unk” would be assigned where the effects are unknown.
- A “low” net effect would be assigned where there is a high degree of certainty that the effect has minimal significance.
- A “medium” net effect would be assigned where there may be reasonable certainty about the potential effects and where effects may be significant in combination with other medium and high net effects.
- A “high” net effect would be assigned where there may be a high level of certainty that a significant effect will occur, or a low level of certainty about one or more effects and a need for further evaluation and exploration of mitigation options. One or more “high” negative net effects may result in a decision to seek other ways of resolving a problem or meeting project objectives.
- “-” means a potential negative effect.
- “+” means a potential positive effect.

To assign the rating in Table 4.1, the reviewer checks-off the appropriate column, and notes any clarifying comments or rationale for the rating. If a project may have both positive and negative effects on one criteria, this should be noted in the columns and described in the comments/rationale column. The screening criteria are not intended to be numerically scored or tallied as this would act against the intent of identifying the criteria of concern. If the effect is unknown, this should be noted in the comment column. Where information is unavailable for the proposal it will be noted and, where MNR considers it relevant to screening or evaluating the project, the deficiency will be addressed. MNR may consult with specialists and the public to assist in making determinations in the screening process. Note that the technical guideline for cultural heritage resources (to be developed by MNR) will be consulted for guidance.



If the project consists of more than one component that would, by itself, be subject to screening, the aggregate effects of all the components should be considered in identifying potential effects. Appendix 5 provides additional guidance and considerations to assist in completing the screening process.

Upon completion of the screening, refer to Section 4.4 and Table 4.2 regarding the assignment of projects to categories.

**Table 4.1: Screening Criteria**

The reviewer should read each criterion as beginning with the phrase: *“This project may affect...”*. All criteria apply to the environment inside as well as outside the provincial park or conservation reserve.

Screening Criteria <i>“This project may affect ...”</i>	Rating of Potential Net Effect								Comments, Rationale
	-H	M	-L	Nil	Unk	+L	+M	+H	
<ul style="list-style-type: none"> <li>Values for which the provincial park or conservation reserve was established</li> </ul>									
<b>Natural Environment Considerations</b>									
<ul style="list-style-type: none"> <li>Air quality</li> <li>Water quality or quantity (ground or surface)</li> <li>Species at risk or their habitat</li> <li>Significant earth or life science features</li> <li>Fish or other aquatic species, communities, or their habitat (including numbers, diversity and movement of resident or migratory species)</li> <li>Land subject to natural or human-made hazards</li> <li>Recovery of a species under a special management program (e.g. elk restoration)</li> <li>Ecological integrity</li> <li>Terrestrial wildlife (including numbers, diversity and movement of resident or migratory species)</li> <li>Natural vegetation and terrestrial habitat linkages or corridors through fragmentation, alteration and/or critical loss</li> <li>Permafrost</li> <li>Soils and sediment quality</li> <li>Drainage or flooding</li> <li>Sedimentation or erosion</li> <li>Release of contaminants in soils, sediments</li> <li>Natural heritage features and areas (e.g. areas of natural and scientific interest, provincially significant wetlands)</li> <li>Other (specify)</li> </ul>									
<b>Land Use, Resource Management Considerations</b>									
<ul style="list-style-type: none"> <li>Remoteness (access inaccessible areas)</li> <li>Navigation</li> <li>Other projects within a park or reserve</li> <li>Other projects outside a park or reserve</li> <li>Traffic patterns or traffic infrastructure</li> <li>Public or private recreation</li> <li>Or create excessive waste materials</li> <li>Or commit a significant amount of a non-renewable resource (e.g. aggregates, agricultural land)</li> <li>Noise levels</li> <li>Views or aesthetics</li> <li>Another project or be a precondition or justification for implementing another project</li> </ul>									

Screening Criteria “This project may affect ...”	Rating of Potential Net Effect								Comments, Rationale
	-H	M	-L	Nil	Unk	+L	+M	+H	
<ul style="list-style-type: none"> <li>• Uses, persons or property outside a park or reserve</li> <li>• Other (specify)</li> </ul>									
<b>Social, Cultural<sup>2</sup>, and Economic Considerations</b>									
<ul style="list-style-type: none"> <li>• Archaeology</li> <li>• Built heritage</li> <li>• Cultural heritage landscapes</li> <li>• Sacred or traditional use sites</li> <li>• Or displace people, businesses, institutions, or public facilities</li> <li>• Community character, enjoyment of property, or local amenities</li> <li>• Demands on government services or infrastructure</li> <li>• Public health and/or safety</li> <li>• Local, regional or provincial economies or businesses</li> <li>• Tourism values (e.g. resource-based tourist lodge)</li> <li>• Other (specify)</li> </ul>									
<b>Aboriginal Considerations</b>									
<ul style="list-style-type: none"> <li>• First Nation reserves or communities</li> <li>• Spiritual, ceremonial, or cultural sites</li> <li>• Traditional land or resources uses, or affect economic activities</li> <li>• Aboriginal values</li> <li>• Lands subject to land claims</li> <li>• Other (specify)</li> </ul>									

2 Where projects may affect a known or suspected cultural resource, further technical heritage studies may be warranted. Technical studies that may be required include items such as archaeological assessments by licensed archaeologists and built heritage studies by qualified heritage consultants if a significant built heritage structural feature is being affected.

MNR shall develop a technical guideline, in consultation with the Ministry of Culture, to address how cultural heritage resources should be identified, and how to assess their significance and develop mitigation techniques.

#### 4.4 Criteria for Assigning Projects to Categories A, B, C, or D

The criteria listed in Table 4.2 are intended to help MNR staff assign projects to the appropriate category, as required in Step 4, Section 4.2. Projects (other than those listed as Category As or Ds) must be considered on a case by case basis because of the wide variety of potential effects and levels of public concern that can be generated by similar projects in different locations.

When assigning projects to categories, MNR staff should ensure that the screening process and the rationale for decision making are documented. Appendix 5 provides guidance to staff in assessing the significance of environmental effects.

The category determination will be made through consideration of the screening criteria from Table 4.1, as well as the criteria for assigning projects to categories, provided in Table 4.2. In some instances one criterion may be sufficient to change the determination; in others, it may be a combination of several criteria.



**The assignment of categories should give full consideration to anticipated Aboriginal, agency, stakeholder, and public interest. Where there is uncertainty as to the possible interest, the MNR manager may elect to issue a notice to indicate that MNR is seeking input to a project screening process.**

**Table 4.2: Considerations for Assigning Projects to Categories**

Potential Net Environmental <sup>3</sup> Effects	Aboriginal, Public and Agency Concern
<p><b>Category A</b></p> <ul style="list-style-type: none"> <li>• Potential for low net negative environmental effects, usually with a high degree of certainty</li> <li>• May be routine</li> <li>• Effects responsive to appropriate mitigation techniques, if needed</li> <li>• If the appropriate type of land use or management direction is in place for the provincial park or conservation reserve, it specifically defines the nature and location of the project and does not require further consideration of alternatives</li> </ul>	<ul style="list-style-type: none"> <li>• Low potential for concern anticipated</li> </ul>
<p><b>Category B</b></p> <ul style="list-style-type: none"> <li>• Potential for low-medium net negative environmental effects, usually with a high degree of certainty</li> <li>• If the appropriate type of land use or management direction is in place for the provincial park or conservation reserve, it specifically defines the nature and location of the project and does not require detailed consideration of alternatives</li> <li>• Effects responsive to appropriate mitigation techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Medium potential for some concern anticipated</li> </ul>
<p><b>Category C</b></p> <ul style="list-style-type: none"> <li>• Potential for medium-high net negative environmental effects</li> <li>• There is some uncertainty associated with predictions of effects, requiring additional research and/or evaluation</li> <li>• The appropriate type of land use or management direction is in place for the provincial park or conservation reserve, but it does not fully define the project, or the plan suggests that alternatives should be considered or additional evaluation carried out</li> <li>• If a project is proposed when the appropriate type of land use or management direction is not in place (see Section 2)</li> <li>• Effects require mitigation techniques tailored to the project</li> <li>• Potential to reduce negative effects or increase public understanding by examining alternatives</li> </ul>	<ul style="list-style-type: none"> <li>• Concern likely to be high, with potential for adverse reaction, based on experience or previous consultation</li> <li>• Consultation and consideration of the proposal and reasonable alternatives may reveal appropriate solutions and common understandings</li> </ul>
<p><b>Category D</b></p> <ul style="list-style-type: none"> <li>• Several inter-related aspects that have high potential for either net positive or negative environmental effects that may conflict, suggesting a complex situation</li> <li>• Potential for serious negative effects on species at risk</li> <li>• Effects require mitigation techniques tailored to the project</li> <li>• Potential to reduce negative effects or increase public understanding by examining other alternatives</li> <li>• Involves a new or contentious interpretation of land use or management direction or other MNR policy</li> <li>• A distinct benefit can be derived from the process requirements of Part II of the <i>EA Act</i>, including Terms of Reference, formal government review and a decision by the Minister of the Environment (or the Environmental Review Tribunal)</li> </ul>	<ul style="list-style-type: none"> <li>• There is likely to be very adverse reaction</li> <li>• May be high negative and positive concerns that may be at odds, suggesting a highly polarized and complex situation</li> <li>• Other project categories would not adequately address concerns</li> </ul>

3 Includes the natural, social, cultural and economic environments.

# 5.0 Project Evaluation and Consultation Processes for Category B and C Projects

**T**his section describes the evaluation, consultation, and documentation requirements for Category B and C projects, as illustrated in Figure 4, and requirements for the monitoring of projects. The required process for a Category D project would be determined through the preparation and approval of Terms of Reference under Part II of the *EA Act*. As a general rule, evaluations should strive to achieve an ecosystem approach (see glossary) including consideration of the interrelationships between potential effects.

Where a high level of public interest is anticipated or requests have been made for additional time or consultation, the MNR manager may extend the normal comment period and/or undertake additional methods of consultation (refer to Appendix 8 for examples).

Some projects may affect areas that are traditionally used by Aboriginal communities who hold existing Aboriginal or treaty rights, or which may be subject to a land claim. Any project that interferes with or infringes on the exercise of these rights must be justifiable and, in that regard, the Crown has a duty to consult with the affected community. Therefore, it is advisable that consultations with Aboriginal communities occur with respect to proposed projects where there is a potential for an infringement of an existing treaty or Aboriginal right. Reference may be made to Appendix 8 for more information on consultation methods.

Sample notices and formats referred to in this Section may be found in Appendix 9. Notice periods refer to calendar days.

## 5.1 Category B Project Evaluation and Consultation Process

Category B projects are described in Section 4.1.2 and Table 4.2. All information described in the following steps will be placed on a project file, first opened during the screening process (Section 4.2), as part of the public record. The records of any future monitoring required as a result of the evaluation process will also be placed on the project file. The process consists of five steps, illustrated in Figure 4.

### *Step 1: Scoping*

MNR staff review the extent of planning and consultation previously conducted in support of the project (for example, through a management planning process). This information is combined with the results of the screening to determine the project evaluation and consultation steps that are remaining and must be completed through this Class EA.

### *Step 2: Public Notice*

At a minimum, this will consist of a mailing to persons and agencies with a known or, what MNR considers to be, a potential interest, or a local newspaper advertisement or both, with an invitation to comment within 30 days. The appropriate MOE regional office will receive a mandatory notice with an indication of whether an advertisement was used or not. Note that a news release on its own does not satisfy the notice requirement. If the provincial park or conservation reserve is operating or otherwise has managed entry, this notice will also be clearly posted at the office and/or normal (or authorized) entry points.

This notice should include the following information:

- A title indicating the project name and location.
- A summary description of the project and any proposed mitigation measures.
- A map and/or description of the location of the project.
- A summary description of previous MNR planning activities leading to the identification of the project, and a statement that MNR will either:
  - Conduct the complete project evaluation specified for a Category B project under this Class EA, or;
  - Conduct the remaining information gathering, evaluation and consultation required for a Category B project under this Class EA that has not already been conducted under a previous planning process, such as a land use or management plan process.
- An invitation to provide comments on the proposed project, specifying the deadline (i.e., the last day of the 30-day period).
- A statement that only those who request notice or who submit comments will be notified directly of the completion of the project evaluation, and that MNR may proceed to implement the project without issuing a further general notice.
- The name, address, telephone number, fax number and e-mail address of a contact person to whom questions or requests for additional information must be directed, and to whom comments must be sent.
- A statement of the authority under which information is being collected from the public, and of that information's availability and confidentiality under the *Freedom of Information and Protection of Privacy Act*.

## **Notices**

**Category B projects include one notice at the beginning of the process (Step 2), and, if concerns remain unresolved, a second with the Notice of Completion to parties who have expressed their interest (Step 4).**

As described in Section 4.4, if a first notice was issued during a screening process that led to the project being assigned to Category B, there may be no need to conduct this notice.

### ***Step 3: Project Evaluation***

MNR staff consider input received from the public notice, and continue the Category B process by collecting and documenting the following information:

- The purpose of the project, including the problem or opportunity being addressed.
- Alternatives to the project and alternative methods of carrying out the project, and the rationale for selecting the preferred alternative over the other alternatives considered. If alternatives were previously addressed through a planning process, a summary and reference will be included in the project file.
- A complete project description, including duration (i.e., one time or recurring) and the final design.
- The study area and the environment affected.
- Potential environmental effects (derived from the screening process and consultation, available resource inventories, and additional information as required).
- Policies, procedures, manuals and guidelines that MNR considers applicable (see Appendix 3), other required approvals (see Appendix 7), and their relevance to the project.
- Required mitigation, remedial and enhancement measures.
- Consideration of whether monitoring is required and, if so, a description of any monitoring requirements and commitments (see Section 5.4).
- A description of consultation conducted, issues raised and MNR's response to these issues, and any changes made to the project in response to public or agency input.
- An assessment of the project to meet its intended purpose.



The evaluation of the environmental effects and/or issues raised may identify the need for additional information and/or mitigation measures. MNR staff may work directly with those affected to try to resolve the concerns before deciding whether to pursue other options, which may include:

- Identifying new approaches to meeting the need that the project was intended to address.
- A decision not to proceed with the project.
- Voluntary elevation of the project to Category C or D. This may be considered at the request of an interested party.
- Alternative dispute resolution methods (see Appendix 8.5.3).

#### ***Step 4: Notice of Completion***

MNR will individually notify all persons and agencies who commented or asked to be notified of its decision on the project. This “Notice of Completion” will include the following information:

- A summary description of the project and any mitigation, remedial or enhancement measures, revised to reflect Step 3.
- A map or description of the location of the project.
- Confirmation that the requirements of the Class EA process for a Category B project have been met, subject to consideration of any request to the Minister of the Environment for an individual EA; that any mitigation or monitoring requirements will be undertaken; and that MNR intends to proceed.
- A description of the Part II Order provisions of the *EA Act*, and an indication of a 30-day period for Part II Order requests or other comments on the proposal, and the address of the Minister of the Environment to whom requests must be sent.
- The name, address, telephone number, fax number and e-mail address of a contact person to whom questions or comments must be directed.
- Availability of the project file for inspection, its location and the hours it is available for review.

MNR will attempt to resolve concerns and will document the resolution of concerns. Note that if no persons and agencies requested to be notified directly of the decision on the project or submit

comments on the project as a result of the notice in Step 2, MNR may proceed to Step 5 without issuing the Notice of Completion or waiting 30 days for the submission of Part II Order requests. If, persons or agencies requested notice or submitted comments on the project, and any concerns that were raised were resolved (for example, through discussions with the person or agency and/or through conditions of approval), MNR may proceed to Step 5 after issuing the Notice of Completion and waiting 14 days for Part II Order requests, with this reduced period being stated in this notice. When a Notice of Completion is issued it will be sent to the appropriate MOE regional office. If a Part II Order request is received, the procedure described in Section 6.6 applies.

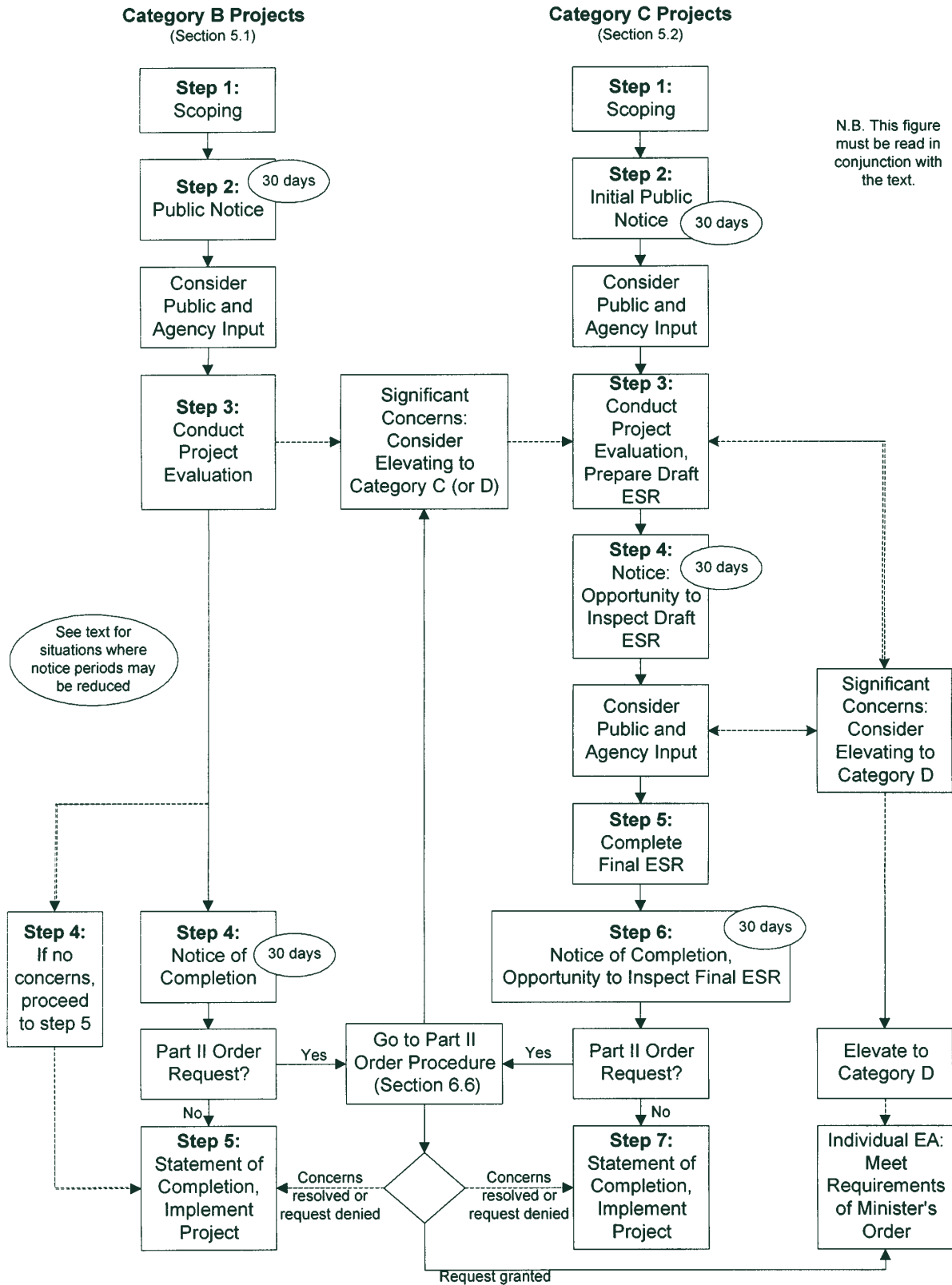
If changes are required to the project at this stage, the procedures in Section 6.8 (Modifications to Project Files and ESRs) will be followed.

#### ***Step 5: Statement of Completion, Implement Project***

If no Part II Order request is received during the 30-day period, or if the request is resolved without elevation of the project to Category C or D, or a requirement for an individual EA by the Minister of the Environment, the responsible MNR manager (the zone manager for a provincial park, or the district manager for a conservation reserve) will prepare a “Statement of Completion”, and the project may proceed within a period of five years (after this time, the provisions of section 6.7 apply). The Statement of Completion will be placed on the project file and will also be sent to the Manager, Planning and Research Section of Ontario Parks. It will include:

- A brief description of the nature and location of the project.
- Confirmation that the project was evaluated as a Category B project in accordance with the requirements of this Class EA.
- Confirmation that no Part II Order requests were received during the notification period, that any Part II Order requests received were withdrawn, or that any requests were denied by the Minister of the Environment (see Section 6.6).
- The signature of the responsible MNR manager, and the date.

**Figure 4: Project Evaluation and Consultation Processes for Category B and C Projects**



## 5.2 Category C Project Evaluation and Consultation Process

Category C projects, described in Section 4.1.3 and Table 4.2, may vary widely in their potential environmental effects and level of public interest. The requirements set out in this Class EA are a minimum.

All information described in the following steps will be placed on a project file, first opened during the screening process (Section 4.2), as part of the public record. The records of any future monitoring required as a result of the evaluation process will also be placed on the project file.

The process consists of seven steps, as illustrated in Figure 4.

### **Notices**

**The Category C process includes three mandatory points of notification, and the preparation of an Environmental Study Report.**

#### *Step 1: Scoping*

MNR staff review the extent of planning and consultation previously conducted in support of the project (for example, through a land use direction or management planning process). This information is combined with the results of the screening to determine the project evaluation and consultation steps that are remaining and must be completed through this Class EA.

#### *Step 2: Initial Public Notice for Category C Projects*

At a minimum, this will consist of a mailing to persons and agencies with a known or, what MNR believes to be, a potential interest, and a local newspaper advertisement, with an invitation to comment within 30 days. The appropriate MOE regional office will receive a mandatory notice. Note that news releases do not satisfy the notice requirements, that is, an advertisement is required. If the provincial park or conservation reserve is operating or otherwise has managed entry, this notice will also be clearly posted at the office and/or normal (or authorized) entry points.

This notice should include the following information:

- A title indicating the project name and location.
- A summary description of the project or alternatives, and any proposed mitigation measures.
- A map or description of the location of the project or alternatives and the study area, if appropriate.
- A summary description of previous MNR planning activities leading to the identification of the project, and a statement that MNR will either:
  - Conduct the complete project evaluation specified for a Category C project under this Class EA, or;
  - Conduct the remaining information gathering, evaluation and consultation required for a Category C project under this Class EA that has not already been conducted under a previous planning process.
- An invitation to provide comments on the proposed project, specifying the deadline (i.e., the last day of the 30-day period), and to participate in the preparation of an ESR.
- An invitation to any additional consultation event(s) associated with the project, giving date, time and location.
- The name, address, telephone number, fax number and e-mail address of a contact person to whom questions and requests for additional information must be directed, and to whom comments or requests to be added to the mailing list must be sent.

- A statement of the authority under which information is being collected from the public, and of that information's availability and confidentiality under the *Freedom of Information and Protection of Privacy Act*.

The comment period will be at least 30 days, and may be extended for more significant projects or to accommodate a high level of public interest. MNR may also include supplementary information with the notice, which may include:

- More detailed information about the project, the environment affected and current knowledge about potential effects.
- Proposed criteria for the evaluation of the project and any alternatives.
- A project schedule, including an outline of additional proposed consultation.
- A questionnaire or comment sheet.

Where comments are received, MNR staff should work directly with those affected to try to resolve the concerns as much as possible before deciding whether to pursue other options, which may include:

- Identifying new approaches to meeting the need that the project was intended to resolve.
- A decision not to proceed with the project.
- Voluntary elevation of the project to Category D. This may be considered at the request of an interested party.
- Alternative dispute resolution methods (see Appendix 8.5.3).

### ***Step 3: Project Evaluation and Preparation of a Draft Environmental Study Report (ESR)***

MNR staff will carry out the evaluation of the project and any additional consultation. A Draft ESR report will be prepared, based on the project evaluation and the results of consultation. The level of detail of Draft ESRs will vary depending on the complexity of the project, its environmental effects and the level of public and agency concern.

The Draft ESR will include:

- A description of what is to be accomplished by the project (the problem, opportunity or issue), and why.
- Confirmation of the project category.
- Review of the planning already undertaken in support of the project and the matters remaining to be addressed in the project evaluation, based on the relevant approved land use or management direction or other policy document or approvals (per Step 1).
- A description of alternatives to the project and alternative methods of carrying out the project, where relevant, including a systematic comparison of alternatives where appropriate (see Appendix 5).
- A description of the project study area and the environment affected, including existing land uses and valued ecosystem components and special features that could be affected.
- Identification of potential environmental effects of the project and any alternatives, focusing on the potential effects identified in the screening, through consultation, and in available resource inventories.
- A description of the project evaluation process conducted, including the rationale for selecting the preferred alternative.
- Details of the proposed project including its location, duration (i.e., one time or recurring), the basic technologies to be used, and the project design. This may include a site plan, where appropriate.
- Applicable MNR policies, procedures, manuals and guidelines (see Appendix 3), other required approvals (see Appendix 7), and their relevance to the project.
- The environmental effects of the project and their significance, including discussion of any benefits that may offset negative effects. Assessing the significance of environmental effects is discussed in Appendix 5.
- Consideration of the implications of not proceeding with the project (the "no-go alternative").
- Commitments to any proposed mitigation, remedial or enhancement measures.
- Consideration of whether monitoring is required, and, if so, commitments to monitoring the project and the future availability of monitoring records (See Section 5.4).

Appendices to the Draft ESR should include:

- Documentation of the screening evaluation.
- A description of the public consultation process, a synopsis of the issues raised, MNR's response to those issues, and any changes made to the project in response to public or agency input.
- Additional summaries or details of the environmental evaluations conducted and their findings (technical materials may be provided in supplementary documents).

#### ***Step 4: Notice of Opportunity to Inspect the Draft Environmental Study Report***

MNR will individually notify everyone on the current project mailing list, and will send the Draft ESR to the appropriate MOE regional office. Where MNR considers that there is a high level of interest or that the project was substantially changed during the process, notice will also be provided in a local newspaper advertisement. The Draft ESR may be sent individually to interested parties and to others who request it.

Depending on the level of public and agency interest and the significance of the project and its potential effects, the MNR manager (the zone manager for a provincial park, or the district manager for a conservation reserve) may add other consultation events as discussed in Appendix 8. Normally the deadline for comments will be 30 days, although this may be extended in situations that are known to be more complex. If the level of interest in the project is low, the manager may reduce the deadline to a minimum of 14 days, however this must be stated in the notice.

This notice will include:

- A summary description of the project, alternatives and proposed mitigation, remedial or enhancement measures described in the Draft ESR.
- A map or description of the location of the project.
- An invitation to inspect the Draft ESR at specified public locations.

- A request for comments on the Draft ESR and its findings, specifying the deadline.
- An invitation to any additional consultation events to be held in connection with the project.
- Contact person information, as in the initial notice (Step 2).
- Notice that MNR intends to proceed with the project, and that a Final ESR will be released for public inspection.
- Reiteration of the *Freedom of Information and Protection of Privacy Act* provisions.

#### ***Step 5: Completion of the Final Environmental Study Report***

MNR staff will consider agency and public comments in refining the Draft ESR, and in deciding whether to proceed with the project. The required contents of the Final ESR are the same as for the Draft.

#### ***Step 6: Notice of Completion, Opportunity to Inspect the Final Environmental Study Report***

MNR will send notice to everyone on the current project mailing list, which includes all persons and agencies who commented or asked to be notified of further steps in the planning of the project, and provide notice in a local newspaper advertisement. MNR will make available and may send the Final ESR individually to interested parties and to others who request it. A copy will be sent to the appropriate MOE regional office. This notice will include:

- Confirmation that the requirements of the Class EA process for a Category C project have been met, subject to consideration of any request to the Minister of the Environment for an individual EA; that any mitigation or monitoring requirements will be undertaken; and that MNR intends to proceed.
- Description of the project and its location (shown on a map, where appropriate).
- Description of the Part II Order provisions of the *EA Act*, indication of a 30-day period for Part II Order requests or other comments, and the address of the Minister of the Environment to whom requests must be sent.

- The name, address, telephone number, fax number and e-mail address of a contact person at MNR to whom questions or requests for a more complete project description must be directed, and comments must be sent.
- A location where the final ESR may be viewed.

Where the project is complex or there is a high level of interest, MNR staff may decide to conduct additional consultation or newspaper notices in connection with the Final ESR. If changes to the ESR are required at this stage, the procedure in Section 6.8 will be followed.

If a Part II Order request is received, the procedure described in Section 6.6 applies. Note that a 7-day waiting period is suggested in Section 6.6.3, to allow for MOE notification of a request.

#### ***Step 7: Statement of Completion, Implement Project***

If no Part II Order requests are received during the 30-day period, or if a request is resolved without elevation of the project to Category D or a requirement for an individual EA by the Minister of the Environment, the responsible MNR manager (the zone manager for a provincial park, or the district manager for a conservation reserve) will prepare a “Statement of Completion” and the project may proceed within a period of five years (after this time, the provisions of section 6.7 apply). The Statement of Completion will be placed on the project file and will also be sent to the Manager, Planning and Research Section of Ontario Parks and MOE’s Environmental Assessment and Approvals Branch. It will include:

- A brief description of the nature and location of the project.
- Confirmation that the project was evaluated as a Category C project in accordance with the requirements of this Class EA.
- Confirmation that no Part II Order requests were received during the notification period, that any Part II Order requests received were withdrawn, or that any requests were denied by the Minister of the Environment (see Section 6.6).
- The signature of the responsible MNR manager, and the date.

All activities associated with the implementation of a project will usually include recommended mitigation measures outlined in the Final ESR. If construction and maintenance is to be contracted out, an agreement will be signed with the contractor that contains provisions requiring that the mitigation measures identified in the ESR be carried out.

### **5.3 Mitigation**

The Class EA process is intended to identify potential adverse environmental effects and where feasible, avoid them. Where avoidance is not feasible, mitigation measures to reduce or minimize these effects will be identified. For example, a planned project should encourage rehabilitation of degraded conditions that may exist on a site prior to the project, and discourage measures that might act to inhibit future rehabilitation of such conditions. Monitoring of project effects may be required to verify the effectiveness of the mitigation measures, or to verify the predicted effects.

Mitigation is the process of avoiding, eliminating, offsetting or reducing to an acceptable level the potential negative effects of a project. It can also include rehabilitation, restoration or enhancement where feasible. The approach to be employed will involve identifying potential project effects early in the planning process and avoiding them, or building a solution into the project plan from the start, so that further mitigation measures are not required. For example, where there are early indications that implementing a project may require a substantial amount of mitigation, it may be advisable to consider alternatives. In cases where negative effects cannot be avoided mitigation measures are introduced to minimize or offset these effects. All mitigation measures should be clearly documented.

### 5.3.1 Typical Mitigation Measures

Generally, mitigation measures may include modifications to the project design or implementation techniques, a change in location, or other measures to minimize effects. Examples of typical mitigation measures include:

- Noise and dust control measures to minimize disruption to adjacent residents.
- Sediment and erosion control measures to avoid surface water sedimentation.
- Seasonal constraints on construction to avoid spawning periods for fish.
- Timing restrictions to avoid disruption to other species (e.g., breeding periods of birds), resources, or users (e.g. canoeists, cottage owners, hunters).
- Avoiding known or potential archaeological sites, sensitive adaptation and reuse of built heritage features, protecting sensitive features through the use of fences, protective coverings, the imposition of a buffer, or other isolating mechanisms.
- Planting of vegetation to replace vegetation that had to be removed.
- Notification of affected owners of construction scheduling.



### 5.3.2 Mitigation During Project Implementation

Some projects under this Class EA will be implemented by a contractor. Contractors differ in their approach to sequence of operation, construction techniques, equipment used, and construction schedule. Since the operations of the contractor may have the potential for negative environmental effects, provisions that indicate what can or cannot be done during specific operations should be included in the construction contract. Those responsible for inspecting a contractor's work must be made aware of such provisions in order to monitor and assess compliance during construction, and with the applicable environmental provisions including the awareness of mitigation measures to be employed. Appendix 3 lists some of the guidelines and references that may be useful in addressing this.

## 5.4 Project Monitoring, Evaluation and Reporting

Monitoring, evaluation and reporting during the pre-implementation phase, the implementation phase, and the post-implementation (ongoing operation) phase of a project is important to the achievement of the purpose of this Class EA as described in Section 1. Monitoring, evaluation and reporting enables MNR to assess whether predictions of environmental effects are valid, and to confirm the effectiveness of implementation and mitigation measures. Where unintended effects occur, further action can be taken to reverse or minimize them wherever possible. Monitoring, evaluation and reporting enables lessons learned to be applied in subsequent phases and years of a project, and in planning future projects, thereby improving the efficiency and effectiveness of the Class EA process.

Potential requirements for monitoring will be considered throughout the planning of Category B, C and D projects. How much monitoring is required will depend on the project. Small, low intensity projects may only require informal monitoring. For projects that employ mitigation measures to solve an anticipated problem or a negative effect, more formal monitoring may be required. Larger scale projects using innovative or untested techniques and mitigation measures may require sophisticated monitoring approaches before, during and after project implementation. Resource inventories should be consulted as an additional piece of information.

Category B project files and Category C ESRs will include a statement that the need for monitoring was considered in the project evaluation (refer to sample form in Appendix 9). If no monitoring is required, reasons will be provided. Where monitoring is required, a monitoring and follow-up program will be described, such as:

- *Purpose*: why monitoring is being done, the potential effect(s).
- *Acceptable Outcomes*: the predicted effects to be monitored and the range of acceptable outcomes.

- *Monitoring Methods*: the protocols to be used (e.g., techniques, equipment, measurements/indicators, duration, frequency, etc.).
- *Reporting*: a description of when and how interim and final reporting will be completed.

Reporting would include an overall analysis of the effectiveness and any environmental effects of the project and adjustments to the project arising from the results of monitoring. Specifically, reporting would include:

- *Results*: a description and assessment of the results with respect to the acceptable outcomes, and any recommendations.
- *Remedial Action*: additional recommended actions that may be required to mitigate a problem, including any related monitoring.

If a project is undertaken by or in co-operation with a partner (see Section 3.4), responsibilities for monitoring and any required mitigation and remediation should be clearly identified. Monitoring records will be maintained on the project file, and copied to the Manager, Planning and Research Section, Ontario Parks.

For Category D projects, MNR or the proponent will identify any monitoring, evaluation and reporting needs in the proposed Terms of Reference that is submitted to MOE for approval.



# 6.0 Class EA Administrative Practices and Procedures

## 6.1 Monitoring the Implementation of this Class EA

The purpose of monitoring the implementation of this Class EA is to determine whether it is fulfilling its stated purpose and to identify opportunities for improvement that would enhance its effectiveness.

To assist in monitoring progress and experience arising from the implementation of this Class EA, MNR will:

- Retain copies of completed Class EA file information and reports (described in Sections 4 and 5) at the provincial park (where park offices exist), and at the relevant district or zone office.
- Retain Statements of Completion at the Planning and Research Section, Ontario Parks.
- Submit an annual report to the Director of the Environmental Assessment and Approvals Branch (EEAB), MOE no later than June 30 for projects initiated, planned and implemented during the previous calendar year. The annual report shall include:
  - i. A statement of effectiveness of this Class EA document in providing an effective and efficient planning process, and in protecting the environment.
  - ii. Identification of any changes to this Class EA document or changes to MNR practices and procedures that would serve to improve the Class EA itself or its administration.
  - iii. Identification of any common problems experienced with the Class EA projects, that may suggest a problem in this Class EA document.
  - iv. Action that MNR has or will be proposing to deal with problems, deficiencies and non-compliance with this Class EA document and whether the problems should be addressed in the five-year review or sooner.
  - v. A statement on how MNR has complied with each of the conditions in the Notice of Approval (Order in Council) of the Class EA parent document and any “Notice of Amendment”, and with the *Environmental Assessment Act*.
  - vi. A copy of the Notice of Approval (Order in Council) and any approved amendments to this Class EA document.
  - vii. The findings and recommendations of any related internal audits or third party audits completed during the course of the year.
  - viii. Changes to MNR policies, procedures, manuals or guidelines that were implemented during the year which affect the implementation of this Class EA.
  - ix. A summary and percentage of Class EA projects planned in accordance with this Class EA document for which Part II Order requests were made to the Minister of the Environment and MNR; of these, the number and percentages of requests that were granted, denied or denied with conditions. This summary is to include the project name, location and brief description of the undertaking; the outcome of the Part II Order requests; and a statement indicating how any conditions attached to decisions on Part II Order requests were fulfilled.
  - x. A summary table listing of all projects carried out following this Class EA document and a breakdown by classification and type (i.e., category/project type).

Projects which are “deemed approved” (i.e., Category A projects) which generally include routine or emergency operational activities, maintenance activities or administrative activities that have minimal environmental effects, would not need to be reported. The summary table would include the following information for each undertaking:

- name and brief description of the project.
- classification of project (i.e., category).
- name of contact person (e.g., project manager).
- location of the project.
- for Category B projects whether newspaper notice was provided.
- dates of the Statement of Completion.
- status.

The annual report will be prepared by Ontario Parks and forwarded to MOE within 180 days of the end of the calendar year under review (June 30). It would also be available to interested members of the public, First Nations, stakeholders and agencies.

MNR shall develop and implement a Class EA Monitoring Program in consultation with MOE’s EAA Branch. The monitoring program shall include compliance, effects and effectiveness monitoring and a strategy for addressing non-compliance. MNR shall consult with staff of the MOE’s EAA Branch prior to finalizing the monitoring program. The finalized program and the details of its implementation shall be submitted to the Director of the EAA Branch for approval no later than six months after the date the Class EA is approved. MNR will implement the program once the Director of EAA Branch has given written notification of satisfaction with the monitoring program to the MNR.

## 6.2 Amendments to this Class EA<sup>4</sup>

MNR or any other party may submit written proposals for amendments to the Class EA to the Director of the EAA Branch, MOE (for minor amendments—see below) or the Minister of the Environment (for major amendments). An outside party should consult with the Manager of Planning and Research, Ontario Parks before submitting a proposed amendment, and should also provide the Manager of Planning and Research with a copy of the proposed amendment. Proposals must set out the specific concern or issue being addressed, the reason for the proposal and the proposed amendment.

Upon approval, minor and major amendments would be appended to this Class EA, or consolidated into the written text. A master copy of the Class EA will be held at Ontario Parks main office, and a consolidation will be provided on an internet web page.

The Minister of the Environment or delegate may require that consideration of a major or minor amendment be deferred for consideration as part of the five-year review of the Class EA, as described in Section 6.3.

Amendments will be treated as minor or major, as described below.

### 6.2.1 Minor Amendments

Minor amendments would include administrative corrections and clarifications, minor updates (such as updating references to policies and guidelines), and changes to procedures that, in the opinion of the Director of the EAA Branch, MOE do not affect the intent of the Class EA.

---

4. As a condition of approval of this Class EA, MOE has directed that the amending procedure referred to in this section will be used until:

a) A regulation is made by the Lieutenant Governor in Council prescribing rules and restrictions under subsection 11.4(4) of the *Environmental Assessment Act* for amending or revoking decisions which apply to this Class EA; and

b) The Minister of Environment has issued a notice to MNR and filed a copy of it in the Public Record for this Class EA prescribing which of the procedures under the regulation shall apply in place of, or in addition to, the procedures set out in this section and which procedures in this section shall cease to apply.

Requests for minor amendments may be made by MNR or by any other party. MNR would consult with the Director of EAA Branch and reach an opinion as to whether or not the proposed amendment is valid, and whether it is minor. If the proposed amendment passes these tests and, in the opinion of the Director of the EAA Branch in consultation with MNR, the proposed amendment is reasonable and appropriate, it may be approved without public consultation.

### 6.2.2 Major Amendments

Major amendments would include changes that, in the opinion of the Director of the EAA Branch, MOE, may have a significant impact on how the Class EA is carried out. They could include changes to:

- The range of projects included within the class or the assignment of projects to categories.
- The essential elements of the screening or Category B or C processes, and the administrative provisions found in this section of the Class EA.
- Mandatory public notice procedures or timelines.

A request for a major amendment may be made by MNR or any other party. MNR would consult with the Director of EAA Branch and reach an opinion as to whether the proposed amendment is valid, and whether it is major. If the proposed amendment passes these tests and, in the opinion of the Director of the EAA Branch in consultation with MNR, the proposed amendment is reasonable and necessary or appropriate, it will be posted by MNR as an information posting with an opportunity to comment on the Environmental Registry for a minimum period of 30 days. In addition, MNR will directly notify persons and agencies with a known or (what MNR considers to be) a potential interest in the proposed amendment. Interested parties will be invited to submit comments to MNR copied at the same time to the Director of the EAA Branch, MOE. In some circumstances, additional public consultation activities may be carried out.

Based on the consideration of any comments received and on further consultation with MNR, the Minister of the Environment or delegate would approve or deny approval for the amendment, with or without conditions, within 60 days after the

deadline for comments. The decision would be provided to those who submitted comments or indicated interest in the amendment, and it would be posted on the Environmental Registry.

### 6.3 Review of the Class EA

The Class EA will be subjected to a review by MNR every five years. The 5-year review shall commence on or before the fifth anniversary of the Class EA effective date, and occur every five years thereafter on that anniversary date until such time as is otherwise indicated in writing by the Director of EAA Branch (MOE) to MNR. Each review shall be submitted to the Director of EAA Branch and placed in the Public Record within 180 days of the anniversary of Class EA effective date. It will provide:

- A description of any changes in relevant legislation, policy or planning practice since the approval of the Class EA or the previous five-year review.
- An analysis of the information contained in the annual reports produced during the five-year period.
- A description of any opportunities to amend the Class EA or to improve its implementation to ensure that it continues to meet the purpose of the *EA Act*.

Any proposed amendments to the Class EA may be undertaken using the process described in Section 6.2.

### 6.4 Emergency Provisions

Situations may arise where there is an imminent threat to human life, property, public services, or the environment. Examples of emergencies include sudden flooding, erosion or collapse of a structure, and chemical spills (emergency measures to fight forest fires are excluded from this Class EA, and will continue to be covered by Exemption Order MNR-1). In these circumstances, it may be advisable to proceed with actions that would otherwise be subject to planning processes under this Class EA. Whenever this occurs, MNR will provide notice to the Director of the EAA Branch, MOE within 30 days of the commencement of the action taken

related to the emergency, containing the following information:

- The location and nature of the emergency.
- The environmental effects of the emergency.
- Actions taken to resolve the emergency and the environmental effects of the actions.
- The effectiveness of the actions.
- Anticipated future remedial works and monitoring, if any.

## 6.5 Transitional Provisions

Planning and implementation of some MNR projects that are subject to this Class EA may be under way on the date when the approval for the Class EA comes into effect. The following provisions are intended to ensure a smooth transition between previous requirements and the new Class EA requirements.

- Where a project is the subject of an ongoing implementation plan, or a process under an Exemption or Declaration Order that is replaced by this Class EA, that process may continue if a public notice for that process has already been issued on the date this Class EA approval takes effect. The requirements of this Class EA should be applied to the rest of the process wherever practicable, but applying the Class EA will not be a formal requirement.
- If no public notice for an implementation plan or a process under an Exemption or Declaration Order has been issued by the date when this Class EA takes effect, or if the project has not been initiated within five years of the effective date of this Class EA, the Class EA planning process will apply. Approved projects that have not been initiated within five years will be screened to determine the appropriate Class EA category, and the requirements of section 6.7 shall apply.
- Where a recurring project (such as fish or wildlife management) has been previously approved that would be subject to this Class EA, the project may continue for five years after the effective date of this Class EA, at which time, it must be evaluated in accordance with this Class EA.
- Where some of the requirements of a project evaluation under this Class EA have been met through another process as described in Sections 2 and 3.5, and the approved document is more

than five years old when the first notice for the evaluation process is issued, the project file or ESR will include a review of the continuing validity of the need for the project and any planning steps that were conducted under the earlier process. Earlier steps will be revisited where circumstances have changed in a way that affects the appropriateness or environmental effects of the project.

## 6.6 Part II Order Provisions

This Class EA provides opportunities for Aboriginal groups, agencies, stakeholders and interested parties to provide input to MNR's decision making for Category B and C projects. The Part II Order provisions described in this section are not intended to apply during the screening or project evaluation processes. As illustrated in Figure 4, they may be used after the posting of a Notice of Completion if there is concern that a project evaluation under this Class EA is insufficient to address public concerns or the characteristics and effects of the project.

Where a person or agency considers that a project is not receiving adequate consideration under the Class EA during a project evaluation process and should be assigned to Category C or Category D, the concerns that lead to this conclusion should first be provided to MNR in writing and discussed with the MNR staff involved. The concerns should be raised as early as possible, so that they can be considered and resolved, if possible, before substantial time and resources have been committed. MNR may volunteer to reassign the project to Category D (or Category C if it is a Category B project), or may decide to continue with its planning process under the category originally assigned.

If these concerns are still not resolved, Aboriginal groups, agencies, stakeholders or individuals have an opportunity to make a formal request to the Minister of the Environment for a Part II Order within 30 days of the release of a Notice of Completion for a Category B or Category C project. Sections 6.7 and 6.8 also allow requests to be submitted when a project is to be implemented after the five-year period following the Statement of Completion, or when an amendment to a Category B project file or an ESR is proposed. Notices of all of these actions must specify that there is an opportunity to request a Part II Order.

It is recognized that resolution of concerns directly between the proponent and the person or party raising the concern is preferable to having the Minister of the Environment make a decision on a Part II Order request. Accordingly, dispute resolution mechanisms (Appendix 8.5.3) may be considered. As well, when concerns are raised late in the project evaluation process, specifically during the 30-day Notice of Completion review period, the proponent may attempt to negotiate a resolution of the issues, even if it means that the 30-day review period may be exceeded. In this event, the proponent should make it clear to those raising the concern that negotiations will continue for a specified period of time as determined by MNR, following which, if the issues remain unresolved, a request for a Part II Order can be made to the Minister of the Environment within a further seven calendar days.

The process for requesting a Part II Order is described below and illustrated in Figure 5.

### **Part II Order** (formerly called a “bump up”)

**Under the provisions of section 16 of the *EA Act*, there is an opportunity under the Class EA planning process for the Minister of the Environment to review the status of a project. Members of the public, Aboriginal groups, interest groups, and review agencies may request the Minister to require a proponent to comply with Part II of the *EA Act* (which addresses the development of individual EAs), before proceeding with a proposed project. This is known as a Part II Order. Section 6.6 describes procedures to elevate a project from consideration under this Class EA so that it is considered as an individual EA (i.e., a Category D project), prepared in accordance with Part II of the *EA Act*.**

#### **6.6.1 Submission of Request for a Part II Order**

The concerned party submits a request for a Part II Order to the Minister of the Environment within the 30-day period indicated in the Notice of Completion, copying it to the MNR contact person specified in the notice. In addition to making the request, the

submission should discuss the reasons for the request, such as:

- The nature of any specific concerns that remain unresolved, and actions other than a Part II Order that might resolve these concerns.
- The availability of more appropriate alternatives to the proposed project.
- The adequacy of the planning and public consultation process conducted under this Class EA, and MNR’s response to concerns and submissions.
- The involvement of the person or agency making the request in the Class EA process, and details of any discussions held with MNR.
- Why the project would be more appropriately considered under the Part II Order provisions (an individual EA) and the tangible benefits that would result (reference may be made to Table 4.2 which describes Category D characteristics).
- Any other information that the requester may feel is relevant to assist the Minister in making a decision.

#### **6.6.2 Attempt Early Resolution**

MNR may attempt to initiate or resume discussions with the parties concerned and may request alternate forms of dispute resolution. If there is potential for progress in resolving the concerns raised, MNR and the requesters may agree to advise MOE in writing to defer the review of the Part II Order request to allow adequate time so that further discussion may take place prior to a final decision.

Where the deferral is being requested by MNR prior to the commencement of the 45-day review period (per section 6.6.3), the 45-day review period will begin following the deferral period and upon submission of the materials requested by MOE to be submitted by MNR for the review of the Part II Order request. The materials will include the results of the discussions with the requester, including any supporting documentation. MNR will give the EAAB written notification of the deferral period having ended.

Where the deferral is being requested by MNR during the 45-day review period, the review will resume for the remainder of the 45 days beginning the day following the end of the deferral period. MNR will give the EAAB written notification of the deferral period having ended.

MNR and the requester(s) will advise MOE in writing of the outcome of the discussions and whether the Part II Order request is confirmed or withdrawn. In turn, MOE will acknowledge the same, in writing, with the party(s) and MNR. Such initiatives for early resolution are the responsibility of MNR and the interested parties.

### 6.6.3 MOE Consideration of the Request

Upon receipt or confirmation of a Part II Order request, the Minister of the Environment or delegate will review the request.

- MOE will advise MNR in a timely manner in writing that the request has been received. MNR shall not proceed with any portion of the project until the Minister of the Environment makes a determination regarding the request, unless permission, with or without conditions, is given by the Director of the EAA Branch. MNR will be requested to provide any information necessary to the MOE to review the requests and provide recommendations to the Minister. MNR will respond to the Minister or delegate within 30 days of the request of information having been received from MOE, unless the Minister or delegate specifies a longer period. MNR may volunteer to elevate a Category B project to Category C (where this has been requested) and advise the Minister of the Environment accordingly in writing at any time before the Minister's decision. In this case, MNR should receive agreement to this effect from the requester. The requester should indicate that s/he is satisfied with this approach. On receiving such advice, MOE would terminate its consideration of the Part II Order request and advise the requester in writing, copying MNR.
- The request will be considered together with any submission from MNR by the EAA Branch of MOE, which may request additional information from MNR.
- The EAA Branch must forward recommendations to the Minister of the Environment within 45 days of having received all required information from MNR, or 45 days from the receipt of a mediator's report (see Section 6.6.4).

### 6.6.4 Minister's Decision

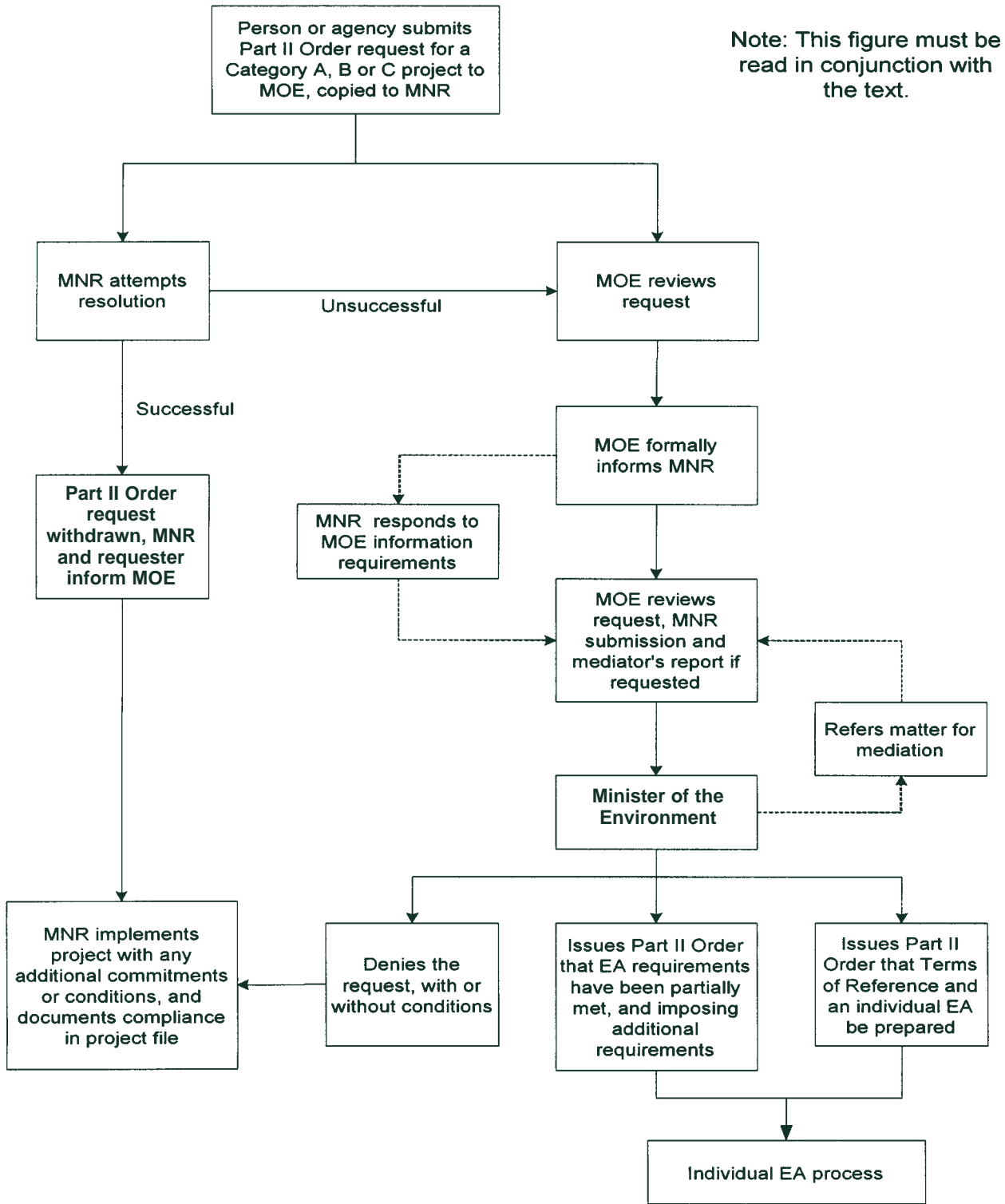
The Minister of the Environment will make a determination on the request within 21 days of receiving the recommendation from the EAA Branch, although the Minister's decision is not invalid if made after 21 days. In making a decision the Minister will consider the matters set out in subsection 16(4) of the *EA Act*.

The Minister may:

- Deny the request, with or without conditions, in which case the responsible MNR manager would meet any additional requirements, file a Statement of Completion, and implement the project. MNR will document on the project file how it has complied with any conditions.
- Refer the matter to mediation under subsection 16(6) of the *EA Act*, in which case a final decision would be deferred until after the mediation report is received.
- Issue an order pursuant to subsection 16(1) of the *EA Act*, to comply with Part II of the *EA Act*. The order may:
  - i. Set out directions for the preparation of Terms of Reference, which would govern the preparation of the required individual EA.
  - ii. Declare that the Class EA documentation meets some of the requirements for an individual EA, and order MNR to meet the remaining requirements (*EA Act*, paragraph 16(2) 2). In this event, the Minister may allow a part or parts of the project to proceed if the following information is provided to the satisfaction of the Minister:
    - Adequate justification of the need for the part or parts of the project to proceed prior to completing the individual EA.
    - That the part or parts are not the subject of the Part II Order.
    - That the part or parts have been evaluated appropriately under the Class EA.
    - That the implementation of the part or parts will not interfere with MNR's ability to comply with the Order and any and all requirements and direction made in the Order.

MNR will document in the project file how it has complied with any and all conditions of a Part II Order denial.

**Figure 5: Procedure for Requesting a Part II Order**



## 6.7 Proceeding with Projects after the Statement of Completion

MNR may proceed with a project that has met the requirements of this Class EA within five years of filing a Statement of Completion. If MNR wishes to proceed with a Category B or C project after that time, it shall review and document any changes that may have taken place since the initial Notice of Completion of the project to ensure that the project and mitigating measures are still valid. The changes may include, for example, environmental conditions, new government policies, new engineering standards or new technologies for mitigating measures. MNR must then provide a notice of intention to proceed with a project. The notice will describe the project, its category and the date of filing of the Statement of Completion, and provide contact information and information regarding the opportunity to request a Part II Order. Part II Order requests would be sent to both the contact person named in the notice and the MOE. A sample notice is provided in Appendix 9.

The notice would be posted in accordance with the procedures for a Notice of Completion for Category B and C projects, as described in Sections 5.1 and 5.2 respectively (e.g., published in a local newspaper and/or sent to government agencies and known potentially interested parties, including those who expressed interest during the original Class EA process, where practicable, given the time lapse). A minimum 30-day response period would be provided.

If a Part II Order request is received, the process described in Section 6.6 will be followed. In addition to the requirements in Section 6.6, any Part II Order request should refer to changes in circumstances that have occurred since the project was originally approved that justify a project evaluation under Category C or D. The responsible MNR manager may elect to respond to the Part II Order request by modifying the project file or ESR as described in Section 6.8.

If no Part II Order request is received within the notice period, MNR may proceed with the project.

## 6.8 Modifications to Project Files and Environmental Study Reports (ESRs)

MNR may wish to modify a Category B or C project after filing the Notice of Completion or the Statement of Completion. MNR will review the proposed modification against the screening criteria in Table 4.1 (Section 4.2, Step 3).

- *Minor modification:* Where there would be no significant increase in negative environmental effects or level of public or agency concern, the modification would be considered minor and the project may proceed.
- *Major modification:* Where there would be a significant increase in potential negative environmental effects or level of public or agency concern, the modification would be considered major and MNR staff will undertake additional evaluation. The results of the evaluation shall be documented in a Revised Project File for a Category B project or a Revised ESR for a Category C project. A Revised Notice of Completion will be posted in accordance with the procedures for Category B and C projects, as described in Sections 5.1 and 5.2 respectively, including direct written notice to all who earlier expressed interest in the project. Where the modification raises new issues that MNR believes may be of interest to agencies, groups or individuals who did not previously express interest, these additional parties will be contacted.

The Revised Notice of Completion will describe the proposed change, the reasons for the change, any changes to the predicted environmental effects, the location where the Revised Project File or ESR can be reviewed, and a contact name. The response period for this notice will be a minimum of 30 days. It will provide contact information and information regarding the opportunity to submit a Part II Order request. Other consultation activities may be initiated. An example of a Revised Notice of Completion is provided in Appendix 9.

If no Part II Order request is received within the notice period, or if the Part II Order request is denied or successfully resolved, the responsible manager will file a Revised Statement of Completion in accordance



with Section 5.1 or 5.2 as appropriate, with any necessary modifications, and the project may proceed. Where a Part II Order request is received, the process described in Section 6.6 will be followed.

### 6.8.1 Recurring Projects

Recurring projects are projects that generally conform to the original project description and project area, and which are implemented periodically or as required to achieve management objectives. Examples of recurring projects include prescribed burning, managing an animal population, managing vegetation, stocking fish, controlling invasive species, and replenishing an existing beach.

When a project is initially screened (per Section 4.2), the project description will describe the anticipated duration and the recurring nature of the management prescriptions. The project evaluation (Section 5) will reflect this anticipated approach in the evaluation. Recurring projects may proceed for a period of up to 10 years.

After this time, or sooner as may be deemed necessary by MNR, the project would be formally reviewed to determine if any modifications to the project are necessary. MNR will issue a general public notice to invite participation. The notice will consist of a mailing to persons and agencies with a known or, what MNR believes to be, a potential interest, (e.g., those who previously submitted comments on the project) and a local newspaper advertisement. Notice to the appropriate MOE regional office will be provided.

The review will, take into consideration the following information:

- Any changes that may have taken place since the initial approval of the project to ensure that the project and mitigating measures are still valid (e.g., environmental conditions, new government policies, new engineering standards or new technologies for mitigating measures).
- The results arising from monitoring, evaluation and reporting initiatives (per Section 5.4).



- Any specific comments received regarding the recurring project that had been received over the 10-year period or as a result of the general public notice.

The results of the review would be documented for the public record, including the specific comments received, and modifications found to be necessary would be addressed in the manner described above for minor and major amendments to project files and Environmental Study Reports.



# Appendices

<b>Appendix 1: Glossary of Terms and Acronyms</b> .....	50
<b>Appendix 2: List of Projects</b> .....	54
<b>Appendix 3: Policies, Procedures, Guidelines, Standards, Manuals</b> .....	68
<b>Appendix 4: Provincial Context</b> .....	75
<b>Appendix 5: Assessing Significance of the Environmental Effects</b> .....	86
<b>Appendix 6: Government and Other Agencies</b> .....	89
<b>Appendix 7: Other Relevant Federal and Provincial Legislation</b> .....	90
<b>Appendix 8: Notification and Consultation</b> .....	100
<b>Appendix 9: Sample Notices and Forms</b> .....	105

## Appendix 1: Glossary of Terms and Acronyms

**Approved Land Use Direction:** *The Ontario's Living Legacy Land Use Strategy* (July 1999), and any other land use direction formally approved by a ministry of the Ontario Government (e.g., MNR's District Land Use Guidelines, Atlas of Land Use Designations, etc.). Land use planning processes are used to arrive at Land Use Direction.

**Bump up:** see Part II Order.

**CEAA:** *Canadian Environmental Assessment Act*.

**Class Environmental Assessment:** An environmental assessment approved under Part II.1 of the *EA Act* for a class or group of undertakings.

**Cultural Heritage Resource:** Any resource or feature of archaeological, historical, cultural, or traditional use significance. This may include archaeological resources, built heritage or cultural heritage landscapes. Heritage resources and features are usually identified by federal or provincial agencies, municipalities, municipal heritage committees or other equivalent local heritage groups, and local and regional band councils. Some heritage resources and features are legally "designated", and can be found in official sources. Some may only be inventoried or listed, either officially, or by interested stakeholders. Others have never been identified, although this does not necessarily diminish their cultural significance.

- **Archaeological Resource:** means the remains of any building, structure, activity, place or cultural feature, which because of the passage of time is on or below the surface of the land or water. Significant archaeological resources are those which have been identified and evaluated and determined to be significant to the understanding of the history of a people or place. The identification and evaluation of this resource is based upon an archaeological assessment.
- **Area of Archaeological Potential:** an area with medium or high potential for the discovery of archaeological resources. The potential is based on the presence of a wide range of geographic and historical features, which influenced past settlement. Archaeological potential is confirmed through archaeological assessment, and refers to

the probability, based on a wide range of information sources, that a significant archaeological site will occur.

- **Identified Archaeological Site:** a registered, designated or identified (existing evidence) site that is contained within the MNR-NRVIS values information data base and/or is a locally identified site that is deemed to be a cultural heritage resource. A registered archaeological site is identified on a Ministry of Culture site registration form with an assigned Borden Number.
- **Traditional Use Site:** a geographically defined area supporting current or past human use as a gathering area, spiritual site, place of worship or cemetery.
- **Built Heritage Resource:** one or more buildings, structures, monuments, installations, or remains associated with architectural cultural, social, political, economic or military history.
- **Cultural Heritage Landscape:** a geographic area of heritage significance, which has been modified by human activities. Such an area is valued by a community and is of significance to the understanding of the history of a people or place.

**Cumulative Environmental Effect:** Cumulative environmental effects are the total effect on the environment within the defined study area from two or more projects. Sometimes the effects of more than one project can accumulate so that they reach a critical threshold, or they can be compounded so that they create an effect that is greater than the sum of the individual effects.

**Declaration Order:** An Order by the Minister of the Environment under Section 3.2 of the *EA Act*, often removing the need for a proponent to comply with the full requirements of the act. It may exempt a proponent or an undertaking entirely from the act, or it may qualify the exemption with the imposition of conditions.

**Decommission:** To retire, abandon, dismantle, or remove from active service, working order, or operation.

**Disposition:** The disposition by the MNR of certain or all rights to Crown resources through such means as permits, licences, approvals, permissions, consents, land use permits, leases, licence of occupation, or sale.

**EAA Branch:** The Environmental Assessment and Approvals Branch of the Ontario Ministry of the Environment.

**Ecoregion and Ecodistrict:** An ecoregion is a unique area of land and water, nested within one of Ontario's larger ecosystems (called ecozones) that is defined by a characteristic climate (e.g., temperature, precipitation, and humidity). This climate has a profound influence on the vegetation types, soil formation and other ecosystem processes, and associated biota that can occur within the ecoregion. An ecodistrict is a smaller area of land and water, contained within an ecoregion, that is defined by a characteristic set of physiographic features, including bedrock and/or surficial geological features and topography. These physiographic features play a major role in determining successional pathways, patterns of species association, and the habitats that may develop. Local climatic patterns, such as higher snowfall areas caused by the effect of a lake, also may characterize ecodistricts.

**Ecosystem Approach:** An ecosystem approach to management is as much a philosophy as it is a set of planning and management tools. It aims to understand the interrelationships that may exist between the elements associated with the social, economic and natural environments that are considered when evaluating projects. Furthermore, it encourages people to: consider the elements of ecosystem composition, structure and function; understand how people's actions affect the human and natural environment; ensure that human actions and disturbance mimic natural processes to the greatest extent possible; recognize the wide range of resource values, and; use ecological classifications to map ecosystems.

**Environment:** Section 1 of the *EA Act* defines "environment" to mean:

- a. air, land or water,
- b. plant and animal life, including human life,
- c. the social, economic and cultural conditions that influence the life of humans or a community,
- d. any building, structure, machine or other device or thing made by humans,
- e. any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or
- f. any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

**Environmental Assessment:** The identification and evaluation of the effects of an undertaking and (where appropriate) its alternatives on the environment, as contained in a document prepared in accordance with the *Ontario* and/or *Canadian Environmental Assessment Acts*.

**Environmental Effect:** Any change to the environment, positive or negative, that would occur as a result of a project.

**Environmental Registry:** The Registry, established under the *Environmental Bill of Rights*, is an internet site that provides the public with electronic access to environmentally significant proposals and decisions, appeals of instruments, and other information related to ministry decision-making.

**Environmental Study Report (ESR):** The report that formally documents a project evaluation process carried out for a Category C project, under this Class EA.

**Exemption Order:** An order made under the EA Act prior to the coming into force of section 3.2 of the *EA Act*. Similar to Declaration Order.

### ***Fish Species:***

**Native:** Species of fish having originated naturally in a specific waterbody or watercourse in Ontario.

**Non-native:** Species of fish not having originated naturally in a specific waterbody or watercourse in Ontario, but is now present in the waters of Ontario.

**Exotic:** Is a species of fish not present in the waters of Ontario.

**Fish Stocking:** The release of fish into a waterbody or watercourse from one that is external to it. Stocked species may be either native or non-native to the recipient waterbody.

**Ongoing (Fish Stocking):** The regular releases of a fish species into a waterbody or watercourse as part of an established program using established stocking procedures in order to meet a desired management objective.

**Introduction:** The initial release of a fish species into a waterbody or watercourse where it does not occur (i.e. a species is not naturally present, is extirpated, or is not likely to have persisted from past stocking efforts). (The re-establishment of a stocking program that has ceased for a period of time that is greater than the maximum life span of the species being stocked, and where the species is no longer present, would be considered an introduction).

**Footprint:** The area occupied by a project.

**Forest Reserve:** Areas where protection of natural heritage and special landscapes is a priority, but some resource use can take place with appropriate conditions. The intention is that these lands will be added to the park or Conservation Reserve if a claim or lease is retired through normal processes.

**Habitat:** The place or environment where a plant or animal naturally or commonly lives and grows.

**Harmonize:** In this Class EA, harmonize means to carry out one or more processes as a single process in a way that MNR considers appropriate will meet the standards and requirements of this Class EA.

**Individual Environmental Assessment:** An environmental assessment that is subject to the requirements set out in Part II of the *EA Act*.

**Maintenance:** Generally, the regular, routine actions, taken to retard the natural deterioration of a resource (or fixture, chattel and/or equipment). These actions are intended to keep the resource from premature loss due to failure, decline, wear or change attributable to normal use or the effect of the natural environment.

**Management Direction:** Includes an interim management statement (IMS) for a provincial park, a statement of conservation interest (SCI) for a conservation reserve, or a management plan. Management direction for provincial parks or conservation reserves may be planned in conjunction with other MNR management planning processes such as forest, fire or fisheries management plans, or in the case of specific projects, through these other relevant MNR planning processes. As described in Appendix 4 (part 4.3), these planning documents are prepared with different information standards and accordingly provide the appropriate type of direction in keeping with their purpose.

**Management Plan:** A document that identifies management objectives and implementation priorities for a defined area, over a period of time (e.g., 20 years). Management plans are based on an understanding of the natural, social, cultural and economic values of the area, usually obtained through detailed inventories. The plans are prepared through a multi-stage public consultation process.

**Mitigation:** Avoiding, eliminating, offsetting or reducing to an acceptable level the potential effects of a project. It can also include rehabilitation, restoration, or enhancement where feasible. The means by which projects can be modified to minimize or eliminate potential negative effects. This can include off-site measures that achieve the same objective.

**MOE:** Ministry of the Environment.

**Natural Heritage Features and Areas:** Features and areas such as significant: wetlands, fish habitat, woodlands, valleylands, and portions of the habitat of endangered and threatened species, wildlife habitat and areas of natural and scientific interest, which are important for their environmental and social values as a legacy of the natural landscapes of an area.

**Net Environmental Effect:** The change to the environment that would occur, following the application of proposed mitigation or enhancement measures.

**Part II Order:** Previously known as a “bump up”; a decision by the Minister of the Environment under section 16 of the EA Act to require that a proponent comply with Part II of the *EA Act* for preparation of an individual environmental assessment for a project or activity that would usually be considered under a Class EA. This is distinct from a voluntary elevation to a higher category.

**Project Evaluation and Consultation Process:** A process required in this Class EA for Category B and Category C projects, as specified in Section 5. The term “project evaluation” pertains to the technical evaluation required as part of each project evaluation and consultation process.

**Project File:** A file that provides the formal documentation for a project evaluation carried out under this Class EA.

**Protected Area:** For the purposes of the Class EA, “protected area” refers to a provincial park or conservation reserve, either existing in regulation, or recommended through an approved land use direction such as Ontario’s Living Legacy Land Use Strategy (1999) or District Land Use Guidelines.

**Recommended Protected Area:** An area included as a recommended provincial park or conservation reserve in an approved land use direction, but not yet in regulation.

**Research:** Research includes measuring, monitoring, and testing and means an undertaking that is carried out for the purposes of or consists of research. For MNR this can consist of projects such as lake surveys, wildlife population and habitat studies, inventories, and other studies, surveys or inventories including measuring, monitoring and testing that is carried out for the purpose of or consists of research.

**Resource:** Generally, a value, feature, attribute, or physical component; an available renewable or non-renewable supply that can be drawn on when needed, be it animal, vegetable, mineral, etc.

**Retirement:** To cease operation, abandon, decommission, or remove from active service or working order.

**Species at Risk:** The categories of species listed by MNR on its Index List of Vulnerable, Threatened, Endangered, Extirpated or Extinct Species of Ontario, as amended from time to time.

**Vulnerable, Threatened, and Endangered Species:** See “Species at Risk”.

**Work Permit:** Means a work permit issued under Ontario Regulation 453/96 made under the *Public Lands Act* and excludes any other approval. A work permit is not a form of land use occupational authority. Work permits could be granted for such proposals as shore land related improvements, trap cabins, boathouses, roads, and trails.

## Appendix 2: List of Projects

This appendix lists a wide array of projects that are carried out in, or for, provincial parks and conservation reserves. The following tables correspond to the groups of projects presented in Section 3:

1. Establishing, amending and rescinding boundary regulations (Section 3.1.1).
2. Acquiring and disposing of land (Section 3.1.2).
3. Managing provincial parks and conservation reserves (Section 3.1.3).
  - a) Resource stewardship
  - b) Development (operations related to the development are included in this table)
  - c) General Operations

Readers should consult the accompanying notes and relevant sections in this Class EA.

Projects that are denoted in the tables as “Screen for Category” (✓) are to be screened for placement into categories B, C or D, unless the table provides specifically for Category A in particular cases. The tables also include entries for “other” projects that were unforeseen or overlooked at the time of preparing this Class EA. Such projects that are not listed and are also the subject of this Class EA will be screened using the screening process in Section 4.2 to determine the appropriate category. These projects could fall into any of the four categories.

### *General Notes:*

- a) Footnote (1) means that a project can be undertaken in, or for, a provincial park or conservation reserve without a management plan, a Statement of Conservation Interest developed through consultation, or Land Use Direction developed through consultation.
- b) Footnote (2) means that a project may only be undertaken in, or for, a provincial park or a conservation reserve if specific direction for the project is provided for in one of the types of plans noted below, that have been developed through public consultation:
  - A management plan (this may include, for example: park, reserve, forest, fisheries, fire plans).
- c) If the Class EA requirements are being satisfied through a public planning process to develop land use direction or management direction (as noted in Section 2), then all notices required by this Class EA will need to be provided.
- d) MNR may determine that a project that meets the minor criteria should be considered major. While this note applies to all projects, MNR shall develop, in consultation with MOE, a bulletin(s) to assist staff in implementing this general note for project numbers 43 (Minor development), 70 (Minor trail development and maintenance), 73 (Minor maintenance, upgrading or development) and 75 (Electrify existing car campsites) in the attached tables. If a project in these four project types is determined to be major based on the bulletins, it will be subject to screening for placement in Categories B, C or D. The bulletin(s) will have the same status as other MNR documents listed in Appendix 3 of the Class EA.
- e) Projects that are recurring and generally conform with the original project description and within the original subject area, may proceed for a period of up to 10 years. After this time, the project would be formally reviewed (refer to Section 6.8).
- f) Where a project involves ground disturbance in an area with archaeological potential, the project will be considered for impacts to archaeological resources. Where a project may impact on structures or cultural heritage landscapes, the project will be considered for potential effects to cultural heritage resources and appropriate mitigation measures will be considered. Staff will consult the cultural heritage guidelines that will be prepared in consultation with Ministry of Culture.

- A Statement of Conservation Interest.
- A Land Use Direction document.

Note that Interim Management Statements do not meet this provision. Statements of Conservation Interest that are intended to provide custodial management and have not been reviewed through a public planning process do not meet this provision.



**Table 1: Establishing, Amending, and Rescinding Boundary Regulations for a Provincial Park or Conservation Reserve** (see Section 3.1.1)

ID	Projects	Category A	Screen for Category	Notes
<b>Establish a Boundary by Regulation</b>				
1	Establish a boundary on Crown land to create a new park or reserve <sup>(2)</sup> , or, establish a boundary on land acquired by the province <sup>(2)</sup>		✓	The Class EA evaluation and consultation requirements may be carried out through land use planning processes. If this is the case and if regulation occurs more than one year beyond the approval of the land use direction document, then additional notification will be issued, and at a minimum, will include a letter to affected First Nations, adjoining landowners, other potentially affected parties and the appropriate MOE regional office prior to regulation.
2	Establish a park boundary on land owned by others, with their consent <sup>(1)</sup>		✓	Notification will include a letter to affected First Nations, adjoining landowners, other potentially affected parties and the appropriate MOE regional office prior to regulation.
<b>Amend or Rescind a Boundary by Regulation</b>				
3	Minor amendment <sup>(1)</sup>	✓		<p>A public notice will be issued (i.e., letter to affected First Nations, adjoining landowners, other potentially affected parties and the appropriate MOE regional office).</p> <p>A minor boundary amendment meets these criteria:</p> <ul style="list-style-type: none"> <li>• administrative changes of a routine nature (e.g. exclude a mining claim, accommodate a road realignment, meet adjacent landowner needs such as a septic bed in accordance with the OLL LUS);</li> <li>• minor impacts on park or reserve values;</li> <li>• minimal change in the land and/or resource management practices inside or outside the park or reserve; and</li> <li>• little public concern anticipated.</li> </ul> <p>If the distinction between minor and major is unclear, consult the screening criteria in Table 4.1 for additional consideration, or treat as major.</p>

- ✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5
- ✗ Project is not subject to this Class EA

**Table 1** *continued*

ID	Projects	Category A	Screen for Category	Notes
4	Major amendment <sup>(1)</sup>		✓	<p>The Class EA evaluation and consultation requirements may be carried out through land use planning processes. If this is the case and if regulation occurs more than one year beyond the approval of the land use direction document, then additional notification will be issued, and at a minimum, a letter to affected First Nations, adjoining landowners, other potentially affected parties and the appropriate MOE regional office. A major boundary amendment meets these criteria:</p> <ul style="list-style-type: none"> <li>• likely to cause a marked change in the land or resource management practices inside or outside of the park or reserve;</li> <li>• likely to cause significant public reaction locally, regionally or provincially; and</li> <li>• likely to have significant impact on park or reserve values.</li> </ul>
5	Amend a boundary to enable disposition of a portion of a park or reserve for a corridor (normally only applies to major, exclusive use projects such as provincial highways) <sup>(1)</sup>	✓	✓	Category A if the proponent certifies compliance with a relevant provincial and/or federal EA process; otherwise Category B/C/D. Refer to Section 3.5.2 in this Class EA for possible additional needs.
6	Rescind a boundary to eliminate entire area <sup>(1)</sup>		✓	<p>The Class EA evaluation and consultation requirements may be carried out through land use planning processes. If this is the case and if regulation occurs more than one year beyond the approval of the land use direction document, then additional notification will be issued, and at a minimum, a letter to affected First Nations, adjoining landowners, other potentially affected parties and the appropriate MOE regional office.</p>

✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5

✗ Project is not subject to this Class EA

**Table 2: Acquiring or Disposing of Provincial Park or Conservation Reserve Land**  
(see Section 3.1.2)

ID	Projects	Category A	Screen for Category	Notes
7	Buy land, acquire land through an exchange, accept donated land, or obtain partial tenure of land (lease, easement, etc.) <sup>(1)</sup>	✓		Screen for potential effects using Table 4.1 (per Section 3.1.2 of the Class EA). Subsequent regulation of the boundary is addressed in Project IDs #1 and 2 above.
8	As part of a single project, acquire, sever and dispose of surplus portions of the acquired land <sup>(1)</sup>	✓		A project description will be prepared to describe this type of project and will include documentation of screening for potential effects using Table 4.1 (including consideration of cultural heritage resources).
9	Sell land or dispose of land (e.g. through a land exchange) <sup>(2)</sup>		✓	The Class EA evaluation and consultation requirements may also be carried out through land use planning processes. Notification, at a minimum, will include a letter to affected First Nations, adjoining landowners, other potentially affected parties and the appropriate MOE regional office.

- ✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5
- ✗ Project is not subject to this Class EA

**Note:** other types of dispositions, such as land dispositions related to issuing a work permit, land use permit or lease, and resource disposition, such as issuing permits to use resources, are included in Section 3.1.3 and Appendix 2, table 3 c (82-86).

**Table 3: Managing a Provincial Park or Conservation Reserve** (see Section 3.1.3)

**a. Resource Stewardship**

ID	Projects	Category A	Screen for Category	Notes
<b>Fish &amp; Wildlife Management</b>				The making of regulations to establish seasons for fishing and hunting is not a provincial park or conservation reserve management activity and is within the subject matter of exemption order MNR-42. The issuance of licences for fishing and hunting is not a provincial park or conservation reserve management activity and is within the subject matter of the Class EA for MNR Resource Stewardship and Facility Development Projects.
10	Manage an animal population <sup>(2)</sup>		✓	
11	Control nuisance (displaced) animals <sup>(1)</sup>	✓		
12	Control rabid animals or rabies <sup>(1)</sup>	✗	✗	Subject to Declaration Order MNR-62.
13	Control invasive fish or wild life species <sup>(1)</sup>	✓	✓	Category A if species is new (not fully established) or if project conforms with an approved management direction or MNR policy for management of the species; otherwise, Category B/C/D.
14	Undertake population or habitat assessment <sup>(1)</sup>	✓		
15	Enhance, rehabilitate, restore or manage habitat <sup>(2)</sup>		✓	
16	Re-introduce missing native species in a park or reserve, or stock naturalized non-native species in a reserve <sup>(2)</sup>		✓	Stocking of naturalized species in a reserve may occur where a non-native species has become naturalized in the area, is of recreational interest, and does not affect native biodiversity. Subject to policy provisions and approved management direction (stocking of non-native species is not permitted in park policy). See additional notes on stocking at the end of this table.
17	Introduce non-native or non-naturalized wildlife species in a reserve <sup>(2)</sup>		D	Individual EA required if proposed for a reserve; not permitted in park policy.
18	Stock fish (existing ongoing introduction) <sup>(1)</sup>	✓		Existing programs to be examined when an IMS, SCI or management plan is prepared or reviewed. See additional notes on stocking at the end of this table.
19	Stock fish (new program) <sup>(2)</sup>		✓	The obligation to provide public notice may be waived in situations where there is concern that the freshly stocked fish would be prematurely fished out by persons who became aware of the stocking through such notices, thus frustrating the purpose of the project. In such situations, the public will be advised of these stocked waters once the fishery is established and healthy.

✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5

✗ Project is not subject to this Class EA

ID	Projects	Category A	Screen for Category	Notes
20	Introduce a new fish species in a reserve not present in Ontario (exotic) <sup>(2)</sup>		D	Category D if a new species is being proposed for a reserve; provincial park policy does not permit this in provincial parks.
21	Construct a fishway <sup>(2)</sup>		✓	For waterbodies draining into the Great Lakes and their connecting channels, MNR will contact DFO Sea Lamprey Control Unit early in the planning stages
22	Restore fisheries through water body reclamation <sup>(2)</sup>		D	Individual EA required.
<b>Landform &amp; Vegetation Management</b>				
23	Maintain or restore natural environments <sup>(2)</sup>		✓	Category B/C/D. See Development section (table 3b) for grade alteration.
24	Undertake prescribed burning, and manage forest fire <sup>(1)</sup>	✓	✓	Category A for fire projects that conform with the Forest Fire Management Strategy for Ontario and the Prescribed Burn Planning Manual. Enhanced or alternative direction will be prepared in accordance with the Fire Management Policy for Provincial Parks and Conservation Reserves and be screened to Category B/C/D.
25	Undertake forest fire protection and operations <sup>(1)</sup>	✗	✗	Subject to Declaration Order MNR-1.
26	Salvage standing, fallen or sunken trees, and dealing with natural blowdowns			Standing, fallen or sunken trees may be removed from development, access, historical, or natural environment zones in parks or from high use areas in reserves to ensure public safety, facilitate capital construction or for resource management purposes, and may be marketed if economical.
	(a) Minor <sup>(1)</sup>	✓		Includes clean up of blowdown and select removal of dead or dying trees along roadways and trails, in campgrounds and around remote campsites. In a reserve, may include incidental salvage for personal use with a permit.
	(b) Major <sup>(2)</sup>		✓	Includes large-scale blowdowns across a large area where a management response is needed.
27	Fuelwood cutting <sup>(1)</sup>	✓		Where permitted in a limited number of cases, in accordance with OLL-LUS.
28	Control insects and forest diseases <sup>(1)</sup>		✓	A pesticides permit may be required from MOE.
29	Control invasive vegetation and insect species <sup>(1)</sup>	✓	✓	Category A if species is new (not fully established) or project conforms with an approved management direction or MNR policy for management of the species; otherwise, Category B/C/D. A pesticides permit may be required from MOE.

✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5

✗ Project is not subject to this Class EA

**Table 3a: Resource Stewardship** *continued*

ID	Projects	Category A	Screen for Category	Notes
30	Manage forests in the recreation-utilization zone of Algonquin Provincial Park <sup>(2)</sup>	✘	✘	Subject to Class EA for Timber Management on Crown Lands.
<b>Cultural Resources Management</b>				Note: archaeological fieldwork requires special licensing under the <i>Ontario Heritage Act</i> .
31	Maintain archaeological, historical, or cultural resources <sup>(1)</sup>	✓		
32	Reconstruct, restore or replicate cultural heritage resources <sup>(2)</sup>		✓	Considered as development. Reconstruction occurs when a building, site feature or artifact that no longer exists, is reproduced with new construction that exhibits the shape, material and detailing (and often construction methods) of the resource as it once appeared. Reconstruction differs from replication in that the original from which the copy is made no longer exists. Restoration refers to the activity in which a building, site or object is returned to the appearance of an earlier time by removing later material and by replacing missing elements and details.
<b>Water &amp; Shoreline Management</b>				
33	Dam, weir, dike works			
	(a) Build, replace or retire a dam, weir, dike or install clay or other impervious liner (not part of a hydro project) <sup>(2)</sup>		✓	May have implications related to water level management-see "Manage water levels", line 36.
	(b) Maintain a dam, weir, dike <sup>(1)</sup>	✓		May include replacing deteriorated concrete in parts of a dam to extend the life of the dam as opposed to substantially replacing the dam.
34	Control erosion or stabilize shoreline or bank <sup>(2)</sup>		✓	Where appropriate knowledge of natural processes and management response can be demonstrated through the Class EA evaluation, then prior approval through an SCI developed through consultation or a management plan may be waived in order to meet the custodial management responsibilities.
35	Dredge or fill below high water mark <sup>(2)</sup>		✓	May include areas adjacent to a watercourse where siltation may be a potential problem. May also include ongoing efforts to maintain navigation.
36	Manage water levels <sup>(1)</sup> (often shared waterbodies)	✓	✓	Category A if project conforms with an approved management direction, or other plan developed through public consultation, concerning management of water levels; otherwise, Category B/C/D. Traditional water level management regimes (e.g., to cover spring runoff or fall drawdown) may continue as a Category A until evaluated through a consultation process, as noted in the previous sentence.
37	<b>Other resource stewardship projects not listed</b>	✓	✓	<b>Screen to determine Category A/B/C/D.</b>

### **Additional Notes on Stocking:**

Fish stocking is a management tool that is used in response to a problem such as loss of fish stocks from habitat degradation or overexploitation. Stocking can also provide additional opportunities in areas of high angling pressure. Stocking is often carried out in conjunction with other management actions such as habitat rehabilitation, implementation of harvest control measures. There are basically two broad objectives of fish stocking:

- To establish or re-establish natural reproducing populations, and
- To provide hatchery dependant fisheries.

Fish stocking, under these objectives, may be undertaken for a variety of reasons, such as to:

- Establish a self-sustaining population that will provide a long-term fishery;
- Restore degraded or extirpated fish stocks that will become naturally reproducing and provide a sustainable fishery;
- Provide hatchery-dependant fishing opportunities by stocking catchable-sized fish or smaller fish that are intended to grow to a catchable size;
- Supplement naturally reproducing fish populations that are limited by habitat conditions;
- Increase our knowledge to manage fish stocks; and/or
- Preserve a native fish stock until rehabilitation is possible.

Refer to the Glossary (Appendix 1) for fish stocking related definitions.

**Table 3: Managing a Provincial Park or Conservation Reserve**

**b. Development and Related Operations**

ID	Projects	Category A	Screen for Category	Notes
<b>Beaches</b> (natural or human made)				
38	Develop a new beach or expand a beach <sup>(2)</sup>		✓	
39	Replenish an existing beach <sup>(1)</sup>	✓	✓	Category A if restricted to above high water mark; otherwise, Category B/C/D.
40	Maintain existing beaches (raking, etc.) <sup>(1)</sup>	✓		
<b>Boat Launch</b>				
41	Develop a new launch <sup>(2)</sup>		✓	
42	Maintain, repair or replace an existing launch (same size and location) <sup>(1)</sup>	✓		
<b>Building or Structure</b>				If a building is being abandoned, mothballed, demolished or replaced its heritage potential should be considered first.
43	Minor development <sup>(1)</sup>	✓		<p>Minor building or structure is in an access or development zone in a provincial park (or in limited situations is a replacement project in the same location in an operating park where a management plan is not in place), or is in an area identified for such activity in a conservation reserve, and meets the following criteria:</p> <ul style="list-style-type: none"> <li>• if an enclosed new building with piped or stand-alone water or sewer services, its footprint is 400 m<sup>2</sup> or less; or</li> <li>• is a shelter (not enclosed) or an enclosed building with no services; or</li> <li>• replaces an existing building of the same general size and footprint; or</li> <li>• is not part of an integrated complex of buildings (e.g., administration complex, Ontario Ranger camp) that is being developed or redeveloped and that taken together, would exceed the above footprint criteria); or</li> <li>• is a structure that is not a building and does not fall within any other type of project listed in this appendix and its footprint is 400 m<sup>2</sup> or less, and its height is 10 m or less.</li> </ul> <p>All other buildings or structures are major.</p>
44	Major development <sup>(2)</sup>		✓	See line 43 to distinguish minor/major.
45	Maintain and operate lock or other waterway structure to enable waterway travel <sup>(1)</sup>	✓		

- ✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5
- ✗ Project is not subject to this Class EA



ID	Projects	Category A	Screen for Category	Notes
<b>Campground/Campsites</b>				
46	Develop a new campground <sup>(2)</sup>		✓	
47	Maintain campground <sup>(1)</sup>	✓		Reconstructing a campground is considered maintenance, provided it does not in any way enlarge the footprint of the area devoted to existing campsites, and does not increase the campground's total number of individual sites or total capacity at group campsites.
48	Establish new <sup>(2)</sup> and maintain existing back-country sites (e.g., canoe-in, hike-in, boat-in, fly-in sites) <sup>(1)</sup>	✓		Installing and maintaining a pit privy serving a back-country area (such as a hike-in or canoe-in campsite, trail or portage) is part of maintaining the campsite, trail or portage and is not a building or structure.
<b>Day Use Area</b>				
49	Develop new area <sup>(2)</sup>		✓	Includes enlarging an area or increasing capacity.
50	Maintain area <sup>(1)</sup>	✓		Reconstructing a day use area is considered maintenance, provided it does not in any way enlarge the footprint of the area devoted to existing facilities, and does not increase the area's capacity for visitors.
51	Playgrounds			
	(a) Develop a new playground <sup>(2)</sup>	✓		
	(b) Maintain or replace a playground <sup>(1)</sup>	✓		
<b>Dock</b>				
52	Minor development <sup>(1)</sup>	✓		Floating dock.
53	Major development <sup>(2)</sup>		✓	Permanent installation (e.g., crib dock).
54	Maintain docks <sup>(1)</sup>	✓		
<b>Road, Bridge, Utility Crossing, Parking</b>				
55	Develop new road, bridge, or parking area <sup>(2)</sup>		✓	
56	Maintain, resurface or reconfigure existing road, bridge or parking area			
	(a) Minor maintenance <sup>(1)</sup>	✓		Includes routine maintenance of existing surface to maintain condition (e.g., filling potholes, adding a lift of gravel to maintain standard). No change in capacity or design standard. Includes minor work on corners to ensure safety.
	(b) Major maintenance <sup>(2)</sup>		✓	Includes increase in capacity or improvement of design standard of existing facility (e.g., widening, straightening, etc.). Also includes major work that significantly extends the life of a facility (e.g., reconstruction of a bridge).

✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5

✗ Project is not subject to this Class EA

**Table 3b: Development and Related Operations** *continued*

ID	Projects	Category A	Screen for Category	Notes
57	Develop, maintain or decommission forest access road or water crossing in a park or reserve <sup>(2)</sup>	✓		Category A as these must meet the requirements of the Class EA for Forest Management on Crown Lands (2003). See Section 3.5.1 in this Class EA.
58	Develop, maintain or decommission roads and other facilities associated with forest management in Algonquin Provincial Park <sup>(2)</sup>	✓		Category A as these must meet the requirements of the Class EA for Forest Management on Crown Lands (2003) and the Algonquin Park Management Plan.
59	Provide a disposition to allow access within a recommended or regulated OLL park or reserve for mineral exploration, mining development or operations.			This provision pertains to specific situations--refer to Section 3.5.3 in this Class EA and consult with MNR land use planning and EA specialists for advice on a case-by-case basis.
	(a) Develop or maintain a trail, or maintain an existing road <sup>(1)</sup>	✓		MNR to work with proponents to locate trail.
	(b) Develop or decommission a road <sup>(1)</sup>		✓	
	(c) Develop a corridor for utilities and services (e.g., water, electricity, drainage) to support exploration, development or operations <sup>(1)</sup>		✓	
60	Develop and maintain public transportation or public utility corridor through a park or reserve (non-MNR proponent) <sup>(1)</sup>	✗	✗	Subject to the relevant provincial or federal EA process. See Sections 3.5.2 and 3.6 of this Class EA related to potential requirements and dispositions.
<b>Landscaping</b>				
61	Alter grade above high water mark <sup>(1)</sup>	✓	✓	Category A if required to implement a Category A project; otherwise Category B/C/D.
62	Cut, mow, plant, spray, etc. vegetation (for groundskeeping, right of way maintenance, hazard removal, etc.) <sup>(1)</sup>	✓		
63	Install fence or other barrier <sup>(1)</sup>	✓		
<b>Private Recreation Camp or Cottage</b>				
64	Maintain, improve (same capacity), or remove <sup>(1)</sup>	✓		Conditions administered through issuance of work permit and/or land use permit or lease.
<b>Commercial Tourism Accommodation or Intensive Recreational Facility</b>				Examples: main base or outpost camp, youth camp, swimming pool, marina, etc.
65	Maintain or improve existing facility (same capacity) <sup>(1)</sup>	✓		
66	Develop new facility or expand existing facility <sup>(2)</sup>		✓	
67	Develop large scale facility <sup>(2)</sup>		D	Examples: lodge, resort, conference facility that is not intended to meet objectives of the park or reserve
68	Develop golf course, alpine ski resort <sup>(2)</sup>		D	
69	Develop large scale marina <sup>(2)</sup>		D	Includes large-scale marina where associated services, dredging, shoreline alteration, or other activities are required to support the activity; excludes docks or series of docks with minimal or no associated services (such smaller scale projects are screened, per line 66 for new facilities).

ID	Projects	Category A	Screen for Category	Notes
<b>Recreational Trail, Portage, Bridge, Boardwalk, Viewing Tower, Platform, Blind</b>				
70	Minor development and all maintenance (includes erosion control) <sup>(1)</sup>	✓		<p>Minor trail, portage, boardwalk, viewing tower, platform, or blind meets these criteria:</p> <ul style="list-style-type: none"> <li>intended for non-motorized use; or</li> <li>is a small new bridge (e.g., bank to bank) that does not require bank work or in-water cribs; or</li> <li>is a boardwalk or viewing tower or platform where there is no work undertaken in creeks, rivers or lakes (e.g., does not require in-water support work); or</li> <li>is a temporary blind.</li> </ul> <p>All other projects are major (see following project)</p>
71	Major development <sup>(2)</sup>		✓	See previous project. Major trail work includes widening of cross-country ski trails and trails for motorized vehicles (e.g., snowmobiles, ATVs).
72	Sign or outdoor display <sup>(1)</sup>	✓		
<b>Services for in-park or reserve use</b>				Examples: water treatment and distribution, sewage collection and treatment, telecommunications and electric distribution services.
73	Minor maintenance, upgrading or development <sup>(1)</sup>	✓		<p>Minor water, sewage, telecommunications and electrical projects meet these criteria:</p> <ul style="list-style-type: none"> <li>a replacement or upgrading of, or improvements to, an existing system that continues to serve the same number of people; and</li> <li>no environmental effects anticipated; or</li> <li>no concerns anticipated, or if any are readily addressed; and</li> <li>if in parks, is within development or access zone or if in a reserve is in an area set aside for this purpose; or</li> <li>is a replacement project in an operating park where a management plan is not in place.</li> </ul> <p>All other projects are major.</p>
74	Major development or upgrading <sup>(2)</sup>		✓	See line 73 to distinguish major/minor.
75	Electrify existing car campsites <sup>(1)</sup>	✓	✓	Projects may only proceed as a category A if they are in a development or access zone in a park or in an area identified for this purpose in a reserve. Projects outside these zones in a park or area in a reserve would need to be screened. If in an operating park where a management plan is not in place, screen to determine Category B/C/D.
76	Develop electric generation facility and associated facilities for in-park or reserve consumption (solar, wind, hydro, generator, etc.) <sup>(2)</sup>		✓	EA processes may be harmonized. Refer to Section 3.5.2 in this Class EA. Maintenance may be carried out as a Category A project.
77	<b>Other development projects not listed</b>	✓	✓	<b>Screen to determine Category A/B/C/D.</b>

**Table 3: Managing a Provincial Park or Conservation Reserve**

**c. General Operations**

ID	Projects	Category A	Screen for Category	Notes
78	Provide visitor programs and services <sup>(1)</sup>	✓		
79	Maintain wildlife in captivity for rehabilitation, or interpretation and education programmes <sup>(1)</sup>	✓		
80	Conduct authorized research <sup>(1)</sup>	✓		
81	Operate and maintain facilities <sup>(1)</sup>	✓		
<b>Land Dispositions</b>				Examples: licence of occupation, land use permit, lease, easement or boat cache. See Table 2 for full dispositions related to sale, trade, etc.
82	Grant a new disposition <sup>(2)</sup>		✓	Includes changing the type of disposition (e.g., from a land use permit to a lease).
83	Transfer, renew or amend an existing disposition <sup>(1)</sup>	✓	✓	Category A if specific direction for the project is provided for in a management plan, a Statement of Conservation Interest that has been developed through public consultation, or a land use direction document (e.g., OLL Land Use Strategy) that has been developed through public consultation; otherwise Category B/C/D. May include changing the term of a disposition. Renew includes re-issuance of the same permit to the same permittee upon expiry.
<b>Resource Disposition</b>				Examples: bait fishing, commercial fishing, trapping & trap cabin, wild rice harvesting.
84	Issue a new licence or permit for commercial use of resource <sup>(2)</sup>		✓	
85	Transfer, renew or amend a licence or permit for commercial use of resource <sup>(1)</sup>	✓	✓	Category A if specific direction for the project is provided for in a management plan, a Statement of Conservation Interest that has been developed through public consultation, or a land use direction document (e.g., OLL Land Use Strategy) that has been developed through public consultation; otherwise Category B/C/D.
86	Issue a permit for aggregate extraction in a provincial park <sup>(2)</sup>	✓		The need for aggregates to be sourced in a provincial park must be addressed as a policy statement in the management plan and a regulation under the <i>Provincial Parks Act</i> . Examples of information needed to support the management plan would include: earth and life science inventories; provisions for protecting the area's values, and; evaluation of alternative sources. Aggregate extraction is not permitted in conservation reserves in accordance with policy.
<b>Public Health &amp; Safety</b>				This is a component of all projects, however, specific items are listed here.
87	Conduct emergency operations <sup>(1)</sup>	✓		See Section 6.4 in this Class EA.

✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5

✗ Project is not subject to this Class EA

ID	Projects	Category A	Screen for Category	Notes
88	Plug oil or gas well <sup>(1)</sup>	✗	✗	Subject to the Class EA for MNR Resource Stewardship and Facility Development Projects.
<b>Waste Management</b>				Pertains to waste generated in a park or reserve by recreational uses or services and infrastructure development in support of meeting the area's objectives. Also includes management of wastes that pre-existed the establishment of the park or reserve. This is not intended to deal with external commercial or industrial wastes.
89	Implement recycling and composting <sup>(1)</sup>	✓		
90	Collect solid waste and dispose of outside park or reserve <sup>(1)</sup>	✓		Non-hazardous and hazardous waste collection is carried out in accordance with Transport Canada and MOE regulations.
91	Collect non-hazardous solid waste in, and dispose within park or reserve <sup>(2)</sup>	✓	✓	Existing operations covered by an approved Certificate of Approval may continue until reviewed through a management plan process. New sites must be addressed in a management plan and screened for Category B/C/D.
92	Remove hazardous waste from, or treat or dispose of, inside park or reserve <sup>(2)</sup>		✓	
93	<b>Other operations projects not listed</b>	✓	✓	<b>Screen to determine Category A/B/C/D.</b>

- ✓ Project is the subject of this Class EA in connection with the requirements of Sections 4 and 5
- ✗ Project is not subject to this Class EA

## Appendix 3: Policies, Procedures, Guidelines, Standards, Manuals

This appendix summarizes MNR's key, relevant support tools pertaining to provincial parks and conservation reserves. Not all are listed, and each is reviewed and amended from time to time to take into account changing circumstances and needs. While

they are not the subject of the Class EA, they provide a supporting context for how projects are carried out. Key reference materials from other agencies are also listed for reference.

### 3.1 Provincial Park Policies, Procedures, Bulletins, Manuals and Standards

#### Administration

Type/Number	Subject	Date Issued
Pol 1.00	Provincial Parks Policy Implementation Details	Jan. 1/89
Pol 1.01	Policy and Procedure for Provincial Parks	Feb.1/03
Bul 1.02	Directives from Other Branches that are Applicable to Provincial Parks Operations	Feb. 1/03

#### Operations

Pol 2.03	Capacity Standards and Control in Provincial Parks	Jan. 1/99
Bul 2.09	Group Camping in Provincial Parks – Notification of Medical Officer of Health	May 1/98
Pol 2.15	Day-Use Privileges in Provincial Parks with a Campsite and Vehicle Permit	Feb. 1/03
Pol 2.16	Use of Pesticides and Herbicides in Provincial Parks	Feb. 1/03
Pol 2.20	Collection of Historical Equipment and Artifacts in Provincial Parks	Feb. 1/03
Pol 2.27	Emergency Plans	Feb. 1/03
Bul 2.27	Dangerous Goods in Provincial Parks	Feb. 1/03
Pol 2.35	Instructions for Campers at Unattended Provincial Park Offices	Feb. 1/03
Pol 2.36	Operation of Waterfront Bathing Area in Provincial Parks	Feb. 1/03
Bul 2.36.01	Operation of Waterfront Bathing Areas – Warning Signs	Feb. 1/03
Bul 2.36.03	Operation of Waterfront Bathing Areas – Buoy Lines and Markers	Nov. 1/84
Bul 2.36.04	Prohibiting Watercraft and Similar Devices in Designated Swimming Areas	July 1/88
Pol 2.37	Search and Rescue – Provincial Parks	May 1/99
Pol 2.41	Minimum Operating Standards for Provincial Parks	Feb. 1/03
Bul 2.42	Safe Handling of Chemicals used in Water Treatment Cleaning and Odour Control in Provincial Parks	Feb. 1/03
Pol 2.45	Research Activities in Provincial Parks	July 1/94
Pro 2.45.01	Research Activities in Provincial Parks	Dec. 1/94
Pol 2.47	High Risk Activities by Organized Group in Provincial Parks	July 1/03
Pol 2.48	General Liability in Provincial Parks	Feb. 1/03
Pol 2.49	Park Operating Plan	Feb. 1/97
Pol 2.54	Control of Noxious Weeds in Provincial Parks	Feb. 1/03
Pol 2.56.	Issuance of Land Use Permits in Provincial Parks	Feb. 1/03
Pro 2.56.01	Issuance of Land Use Permits in Provincial Parks	Feb. 1/03
Pol 2.57	Seasonal Leasing	May 1/98

## Enforcement

Type/Number	Subject	Date Issued
Pol 3.00	Park Warden Guidelines	Feb. 1/03
Pol 3.01	Security Officer Guidelines	Apr. 1/01
Pol 3.03	Park Warden Training	Feb. 1/03
Pol 3.04	Security Officer Training	Apr. 1/01
Pol 3.05	Liaison with Ontario Provincial Police Concerning Provincial Parks	Feb. 1/03

## Staff Training and Development

Pol 5.01	Staff Training	Feb. 1/03
Pol 5.02	Parks Training Program	Apr. 1/92
Bul 5.02	Parks Training Program	Apr. 1/94
Pro 5.02.01	Parks Training Program – Elective Seals	Mar. 1/94
Pol 5.03	Staff Training in Customer Service	Feb. 1/03
Pro 5.03.01	Staff Training in Customer Service	Feb. 1/03

## Visitor Services

Pol 6.00	Visitor Centres in Provincial Parks	Apr. 1/97
Pol 6.02	Natural Heritage Education in Ontario Parks	Nov. 1/98
Bul 6.02	Interpretive Service in Provincial Parks in Designated Areas	Mar. 1/90
Pro 6.02.01	Zone and Park Natural Heritage Education Plans	May 1/99
Pol 6.04	Provincial Park Co-operating Associations	July 1/93

## Design and Development

Pol 7.01	Construction of Park Facilities and Structures	Dec. 1/95
Bul 7.01	Municipal Building Permits not Required in Provincial Parks	Feb. 1/93
Pro 7.01.01	Site Planning\Development in Provincial Parks	Feb. 1/03
Pro 7.01.2	Provincial Park Facility Project Audits	Feb. 1/03
Pol 7.03	Ministry Asset Inventory System (MAIS)	Mar. 1/03
Pro 7.03.01	Ministry Asset Inventory System (MAIS)	Mar. 1/03
Pol 7.06	Inventory Base Map of Park Structures and Utilities for Provincial Parks	Feb. 1/03
Pol 7.07	Entrances to Provincial Parks from Public Roads	Feb. 1/03
Pol 7.08	Proposed Development by an Outside Agency in a Provincial Park	Feb. 1/03
Pol 7.09	Playground and Equipment Safety Inspection in Provincial Parks	Feb. 1/03
Pol 7.10	Inspection of Electrical Installations in Provincial Parks	Apr. 1/03
Pol 7.11	Utility Cables in Provincial Parks	Feb. 1/03
Pol 7.12	Conversion of Vault Privies to Flush Toilets	Feb. 1/03
Pol 7.13	Road Dust Control	Feb. 1/03
Pro 7.14.01	Provincial Parks Access Roads Agreement	Feb. 1/03
Bul 7.15	Buoy Line Anchorage	Feb. 1/03
Bul 7.16	Backflow Prevention for Portable Water System	Feb. 1/03
Bul 7.17	Liquid Level Switches for Portable Water Reservoirs	May 1/91

## Contracting and Concessions

Pol 8.01	Establishing a Concession	Dec. 1/83
Pol 8.02	Approval Requirements for Service & Concession Contracting in Provincial Parks	Aug. 1/87
Pol 8.06	Concessions – Public Liability, Property Damage and Fire Insurance	Dec. 1/84

## Sanitation

Type/Number	Subject	Date Issued
Pol 9.01	Public Health Inspection	Feb. 1/03
Pol 9.02	Waste (Garbage) Disposal in Provincial Parks	Feb. 1/03
Pol 9.03	Hydropneumatic Tanks in Provincial Park Water Systems	Jan. 1/93
Pol 9.04	Water Monitoring in Provincial Parks	Mar. 1/04
Pro 9.04.01	Drinking Water Monitoring in Provincial Parks	Mar. 1/04
Pro 9.04.02	Bathing Beach Water Monitoring in Provincial Parks	Mar. 1/04
Pro 9.05	Water Supply Data Collection (Water Meter Report)	June 1/97
Pro 9.06	Septic Tank System Approval	Jan. 1/95
Bul 9.07	Parks Water Systems Approval	Feb. 1/86
Pol 9.08	Sewage Waste Disposal	Feb. 1/03
Pol 9.09	Trailer Sink Waste Disposal	May 1/98
Pol 9.10	Disinfection of Water Works in Provincial Parks	Jan. 1/95
Pol 9.11	Additives to Sewage Systems (Odour Control)	Feb. 1/03
Pol 9.12	Plugging Abandoned Wells in Provincial Parks	Apr. 1/93
Pol 9.13	Facility Classification and Operator Certification	Dec. 1/95
Pol 9.14	Water Works Approval	Feb. 1/95
Pol 9.15	Food Service in Provincial Parks (Special Events)	May 1/99
Pol 9.16	Food Handling Training	May 1/98
Pol. 9.17	Spill of Pollutants in Provincial Parks	June 1/97
Pol. 9.19	Establishment of a Food Premise Operation	Feb. 1/03

## Park Planning

Pol 11.01	Amending and Rescinding Provincial Park Boundaries	Jan. 31/98
Pro 11.01	Amending and Rescinding Provincial Park Boundaries	Jan. 31/98
Bul 11.01.01	Boundary Description for Recommended Provincial Parks (under review)	May 17/88
Pol 11.01.03	Establishing New Parks Under the Provincial Parks Act (under review)	Apr. 1/89
Pro 11.01.03	Establishing New Parks Under the Provincial Parks Act (under review)	Apr. 1/89
Pol 11.02	Authority for Provincial Park Management Plans	Jan. 1/95
Pol 11.02.01	Preparation of Interim Management Statements	Aug. 1/94
Pro 11.02.01	Preparation of Interim Management Statements	Jan. 31/98
Bul 11.02.01	Guidelines for the Preparation of Interim Management Statements	Jan. 31/98
Pol 11.02.02	Approval of Preliminary and Recommended Park Management Plans	Jan. 31/98
Pro 11.02.02	Approval of Preliminary and Recommended Park Management Plans	Jan. 31/98
Bul 11.02.02	List of Mandatory & Discretionary Contacts for Public Consultation Programs	Jan. 31/98
Pol 11.02.03	Park Management Plan Amendment and Review	Mar. 1/99
Pro 11.02.03	Park Management Plan Amendment or Review	Jan. 31/98
Bul 11.02.03	Content and Consultation Guidelines – Major Amendment to Approved Park Management Plan	Jan. 31/98
Pol 11.02.04	Management Planning in Provincial Parks Using an Advisory Committee	Jan. 31/98
Pro 11.02.04	Management Planning in Provincial Parks Using an Advisory Committee	Jan. 31/98
Pol 11.03.01	Preparation of Implementation Plans for Provincial Parks	Jan. 31/98
Pro 11.03.01	Preparation of Implementation Plans for Provincial Parks	Jan. 31/98
Bul 11.03.01	Guidelines for the Preparation of Provincial Parks Implementation Plans	Jan. 31/98
Pol 11.03.02	Protection of Species at Risk in Provincial Parks	Sept. 22/04
Bul 11.04	Incorporating EBR requirements in park planning processes	Jan. 31/98
Pol 11.05	Treatment of Human Burial Sites In Provincial Parks	June 30/98
Pro 11.05	The Discovery of a Burial Site	June 30/98
Pol 11.03.03	Fire Management Policy for Provincial Parks and Conservation Reserves (also known as Pol PL 3.03.09 and FM 2.12)	June 24/04

## Ontario Parks Standards and Manuals

- Park Development Standards, 1983
- Minimum Operating Standards, 1992 update
- Ontario Provincial Parks Planning and Management Policies, 1992
- Ontario Provincial Parks Management Planning Manual, 1994
- Barrier Free Guidelines Design Manual, 1996
- Guidelines for Alternative Roofed Accommodations Projects, 1998
- Design Manual, 2000
- Ontario's Living Legacy Implementation Manual (version 1.2), July 10, 2000
- Ontario's Living Legacy Regulations Handbook (version 1.1), October 25, 2002
- Fire Management Planning Guidelines for Provincial Parks and Conservation Reserves (approval pending)



### 3.2 Conservation Reserve Policy, Procedures, Bulletins & Manuals

Type/Number	Subject	Date Issued
Pol PL 3.03.05	Conservation Reserves	Feb 11, 1997
Pro PL 3.03.05	Conservation Reserves A. Resource Management Planning B. Land Uses – Test of Compatibility C. Research Activities	Feb 11, 1997
Pol PL 3.03.09	Fire Management Policy for Provincial Parks and Conservation Reserves (also known as Pol 11.03.03 and FM 2.12)	June 24/04
	Fire Management Planning Guidelines for Provincial Parks and Conservation Reserves	approval pending

### 3.3 Other MNR Manuals and Guidelines That May Be Used for Provincial Parks and Conservation Reserves

The timber environmental assessment hearings, completed in 1994, placed importance on the use of environmental guidelines and standards that modify how timber management is carried out in recognition of other values. MNR staff may use the guidelines applicable to forest management to ensure values are protected in provincial parks and conservation reserves. The current guidelines, which may be amended from time to time, include:

#### *Forest Management Guidelines*

- Forest Management Guidelines for Retaining Forest Ecosystem Structure and Function: The Fire Simulation Guidelines (Draft)
- Forest Management Guide for Natural Disturbance Emulation (2001)
- Timber Management Guidelines for the Protection of Fish Habitat, 1988 (under revision)
- Timber Management Guidelines for the Provision of Moose Habitat, 1988 (under revision)
- Forest Management Guidelines for the Provision of White-tailed Deer Habitat, August 1997
- Forest Management Guidelines for the Conservation of Woodland Caribou: A Landscape Approach (Final Draft, January 1999)
- Forest Management Guidelines for the Provision of Marten Habitat, 1996
- Forest Management Guidelines for the Provision of Pileated Woodpecker Habitat, 1996

- Forest Management Guidelines for the Protection of the Physical Environment, 1997
- Timber Management Guidelines for the Protection of Tourism Values, 1986 (under revision)
- Timber Management Guidelines for the Protection of Cultural Heritage Resources, 1991 (under revision)
- A Silvicultural Guide to Managing for Black Spruce, Jack Pine and Aspen on Boreal Forest Ecosites in Ontario, 1997
- A Silvicultural Guide for the Tolerant Hardwood Forest in Ontario, 1998
- A Silvicultural Guide for the Great Lakes St. Lawrence Conifer Forest in Ontario, 1998
- A Silvicultural Guide to Managing Southern Ontario Forests (in preparation)
- Boreal Mixedwood Notes (in preparation)
- A Silvicultural Guide for the Boreal Mixedwood Forest in Ontario (in preparation)
- A Tree-Marking Guide for the Tolerant Hardwoods Working Group in Ontario, 1993 (under revision)

#### *Resource/Environmental Manuals*

- A Management Framework for Woodland Caribou Conservation in Northwestern Ontario, June 1999
- Guidelines for Providing Furbearer Habitat in Timber Management, March 1986 (Draft)
- Management Guidelines and Recommendations for Osprey in Ontario, 1983

- Bald Eagle Habitat Management Guidelines, June 1987
- Golden Eagle Habitat Management Guidelines, November 1987
- Habitat Management for Ontario's Forest Nesting Accipiters, Buteos and Eagles, March 1984
- Peregrine Falcon Habitat Management Guidelines, June 1988 (under revision)
- Management Guidelines for the Protection of Heronries in Ontario, April 1984
- Habitat Management Guidelines for Cavity Nesting Birds in Ontario, March 1984
- Habitat Management Guidelines for Warblers of Ontario's Northern Coniferous Forests, Mixed Forests or Southern Hardwood Forests, March 1984
- Habitat Management Guidelines for Waterfowl in Ontario, March 1985
- Habitat Management Guidelines for Birds of Ontario Wetlands including Marshes, Swamps and Fens or Bogs of Various Types (excluding waterfowl), March 1985
- Habitat Management Guidelines for Bats of Ontario, August 1984
- Selected Wildlife and Habitat Features: Inventory Manual, 1998
- Hawk Guide for MNR Field Personnel, 1991
- Forest Raptors and Their Nests in Central Ontario, 1998
- Field Guide to Forest Ecosystems of Northeastern Ontario, 1994 (under revision)
- Field Guide to the Forest Ecosystems of Central Ontario, 1997
- Silvicultural Effectiveness Monitoring Guideline, 2001
- Forest Compliance Handbook, 1996
- Species and Stock Selection Manual, 1996
- Guidelines for Forestry and Resource-Based Tourism, 2001

#### *Additional MNR Resources*

#### *Operation and Construction Manuals*

- Ecological Impacts of Fish Introductions: Evaluating the Risk
- Guidelines for Stocking Fish in Inland Waters of Ontario (draft)
- MNR Trail Planning Guidelines
- Urban Drainage Guidelines
- Great Lakes Fish Health Committee Control Policy and Model Program (Great Lakes Fisheries Commission)
- MNR Manual of Fish Health Protection
- American Fisheries Society Fish Health Blue Book
- Fish Timing Window Guidelines for In-Water Work, Southcentral Region (OMNR, draft)
- Strategic Operating Plan for Ontario Fish Culture Program
- Natural Heritage Reference Manual
- Natural Channel Systems: Adaptive Management of Stream Corridors
- Waterpower Program Planning Guidelines
- Community Fisheries Involvement Program Field Manual Part 1: Trout Stream Rehabilitation
- Community Fisheries Involvement Program Field Manual Part 2: Lakes and Rivers Fisheries Rehabilitation
- Public Involvement Guidelines, 1991
- Land Use Strategy Amendment Procedure
- Environmental Guidelines for Access Roads and Water Crossing, 1988 (under revision)
- Prescribed Burn Planning Manual, 1997
- Aerial Spraying for Forest Management, January 1991 (under revision)
- Code of Practice for Timber Management Operations in Riparian Areas, 1991
- Design and Construction Guidelines for Work Under the Drainage Act
- Technical Guidelines for Erosion and Sediment Control
- Access Roads Manual, 1992
- Development of Forest Operations Prescriptions (in preparation)
- Field Guide to the Forest Ecosystem Classification for Northwestern Ontario, 1997

### 3.4 Other Agencies

#### *Ministry of Tourism and Recreation, Ministry of Culture*

- Eight Guiding Principles in the Conservation of Historic Properties (Ontario Ministry of Tourism, Culture and Recreation, Architectural Conservation Note #1, n.d., current 2001)
- Conserving a Future for Our Past: Archaeology, Land Use Planning & Development in Ontario: An Educational Primer and Comprehensive Guide for Non-Specialists (Ontario Ministry of Citizenship, Culture and Recreation, Revised March 1998)
- Memorandum of Understanding – MNR-MCzCR – for Cultural Heritage Resources – Cultural Heritage Resource Screening When Issuing Work Permits or Disposing Crown Rights under the Authority of the *Public Lands Act* (September 25, 2000)
- Archaeological Assessment Technical Guidelines, (Stages 1-3 Reporting Format) (Ontario Ministry of Culture, Tourism and Recreation, Cultural Programs Branch, 1993)
- Guideline for Preparing the Cultural Resource Component of Environmental Assessments (Ontario Ministry of Culture and Communications/Ministry of the Environment, 1992)
- Timber Management Guidelines for the Protection of Cultural Heritage Resources (MNR, September 1991)
- Guidelines on the Man-Made Heritage Component of Environmental Assessments (Ontario Ministry of Culture and Recreation, reprinted 1981)
- Heritage Conservation Principles for Land Use Planning (Ontario Ministry of Tourism, Culture and Recreation, Architectural Conservation Note #6, n.d., current 2001)

#### *Ministry of the Environment*

- Water Management: Policies, Guidelines Provincial Water Quality Objectives
- Hydrogeological Technical Information Requirements for Land Development Applications
- Interim Land Use Planning Guidelines

- Guidelines for Sanitary Sewers, Storm Sewers, Water Distribution Adverse Conditions, Small Water Systems, and Seasonal Water Systems
- Guidelines – Noise Assessment Criteria in Land Use Planning
- Stormwater Management Practices Planning and Design Manual
- Standard Specifications for the Construction of Sewers and Water Mains
- Guidelines for Use at Contaminated Sites in Ontario (revised 1997)
- Criteria for the Management of Inert Fill (proposed amendment to Regulation 347 – draft version July, 1998)
- Guidance on Site Specific Risk Assessment for Use at Contaminated Sites in Ontario
- Fill Quality Guidelines for Lakefilling in Ontario
- Guideline for Evaluating Construction Activities Impacting on Water Resources
- Guideline for the Protection and Management of Aquatic Sediment Quality in Ontario
- Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario
- Provincial Water Quality Objectives
- Guide to EA Requirements for Electricity Sector Projects

#### *Ministry of Municipal Affairs and Housing*

- Innovative Municipal Land Use Planning Practices
- Provincial Policy Statement

#### *Ministry of Transportation*

- Environmental Construction Guidelines for Ministry of Transportation Projects
- Environmental Reference Book Series; Historical Resources (Vol 4B), Archaeology (Vol. 4C), etc.

#### *Ministry of Northern Development and Mines*

- Guidelines for Identifying Areas of Provincially Significant Mineral Potential (in preparation)

### ***Municipal***

- Municipal Engineers Association, Environmental Construction Guidelines for Municipal Road Sewer and Water Projects
- Municipal Engineers Association, Municipal Class Environmental Assessment

### ***Management Board Secretariat***

- Class EA Process for Management Board Secretariat and Ontario Realty Corporation, September 2003
- Manual of Guidelines for Cultural Heritage Resource Conservation (June 1994)
- A Cultural Heritage Inventory for the Management Board Secretariat – Phase 1: Cultural Heritage Process – Final Report – June 1994

### ***Conservation Ontario***

- Class EA for Remedial Flood and Erosion Control Projects

### ***Ontario Native Affairs Secretariat***

- Guide to Property Selection and Land Transfer

### ***Federal Government***

- Fish Health Protection Regulation Manual of Compliance
- Migratory Birds Environmental Assessment Guideline
- Environmental Assessment Guideline for Forest Habitat of Migratory Birds
- Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada (Canadian Wildlife Service, 2004)
- Wetlands Environmental Assessment Guideline
- Pollution Prevention Fact Sheets
- Federal Policy on Wetland Conservation
- Canadian Biodiversity Strategy (United Nations Convention on Biological Diversity)
- The Department of Fisheries and Oceans Policy for the Management of Fish Habitat (1986)
- Decision Framework for the Determination and Authorization of Harmful Alteration, Disruption or Destruction of Fish Habitat (1998)
- Fish Habitat Conservation and Protection –

What the Law Requires / Guidelines for Attaining No Net Loss (Brochure)

- Approach to the Physical Assessment of Developments Affecting Fish Habitat in the Great Lakes Nearshore Regions (1996)
- Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (1998)
- Department of Fisheries and Oceans Freshwater Intake End-of-Pipe Fish Screen Guideline.
- Introduction to Fishway Design (January 1992)
- The Dock Primer – a cottager’s guide to waterfront-friendly docks
- The Shore Primer – a cottager’s guide to a healthy waterfront
- Habitat Conservation & Protection Guidelines (Developed from the Policy for the Management of Fish Habitat (1986), 1998, Second Edition)
- A Protocol Detailing The Fish Habitat Referral Process in Ontario, August 2000
- Fish Habitat Compliance Protocol, 2004 Interim Measures
- Road Maintenance Activities and the *Fisheries Act* – A Guidance Document to Avoiding Conflict (March 1997)
- Working Around Water?
  - What you should know about Fish Habitat
  - Fish Habitat and Dredging
  - Fish Habitat and Building Docks, Boathouses and Boat Launches
  - Fish Habitat and Building a Beach
  - Fish Habitat and Building Materials
  - Fish Habitat and Obtaining a Section 35 Fisheries Act Authorization
  - Fish Habitat and Shoreline Stabilization
  - Fish Habitat and the Effects of Silt and Sediment
  - Fish Habitat and Constructing Ponds
  - Fish Habitat and Sunken Log Retrieval
  - Fluctuating Water Levels on the Great Lakes
  - Fish Habitat and Stream Cleanup
  - Fish Habitat and Fluctuating Water Levels on the Great Lakes

See [www.dof-mpo.gc.ca](http://www.dof-mpo.gc.ca)

## Appendix 4: Provincial Context

This appendix provides background information about MNR's planning system illustrated in Figure 2. It presents the context for the Class EA, but is not the subject of the Class EA.

### 4.1 Corporate Strategy

Strategic planning provides the context for the definition and description of corporate direction. It provides MNR with the opportunity to:

- Identify and analyze ecological, social, cultural, and economic trends at the global to local scales, and to gauge change.
- Conduct analyses to measure program strengths, weaknesses, opportunities, costs, and threats.
- Provide direction to guide the establishment of program priorities, policy, and legislation.

#### 4.1.1 Beyond 2000

Beyond 2000 is MNR's framework for strategic planning – it consists of a number of interrelated elements.

The ministry's vision, sustainable development, sets out the overall goal of the ministry and the desired end state for the use and management of our natural resources, while the ministry's mission, ecological sustainability, describes the role of the ministry in achieving the vision. A set of desired outcomes identifies specific purposes to be achieved in managing our natural resources in a manner consistent with the ministry's vision and mission. The ministry's operating philosophy of resource stewardship and the stewardship principles, set out the system of beliefs, values and principles which guide MNR decision-making and actions.

The strategic planning framework also sets out six supporting strategies:

- Integrated resource management.
- Partnerships in resource management.
- Valuing resources.
- Knowledge and information base.
- Customer service.
- Organizational excellence.

Together, these strategies describe in broad terms how the ministry proposes to conduct its activities and the methods and approaches the ministry will undertake to achieve the ministry's vision, mission and desired outcomes.

To aid in the implementation and evaluation of the strategy, specific performance measures for core businesses and programs are developed.

### Beyond 2000: MNR's Strategic Direction

#### *Vision*

*To contribute to the environmental, social and economic well being of the people of Ontario through the sustainable development of natural resources.*

#### *Mission*

*To manage our natural resources in an ecologically sustainable way to ensure they are available for the enjoyment and use of future generations.*

#### *Desired Outcomes*

- The long-term health of ecosystems is maintained.
- The continuing availability and sustainability of natural resources is secured.
- Significant natural heritage features and landscape values are protected.
- Economic development potential associated with natural resources is maintained.
- Ontarians receive a fair return for the use of natural resources.
- A variety of natural resource-based recreation opportunities are provided.
- Human life, property, and natural resource values are protected from hazards such as forest fires, floods and erosion.
- Management decisions are based on high quality natural resource science and information.
- The public interest in Ontario's natural resources and the need to manage them sustainably is appreciated.

These strategic directions provide a basis and context for the ministry's business plan, which annually sets out a program of activities and initiatives that the ministry proposes to carry out in the conduct of its mandate.

The delivery of the provincial parks and conservation reserves programs contribute substantially to MNR's strategic directions.

#### 4.1.2 Nature's Best

Nature's Best (Ontario's Parks & Protected Areas – A Framework and Action Plan, MNR, 1997a), recognizes the evolving concern in Ontario for natural heritage values and the need for protected areas. Nature's Best provides a framework for focusing activities, co-ordinating various related initiatives, and identifying needed reforms associated with the challenges and opportunities in the developed areas of southern Ontario, the forested regions of central and northern Ontario (coinciding with the Ontario's Living Legacy planning area), as well as the far north. The framework renews the Government's commitment to establishing Ontario's system of protected areas, by providing the context and direction for Ontario's system, as described in the following goal and objectives.

##### **Goal:**

*To establish a system of protected natural heritage areas, representing the full spectrum of the province's natural features and ecosystems.*

##### **Objectives:**

- *Identification:* To identify, evaluate and select areas that embody the provincially significant geological, aquatic and terrestrial diversity of the Province.
- *Protection:* To protect a system of natural heritage areas through legislation, regulations, policies and programs.
- *Supportive Landscape Management:* To foster land use planning and management in the intervening landscape that ensures ecological sustainability of a system of protected natural heritage areas.

### **A Brief History of Ontario's Protected Areas**

- 1887 Queen Victoria Niagara Falls Park-first protected area.
- 1893 Algonquin-Ontario's first provincial park.
- 1913 First *Parks Act* was passed and Quetico Park was established.
- 1954 A revised *Provincial Parks Act* passed; a Division of Parks was established.
- 1959 First park policy statement was read in the legislature and the *Wilderness Areas Act* was passed.
- 1960 Ontario had 72 parks.
- 1961 Nature Reserves Committee tabled a list of candidate areas for protection.
- 1965 10 new provincial parks established.
- 1978 A new provincial parks policy was approved by Cabinet, laying the foundation for a systems approach.
- 1983 155 parks were designated through province-wide land use planning. The Areas of *Natural and Scientific Interest* program was established.
- 1995 Ontario created a new Conservation Reserve designation under the *Public Lands Act*.
- 1996 Government released *Nature's Best*.
- 1997 *Lands for Life* land use planning initiated to complete the system of parks and protected areas.
- 1997 Government initiates the *Natural Areas Protection Program*, a \$20 million program to purchase key natural areas.
- 1999 Ontario's Premier announced 378 new protected areas (parks and conservation reserves) amounting to 2.4 million hectares as part of the Living Legacy Land Use Strategy.
- 2000 \$10 million *Ontario Parks Legacy 2000* land acquisition partnership with Nature Conservancy completed.
- 2004 Class EA for Provincial Parks and Conservation Reserves approved.

- *Area Management:* To manage a system of protected natural heritage areas in order to retain and restore representative and special ecological and geological features, processes and systems.
- *Shared Responsibility:* To manage a system of protected areas on public and private lands through consultation, co-operation, and partnerships among government and non-government organizations, Aboriginal peoples, industry and private landowners.
- *Recreation:* To provide outdoor recreation opportunities ranging from high-intensity day-use to low-intensity wilderness experiences.
- *Heritage Appreciation:* To provide opportunities for exploration and appreciation of the outdoor natural and cultural heritage of Ontario.
- *Tourism:* To provide Ontario's residents and out-of-province visitors with opportunities to discover and experience the distinctive regions of the province.

The two most significant forms of protected areas in Ontario's system are provincial parks and conservation reserves, described in the following sections.

#### 4.1.3 Provincial Park Policy

Provincial parks policy has evolved over the last century, since the establishment of Algonquin Park in 1893. Today, provincial parks are governed by three key tools: the *Ontario Provincial Parks Act*, the Ontario Provincial Parks Policy Statement (MNR, 1978), and Ontario Provincial Parks: Planning and Management Policies (MNR, 1992). The latter was amended by the Ontario's Living Legacy Land Use Strategy (MNR, 1999), for provincial parks within the OLL planning area.

The 1978 Cabinet-approved Ontario Provincial Parks Policy Statement established the goal and objectives for the park system, provided nine guiding principles, and identified the six classes of parks which comprise the current system (MNR, 1992).

The goal of the Ontario provincial parks system is:

*To ensure that Ontario's provincial parks protect significant natural, cultural, and recreational environments, while providing ample opportunities for visitors to participate in recreational activities.*

The four key objectives are:

- *Protection:* To protect provincially significant elements of the natural and cultural landscape of Ontario.

Nine principles guide the management of the provincial parks system:

- *Permanence:* The provincial parks system is dedicated for all time to the present and future generations of the people of Ontario for their healthful enjoyment and appreciation.
- *Distinctiveness:* Provincial parks provide a distinctive range of quality outdoor recreation experiences, many of which cannot be provided in other types of parks; for example, wilderness travel and appreciation.
- *Representation:* Provincial parks are established to secure for posterity representative features of Ontario's natural and cultural heritage. Wherever possible, the best representations of our heritage will be included in the park system.
- *Variety:* The provincial parks system provides a wide variety of outdoor recreation opportunities, and protected natural and cultural landscapes and features.
- *Accessibility:* The benefits of the system will be distributed as widely as possible geographically and as equitably as possible socially so that they are accessible to all Ontario residents.
- *Co-ordination:* the provincial parks system will be managed to complement, rather than compete with, the private sector and other public agencies.

- *System:* Individual provincial parks contribute to the overall objectives of the provincial parks system; all objectives may not be met in each park. The park system, rather than the individual parks, provides the diversity of experiences and landscapes that are sought.
- *Classification:* No individual park can be all things to all people. Park classification organizes Ontario's provincial parks into broad categories, each of which has particular purposes and characteristics as well as distinctive planning, management and visitor service policies.
- *Zoning:* Ontario's provincial parks are zoned on the basis of resource significance and recreational potential; various types of zones ensure that users get the most out of individual parks. Planning and management policies appropriate to each zone types are applied consistently throughout the parks system.

The Ontario Provincial Parks Planning and Management Policies (commonly known as the Blue Book) was first tabled in 1978 as a companion document to the Ontario Provincial Parks Policy Statement, described above. Updated in 1992 to reflect new Government direction, the planning and management policies contain a mixture of park philosophy, systems rationale, program targets, and management policies associated with each class of provincial park (e.g., the nature and types of projects and activities that may be permitted in each zone of a park).

The provincial parks system incorporates six classes of parks, which are selected to meet representation targets in addition to the protection of special values, as follows:

- *Wilderness Parks:* The target is to establish one Wilderness Park and one Wilderness Zone (in either a Waterway or Natural Environment Park) or a National Park equivalent in each ecological region. Examples include Wabakimi and Killarney.
- *Nature Reserve Parks:* Nature Reserve Parks and zones are established to represent and protect Ontario's geological, ecological, and species

diversity. The target is to represent each of the vegetative types found in Ontario's 14 ecoregions (see Figure 4.2) and all of Ontario's past geological environments (MNR, 1992). Examples include Ouimet Canyon and Morris Tract.

- *Historical Parks:* The evaluation and selection of archaeological and historical features in Ontario's provincial parks is based on criteria developed and described in "A Topical Organization of Ontario's History" (MNR, 1975). The system defines 13 significant landscape-related themes (and 115 sub-themes) that depict Ontario's human history. An example is Petroglyphs.
- *Natural Environment Parks:* Natural Environment Parks are selected to protect large, representative, and ecologically viable areas throughout Ontario. They represent elements of geological, ecological, and species diversity commonly found within an ecological region, but not contained within Provincial Wilderness Parks or National Park equivalents. The target is to establish one Natural Environment Park in each of the province's ecological districts. Examples include Bon Echo and Lake Superior.
- *Waterway Parks:* Waterway Parks are selected river corridors that complement other parks by representing elements of diversity not found within the other park classes. The class target is to establish one Waterway Park in each ecological district. Examples include Missinaibi and Turtle River.
- *Recreation Parks:* Recreation Parks are selected to protect outstanding recreational environments. They also may include representative examples of Ontario's geological, ecological, and species diversity. There is no specific target for the number of Recreation Parks, though the intent is to ensure a sufficient supply of recreational and tourism opportunities. Examples include: Wasaga Beach and Sauble Falls.

Classification of provincial parks and zoning are the key elements in determining the type and extent of management activities that may take place in a provincial park. Classification sets the direction for the types of zones that a park may contain and the



**Figure 4.1 The Use of Zones in Ontario’s Provincial Parks**

Class of Park	Zones					
	Wilderness	Nature Reserve	Historical	Natural Environment	Development	Access
Wilderness	Yes	Yes	Yes	No	No	Yes
Nature Reserve	++	Yes	Yes	No	No	Yes
Historical	No	Yes	Yes	Yes	Yes	Yes
Natural Environment	Yes	Yes	Yes	Yes	Yes	Yes
Waterway	Yes	Yes	Yes	Yes	Yes	Yes
Recreation	No	Yes	Yes	Yes	Yes	Yes

Notes: ++ A Wilderness Zone designation is not required given the purpose and restrictive management prescriptions for Nature Reserve Parks. Recreation Utilization Zones only apply to Algonquin Park.  
Source: MNR, 1992

general approach used in formulating management policies (Figure 4.1). Park zoning permits further refinement in the development of alternative methods by setting limits on the range of management activities that can be considered – these activities are described in the “Blue Book”. This approach is flexible enough that management policies can be tailored to reflect resource significance and management objectives for individual parks during the management planning stage (refer to Section 4.3.1 in this appendix). At the same time, it ensures general consistency in approach across the entire system (MNR, 1992).

**4.1.4 Conservation Reserve Policy**

Conservation reserves are established to protect natural heritage values on public lands while permitting compatible land use activities (MNR, 1997a). This newer form of protection in Ontario was first used in 1994. The conservation reserves mechanism complements the provincial parks system by protecting important representative areas and special values of the province (e.g., ecosystems, species, recreational, historical, cultural values). They differ by allowing a wider array of traditional local uses.

Conservation reserves are regulated under the *Public Lands Act*, as well as being withdrawn from staking under the *Mining Act* and removed from licensed forest areas under the *Crown Forest Sustainability Act*. They are managed in accordance with the Conservation Reserves Policy (PL 3.03.05), which provides direction for establishing, planning and managing conservation reserves. This policy was amended by the Ontario’s Living Legacy Land Use Strategy (MNR, 1999) for reserves within the OLL planning area.

Conservation reserves are a component of MNR’s broader natural heritage areas program, and are guided by the broad goals and objectives described previously in Section 4.1.2 Nature’s Best. The systems planning method used to select conservation reserves is described in the next section.

**4.2 Land Use Direction**

**4.2.1 Systems Planning**

Systems planning involves the identification and selection of provincially significant areas that merit protection. Two organizing concepts are used to identify MNR’s system of natural heritage areas: representation, and special values.

The primary concept is representation. Areas that are identified contain the best available examples to represent the full spectrum of natural characteristics, or natural diversity, of the province. These elements are defined by scientific criteria, using a “gap analysis” methodology.

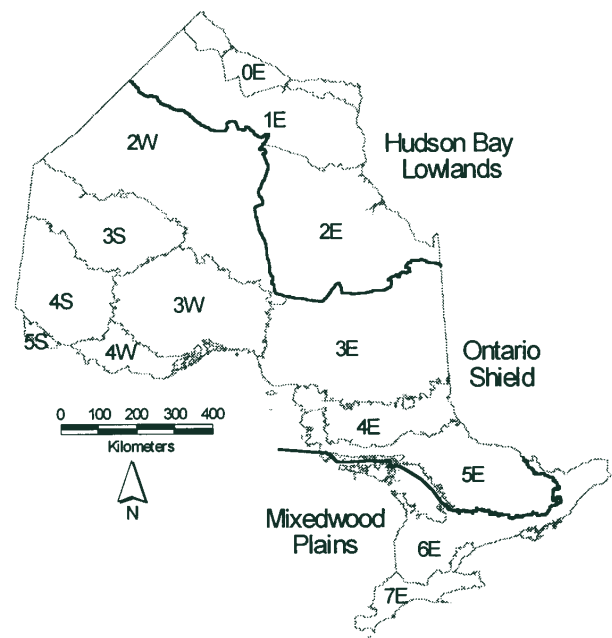
- Geological (earth science) diversity includes distinct geological and geomorphological features. They are distinguished by their age, stratigraphy, and topography. Representative earth science features have been organized into 44 themes and more than 1200 typical rock types, fossil assemblages, landforms and related processes. Provincial park policy includes representation targets for earth science features (refer to Section 4.1.3 in this appendix). Conservation reserves contribute to this representation.
- Terrestrial (life science or ecological) diversity is defined on the basis of 14 ecological regions (Figure 4.2) and a subset of 67 ecological districts that comprise Ontario’s ecological land classification. Representation is based on protecting the best available examples of Ontario’s ecological regions and districts. Provincial park policy includes representation targets for four classes of parks using the ecological land classification (refer to Section 4.1.3 in this appendix). Conservation reserves contribute to this representation.
- Aquatic diversity is included in the protected areas system, incidentally. A formal system for protecting representative areas, features or species has not yet been developed, though work in this area is in progress.

The second concept involves the identification of special natural heritage values, for example, an endangered species’ habitat. Although this habitat is provincially significant because it supports an endangered species, it may not be especially representative of the broader landscape in which it occurs.

Through protected area systems planning, priority natural areas are identified for further consideration through a variety of securement mechanisms, such as:

- Crown land use planning processes.
- Purchase (e.g., through Natural Areas Protection Program and the Ontario Parks-Legacy 2000).
- Donations and bequests.
- Private land stewardship initiatives.
- Other evolving approaches (e.g., formal lease agreements with private landowners, conservation easements, etc.).

**Figure 4.2 Ontario’s Ecological Regions**



## 4.2.2 Land Use Planning

Through public planning and review processes, MNR establishes land use strategies that guide the allocation of Crown lands. Land use planning seeks to identify and balance the allocation of Crown resources in a manner that meets public interest and Government priorities. MNR's strategic direction, *Beyond 2000* (Section 4.1.1 in this appendix) provides the context in which land use planning is undertaken, and in turn, land use planning yields decisions on new provincial parks and conservation reserves. A wide array of public consultation methods is employed in land use planning, depending on the scope of the issues being dealt with. Methods that are used to provide information and solicit input normally include:

- Posting proposals on the *Environmental Bill of Rights* registry.
- Issuing public notices in newspapers and sending them directly to stakeholders.
- Producing reports with background information or proposals for public review.
- Providing information on MNR's Web site.

Public information sessions and/or meetings are often held for issues where there is significant public interest. In addition, advisory committees are often used. There are a number of permanent advisory committees that can provide advice on land use issues. For major projects, such as the preparation of Ontario's Living Legacy Land Use Strategy, special multi-stakeholder advisory committees may be established.

MNR also has established policies and procedures for processing minor and major amendments to the land use direction for Crown lands. These procedures define the nature of public consultation and the approval processes, based on the type of proposed amendment.

Prior to the approval of Ontario's Living Legacy Land Use Strategy, Ontario had 271 regulated provincial parks that encompassed approximately

**Figure 4.3 The Number and Types of Established and Recommended Provincial Parks in Ontario**

Park Class	Current Number	Current Area (ha) <sup>1</sup>	Recommended Parks (#) <sup>2</sup>	Recommended Parks (ha) <sup>2</sup>	Recommended Additions <sup>2</sup>	Recommended Additions (ha) <sup>2</sup>	Total (#) <sup>3</sup>	Total (ha) <sup>3</sup>
Wilderness	8	4,822,920	0	—	2	31,688	8	4,854,608
Nature Reserve	103	107,033	4	6,235	2	833	107	114,101
Historical	4	2,107	0	—	1	5,163	4	7,270
Natural Environment	77	752,592	2	17,795	9	91,705	79	862,092
Waterway	57	1,360,163	8	42,739	7	100,279	65	1,503,181
Recreation	67	42,152	0	—	1	6,054	67	48,206
<b>Total</b>	<b>316</b>	<b>7,086,697</b>	<b>14</b>	<b>66,769</b>	<b>22</b>	<b>235,722</b>	<b>330</b>	<b>7,389,458</b>

<sup>1</sup> Excludes Algonquin Provincial Park Recreation-Utilisation Zone (594,860 ha)

<sup>2</sup> These numbers may change during the regulation process of recommended parks.

<sup>3</sup> These values are a total of regulated protected areas and remaining recommended parks.

Source: Ontario Parks database as of August 20, 2004

7.1 million hectares, or 6.6 per cent of the province. In 1999, 61 new parks and additions to 45 existing parks were announced by the Government through the Ontario's Living Legacy Land Use Strategy – this will bring the total number to 330 parks, and the total area to about 7.4 million hectares (Figure 4.3).

Conservation reserves arose as a new protected area designation in Ontario in 1994 during the government's *Keep it Wild Campaign* to create new protected areas. Between 1994-97, 23 reserves were established, amounting to 68,734 hectares. As a result of the Temagami Land Use Plan (MNR, 1997b), and the Ontario's Living Legacy Land Use Strategy (MNR, 1999), 280 new conservation reserves (plus one addition to an existing area) encompassing approximately 1.5 million hectares were recommended. Currently, 249 conservation reserves are in regulation and 55 are recommended, bringing the approximate total area to 1.6 million hectares (Figure 4.4).

As a result of the Ontario's Living Legacy Land Use Strategy and other land acquisition initiatives, the total area of Ontario's lands and waters formally protected in provincial parks and conservation reserves will be approximately 9 million hectares, representing about 8.4 per cent of the province. These figures will change with time as a result of ongoing processes, such as:

- Amendments or updates to existing land use strategies.
- Preparation of new land use strategies, such as in the far north.
- More detailed local-level land use planning.
- Amendments to provincial park or conservation reserve boundaries that may be identified through public management planning processes.

**Figure 4.4 Conservation Reserves in Ontario**

Conservation Reserve	Number	Area (ha)
Existing (regulated)	249	1,046,909
Recommended <sup>1</sup>	55	582,103
<b>Total</b>	<b>304</b>	<b>1,629,007</b>

<sup>1</sup> These numbers may change during the regulation process of recommended parks.

Source: Ontario Parks database as of August 20, 2004

## 4.3 Management Direction

### 4.3.1 Provincial Parks

Two types of management documents are used for provincial parks: Interim Management Statements and Park Management Plans.

#### *Interim Management Statements (IMS)*

Interim Management Statements are intended to guide the custodial management of a park until such time as a full management plan is prepared. At a minimum, the IMS identifies:

- Values to be protected.
- Resource management prescriptions necessary to protect values.
- Restrictions on existing or potential use.

IMs are internal documents intended to provide short-term guidance for park managers. Their preparation does not normally entail extensive new research or inventory work. While they are not the subject of extensive public consultation, their availability is a matter of public record. Accordingly, significant capital development or decisions, which could be permanent or irreversible, are deferred to the management planning process, with the benefit of public input.

## *Park Management Plans*

Management plans are prepared to identify management policies aimed at maintaining or enhancing the achievement of the four parks system objectives (protection, heritage appreciation, recreation, tourism). Ontario Provincial Parks Planning and Management Policies (MNR, 1992) provides the provincial direction and context relating to classification, zoning, and permitted uses, while each management plan is developed to provide park-level policy. Planning is normally supported with more detailed background information arising from special studies on the park's earth and life sciences, cultural resources, and recreational resources. These studies aim to identify areas of significance that need to be carefully considered during planning.

The Park Management Plan includes (MNR, 1994):

- A definition of the park's role, significance and classification in the context of the provincial system.
- A statement of policy, including classification and zoning, addressing the protection, planning, development and management of the significant resources and values with each park. Amendments to the park boundary (additions or deletions) are also prescribed.
- Documented evidence that planning, development and management activities reflect the need for environmental protection and sustainability and are responsive to public interests.
- Guidance in preparing subsidiary implementation plans for the various activities and projects needed to achieve park objectives.
- A rationale and priorities for the long term funding of capital development and operations.
- A record of issues identified through internal and public consultation, and their resolution through the management planning process.
- A basis for auditing the development, operations and resource management activities in a park.
- Assurance that proposed management activities and projects are assessed for *Environmental Assessment Act* compliance (this Class EA addresses this assurance).

The park management planning process is also used to re-examine any boundary concerns. Additions or deletions to a park boundary are identified during the process.

The park management planning process may contain as many as six distinct stages, as follows:

1. Preparation and approval of the terms of reference for the planning process.
2. Inventory and analysis of background information.
3. Identification of issues and the preparation of conceptual plan alternatives.
4. Preparation and review of the preliminary park management plan.
5. Preparation and approval of the recommended park management plan.
6. Scheduled or unscheduled review of the approved plan, or a plan amendment.

Public consultation is carried out during each stage, and usually includes the following methods to provide information and solicit input:

- Posting proposals on the *Environmental Bill of Rights* registry.
- Issuing public notices in newspapers and sending them directly to stakeholders.
- Producing reports with background information or proposals for public review.
- Information sessions and/or meetings with the public, stakeholders, government ministries, Aboriginal organizations and First Nations. In addition, advisory committees are often used.
- Providing information on MNR's Web site.

### 4.3.2 Conservation Reserves

Two types of management documents are prepared for conservation reserves: Statements of Conservation Interest, and Resource Management Plans.

Procedural guidelines assist staff in:

- Preparing Statements of Conservation Interest and Resource Management Plans.
- Reviewing proposed activities using a test of compatibility.
- Reviewing proposed research activities.

Refer to Appendix 3 for a listing of supporting tools.

#### *Statements of Conservation Interest (SCI)*

The SCI is the policy document for a conservation reserve. It identifies area values and provides direction on management activities and appropriate/compatible uses. In most cases, where there are no complex issues, the SCI will serve as the only planning document that is required to guide resource management. Where planning information is based on limited information, major decisions, particularly those that are permanent or irreversible, should be left to the more comprehensive resource management planning process. The SCI contains the following information:

- A summary of earth and life science values and cultural resources represented and recreational opportunities available.
- An overview of inventories that have been completed or required.
- Sensitive values and locations.
- Management guidelines for the range of activities permitted in the reserve.
- Implementation priorities.
- Process for minor and major amendments.

SCIs may require some level of public consultation. If SCI land use direction does not differ substantively from that which was provided during consultation on area protection (e.g., land use planning), then additional consultation will not be needed. However, with more complex issues, the SCI may require broader public discussion (e.g. including posting

proposal notices on the *Environmental Bill of Rights* registry, meeting with Local Citizens' Committees or special interest groups, etc.) before being approved. Appendix 2 distinguishes projects that do not require prior public consultation through an SCI from those that do require consultation as part of the SCI or resource management planning processes.

#### *Resource Management Plans*

Resource management plans contain the same information as an SCI, though the process is more complex, with additional stages of planning and public review. Resource Management Plans are therefore more detailed and comprehensive than an SCI. For example, depending upon the degree of complexity, the process may include:

- Background information reports. Planning is normally supported with more detailed background information arising from specific studies on the reserve's earth and life sciences, cultural resources, and recreational resources. These studies aim to identify areas of significance that need to be carefully considered during planning.
- Management options.
- Draft plan.
- Final plan.

Public consultation is carried out during each stage, and often includes the following methods to provide information and solicit input:

- Posting proposals on the *Environmental Bill of Rights* registry.
- Issuing public notices in newspapers and sending them directly to stakeholders.
- Producing reports with background information or proposals for public review.
- Information sessions and/or meetings with the public, stakeholders, government ministries, Aboriginal organizations and First Nations. In addition, advisory committees are often used.
- Providing information on MNR's Web site.

As a result of the substantial increase in the number of conservation reserves and area protected through the Ontario's Living Legacy Land Use Strategy, MNR anticipates a need to expand its policies, procedures, guidelines and other support tools for the planning and management of conservation reserves.

#### 4.4 Implementation

Implementation planning with public consultation is carried out for a variety of activities and projects and is supported by policies, procedures, guidelines and manuals for both provincial parks and conservation reserves.

In provincial parks, implementation plans are prepared to guide the operational delivery of resource stewardship, operations, and development activities and projects. They are subsidiary plans to Park Management Plans, and are intended to translate broad direction into specific actions. It is Ontario Park's policy to prepare implementation plans when comprehensive direction for a particular activity or project cannot be adequately provided for in the Park Management Plan. For example, an implementation plan was prepared to guide the reduction of Rondeau Provincial Park's deer herd, as a means to protect the biodiversity of the park's Carolinian ecosystem.

The *Class EA for Provincial Parks and Conservation Reserves* focuses on implementation activities.

#### 4.5 References Cited in this Appendix

- Ministry of Natural Resources. 2000. Beyond 2000 Strategic Directions
- Ministry of Natural Resources. 1999. Ontario's Living Legacy Land Use Strategy
- Ministry of Natural Resources. 1997a. Nature's Best. A Framework and Action Plan
- Ministry of Natural Resources. 1997b. Temagami Land Use Plan
- Ministry of Natural Resources. 1994. Ontario Provincial Parks Management Planning Manual
- Ministry of Natural Resources. 1992. Ontario Provincial Parks Planning and Management Policies
- Ministry of Natural Resources. 1978. Ontario Provincial Parks Policy Statement
- Ministry of Natural Resources. 1975. A Topical Organization of Ontario's History

## Appendix 5: Assessing the Significance of Environmental Effects

An environmental effect is any change to the environment, positive or negative, that would occur as a result of a project. In some cases, it may be important to also assess the change to the project that may be caused by the environment. This Class EA requires MNR staff to assess the significance of environmental effects at a number of steps in the planning process, including:

- Using the screening process to assign projects to categories B, C or D (or to Category A where a project is not specified in Appendix 2, as described Section 4.1.2 of the Class EA).
- Assessing the environmental effects of a Category B project.
- Assessing the environmental effects of the alternatives (where applicable) and the preferred alternative, in the case of a Category C project.

This appendix is intended to provide guidance to MNR staff in assessing the significance of potential environmental effects under individual criteria, for the project as a whole, and for alternatives. It includes factors that may be applied in assessing the significance of effects, and a series of considerations that should be taken into account in applying them. Further guidance is provided to assist in considering significance in conducting a screening, in assigning projects to categories or to individual EA, and in evaluating projects and alternatives. This guidance reflects an ecosystem approach to planning, which is embodied in the MNR planning system as described in Section 2 and Appendix 4.

### 5.1 Factors for the Assessment of Significance

The following factors may be used in assessing the significance of the environmental effects of a project.

#### *Magnitude*

Magnitude represents the relative severity or benefit of the effect under consideration. For example, the complete displacement of a feature would represent a greater magnitude of effect than a minor effect of dust from construction. Larger scale projects may often have a greater magnitude of effect. Relevant policies and standards may assist in assessing the magnitude of an effect.

#### *The Value of the Feature or Situation Affected*

Some features or situations may be given a higher priority than others. Where a project would have a negative effect on the values for which a provincial park or conservation reserve was established to protect, this would be of greater concern than most other criteria. For example, an effect on an endangered species habitat would be of greater significance than an equivalent effect on an area of natural vegetation that is not identified as having any special importance. On a broader scale, effects under some categories of screening criteria, such as natural environmental effects, may be given greater priority over other effects.

Where a comparison of alternatives is undertaken, criteria or groups of criteria are prioritized or weighted according to their relative importance. It is important to ensure that value is not “double counted”, both in the evaluations under each criterion and in the weightings or priorities used in the comparison.

#### *Geographic Extent*

Localized environmental effects may not be as significant as those that extend over a wide area.



### *Duration and Frequency*

Effects should be considered for the construction, operation, and, where appropriate, the decommissioning phases of a project. Longer term or more frequent effects may have greater significance. For example, a temporary effect of project construction may be less significant than an effect of lesser magnitude that extends over the life of the project.

### *Likelihood of the Effect*

Some effects are more easily predicted than others. Uncertainty should be recognized and reflected in the evaluation.

### *Reversibility and Irreversibility*

Some effects such as groundwater contamination may be regarded as having a low likelihood, but would be difficult to reverse if they occur. Other effects may be relatively easy to remedy.

## **5.2 Other Considerations**

The following considerations may assist in applying the factors provided above.

### *Concerns of Interested Agencies, Groups and Individuals*

The assessment will consider the input from consultation. In a screening, likely reaction will be assessed based on the experience of MNR staff in dealing with similar issues and stakeholders. Where there is uncertainty as to the possible reaction, the Class EA process provides for notification to assist in this decision. For Category B or C projects, MNR staff will have the benefit of responses to notification and consultation activities to assist in this determination.

Information provided by the public, Aboriginal organizations, First Nations, agencies and non-government organizations may contribute factual

information that contributes to the “technical” assessment of significance. In other instances, input may reflect the level of concern regarding a project.

### *Level of Detail*

Information on the existing environment and potential environmental effects should be reviewed and assessed for its adequacy in determining significance. Any gaps in the information required to assess significance should be identified. Where there are gaps, these should be recognized in a screening and specialist help may be sought or special studies may be initiated for a project evaluation.

The level of detail would generally increase as the process proceeds through screening to the assessment of alternatives (where appropriate) and the refinement of the project. Alternatives should be compared based on a generally equivalent level of detail.

### *Net Environmental Effects*

A net (or residual) environmental effect is a change to the environment that would result from the project, following the application of proposed mitigation or enhancement measures. Monitoring may be proposed to assess the need for mitigation measures in the future.

In the project evaluations conducted under this Class EA, decisions on the significance of environmental effects are based either on the effects of the project with appropriate mitigation measures in place (as specified in the project description), or the effects with both appropriate mitigation and any additional measures found to be necessary during the project evaluation. Appropriate mitigation and enhancement measures would generally be those required by MNR guidance documents, and may be assumed for Category A projects. For Category B and C projects, the level of detail of information on additional mitigation measures and their anticipated effectiveness should be generally greater for more significant and complex effects, and for decisions taken at later stages of the process.

### *Direct and Indirect Effects*

A project may give rise to a chain of environmental effects. For example, flooding of a reservoir can cause elevated levels of methyl mercury, followed by indirect effects including effects on fish, the destruction of a fishery, and impacts on a traditional or commercial economy. The potential for indirect effects should be considered in conducting more complex project evaluations.

### *Cumulative Effects*

Cumulative effects are the total effect on the environment from two or more projects. Sometimes the effects of more than one project can accumulate so that they reach a critical threshold, or they can be compounded so that they create an effect that is greater than the sum of the parts.

Consideration should be given to whether the environment affected by the project is undergoing change as a result of other projects or activities. For example, if a campground is proposed on the shore of a lake on which marinas or other developments are also proposed, the longer term effects of all of these projects on water quality and fisheries, for example, should be taken into consideration.

Where there is potential for significant cumulative effects, this should be considered in defining study areas for a project evaluation.

### *Tangibles and Intangibles*

Some potential effects are more easily measured and predicted than others. More “subjective” effects such as visual and social impacts can often be neglected in favour of those for which “hard” information is more easily obtained. In such circumstances special consideration should be given to public input in assessing the significance of effects.

## **5.3 Comparing Alternatives**

Where the project evaluation involves a comparison of alternative projects (e.g., locations, routes, etc.), the comparison should demonstrate a logical and systematic consideration of potential net environmental effects. A detailed review of methodologies is beyond the scope of this Class EA, however the following general considerations apply.

The level of sophistication of the comparison should respond to the complexity of the project, its potential environmental effects, and the types of differences between alternatives.

There should be some assignment of priorities or weighting to the evaluation criteria or groups of criteria to be applied in the comparison. This should be reflective of MNR policy (e.g. priority to protection of the natural environment in natural environment zones), and public and agency input.

The comparison should provide enough information to enable a lay reader to understand the rationale supporting the selection of the preferred alternative. An evaluation matrix describing environmental effects under each criterion for each alternative, supported by a narrative description of the comparison, is helpful. Low, moderate and high positive and negative effects may be assigned to each criterion. The ranges of values for indicators used to assess effects in low, moderate and high categories should be specified and explained.

Again, the advantages and disadvantages of the preferred alternative should be reviewed against the purpose the project is intended to serve.

## Appendix 6: Government and Other Agencies

The following government and other agencies may have an interest in provincial park and conservation reserve projects, and will be considered in compiling mailing lists for notification and consultation.

### *Aboriginal*

First Nations (local protocols for consultation may exist or may be established as required)  
Treaty Organizations

### *Local*

Upper and lower tier municipalities  
Conservation Authorities  
Planning Boards  
Local Architectural Conservation Advisory Committees

### *Provincial*

Ministry of Agriculture and Food, Agricultural Land Use Planning Section  
Ministry of Community, Family and Children's Services  
Ministry of Tourism and Recreation  
Ministry of Culture  
Ministry of Education  
Ministry of Enterprise, Opportunity and Innovation  
Ministry of the Environment (MOE Regional Air, Pesticides & Environmental Planning Supervisor; for mandatory project reviews under this Class EA)  
Ministry of Transportation  
Ministry of Municipal Affairs and Housing  
Ministry of Northern Development and Mines  
Ontario Native Affairs Secretariat  
Niagara Escarpment Commission

*Federal* (see Appendix 7, Table B for more detail)

Canadian Environmental Assessment Agency  
Fisheries and Oceans Canada  
Environment Canada  
Indian Affairs and Northern Development  
Parks Canada  
Transport Canada

### *Utilities*

Ontario Power Generation  
Hydro One Networks Limited  
Local and private electricity utilities  
Relevant gas utilities  
CN Railway

## Appendix 7: Other Relevant Federal and Provincial Legislation

The following is an outline of other federal and provincial legislation, as it may affect activities and projects conducted in provincial parks and conservation reserves. It is not an exhaustive description, and is intended for general guidance only.

### 7.1 Federal Legislation

#### *Canadian Environmental Assessment Act*

Projects that are subject to this Class EA may also be subject to the requirements of the *Canadian Environmental Assessment Act (CEA Act)*. Under the *CEA Act*, federal departments are required to conduct an environmental assessment of projects for which they are the proponent, provide funds or lands to facilitate the project, or exercise a regulatory duty that is described in the *CEA Act Law List Regulation*, in relation to the project. These are known as “triggers” to the Act. Federal departments responsible for the environmental assessment of a proposed undertaking are referred to as responsible authorities (RAs).

The Canadian Environmental Assessment Agency administers the *CEA Act* and in doing so provides advice, guidance and training to federal departments, proponents, the public and others related to the implementation and requirements of *CEA Act*. Copies of the legislation and associated regulations, as well as other helpful reference materials, are found on the agency’s web site at: <http://www.ceaa-acee.gc.ca>.

This appendix provides a brief overview of the *CEA Act* requirements. This information, however, is not all-inclusive and is to help proponents in identifying potential *CEA Act* requirements. For specific details, refer to the legislation and the Canadian Environmental Assessment Agency’s guidance material found on their web site ([www.ceaa-acee.gc.ca](http://www.ceaa-acee.gc.ca)).

Table A outlines some common potential *CEA Act* triggers, along with an associated listing of RAs. Note that the *CEA Act* does not apply if there is no trigger. For a full list of regulatory triggers, consult the annotated law list at the above noted web site. Where there is a trigger, the federal RA assesses the project

in accordance with the requirements of the *CEA Act*. Under *CEA Act*, it is the RAs responsibility to establish the scope of the project and the scope of the assessment. Proponents may, however provide input to the scope of project and scope of assessment. The RA may agree or require that additional information or issues are addressed.

Table B in this appendix provides further details on identifying federal departments who may have an interest in a project that is subject to this Class EA. These departments should be contacted as early as possible in the project planning process.

An objective of the Canadian Environmental Assessment Agency is to ensure that where a project is subject to both federal and provincial environmental assessment requirements, the environmental assessment be co-ordinated and guided by the principle of one project – one assessment, if appropriate. Therefore, for a project that is subject to this Class EA, and that also requires an assessment in accordance with *CEA Act*, the intent is that one assessment would be undertaken to meet the requirements of both processes, where possible. The Ontario Region Office of the Canadian Environmental Assessment Agency should be contacted for further details (see below).

While it is often possible to use the Environmental Study Report (ESR) prepared under this Class EA (refer to Section 4) as the basis for the *CEA Act* assessment, it should not be assumed that the ESR will always be sufficient or acceptable in all cases. Some additional information may have to be incorporated depending on what the RA requires to meet *CEA Act* requirements. The proponent should, therefore, contact the RA early in the process to confirm requirements for the assessment.

In cases where a permit or licence is required, a trigger may not be confirmed until the later stages of the planning process. Proponents are, therefore, encouraged to contact federal authorities with a potential interest in the project early in the planning process to discuss potential issues.

To determine whether a project is subject to the *CEA Act* (in addition to referring to the triggers in Table A) and to obtain further details on the requirements and implementation of *CEA Act*, MNR may contact:

Regional Director, Ontario Region Office  
Canadian Environmental Assessment Agency  
55 St. Clair Avenue East  
9th Floor, Room 907  
Toronto, Ontario, M4T 1M2

Phone: 416-952-1576  
Fax: 416-952-1573  
E-mail: [ceaa.ontario@ceaa.gc.ca](mailto:ceaa.ontario@ceaa.gc.ca)

The two most common regulatory triggers for *CEA Act* involve approvals under the *Fisheries Act* and the *Navigable Waters Protection Act*. Further details on these and other pieces of legislation are provided below.

#### ***Canadian Environmental Protection Act***

Certain guidelines, codes of practice and regulations under the Canadian Environmental Protection Act, 1999, may apply to these projects. These include, but are not limited to: Part 3, Information Gathering, Objectives, Guidelines and Codes of Practice and Part 4, Pollution Prevention, Part 7, Controlling Pollution and Managing Wastes, Part 8, Environmental Matters Related to Emergencies and applicable regulations including: *New Substances Notification Regulations*, *Chlorobiphenyls Regulations*, *Storage of PCB Material Regulations*, *PCB Waste Export Regulations*, *Export and Import of Hazardous Waste Regulations*, *Transportation of Dangerous Goods Regulations*, *Environmental Emergencies*, *Disposal at Sea* and other regulations to be developed may apply to these projects.

#### ***Fisheries Act***

The federal *Fisheries Act* gives the Minister of Fisheries and Oceans the authority to protect fish and fish habitat from destructive activities. Any works that occur in or near water may require authorization under the *Fisheries Act*. Under Section

35(1) of the Act, no person shall carry out any work or undertaking that harmfully alters, disrupts or destroys fish habitat, unless authorized by the Minister of Fisheries and Oceans Canada under Section 35(2). An authorization under Section 35(2) of the *Fisheries Act* protects an individual from prosecution under the Act, provided the conditions of the authorization are met. A Section 35(2) Fisheries Act authorization is a regulatory trigger for an environmental assessment under the *CEA Act*. It should be noted that Fisheries and Oceans Canada can refuse authorization where impacts to fish habitat are unacceptable.

In addition to Section 35, the *Fisheries Act* Sections 22(1)(2)(3), 32 and 37(2) sets out general habitat and pollution provisions which are binding on all levels of government and the public in areas such as:

- The provision of sufficient water flows.
- Passage of fish around migration barriers.
- Screening of water intakes.
- Prohibition against the destruction of fish by means other than fishing unless authorized by Fisheries and Oceans Canada.
- Restrictions on fishing near a barrier.
- Deposit of a deleterious substance into waters frequented by fish unless authorized by regulation.

These issues should be addressed early in the Class EA process. Information on the *Fisheries Act* and Fisheries and Oceans Canada's Policy for the Management of Fish Habitat are available on the Internet at: [www.dfo-mpo.gc.ca/canwaters-eauxcan](http://www.dfo-mpo.gc.ca/canwaters-eauxcan).

Section 36 of the *Fisheries Act* specifies that, unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water. If no regulation exists defining a specific substance to be deleterious, then each substance must be evaluated to determine whether it is deleterious.

### ***International Boundary Waters Treaty Act***

Works within Great Lakes inter-connecting channels\* and other boundary waters rivers\* must not obstruct, or divert waters in Canada in a manner that may affect the level or flow of boundary waters in the United States, except in accordance with a license from the Minister of Foreign Affairs. Under the International Boundary Waters Treaty Regulations, Foreign Affairs Canada is responsible for issuing permits for in-water and shoreline activities affecting levels and flows in interconnecting channels and other transboundary waters. The documentation submitted to Foreign Affairs Canada for the review of individual projects should include impact predictions, proposed mitigation/compensation measures and technical analyses to support any conclusions and final designs.

\* These waterbodies include: Rainy River, Namakan River, St. Mary's River, St. Clair River, Detroit River, Niagara River and St. Lawrence River.

### ***Migratory Birds Convention Act***

The *Migratory Birds Convention Act*, 1994, deals with the conservation and protection of listed species of migratory birds and their nests. Under the Act, release of a harmful substance into any waters or other areas frequented by migratory birds, and the "incidental take" of migratory birds and the disturbance, destruction or taking of the nest of a migratory bird are prohibited pursuant to sections 35(1) and 6, respectively, of the *Migratory Birds Regulations*. "Incidental take" is the killing or harming of migratory birds due to actions, such as economic development, which are not primarily focused on taking migratory birds.

### ***Navigable Waters Protection Act***

Construction or placement of work in, on, over, under, through or across navigable water may require approval under the *Navigable Waters Protection Act (NWPA)*. A bridge, boom, dam or causeway always requires approval. Other work (e.g., docks, pipes, spawning bed construction) requires approval unless the federal Minister or delegate is of the opinion that the work does not interfere substantially with navigation. If an approval under the *NWPA* were required, this would trigger the requirement for an assessment by the responsible federal agency under the *CEAA*. To determine whether or not a waterway or watercourse is considered to be navigable, MNR may contact the Transport Canada-Navigable Waters Protection.

### ***Species at Risk Act***

The *Species at Risk Act (SARA)*, 2003, is intended to provide protection for individuals of wildlife species at risk listed under schedule 1, parts 1-3 of the Act, their residences (dwelling places, such as a den or nest or other similar area that is occupied or habitually occupied by one or more individuals during part or all of its life cycle) and their critical habitat. Critical habitat, as it is or will be identified in species specific recovery strategies or action plans, is the part of areas used or formerly used by listed species to carry out their life processes that is deemed essential for survival or recovery. Prohibitions under *SARA* apply to federally regulated migratory birds and aquatic species and all species on federal lands.

**Table A: Potential *Canadian Environmental Assessment Act (CEAA)* Triggers**

Potential Project Trigger	Provisions of Act	Responsible Authority	Comments
<b>A CEAA screening is triggered if the project:</b>			
1. is being funded with federal money	<i>CEAA</i> s.s. 5(1)b	the funding department	<ul style="list-style-type: none"> <li>Act is triggered where federal money is being provided (e.g., Infrastructure Program projects)</li> </ul>
2. is on federal land	<i>CEAA</i> s.s.5(1)c	Federal department responsible for the implicated lands	<ul style="list-style-type: none"> <li>this would affect projects crossing federal lands such as national parks (Heritage Canada), Indian reserves (Department of Indian Affairs and Northern Development) or national defence bases (Department of National Defence)</li> </ul>
3. is likely to affect a line or property, regulated by the National Energy Board (NEB), that is used for the transmission of oil or gas	<i>National Energy Board Act</i>	National Energy Board	<ul style="list-style-type: none"> <li>may apply to highway projects requiring the re-location of a pipeline that is regulated by the NEB</li> </ul>
4. is likely to affect the operation of a railway company or property	<i>Canadian Transportation Act</i>	Transport Canada, Canadian Transportation Agency	<ul style="list-style-type: none"> <li>generally will apply to projects where a rail line crossing is contemplated</li> </ul>
5. involves the temporary storage of explosives on-site	<i>Explosives Act</i> , par. 7(1)a	Natural Resources Canada	<ul style="list-style-type: none"> <li>projects which involve blasting and will store the explosives on-site require a permit under the <i>Explosives Act</i></li> </ul>
6. involves the federal government in the acquisition, administration or disposal of real property for which a license for any use or occupation of real property is required	Federal Real Property Regulations, par. 4(2)a	Various – the Federal Department providing the licence	<ul style="list-style-type: none"> <li>would apply to projects which propose to use or occupy federal real property</li> </ul>
7. is likely to harmfully affect fish or fish habitat,	<i>Fisheries Act</i> , s.s. 22(1), 22(2), 22(3), 32, 35(2), and 37(2)	Fisheries and Oceans Canada	<ul style="list-style-type: none"> <li>applies to any work in or near water</li> <li>provision of sufficient water flow</li> <li>passage of fish around barriers</li> <li>screening of water intakes</li> <li>destruction of fish by means other than fishing (e.g. blasting)</li> <li>authorization is required to harmfully alter, disrupt, or destroy fish habitat</li> </ul>

Potential Project Trigger	Provisions of Act	Responsible Authority	Comments
<b>A CEAA screening is triggered if the project:</b>			
8. is likely to substantially interfere with the public right to navigation on water	<i>Navigable Waters Protection Act</i> , s.s. 5(1)a, 6(4), 16, and 20	Transport Canada, Navigable Waters	<ul style="list-style-type: none"> <li>applies to any work in, on, over, under, through or across navigable waters</li> <li>approval is mandatory for a new bridge, dam, boom, or causeway</li> <li>other works that cause changes to flows, water levels or navigation clearances may require approval</li> </ul>
9. is likely to take place in, involve dredge and fill operations, draw water from or discharge to a historic canal operated by Parks Canada	I.A. and N.D. Canal Land Regulations Public Lands Licensing Order Heritage Canal Regulations	Heritage Canada – Parks Canada	<ul style="list-style-type: none"> <li>potentially triggered by projects crossing the Trent Severn Waterway and Rideau Canal. The Canal Land Regulations and Public Lands Licensing Order address drainage into a canal (e.g., stormwater drains) and the Heritage Canal Regulations address dredge and fill activities (e.g., construction of bridge piers)</li> </ul>
10. is likely to affect Indian reserve lands	<i>Indian Act</i> , s.s. 28(2), 35(1), 35(2) and 39	Department of Indian Affairs and Northern Development	<ul style="list-style-type: none"> <li>would only apply to projects that are located on, or require access through, Indian reserves</li> </ul>

**Note:**

The table is not all-inclusive. It is the Responsible Authority's (RA) responsibility to confirm the application of the CEAA and to determine the scope of assessment that is to be conducted. Proponents are therefore encouraged to contact potential RAs early in the process.



## Table B: Identifying Federal Authorities

The following reference information is offered to assist proponents in establishing contact with appropriate review agencies when certain situations are identified which result in various types of environmental effects. The examples that follow are

not expected to be comprehensive. The proponent is responsible to determine the appropriate agency to contact when different situations arise and different environmental effects are identified.

Environmental Issues	Expert Federal Authority
general	Environment Canada
air	Environment Canada
land	Natural Resources Canada Environment Canada
wildlife	Environment Canada
fish and fish habitat	Fisheries and Oceans Canada
navigation	Transport Canada
species at risk	Environment Canada
soil	Agriculture Canada
forest resources	Natural Resources Canada
humans	Health Canada
water	Environment Canada Fisheries and Oceans Canada Natural Resources Canada
sustainable use	Environment Canada
human health conditions	Health Canada
socio-economic conditions	Agriculture Canada Health Canada Department of Indian Affairs and Northern Development Industry, Science and Technology Canada Natural Resources Canada
cultural resources	Canadian Heritage Department of Indian Affairs and Northern Development
Aboriginal resource use	Department of Indian Affairs and Northern Development
Aboriginal land use	Department of Indian Affairs and Northern Development
historical, archaeological, paleontological and architectural resources	Canadian Heritage Natural Resources Canada Public Works Canada
management of protected areas – national parks, national historic sites, historic rivers and heritage canals	Canadian Heritage
CEAA process and procedures	Canadian Environmental Assessment Agency
international environmental issues	Foreign Affairs and International Trade Canada Canadian International Development Agency

## 7.2 Provincial Legislation

### *Aggregate Resources Act*

The *Aggregate Resources Act (ARA)*, administered by the Ministry of Natural Resources, provides for the management of the aggregate resources of Ontario, and controls or regulates aggregate operations on crown or private lands. The operation of a wayside pit for road construction or road maintenance in certain designated parts of Ontario requires a permit under this legislation. The excavation of aggregates for other purposes, on private land, in designated parts of Ontario, requires a licence. On all Crown land, an aggregate permit is required.

### *Algonquin Forestry Authority Act*

The *Algonquin Forestry Authority Act* establishes a Crown corporation known as the Algonquin Forestry Authority (AFA) to manage forests in Algonquin Provincial Park and public lands adjacent to the park as the Minister of Natural Resources authorizes. Consistent with the *Crown Forest Sustainability Act*, 1994 and the Management Plan for Algonquin Provincial Park, the AFA harvests Crown timber and produces logs for sale, undertakes forestry, land management and other programs and projects authorized by MNR, and advises the Minister on forestry and land management programs and projects of general advantage to Ontario.

### *Drainage Act*

The *Drainage Act* balances the rights of landowners living along watercourses with the rights of property owners who do not have access to a stream or creek in order to drain their lands. This Act is administered by the Ontario Ministry of Agriculture and Food (OMAF) and provides a legal means for the construction and maintenance of sufficient outlets to drain surface and subsurface water. Municipalities are responsible for the repair and maintenance of drainage systems constructed under the *Drainage Act*.

### *Endangered Species Act*

The *Endangered Species Act* provides for conservation, protection, restoration or propagation of species of flora and fauna that are threatened with extinction in Ontario. No person shall willfully kill, injure, interfere with, or destroy any endangered species or its habitat, or risk fines of up to \$50,000 or two years in jail, or both – however, most experts prefer to use the stewardship and education approach to ensuring the protection of such species and their habitat.

### *Environmental Assessment Act*

The *Environmental Assessment Act* provides for the protection, conservation and wise management of the environment. Section 1 of the *EA Act* defines “environment” to mean:

- a) air, land or water,
- b) plant and animal life, including human life,
- c) the social, economic and cultural conditions that influence the life of humans or a community,
- d) any building, structure, machine or other device or thing made by humans,
- e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or
- f) any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

### *Environmental Bill of Rights*

The *Environmental Bill of Rights* is based on the principle that Ontario’s environment should be protected, conserved and, where reasonable, restore the integrity of the environment. In the Act, “environment” is defined as the air, land, water, plant life, animal life and ecological systems of Ontario. It provides a mechanism for the people of Ontario to become involved in environmental decision making (e.g., a person may comment on proposals for environmentally significant acts, policies, regulations or instruments that are posted on the Environmental Registry for public consultation.

### ***Environmental Protection Act***

The *Environmental Protection Act (EPA)* prohibits the discharge of contaminants into the natural environment that will or are likely to have an adverse effect. A certificate of approval would be required, for example, for a waste disposal site in a provincial park or conservation reserve. The *EPA* is administered by the Ministry of the Environment.

### ***Farming and Food Production Protection Act***

The purpose of the *Farming and Food Production Protection Act* is to give farmers protection from nuisance complaints and subsequent lawsuits or injunctions. It also ensures that the farming and food production industry is protected from restrictive municipal by-laws that constrain normal farm practices. In agricultural area, agricultural uses and normal farm practices be promoted and protected in a way that balances the needs of the agricultural community with provincial health, safety and environment concerns.

### ***Fish and Wildlife Conservation Act***

The *Fish and Wildlife Conservation Act* replaced the *Game and Fish Act* in 1997. The Act focuses on the management, perpetuation and rehabilitation of fish and wildlife resources in Ontario. Many of the changes focus on enhancing protection and management of both game and specifically protected species of wildlife, giving enforcement more teeth and improving service to the public. The act provides for hunting, trapping, fishing and related activities including: sale, purchase and transport; licensing and other authorities; administration, regulation enforcement, offences and penalties. Normally, any person who wishes to hunt or trap any animal in Ontario must first obtain a licence, and must comply with all regulations regarding bag limits, method of chase and capture, etc, except for farmers, who may do certain activities on their own lands (see 6(3) for exceptions). Section 8(3) of the act states that no person may damage or destroy a beaver dam without a trapper's licence – except to protect their own property (8(4)). All hunters and trappers must also respect the *Trespass to Property Act*, which means that they can not access private lands without the permission of the owner.

### ***Forest Fires Prevention Act***

The *Forest Fires Prevention Act* provides the mechanism for the control and use of outdoor fires. The act applies to the two fire regions, which include all lands in Northwestern, Northern, Northeastern and Central Ontario. The fire season from April 1st to October 31st may be extended by regulation. The Act establishes rules for: open burning, reporting fires, prevention measures (e.g., land clearing, smoking in the bush, etc.), and provides for Restricted Fire Zones, Emergency Area Orders and agreements.

### ***Kawartha Highlands Signature Site Park Act***

The *Kawartha Highlands Signature Site Park Act* provides for the protection of the ecological integrity of the park as the overriding priority for management, as well as protecting the natural and cultural values and traditional uses that are compatible with the natural heritage values and semi-wilderness character of the park. The Act provides for access to and enjoyment of private property and Crown lands that are subject to a land use permit, licence of occupation or lease under the *Public Lands Act* where these lands are surrounded by the park or abutting the park. It also includes provisions to ensure that public consultation will be carried on decisions related to development or any major revision to the park management plan.

### ***Lakes and Rivers Improvement Act***

The *Lakes and Rivers Improvement Act* regulates structures in and alterations to lakes, rivers and streams. It is administered by the Ministry of Natural Resources.

### ***Mining Act***

The Mining Act provides for prospecting, staking and exploration for the development of mineral resources. Prospecting or the staking out of mining claims or the development of mineral interests or the working of mines in provincial parks is prohibited except as provided by the regulations made under the Provincial Parks Act. R.S.O. 1990, c. M.14, s. 31.

### ***Niagara Escarpment Planning and Development Act***

The *Niagara Escarpment Planning and Development Act* provides for the protection and maintenance of the natural environment of the Niagara Escarpment. The Act requires municipalities and ministries in the planning area to ensure compatibility of their own planning and activities with the approved Niagara Escarpment Plan.

### ***Nutrient Management Act***

The *Nutrient Management Act* provides for the management of material containing nutrients in ways that will enhance protection of the natural environment and provide a sustainable future for agricultural operations and rural development. The Ontario Ministry of Agriculture and Food and the Ministry of Environment are responsible for governing the Act. Along with the Act itself, there is a regulation, which outlines standards, and protocols, which explain the regulation in greater detail.

### ***Oak Ridges Moraine Conservation Act***

The *Oak Ridges Moraine Conservation Act*, 2001, administered by the Ministry of Municipal Affairs and Housing, is an Act to conserve the Oak Ridges Moraine by enabling the designation of the Oak Ridges Moraine Area and the establishment of the Oak Ridges Moraine Conservation Plan. The plan is designed to protect the ecological and hydrological integrity of the Oak Ridges Moraine while providing for land and resource uses and development that are compatible with maintaining the ecological well-being of the moraine. The Act states that decisions shall conform with the Oak Ridges Moraine Conservation Plan.

### ***Ontario Water Resources Act***

The *Ontario Water Resources Act (OWRA)* provides for the protection of surface and ground water related to adverse discharges. The Act regulates the taking of water from wells or surface water sources and the treatment and disposal of sewage. It is administered by the Ministry of the Environment. Approvals that MNR may require may consist of a certificate of approval for a sewage system and/or a permit to take water. Ontario Regulation 129/04,

made under the *Ontario Water Resources Act*, governs the certification and training of both drinking water and wastewater operators.

### ***Ontario Heritage Act***

The *Ontario Heritage Act* came into force in 1975. Its purpose is to give municipalities and the provincial government powers to preserve the heritage of Ontario. The primary focus of the Act is the protection of property of cultural heritage value or interest, heritage districts and archaeological sites. The legislation also mandates the Ontario Heritage Foundation, a Crown agency, and the Conservation Review Board, a tribunal that hears objections to municipal and provincial decisions under the Act.

### ***Ontario Planning and Development Act***

The *Ontario Planning and Development Act*, 1994, permits the Minister to establish a development planning area. The Act also permits the Lieutenant Governor in Council to put in place a development plan for such a planning area. Section 14 of the Act states that if there is a conflict between a development plan and an official plan or zoning by-law covering part or all of the same area, the development plan prevails.

### ***Pesticides Act***

The *Pesticides Act* regulates the sale, use, storage, transport and disposal of pesticides in Ontario. This Act is administered by the Ministry of the Environment. Permits and licences may be required, for example, for chemical control of nuisance species.

### ***Planning Act***

The *Planning Act* guides land use development through a provincial policy-led planning system to:

- promote sustainable economic development, in a healthy natural environment;
- provide for planning processes that are fair, open, accessible, timely and efficient;
- integrate matters of provincial interest in provincial and municipal planning decisions; and,

- encourage co-operation and co-ordination among various interests.

It also recognizes the decision-making authority and accountability of municipalities in planning. Section 3 of the *Planning Act* authorizes the Minister of Municipal Affairs and Housing, together with any other minister of the Crown to issue policy statements that have been approved by the Lieutenant-Governor-in-Council. These statements provide direction on matters of provincial interest related to land use planning. In exercising any authority that affects planning matters, the council of a municipality, a local board, a planning board, a minister of the Crown, and a ministry, board, commission, or agency of the government including the Ontario Municipal Board shall “have regard to” the policy statement. This means that a decision-maker is obliged to consider the application of these policy statements when carrying out any planning activity as directed in planning documents such as Official Plans.

Under section 3(1) of the *Planning Act*, matters relating to municipal planning that are considered to be of provincial interest were integrated into the Provincial Policy Statement (PPS, 1997). The PPS outlines direction for matters such as mineral resources, natural heritage values, cultural heritage and archaeological resources, and natural and human made hazards. MNR is committed to have regard for these policies in its projects.

### ***Provincial Parks Act***

The *Provincial Parks Act* authorizes the Lieutenant-Governor-in-Council to set apart as a provincial park any area in Ontario, may increase or decrease the area of any provincial park and may delimit any provincial park. Parks may be classified as a natural environment park, a nature reserve park, a wilderness park, a recreational park, a waterways park, or a historical park. Any of these classes may be zoned with controlled uses in zones.

### ***Public Lands Act***

The *Public Lands Act* provides for:

- the management, sale and disposition of public lands and forests;
- the setting aside of lands for various uses including conservation reserves;
- the granting, sale or lease of public lands;
- the requiring of a work permit for activities on Crown lands; and,
- the release of trees reserved to the Crown on patent lands (where only some of the species have been reserved).

Under the Act, letters patent for land sold or leased may contain a condition that the land is to be used in a particular manner or a condition that the land is not to be used in a particular manner, etc. Easements in or over public lands may also be granted for any purpose.

### ***Safe Drinking Water Act***

The *Ontario Safe Drinking Water Act* provides for the protection of human health through the control and regulation of drinking water systems and drinking water testing. The Act regulates drinking water testing laboratories, operator certification, and the reporting of adverse drinking water results. The Ministry of Natural Resources would require approvals from the Ministry of the Environment for establishing, altering, or replacing a regulated system. The Ministry of the Environment administers the Act.

### ***Tourism Act***

The *Tourism Act* addresses the licensing, issuance of permits for construction, and the regulating of tourism establishments. In accordance with the regulations, MNR requires that a Resource-Based Tourism establishment be licensed by the Ministry of Tourism and Recreation.

## Appendix 8: Notification and Consultation

### 8.1 Introduction

Consultation with agencies and parties that may be affected by a project is an important part of the process of conducting project evaluations under this Class EA. Section 4 of this document identifies a discretionary point of contact for projects undergoing the screening process, and Section 5 identifies both mandatory and discretionary points of contact for Category B and C projects. The mandatory points of contact are minimum requirements, and MNR staff may provide additional consultation opportunities where MNR considers this appropriate to the scale, the level of complexity, the potential environmental effects and the level of public concern associated with each project.

This appendix provides a general outline of the role of consultation in the project evaluation and a brief summary of public consultation and dispute resolution techniques. Further guidance may be found in MNR's Public Involvement Guidelines (1991) and in current guidelines issued by the EAA Branch of the Ministry of the Environment.

Consultation is intended to achieve the following objectives:

- To provide information to agencies and interested parties regarding the characteristics of the project, the environment that may be affected (including natural, cultural, socio-economic), and its environmental effects.
- To receive information regarding potential environmental effects and concerns related to the project.
- To generate an atmosphere of trust and co-operation between the parties involved.
- To provide a forum for the exchange of ideas and suggestions regarding the problem or opportunity to be addressed and to improve the quality of decision making at each stage of the process.
- To endeavour to resolve issues and concerns early in the project evaluation process and before final decisions are made.

**Consultation is an important part of the project evaluation.**

### 8.2 Parties to Consultation

The parties to be consulted in a project evaluation may include but are not limited to:

- Aboriginal organizations and First Nations.
- Government review agencies that may have an interest (see Appendix 6).
- Affected municipalities or planning boards.
- Individual members of the public.
- Public groups that may be formed in response to the proposed project.
- Groups representing interests related to provincial parks and conservation reserves (e.g., natural environment protection, hunting, tourism, historical and cultural heritage protection).
- Companies that may be affected (e.g., forestry, resource-based tourism, mining, etc.).
- Where a project is proposed in partnership with an association or commercial entity, MNR would also consult with this partner. In some instances, the partner or co-proponent may take the lead in conducting the project evaluation under MNR's supervision.

### 8.3 Conducting Public and Agency Consultation

MNR staff should consider the following suggestions when designing consultation processes:

- Prepare a schedule of mandatory and discretionary consultation events.
- Identify the consultation methods to be used at each step.
- Clearly state the messages to be conveyed.
- Identify how concerns will be incorporated into the project evaluation process.

Consultation processes should allow for a degree of flexibility so that MNR can respond to circumstances as they arise. If the project generates a greater degree of concern than anticipated, the process may be supplemented with additional consultation steps or events, and the schedule may be modified. If there is a low level of public interest, consultation requirements

may be reduced, although the mandatory requirements must still apply. Preparation of a consultation plan is suggested for more complex situations.

In conducting public and agency consultation, it is advisable to consider the following general principles:

- Consultation should be initiated as early as possible in the process.
- Responsibility for the management of the consultation program should be assigned to an individual who is accountable for its successful implementation. More contentious projects can benefit from a consultation expert who is able to take on an independent role as facilitator between MNR and the parties, and can provide ongoing advice on appropriate consultation approaches.
- The initial mailing list should be comprehensive, and should be updated throughout the project evaluation. Lack of contact at the early stages can lead to a loss of confidence in the process among persons and agencies that do not find out about the project until significant decisions have been made. Where parties do not respond, judgement may be applied in deciding whether to exclude them from the list. The list should include relevant government agencies (per Appendix 6), municipalities, conservation authorities, local community members and groups, non-government organizations, Aboriginal organizations, and First Nations.
- Protocols or agreements may be in place for consultation with local First Nations. These should be identified and used to develop the appropriate approach.
- There should be a variety of consultation opportunities to ensure that all interested parties are able to provide input. For example, more significant projects may generate interest among parties located at some distance as well as from local communities, and their different needs should be provided for.

- The timing of consultation events should respect the needs and seasonal activities of the potential parties (e.g., cottagers, anglers and hunters, religious holidays). Adequate notice should be given.
- MNR should be clear in describing the input requested from parties at each stage of the process. Materials may include specific questions to be resolved.
- Enough information should be provided to enable parties to provide constructive input at each step. Consultation materials should be in plain language. Where additional information is requested, this should be provided in a timely manner, or as soon as it becomes available.
- An ongoing record should be kept of comments received, and MNR's responses to them.
- Parties should be informed of MNR's responses to concerns, and the ways in which their input has been incorporated into the process.
- All regulatory and policy requirements related to freedom of information and the right to privacy as well as French language services must be adhered to.
- Where possible, concerns should be resolved before decisions or recommendations that relate to them are made at a subsequent step of the process. Where concerns prove difficult to resolve, consideration should be given to the use of alternative dispute resolution methods, described below.

#### **8.4 Consultation with Aboriginal Communities**

Some projects may affect areas that are traditionally used by Aboriginal communities who hold existing Aboriginal or treaty rights, or which may be subject to a land claim.

Constitutionally protected treaty and Aboriginal rights, such as traditional harvesting activities, are often exercised on/in Provincial Crown lands and waters, including provincial parks and conservation reserves. Any project that interferes with or infringes on the exercise of these rights must be justifiable and, in that regard, the Crown has a duty to consult with the affected community.

Therefore it is advisable that consultation with Aboriginal communities occur with respect to proposed projects where there is a potential for an infringement of an existing treaty or Aboriginal right. Consultation should commence at the time of the initial project notification and be undertaken with the intent of meaningfully addressing the Aboriginal community's concerns and interests. Any consultation process undertaken will vary with the circumstances of each individual case and project. If an agreement can be reached with respect to a proposed course of action this is a preferred outcome, but is not a requirement.

The MNR or the local office of the MNR may have agreements with specific First Nations as to notice, disclosure, or consultation regarding MNR projects. The Class EA is not intended to change the notice, disclosure and consultation provisions in any such agreements.

In the event that an Aboriginal community, organization or First Nation identifies a land claim issue during the consultation process, or MNR is otherwise aware of a potential land claim issue, it is advisable that the Ontario Native Affairs Secretariat (ONAS) be contacted for advice and information.

Useful contact and related information can be found at the following Web sites.

Organization	Useful Information Provided
Ontario Native Affairs Secretariat <a href="http://www.nativeaffairs.jus.gov.on.ca/">http://www.nativeaffairs.jus.gov.on.ca/</a>	<ul style="list-style-type: none"> <li>• Ontario's Aboriginal Policy Framework</li> <li>• Information on land claims</li> <li>• Land Claim fact sheets</li> <li>• Links to Web sites pertaining to Aboriginal affairs</li> </ul>
Indian and Northern Affairs Canada <a href="http://www.inac.gc.ca">http://www.inac.gc.ca</a>	<ul style="list-style-type: none"> <li>• First Nation profiles</li> <li>• Information on land claims</li> <li>• Treaty information</li> <li>• Agreements</li> </ul>
Chiefs of Ontario <a href="http://www.chiefs-of-ontario.org">http://www.chiefs-of-ontario.org</a>	<ul style="list-style-type: none"> <li>• Tribal Council and District Chiefs contact information</li> </ul>
First Nation Information Project <a href="http://www.aboriginalcanada.com/firstnation">http://www.aboriginalcanada.com/firstnation</a>	<ul style="list-style-type: none"> <li>• First Nation directory for Ontario</li> </ul>
Ontario First Nations Technical Services Corporation <a href="http://www.ofntsc.org">http://www.ofntsc.org</a>	<ul style="list-style-type: none"> <li>• Map of Ontario's First Nations</li> <li>• Ontario First Nations and Tribal Council affiliation contact information</li> </ul>



## 8.5 Notification and Consultation Techniques

This section summarizes a variety of notification, consultation and dispute resolution techniques that are available. Further guidance may be found in MNR's "Public Involvement Guidelines" and current guidelines that may be available from the Ministry of the Environment, EAA Branch.

### 8.5.1 Notices

#### *Newspaper Advertisements*

Newspaper advertisements are normally used to provide formal notice. Their coverage is limited to the circulation area of the publication and its readers.

The title of a press advertisement must give a concise indication of what the project is and who will be affected (location). Misunderstandings can result in exclusion of parties who would otherwise wish to be involved.

The amount of information that can be conveyed is limited, but should provide contact information. Press releases and conferences can assist in spreading information about a project, but they do not comprise formal notice.

#### *Mailings*

Mailings are often used to provide formal notice, since they ensure a uniform provision of information to a known list of respondents. The scope of coverage is only as good as the mailing list. Mailings can convey large amounts of information, including reports. They should include contact information for those wishing to respond.

#### *On-site Notices*

On-site notices are limited as to how much information they can convey, but they can initiate communication with individuals who use and know the provincial park or conservation reserve, but would not otherwise have known about the project.

#### *Internet and E-mail*

The internet is increasingly used to provide a means to download and print EA-related documents from a Web site. Internet access is limited to those with access to computers with on-line connections, and only those who log on see the information unless e-mail mailing lists are used. Therefore, at this time and until electronic communications become widespread, these methods can be used to complement other traditional methods and should not be relied upon solely for notice. Provision can be made for parties to provide written consultation submissions comments via e-mail.

### 8.5.2 Consultation

#### *Public Open Houses*

Public open houses are used to convey information and to facilitate interaction with the public. They usually take the form of a display with staff or consultants available for discussion. They can include a presentation followed by questions. Where significant issues are within the mandate of an agency other than MNR, a representative of the other agency should be present to answer questions

#### *Meetings*

Public meetings alone may encourage divisiveness and encourage dispute. Often, smaller focused meetings are more successful. Where contentious issues are being dealt with, it is advisable to have a facilitator to guide the meeting process.

So-called "kitchen table" meetings provide an opportunity to discuss the concerns of a small group of individuals in an informal setting.

### *Comment Sheets*

Comment sheets enable individuals to submit views in a structured way that can be easily analysed, in a non-threatening environment. They can be submitted after the event, such as an open house, or included with a document.

Care must be taken in framing and interpreting comment sheets so that relevant information is obtained, the scope of the response is not unduly constrained, and the reasons for the response are understood.

### *Displays*

Small displays may initiate contact with those who would not otherwise have been involved and whose views are important, such as users of campgrounds and visitor centres.

### *Consultative Committees*

For larger and more complex projects, it may be appropriate to invite participation in one or more committees comprising agency, community, Aboriginal and/or interest group representatives who would act as a sounding board for ideas and solutions as they are developed through the project evaluation. The mandate of the committee must be clearly defined, and care must be taken in confirming any findings with the community as a whole.

### *Workshops and Seminars*

Workshops and seminars can be very effective in enabling improved understanding among the parties in situations where evaluation and decision making involves complex scientific or other information.

### *Site Visits*

Site visits provide an informal opportunity for MNR and the parties to exchange information about the nature and scale of the project, as it relates to its environmental setting.

### *Correspondence*

Parties should be invited to submit comments in writing at the appropriate steps during the evaluation. Agencies will normally use this method, and some Aboriginal organizations, First Nations, interest groups and individuals will prefer this approach to a comment sheet.

Reasonable deadlines should be set so that responses can be incorporated into the project evaluation process. Responses should be acknowledged if a documented response will not be provided in the near future.

### *Telephone Conversations*

While telephone conversations have the advantages of immediacy and informality, it is important that these exchanges are well documented. Where important commitments are made they should be followed up in the form of a letter.

## **8.5.3 Dispute Resolution**

MNR may opt to use alternative dispute resolution techniques (e.g., facilitation, negotiation, mediation) at any stage during a project evaluation process when other attempts to resolve issues have been unsuccessful. The *EA Act* also enables the Minister of the Environment to require mediation, which is one form of dispute resolution, before making a decision on a request for a Part II Order (refer to Section 6.6.4). Further information on alternative dispute resolution may be found in MOE guidelines (in preparation).

## Appendix 9: Sample Notices and Forms

The following examples of notices and forms are intended to illustrate how the requirements of the Class EA can be met at critical steps in the planning process. The notices describe hypothetical projects in hypothetical locations and are intended only as a

guide. Adjustments would be made to meet particular circumstances. All sample notices and forms presented here may be changed from time to time, to make them useful, effective and efficient.

The sample formats and notices contained in this appendix are:

1. **Record of Screening Process** (per Section 4.2)
2. **Public Notice Requesting Input to a Screening Process** (per Section 4.3)
3. **Category B: Public Notice** (per Section 5.1, Step 2)
4. **Category B: Record of Project Evaluation** (per Section 5.1)
5. **Category B: Notice of Completion** (per Section 5.1, Step 4)
6. **Category B: Statement of Completion** (per Section 5.1, Step 5)
7. **Category C: Initial Public Notice** (per Section 5.2, Step 2)
8. **Category C: Notice of Opportunity to Inspect Draft ESR** (per Section 5.2, Step 4)
9. **Category C: Notice of Completion, Opportunity to Inspect the Final ESR** (per Section 5.2, Step 6)
10. **Category C: Statement of Completion** (per Section 5.2, Step 7)
11. **Project Monitoring Record** (per Section 5.4)
12. **Notice of Intention to Proceed** (per Section 6.7)
13. **Notice of Revised Statement of Completion** (per Section 6.8)

# 1. Record of Screening Process (per Section 4.2)

## Step 1: Assess Project Against List of Projects (Appendix 2)

- Project is listed as Category A or D in Appendix 2 and no further screening is required to determine category. (ID # \_\_\_\_).
- Project is listed in Appendix 2 and requires screening to category. (ID # \_\_\_\_).
- Project is not listed in Appendix 2 and requires screening to determine category.

## Step 2: Prepare Project Description

<b>Name of Project</b>
Provincial Park or Conservation Reserve name and location
Purpose and rationale (problem or opportunity)
Project description, scale, duration
Study area that may be affected
Applicable MNR policies, procedures, manuals, guidelines
Other required approvals or permits
Alternatives to the project and alternative methods of carrying out the project (explain if no alternatives)

Preliminary evaluation (cost, feasibility, effectiveness, potential effects)

Applicable policies, procedures, manuals and guidelines, and other permits or approvals required to undertake the project (see Appendices 3 and 7)

Mitigation features that will apply to the design of the project

**Step 3: Assess Against Screening Criteria** (per Table 4.1)

Main potential net environmental effects (attach screening table)

Additional investigation and analysis required to confirm environmental effects

**Step 4: Assign Project to Appropriate Category**

Anticipated level of public or agency concern

This project has been assigned to Category \_\_\_\_\_.  
Brief rationale

\_\_\_\_\_  
Signature and Position (staff member who conducted the screening)

\_\_\_\_\_  
Date

**Step 5: MNR Manager Confirms or Modifies Category**

Category confirmed     Category modified and brief rationale     Category not confirmed

\_\_\_\_\_  
Signature and Position (responsible manager)

\_\_\_\_\_  
Date

Additional notes/direction for project evaluation (e.g., further studies or assessment required to confirm category, further investigation of alternatives required, etc.)

## 2. Public Notice Requesting Input to a Screening Process (per Section 4.3)

### Proposed Snowmobile Trail: Snake River Conservation Reserve, Algoma District

## Public Notice Requesting Input to a Screening Process

The Ministry of Natural Resources (MNR) invites public comment on its proposal to realign an existing snowmobile trail in the Snake River Conservation Reserve.

A screening is being conducted under the Class Environmental Assessment for Provincial Parks and Conservation Reserves to assign this project to a category for evaluation. The assigned category determines the level of detail of the evaluation and the amount of consultation. This project has been tentatively assigned to Category B on the basis that little or no public concern is anticipated with the project. MNR is requesting public input on this assignment before proceeding further.

Comments must be received within the 30-day comment period, which expires on \_\_\_\_\_.

If MNR decides that this is a Category B project, this notice will serve as the first of two notices. The second notice—a Notice of Completion—will be provided only to parties who have requested further notice. MNR may proceed to implement the project without issuing a further general notice.

For more information on the project, to submit comments or to request further notice, please contact:

Name, position

Address

Phone/Fax/E-mail address

*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*



### 3. Category B: Public Notice (Section 5.1, Step 2)

#### Dam Maintenance: Snake River Conservation Reserve, Algoma District

### Public Notice for a Category B Project Evaluation

The Ministry of Natural Resources (MNR) invites public comment on its proposal to undertake maintenance work on the Snake River dam, located xx-km east of Sudbury. This work is being undertaken in accordance with the approved management guidelines for the reserve. This minor maintenance will require MNR to lower the water level. The work is proposed to occur during the fall in order to minimize impact on area cottagers. No environmental effects are anticipated.

Comments must be received within the 30-day comment period, which expires on \_\_\_\_\_.

The proposal is being evaluated as a Category B project under the Class Environmental Assessment for Provincial Parks and Conservation Reserves. A Notice of Completion will be sent to those who submit comments or request further notice when the project evaluation is finished. MNR may proceed to implement the project without issuing a further general notice.

For more information on the project, to submit comments or to request further notice, please contact:

Name, position

Address

Phone/Fax/E-mail address

*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*



## 4. Category B: Record of Project Evaluation (per Section 5.1)

### Record of Category B Project Evaluation

(Add additional material as required)

#### Step 1: Scoping

Extent of planning and consultation previously conducted in support of the project (e.g., through a management plan process)

Description of required evaluation and consultation steps completed and remaining

#### Step 2: Public Notice (see sample #3 in Appendix 9)

- Mailing to persons and agencies with a known or potential interest (on file)
- Local newspaper advertisement(s), with an invitation to comment within 30 days (on file)

#### Step 3: Project Evaluation

##### Name of Project

Provincial Park or Conservation Reserve, Location

Purpose and Rationale (problem or opportunity)

Project Description (include alternatives to the project, alternative methods of carrying out the project, duration, and summary description of the reasons for selecting the preferred option. If alternatives were previously addressed through a planning process, a summary and reference will be included in the project file)

Study area and environment affected

Applicable MNR policies, procedures, manuals, guidelines

Other required approvals and dates when secured



Potential environmental effects (derived from the screening process, with additional information as required), including effects of the alternatives
Required mitigation, remedial and enhancement measures
Consideration of whether monitoring is required and, if so, a description of any monitoring requirements and commitments (see Section 5.4 and sample form #11 in Appendix 9)
A description of consultation conducted, issues raised and MNR's response to these issues. Changes to the project in response to input  <input type="checkbox"/> No concerns raised <input type="checkbox"/> Concerns noted above can be resolved through conditions of approval, as described above
An assessment of the project to meet its intended purpose
Determination <input type="checkbox"/> Proceed to Step 4 with evaluation <input type="checkbox"/> Elevate the project to a higher category <input type="checkbox"/> Do not proceed at this time

**Step 4: Notice of Completion** (see sample #5 in Appendix 9)

Notice and 30-day comment period not required (no public or agency requests for further information from Step 2)  
 Notice and 14-day comment period required (all comments resolved)  
 Notice and 30-day comment period required

**Step 5: Statement of Completion, Implement Project** (see sample #6 in Appendix 9)

"Statement of Completion" issued (on file) Date: \_\_\_\_\_  
 No Part II Order requests received during the 30-day period  
 Part II Order request received and resolved without elevation of the project to Category C or D or a requirement for an individual EA  
 Request for Part II Order process being followed per Section 6.6

Additional notes or direction for project implementation	
Certification <input type="checkbox"/> The project was evaluated as a Category B project in accordance with the requirements of this Class EA <input type="checkbox"/> Environmental effects are acceptable <input type="checkbox"/> Project may proceed	
_____ Signature and Position (responsible manager)	_____ Date

## 5. Category B: Notice of Completion (per Section 5.1 Step 4)

### Proposed Dam Maintenance: Snake River Conservation Reserve, Algoma District

## Notice of Completion for a Category B Project Evaluation

The Ministry of Natural Resources (MNR), Ontario Parks has completed a project evaluation for a proposal to undertake maintenance of the control dam in Snake River Provincial Park, located on Highway 105 approximately 15 kilometres north of Red Falls. The project is in accordance with the Snake River Park Management Plan, and would ensure proper and safe functioning of the dam.

A Category B project evaluation and consultation process was carried out in accordance with the Class Environmental Assessment for Provincial Parks and Conservation Reserves (Class EA), and it identified no significant environmental effects. In response to public concern about the timing of the project, the work will occur in October instead of September to lessen impact on area cottagers.

For further information on the project, to submit comments or to inspect the project file during regular office hours, please contact:

Name, position

Address

Phone/Fax/E-mail address

If there are concerns about this project that cannot be resolved in discussion with MNR, interested parties may request that the Minister of the Environment issue a Part II Order requiring an individual environmental assessment under the Environmental Assessment Act. For information on what a Part II Order request should contain, consult the Class EA. Requests must be received by the Minister of the Environment within the 30-day comment period, which expires on (insert date), and copied at the same time to MNR at the above address. The address of the Minister of the Environment is: 135 St. Clair Avenue West, 10th Floor, Toronto, ON M4V 1P5.

If no request for an individual environmental assessment is received within the 30-day period, or if a request is successfully resolved, MNR may proceed to implement the project without further public notice.

*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*



## 6. Category B: Statement of Completion (per Section 5.1 Step 5)

### Statement of Completion for a Category B Project Evaluation

Class Environmental Assessment for Provincial Parks and Conservation Reserves

#### Project Description

Maintenance of the control dam in Snake River Provincial Park, located on Highway 105 approximately 15 kilometres north of Red Falls. The maintenance work will ensure proper and safe operation of the structure.

#### Project Evaluation

The project was evaluated in accordance with the requirements for a Category B project under the Class Environmental Assessment for Provincial Parks and Conservation Reserves.

#### Part II Order Provisions

A Notice of Completion was issued on *(date)*. One Part II Order request was received, but this was satisfactorily resolved and was withdrawn by the objector within the 30-day comment period. MNR now intends to proceed with the project.

#### Note on Timing

Within five years of the approval of this Statement of Completion MNR may proceed with project implementation; after this time, the provisions of section 6.7 of the Class EA shall apply.

---

Name

Date

Position (Zone or District Manager)

Address

Copies to:

- Project file, and
- The Manager, Planning and Research Section  
Ontario Parks, Ministry of Natural Resources  
300 Water Street  
Peterborough, ON K9J 8M5

## 7. Category C: Initial Public Notice (per Section 5.2 Step 2)

### Proposed New Campground: Osprey Lake Provincial Park, District of Rainy River

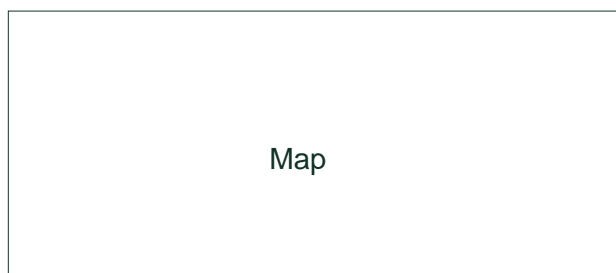
## Invitation to Comment and to Attend a Public Open House

The Ministry of Natural Resources (MNR), Ontario Parks is inviting comments on its proposal to develop a new campground at the Osprey Lake Provincial Park, located on Highway 11 approximately 10 kilometres east of Burnt River. The campground is anticipated to include xx campsites serviced with electricity and water, xx tent campsites, a playground area, a comfort station, vault privies, a boat dock, an entrance structure and road access. Water is to be provided from the Park's existing water treatment plant. The campground project is in accordance with the Osprey Park Management Plan. Several locations near the shore of Osprey Lake are under consideration, within the study area shown on the following map. Environmental effects would vary depending on the selected location and configuration of the campground.

The proposal will be evaluated as a Category C project under the Class Environmental Assessment for Provincial Parks and Conservation Reserves, which requires the preparation of an Environmental Study Report (ESR).

You are invited to attend a Public Open House to view further information and to discuss the project with MNR staff, at (*location, date, time*). Comments must be received within the 30-day comment period, which will expire on \_\_\_\_\_. A package of additional information has been prepared for interested parties. To obtain the package, to discuss the project, to provide comments or to be placed on the project mailing list, please contact:

Name, position  
Address  
Phone/Fax/E-mail address



There will be at least one additional general notice concerning this project, to be issued on the completion of a Draft ESR. Interested parties are strongly encouraged to discuss any concerns with MNR, early in the planning process.

*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*



## 8. Category C: Notice of Opportunity to Inspect Draft ESR (per Section 5.2 Step 4)

### Proposed New Campground: Osprey Lake Provincial Park, District of Rainy River

## Notice of Opportunity to Inspect the Draft Environmental Study Report and to Attend a Public Open House

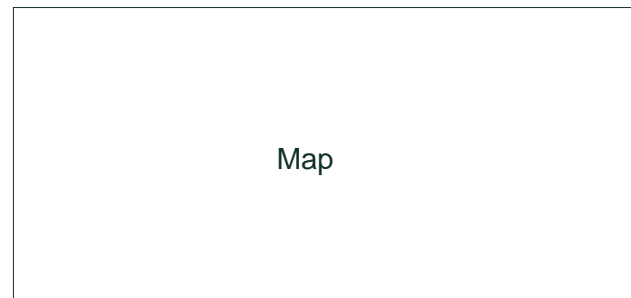
The Ministry of Natural Resources (MNR), Ontario Parks is inviting comments on a Draft Environmental Study Report (ESR) for its proposal to develop a new campground at the Osprey Lake Provincial Park, located on Highway 11 approximately 10 kilometres east of Burnt River. The campground would include xx motor vehicle and trailer campsites serviced with electricity and water, xx tent campsites, a play area, a comfort station, vault privies, a boat dock, an entrance structure and road access. Water would be provided from the Park's existing water treatment plant. The campground is in accordance with the Osprey Park Management Plan. The Draft ESR was prepared in accordance with the Class Environmental Assessment for Provincial Parks and Conservation Reserves. It describes the process for the selection of a preferred location and alternative, the development of a site plan and an evaluation of environmental effects. The preferred location is shown on the following map.

You are invited to attend a Public Open House to view further information and to discuss the project with MNR staff, at (*location, date, time*). Comments must be received within the 30-day comment period, which will expire on\_\_\_\_\_.

To obtain the Draft ESR (a copy may be included with the mailed version of the notice), to discuss the project, or to be placed on the project mailing list, please contact:

Name, position  
Address  
Phone/Fax/E-mail address

Interested parties are strongly encouraged to discuss any concerns with MNR at this time.



*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*

## 9. Category C: Notice of Completion, Opportunity to Inspect the Final ESR

(per Section 5.2 Step 2)

### Proposed New Campground: Osprey Lake Provincial Park, District of Rainy River

## Notice of Completion, Opportunity to Inspect the Final Environmental Study Report

The Ministry of Natural Resources (MNR), Ontario Parks invites inspection of the Final Environmental Study Report for its proposal to develop a new campground at the Osprey Lake Provincial Park, located on Highway 11 approximately 10 kilometres east of Burnt River. The campground would include xx motor vehicle and trailer campsites serviced with electricity and water, xx tent campsites, a play area, a comfort station, vault privies, a boat dock, an entrance structure and road access. Water is to be provided from the Park's existing water treatment plant. The campground is in accordance with the Osprey Park Management Plan. A Final Environmental Study Report (ESR) for the campground has now been completed, as required for a Category C project by the Class Environmental Assessment for Provincial Parks and Conservation Reserves (Class EA). The Final ESR describes the process for the selection of a preferred location, the development of a site plan and an evaluation of environmental effects.

To obtain the Final ESR (*a copy may be included with the mailed version of the notice*), to discuss the project, to provide comments or to inspect the project file during normal office hours, please contact:

Name, position

Address

Phone/Fax/E-mail address

If there are concerns about this project that cannot be resolved in discussion with MNR, interested parties may request the Minister of the Environment to issue a Part II Order requiring an individual environmental assessment under the *Environmental Assessment Act*. For information on what a Part II Order request should contain, consult the Class EA. Requests must be received by the Minister of the Environment within the 30-day comment period, which expires on \_\_\_\_\_, and copied at the same time to MNR at the above address. The address of the Minister of the Environment is: 135 St. Clair Avenue West, 10th Floor, Toronto, ON M4V 1P5.

Interested parties are strongly encouraged to discuss any concerns with MNR before requesting an individual environmental assessment. If no request is received within the 30-day period, or if a request is successfully resolved, MNR may proceed to implement the project without further public notice.

*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*



## 10. Category C: Statement of Completion (per Section 5.2 Step 7)

### Statement of Completion of an Environmental Study Report for a Category C Project

Class Environmental Assessment for Provincial Parks and Conservation Reserves

#### Project Description

The project comprises a new campground at the Osprey Lake Provincial Park, located on Highway 11 approximately 10 kilometres east of Burnt River. The campground will include xx motor vehicle and trailer campsites serviced with electricity and water, xx tent campsites, a play area, a comfort station, vault privies, a boat dock, an entrance structure and road access. Water would be provided from the Park's existing water treatment plant.

#### Project Evaluation

The project was evaluated in accordance with the requirements for a Category C project under the Class Environmental Assessment for Provincial Parks and Conservation Reserves.

#### Part II Order Provisions

A Notice of Completion and Opportunity to Inspect the Final ESR was issued on (*date*). One Part II Order request was received, but this was satisfactorily resolved and was withdrawn by the objector within the 30-day comment period. MNR now intends to proceed with the project.

#### Note on Timing

Within five years of the approval of this Statement of Completion MNR may proceed with project implementation; after this time, the provisions of section 6.7 of the Class EA shall apply.

I certify that the above is correct.

---

Name

Position (Zone or District Manager)

Address

---

Date

Copies to:

- Project file, and
- The Manager, Planning and Research Section  
Ontario Parks, Ministry of Natural Resources  
300 Water Street  
Peterborough, ON K9J 8M5
- MOE Environmental Assessment & Approvals Branch

## 11. Format for Project Monitoring Requirements (per Section 5.4)

### Project Monitoring Record

Name of Project
Location (Park/Conservation Reserve, Zone/District)
Project Category

The need for monitoring has been considered in the project evaluation, as follows:

- Monitoring is not required. Provide justification below:
- Monitoring is required, as outlined in the following monitoring plan.

Monitoring Objectives
Monitoring Requirements <ul style="list-style-type: none"><li><input type="checkbox"/> Pre-implementation phase</li><li><input type="checkbox"/> Project implementation phase</li><li><input type="checkbox"/> Post-implementation (operations) phase</li></ul>
Purpose: Potential Effects to be Monitored (list) <ul style="list-style-type: none"><li>• Item 1</li><li>• Item 2 (etc.)</li></ul>
Item 1: ( <i>name of potential effect</i> ) <ul style="list-style-type: none"><li>(a) <b>Acceptable Outcome:</b> the predicted effects to be monitored and the range of acceptable outcomes (based on pre-project inventory where required)</li><li>(b) <b>Monitoring Methods:</b> the protocols to be used (techniques, equipment, measurements/indicators, duration, frequency, etc.)</li><li>(c) <b>Reporting:</b> a description of when and how interim and final reporting will be completed (see Section 5.4 for reporting needs)</li></ul>
Item 2: (per outline above)

\_\_\_\_\_  
Signature and Position (responsible manager)

\_\_\_\_\_  
Date

Copies to:

- Project file, and
- The Manager, Planning and Research Section, Ontario Parks



## 12. Notice of Intention to Proceed Following Expiry of Project Approval (per Section 6.7)

### Proposed New Campground: Osprey Lake Provincial Park, District of Rainy River

#### Notice of Intention to Proceed

The Ministry of Natural Resources (MNR) is seeking comments on its intention to proceed with plans to develop a new campground at the Osprey Lake Provincial Park. The park is located on Highway 11 approximately 10 kilometres east of Burnt River. The campground would include xx motor vehicle and trailer campsites serviced with electricity and water, xx tent campsites, a playground area, a comfort station, vault privies, a boat dock, an entrance structure and road access. Water is to be provided from the Park's existing water treatment plant. The campground is provided for in the Osprey Park Management Plan.

The project evaluation met the requirements for a Category C project in the Class Environmental Assessment for Provincial Parks and Conservation Reserves (Class EA) on \_\_\_\_\_ (insert date), with the filing of a Statement of Completion. The Class EA requires that a new notice must be issued if more than five years elapse between completion of the process and the start of construction. The implementation of the project has been deferred due to reassignment of priorities within MNR, however the Ministry now wishes to proceed. The project and its potential environmental effects remain unchanged. To obtain the Final Environmental Study Report (ESR), to discuss the project, or to submit comments, please contact:

Name, position

Address

Phone/Fax/E-mail address

If there are concerns about this project that cannot be resolved in discussion with MNR, interested parties can request the Minister of the Environment to issue a Part II Order requiring an individual environmental assessment under the *Environmental Assessment Act*. For information on what a Part II Order request should contain, consult the Class EA. Interested parties are strongly encouraged to discuss any concerns with MNR before requesting an individual environmental assessment. Requests must be received by the Minister of the Environment within the 30-day comment period, which expires on \_\_\_\_\_, and copied at the same time to MNR at the above address. A request should describe any changes in circumstances affecting the project since the initial Statement of Completion that would justify the request. If no request is received within the 30-day period, or if it is successfully resolved, MNR may proceed to implement the project without further public notice. The address of the Minister of the Environment is: 135 St. Clair Avenue West, 10th Floor, Toronto, ON M4V 1P5.

*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*



## 13. Notice of Revised Statement of Completion (per Section 6.8)

### Proposed New Campground: Osprey Lake Provincial Park, District of Rainy River

## Notice of Revised Statement of Completion

The Ministry of Natural Resources (MNR) is seeking comments on its proposal to modify an approved project for a new campground at the Osprey Lake Provincial Park. The Park is located on Highway 11 approximately 10 kilometres east of Burnt River. The original proposal met the requirements of the Class Environmental Assessment for Provincial Parks and Conservation Reserves (Class EA) with the filing of a Statement of Completion for a Category C project evaluation on \_\_\_\_\_ (insert date).

Due to changes in demand, it is proposed to increase the approved number of motor vehicle and trailer campsites from 50 to 70. Other aspects of the project are unchanged. This modification would require an increase in the footprint of the campground of approximately 0.5 ha. The additional area would displace emergent vegetation, and would not result in any significant increase in environmental effects.

To obtain the revised Environmental Study Report (ESR), to discuss the project, or to submit comments, please contact:

Name, position

Address

Phone/Fax/E-mail address

If there are concerns about this project that cannot be resolved in discussion with MNR, an interested person may request the Minister of the Environment to require the project to comply with Part II of the *Environmental Assessment Act*. For information on what a Part II Order request should contain, consult the Class EA. Requests must be received by the Minister of the Environment within the 30-day comment period, which will expire on \_\_\_\_\_, and copied at the same time to MNR at the above address. A request should describe how the proposed changes justify a Part II Order. Interested parties are strongly encouraged to discuss any concerns with MNR before making a request. If no request is received within the 30-day period, or if a request is successfully resolved, MNR may proceed to implement the project. The address of the Minister of the Environment is: 135 St. Clair Avenue West, 10th Floor, Toronto, ON M4V 1P5.

*This information is being collected for the purpose of planning and implementing a Class EA project for a provincial park or conservation reserve in accordance with the Environmental Assessment Act and the Provincial Parks Act or Public Lands Act. All input and contact information such as name and address will become part of the public record for this project and administration of the Class EA, unless privacy is requested, pursuant to the Freedom of Information and Protection of Privacy Act. For more information on the collection and use of personal information, contact: [insert title, address and telephone number of contact person].*



51428

(1 k P.R. 01 18 05)

ISBN 0-7794-3848-5

**A Reconnaissance  
Life Science Inventory**

of the  
**Komoka Park Reserve**

and the  
**Komoka Park  
Area of Natural and  
Scientific Interest (A.N.S.I.),**

**R. Klinkenberg  
Southwestern Region  
London**



**Ontario**

**Ministry of  
Natural  
Resources**

**Hon. Vincent G. Kerrio  
Minister  
Mary Mogford  
Deputy Minister**

Additional copies available from

Ministry of Natural Resources  
Aylmer District  
353 Talbot Street West  
Aylmer, Ontario  
N5H 2S8

Telephone (519) 773-9241

©1985 Government of Ontario  
Printed in Ontario, Canada

## PREFACE

Klinkenberg, R. 1985. A Reconnaissance Life Science Inventory of the Komoka Park Reserve and Komoka Park Reserve Area of Natural and Scientific Interest. Ontario Ministry of Natural Resources, Southwestern Region, London, Ontario.

---

A reconnaissance life science inventory was conducted for the five areas of Crown land and small riverine islands located within the Komoka Park Reserve Proposed Acquisition Area Boundary. In addition, the main features of the Komoka Park Reserve Area of Natural and Scientific Interest (ANSI) were assessed, and a final boundary for the ANSI has been proposed. The boundaries of the park reserve and the ANSI overlap, and the ANSI generally lies within the park reserve.

The field work for this study was initiated in 1981, and the inventory report completed in 1985. Baseline data was collected for the Crown land properties of the park reserve, with some additional information collected for the ANSI area. The ANSI is both privately and publicly owned.

A checklist of vascular plants was initiated for areas of Public Land, and the plant communities of the area were mapped. Faunal information was compiled from the literature and from discussions with knowledgeable local individuals. Where possible, vegetation mapping on private property is provided based upon aerial photo interpretation and limited field work.

In addition to the significant vegetation features of this study area, twelve rare vascular plants species (Ontario) (Canada) have been discovered, and five plant species which are new to Middlesex County are reported. The site supports a strong complement of Carolinian flora and many prairie associates.

Three species of fauna which are considered rare or threatened in Ontario or Canada have been recorded for the Komoka study area. The site also offers representation of regionally significant earth science features and significant archaeological features.

The Komoka Park Reserve ANSI and the Komoka Sand Plain Forest are recommended as areas of Nature Reserve Zone within the Park Reserve. Sensitive and significant areas within the Park Reserve also comprise the significant features of the ANSI, and include wet areas, valley and ravine slopes, and wet clay seepage areas. An addition to the ANSI is proposed in order to complete feature representation. A volunteer agreement with local naturalists is proposed as a means of maintaining and accumulating data on this significant natural area, particularly for faunal groups.

## ACKNOWLEDGEMENTS

I would like to thank the many people who contributed information, field assistance, technical assistance and guidance during the course of this project. Bill Crins, Dave McLeod, Tony Reznicek, Mike Oldham, Gary Allan, and Sandy Sutherland assisted with plant identification and verification; Paul Maycock provided information on the Komoka Sand Plain Forest; Eileen Stewart and Frank Cook provided background information on previous botanical work in the area; Peter Reade, Bill Jarman, Bill Girling and John Cartwright provided information on the birds of the study area; Alwynne Beaudoin provided field assistance and confirmation of physical features of the site; Dave Ward, Kevin Hawthorne and Ron Spurr provided background information on the area; Judy Rhodes provided field assistance as well as background information on the physical features of the site; Brian Klinkenberg, Cathy Meathrel and Marilyn Ball provided field assistance; Earl Livermore provided information on wildlife; D. van Vrouwerff provided information on forestry; Bob Moos and Jane Shannon prepared the mapwork for the report; Paul Prevett, Gene Murphy, Ernie Martelle and Tom Beechey provided overall project administration. Preliminary field work on the Komoka Park Reserve Public Land Properties was done by Marcy Smith and Elizabeth Strebe.

Particular thanks are due to Brian Klinkenberg for continued field assistance since the initiation of the project, and for his review of the draft manuscript.

## TABLE OF CONTENTS

PREFACE . . . . .	i
ACKNOWLEDGEMENTS . . . . .	ii
TABLE OF CONTENTS . . . . .	iii
LIST OF FIGURES . . . . .	v
<b>CHAPTER 1: REGIONAL BACKGROUND . . . . .</b>	<b>1</b>
1.1 Introduction . . . . .	1
1.2 Regional Life Science Overview . . . . .	5
1.3 Regional and Local Earth Science Overview . . . . .	8
1.4 Present Land Uses . . . . .	16
<b>CHAPTER 2: VEGETATION AND FLORISTICS . . . . .</b>	<b>18</b>
2.1 Introduction . . . . .	18
2.2 Plant Community Descriptions . . . . .	21
2.3 Floristics . . . . .	37
<b>CHAPTER 3: FAUNA . . . . .</b>	<b>38</b>
3.1 Introduction . . . . .	38
3.2 Birds . . . . .	38
3.4 Reptiles and Amphibians . . . . .	39
3.5 Fish . . . . .	39
<b>CHAPTER 4: SIGNIFICANT FEATURES AND PLANNING CONSIDERATIONS . . . . .</b>	<b>40</b>
4.1 Significant Features . . . . .	40
4.1.1 Significant Vegetation-Landforms . . . . .	40
4.1.2 Significant Flora . . . . .	40
4.1.3 Significant Fauna . . . . .	42
4.2 Study Area Evaluation . . . . .	44
4.2.1 Introduction . . . . .	44
4.2.2 Feature Representation/Boundary Evaluation . . . . .	45
4.3 Development Constraints . . . . .	45
4.4 Summary . . . . .	46
4.5 Planning Considerations . . . . .	48
GLOSSARY . . . . .	51
APPENDIX A: TERMS OF REFERENCE . . . . .	53
APPENDIX B: METHODOLOGY . . . . .	54
APPENDIX C: CHECKLIST OF VASCULAR PLANTS . . . . .	55
APPENDIX F2: PRELLIMINARY CHECKLIST OF MAMMALS . . . . .	73



APPENDIX F3: PRELIMINARY CHECKLIST OF REPTILES AND AMPHIBIANS . . . . .	74
APPENDIX G: ANSI SELECTION CRITERIA . . . . . and ANSI Checksheet	78
Bibliography . . . . .	81

LIST OF FIGURES

<u>Figure #</u>		<u>Page #</u>
1	Regional Setting . . . . .	2
2a	Proposed Komoka Park Reserve Boundaries. . . . .	3
2b	Komoka Park Reserve Area of Natural and Scientific Interest (ANSI) Boundary. . . . .	4
3	Forest Regions of Ontario. . . . .	6
4	Site Regions and Site Districts of Southern Ontario. . . . .	7
5	Bedrock Geology of Southwestern Ontario. . . . .	10
6	Physiography of Middlesex County . . . . .	11
7	Physiography of Komoka Park Reserve. . . . .	12
8	Topography and Drainage of Komoka Park Reserve	13
9a	Topography and Contours of Komoka Park Reserve	14
9b	Earth Science Inventory Checklist (Komoka) . . . . .	15
10	Present Land use Komoka Park Reserve . . . . .	17
11	Vegetation Matrix -- Komoka Study Area . . . . .	20
12	Vegetation, Significant Features and ANSI Boundary Proposals (see back pocket) . . . . .	--
13	Development Constraints and Site Sensitivity (Available Upon Request)	--

LIST OF TABLES

<u>Table #</u>		<u>Page #</u>
1	Rare Vascular Plants of the Komoka Study . . . . . Area	41
2	Plants New to Middlesex County . . . . .	41
3	Rare Fauna of the Komoka Study Area. . . . .	43



## CHAPTER 1: REGIONAL AND PHYSICAL BACKGROUND

### 1.1 Introduction

The study area is located approximately 4 km west of London, in Delaware and Caradoc Townships, Middlesex County, Ontario (Figure 1), and includes the proposed Komoka Park Reserve (Figure 2a)--a proposed recreation class provincial park (OMNR, 1983)--and the Komoka Park Reserve Area of Natural and Scientific Interest (ANSI) (Figure 2b). The ANSI lies generally within the Park Reserve, with only small sections occurring outside the Park Reserve boundary.

The site straddles the Thames River from the Kilworth Bridge on County Road 14 to the Komoka bridge on the southwest. The nearest population centres are the Village of Kilworth on the northeast and the Town of Komoka on the Northwest.

The preliminary boundary for the Komoka Park Reserve ANSI was mapped by Hanna (1984) at a scale of 1:50,000. This boundary was assessed during this inventory and a final boundary is proposed. Field work was carried out on publicly owned and accessible portions of the ANSI, while air photos and limited site assessment were used for privately owned portions. Detailed inventory of the Park Reserve was carried out only in areas of public land.

The UTM grid reference number for this site is 670550 (Map Sheet 40 I/14, St. Thomas), and the 1978 airphoto coverage for the area is:

4265	210	45 - 48
4266	260	90 - 94
4267	197	97 - 99

Figure 1 - Regional Setting

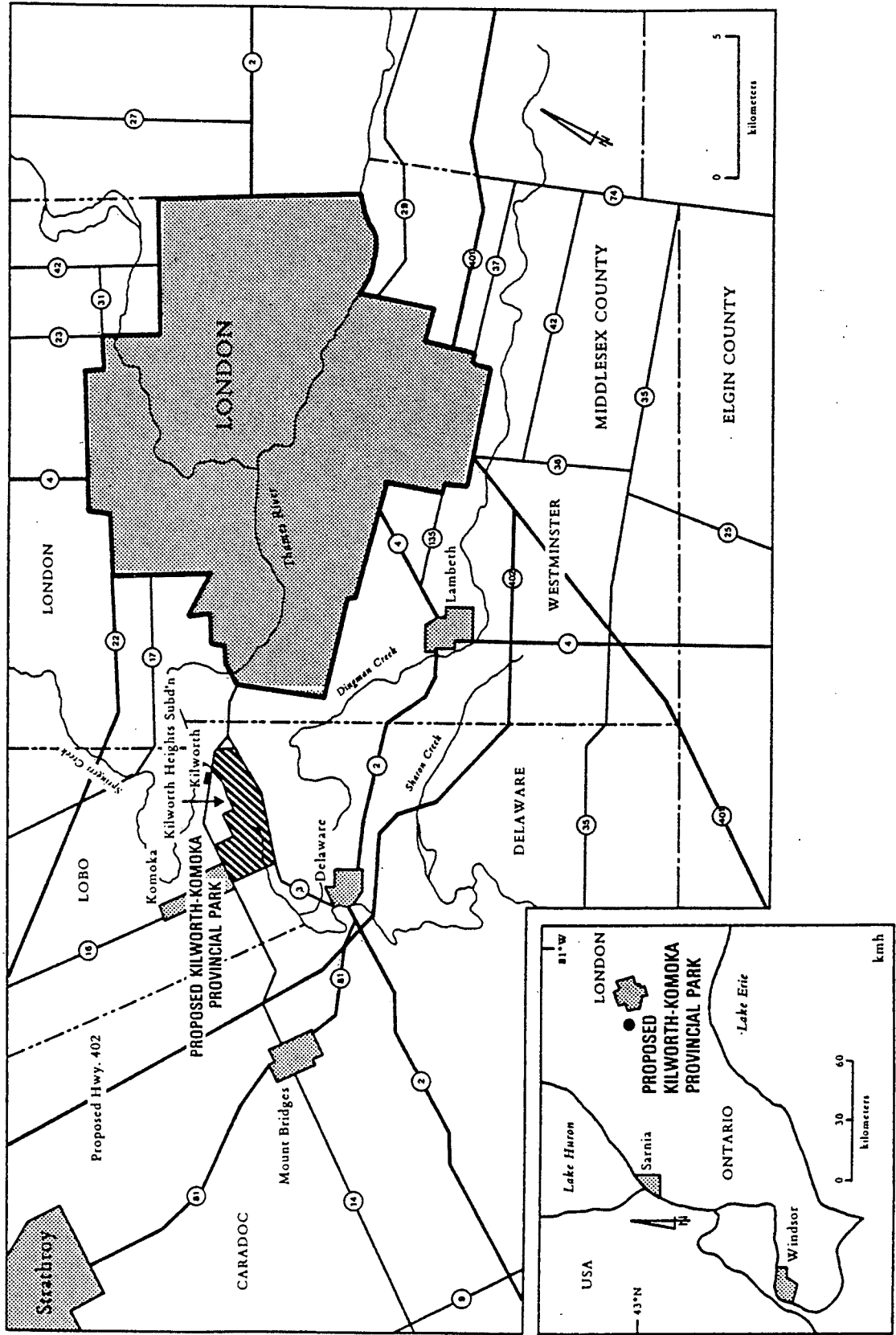
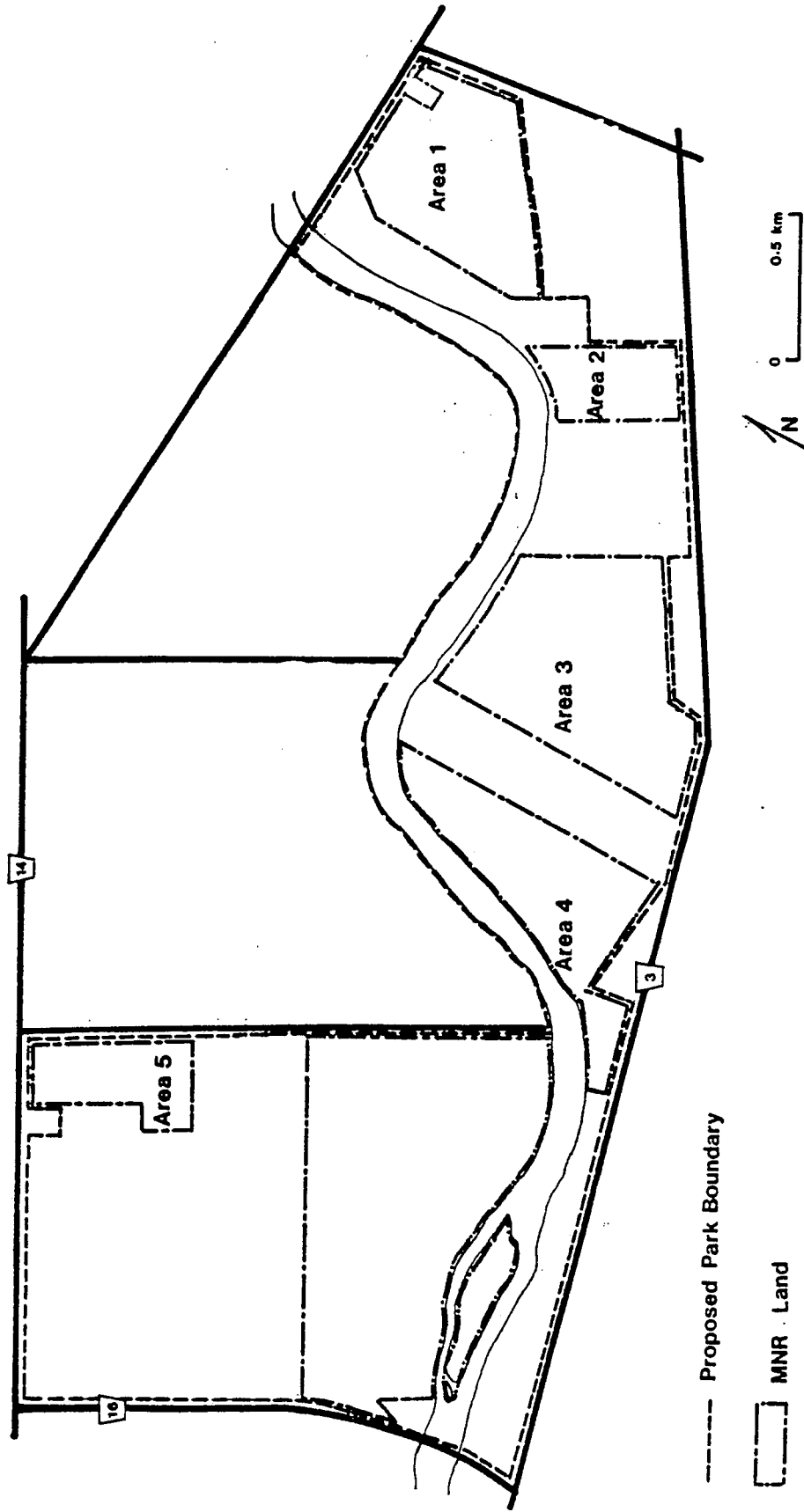


Figure 2a: Proposed Komoka Park Reserve Acquisition Boundaries



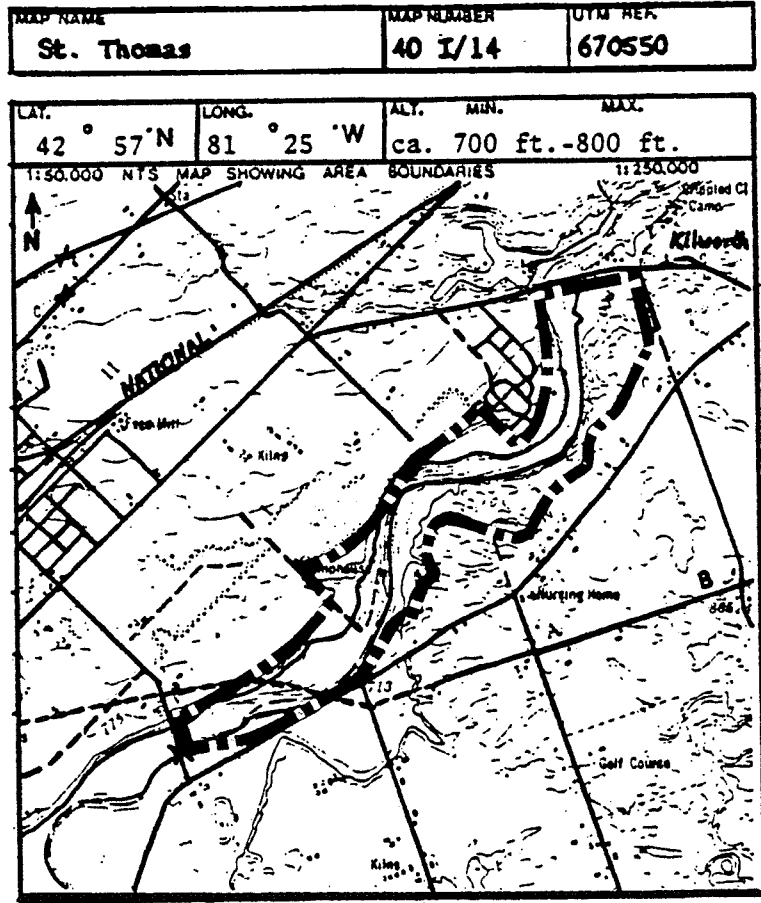


Figure 2b - Komoka Park Reserve and Adjacent Lands Area of Natural and Scientific Interest (ANSI)

— ■ ■ ■ ANSI boundary

Source: Hanna, 1984

## 1.2 Regional Life Science Overview

The study area lies within the Deciduous Forest Region of Canada as defined by Rowe (1972), the Beech-Maple Forest Region as defined by Braun (1950), and within Site Region 7, Site District 7-6 as defined by Hills (1959). Maycock (1963) indicates that Hills' Site Region 7(E) corresponds with Rowe's Deciduous Forest Region. Hanna (1980) provides an overview and evaluation of the natural features of Site District 7-6.

The site also lies within the Carolinian Floristic Zone as defined by Fox and Soper (1954) and supports numerous Carolinian species. In addition to this species complement, many northern species of flora are found in Komoka. This combination of northern/southern species is indicative of the range of microclimatic features found in the site.

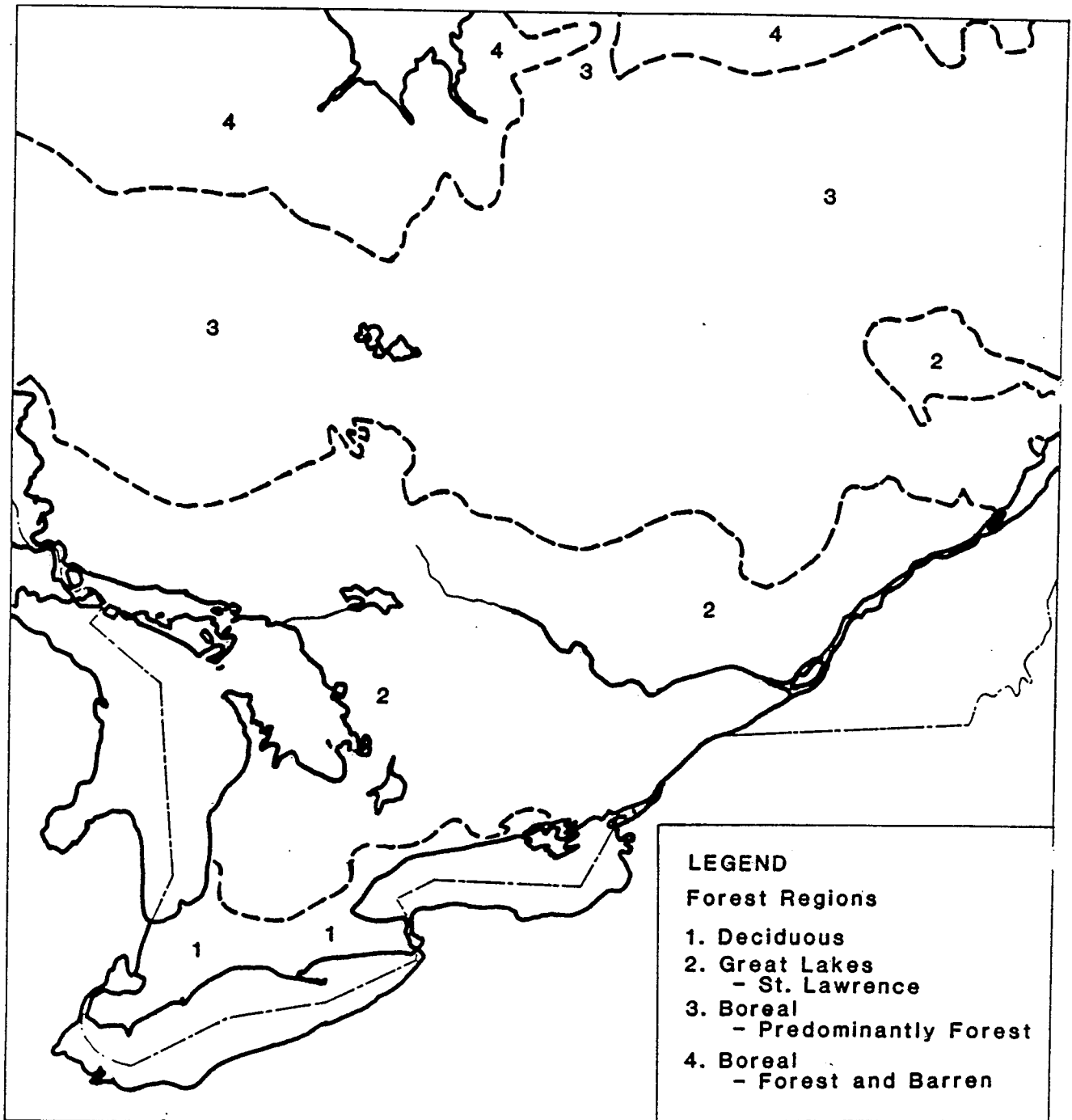
The vegetation of the Deciduous Forest Region in Canada has been described by Maycock (1963, 1975) as primarily broad-leaved deciduous, with an estimated total vascular flora of circa 2200 species. He indicates that forest composition on a broad scale in this Region is generally dependent upon varying moisture conditions which result from variation in topographic, soil and drainage patterns. Well-drained drier sites generally support oaks and hickories (commonly Quercus rubra, Q. velutina and Carya ovata). Upland moist sites generally support stands of maple-beech (Acer saccharum - Fagus grandifolia). Wetter sites support elm, ash and red maple (Ulmus americana, Fraxinus americana and Acer rubrum) in lowland areas, and willows and cottonwood (Salix nigra, S. amygdaloides and Populus deltoides in bottomland sites.

Species which have their main Canadian distribution in the Deciduous Forest Region include: swamp white oak, sycamore and shagbark hickory. Several southern species, such as tulip tree, pawpaw and black gum, are found only in this Forest Region in



Figure 3

# Deciduous Forest Region

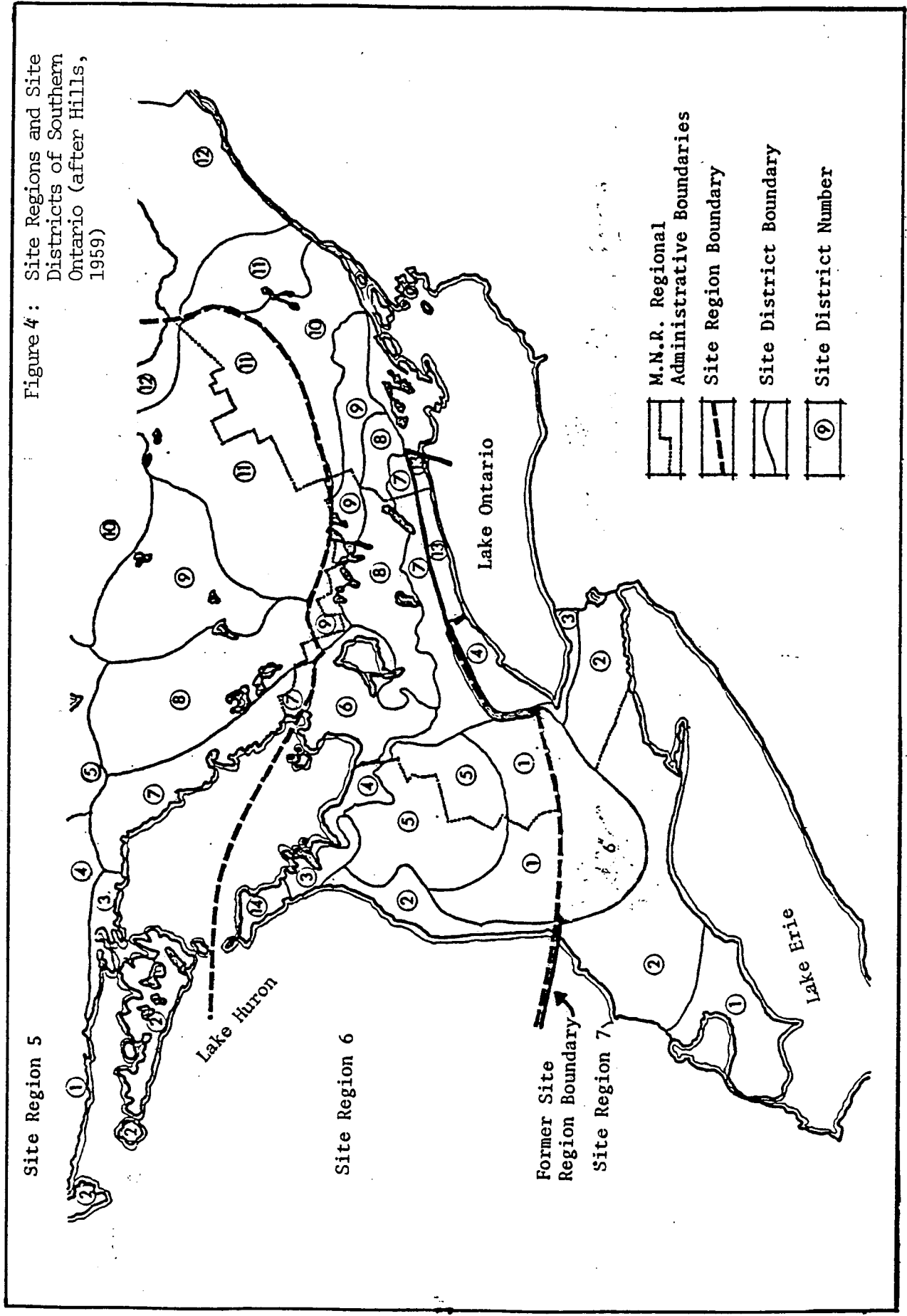


Scale 1:6,666,666

North

After Rowe, 1972

Figure 4: Site Regions and Site Districts of Southern Ontario (after Hills, 1959)



Canada, where they reach their northern limits of distribution. Rowe (1972) indicates that the presence of such species in this Region indicates the close affinity of the Canadian Deciduous Forest with the forests of the east-central United States.

Several life science works are relevant to this study, including McLeod and Cook (in prep.); Hanna (1980); Jarman (n. d.); Hawkins (1981); Saunders and Dale (1933); Judd (1981); and Campbell (1977). Judd (1981) provides a comprehensive bibliography of the literature which deals with the Middlesex County area.

### 1.3 Regional and Local Earth Science Overview

Rhodes (1982) indicates that this site supports diverse and regionally significant earth science features. Several works deal with the regional and local earth science features of the Komoka area. Hawthorne (1978) discusses physiography, topography and drainage, and glacial history of the region and of the site. Pinder (1975) discusses the deltaic formations of Komoka, with an overview of general geology and glacial history of the area. Tracey (1974) briefly outlined the earth science features of the site:

In general, the Komoka area shows an unusually good sequence of features associated with rising and falling glacial lakes. Of special interest is the deltaic sequence relating to each glacial lake level and the distributing channels which are still preserved. The occurrence of such a major delta complex relating to so many glacial lake levels is indeed rare, making Komoka Park Reserve a very special area from an earth science point of view. Also of great interest is the series of terraces associated with the Thames River. The different terrace levels provide clues to the history of the Thames when it served as a glacial spillway. The down cutting of the Thames through the deltaic complex has provided excellent profiles of the different deltaic features for scientific and educational purposes. The sequence of terrace beaches leading down to the river is also important. It is unlikely that an equivalent site exists.

Tracey (1974) summarized the site features as follows: glacial spillway terraces (several at least); deltaic deposits (associated with glacial lakes Maumee II, Arkona, and Whittlesey); distributionary channels (associated with the Lake Arkona delta); beach formation (associated with Lake Whittlesey).

The features have also been summarized by (O.M.N.R. 1980):

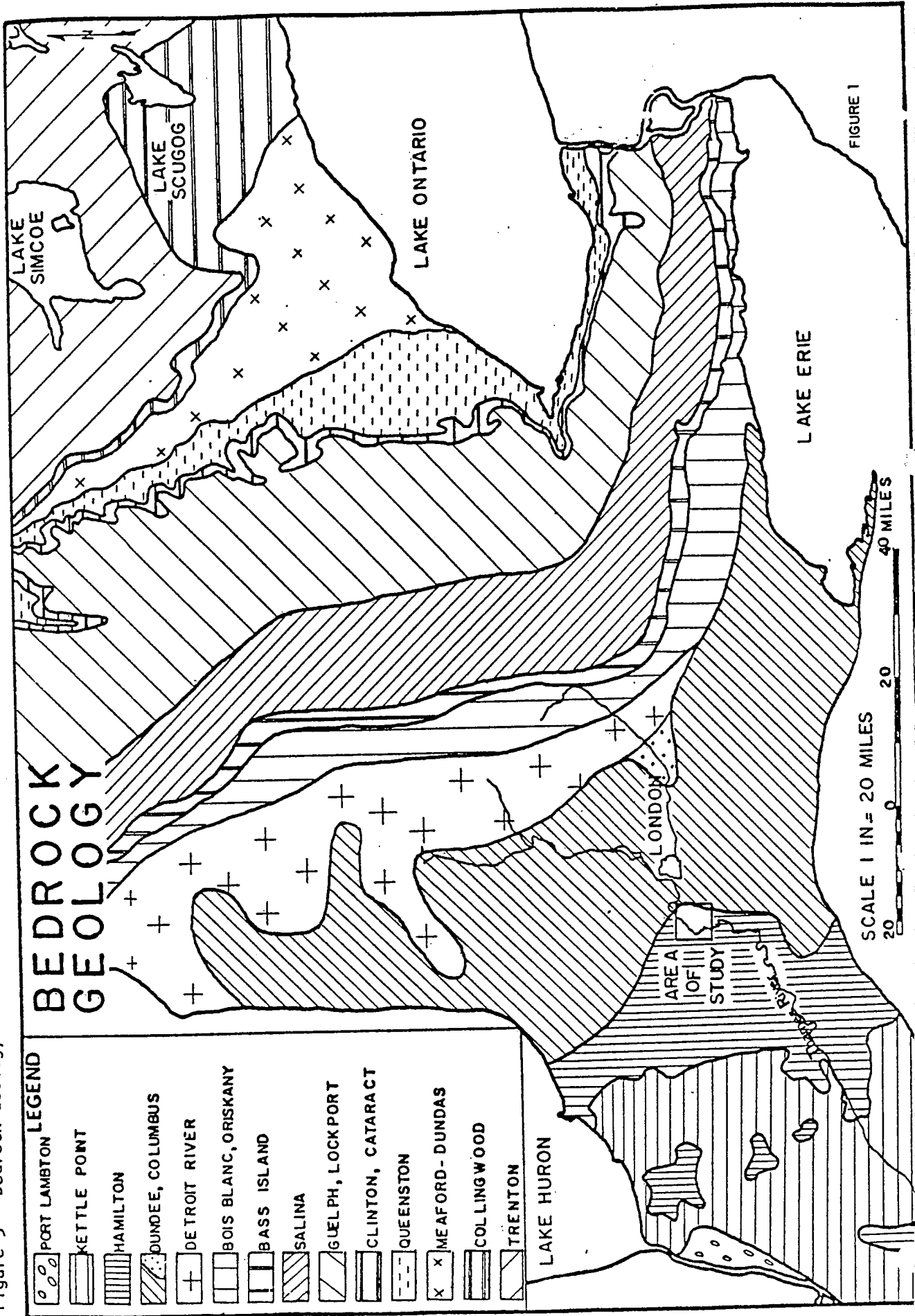
This park reserve contains deposits of the Komoka delta formed between 14,800 and 12,500 years ago. Deposits of the post-glacial Lake Maumee II delta, and the post-glacial Lake Whittlesey shoreline and deltaic deposits, are well exposed....The glacial history of the Komoka Delta and the interactions of the Huron and Erie Lakes in the London area is..... intricate... This would be considered a regionally significant site.

Highly calcareous seepage areas occur along the north bank of the river in this area. These seepage areas support calciphilic vegetation -- in particular mosses and liverworts (Hawthorne, 1978).

The diverse physical features of the site contribute directly to the diversity of the life science features. In addition, the combination of topography and drainage (steep unstable slopes and perched water tables) places development constraints on the site. Development constraints were mapped by Tracey and Beechey (1974). Their map, with some modification, is included in this report as Figure 13 (available upon request).

The physical features of Komoka have been mapped by several authors, and the following maps have been included: Bedrock Geology of Southwestern Ontario (Fig. 5), Physiography of Middlesex County (Fig. 6), Physiography of Komoka Park (Fig. 7), Topography and Drainage of Komoka Park (Fig. 8), and Topography and Contours of Komoka Park (Fig. 9a). In addition, an excellent map showing the contours of the park reserve area (scale: 1" = 200 feet) was prepared by the Northway Survey Company in 1975 (Figure 9b); copies are available upon request.

Figure 5 - Bedrock Geology of Southwestern Ontario



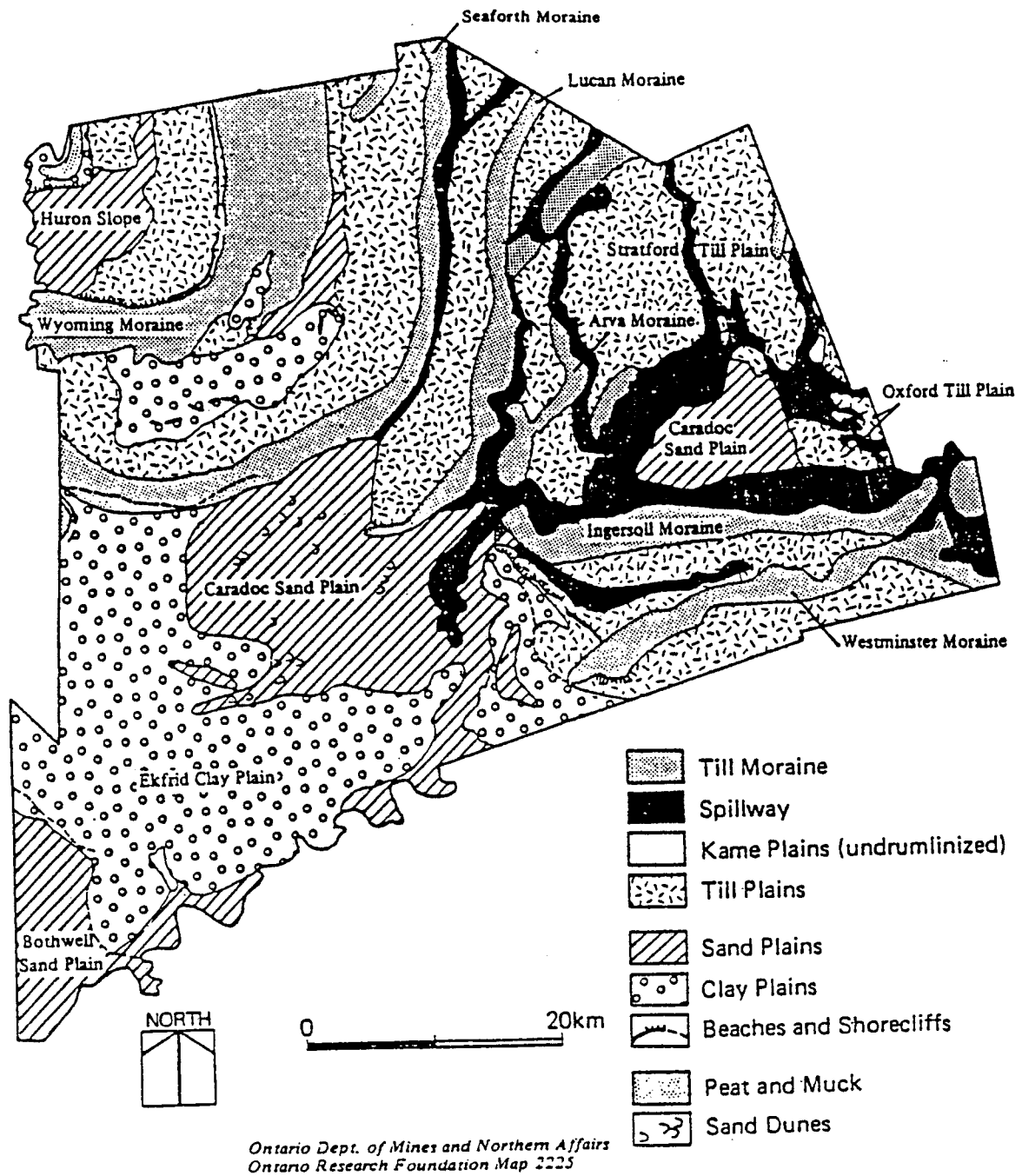
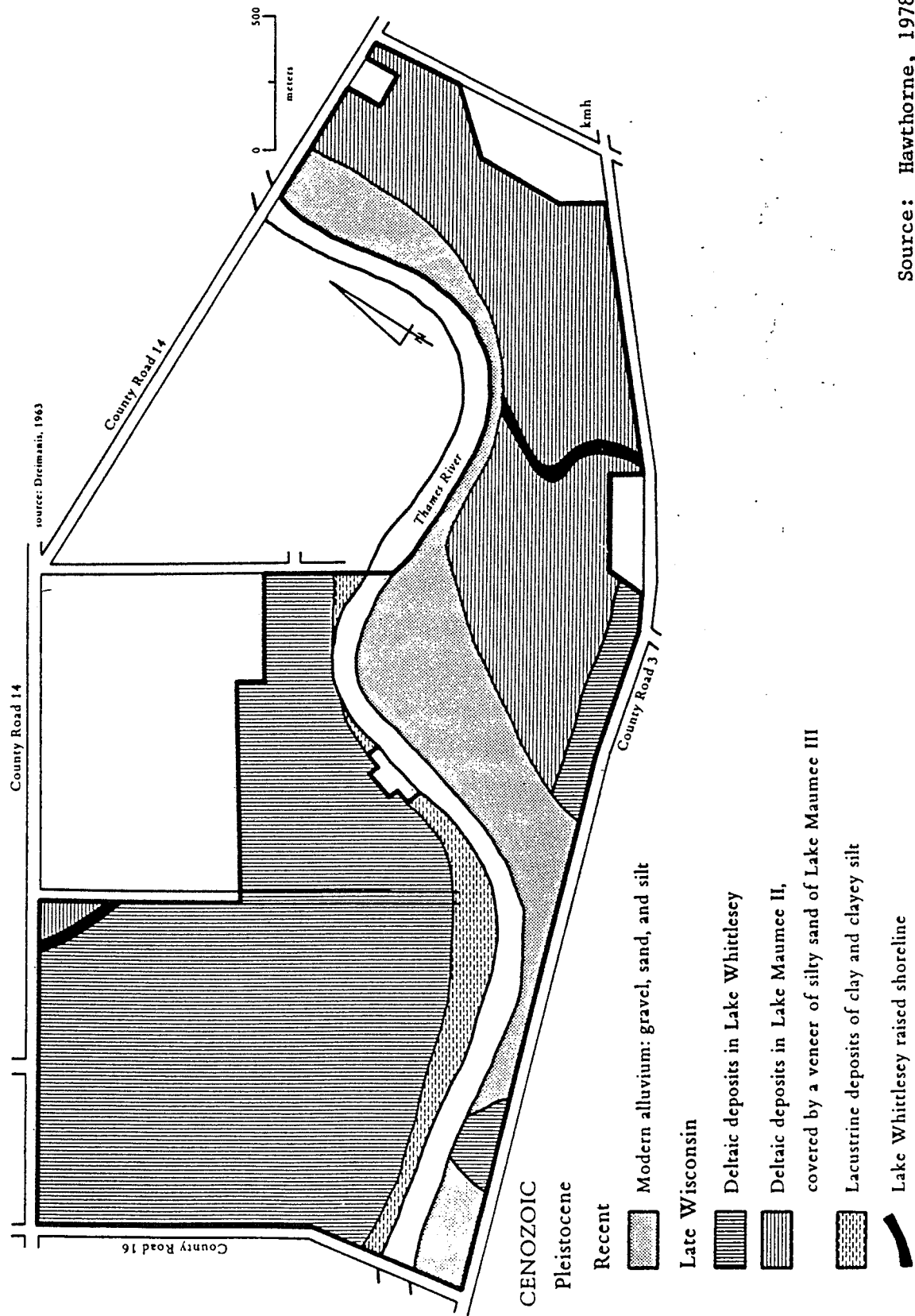


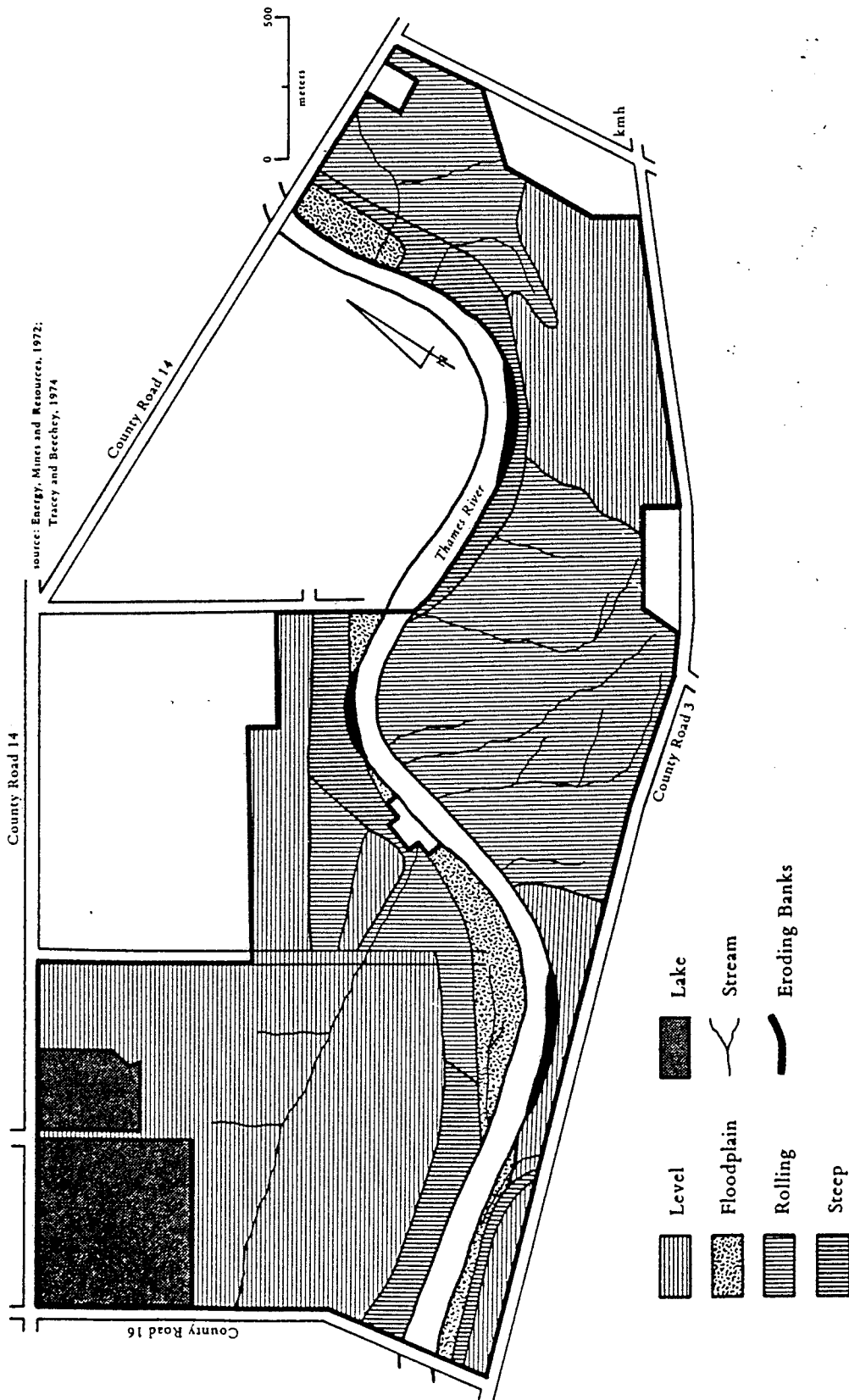
Figure 6 - Physiography of Middlesex County

Figure 7 - Physiography of the Proposed Komoka Provincial Park



Source: Hawthorne, 1978

Figure 8 - Topography & Drainage of the Proposed Komoka Provincial Park





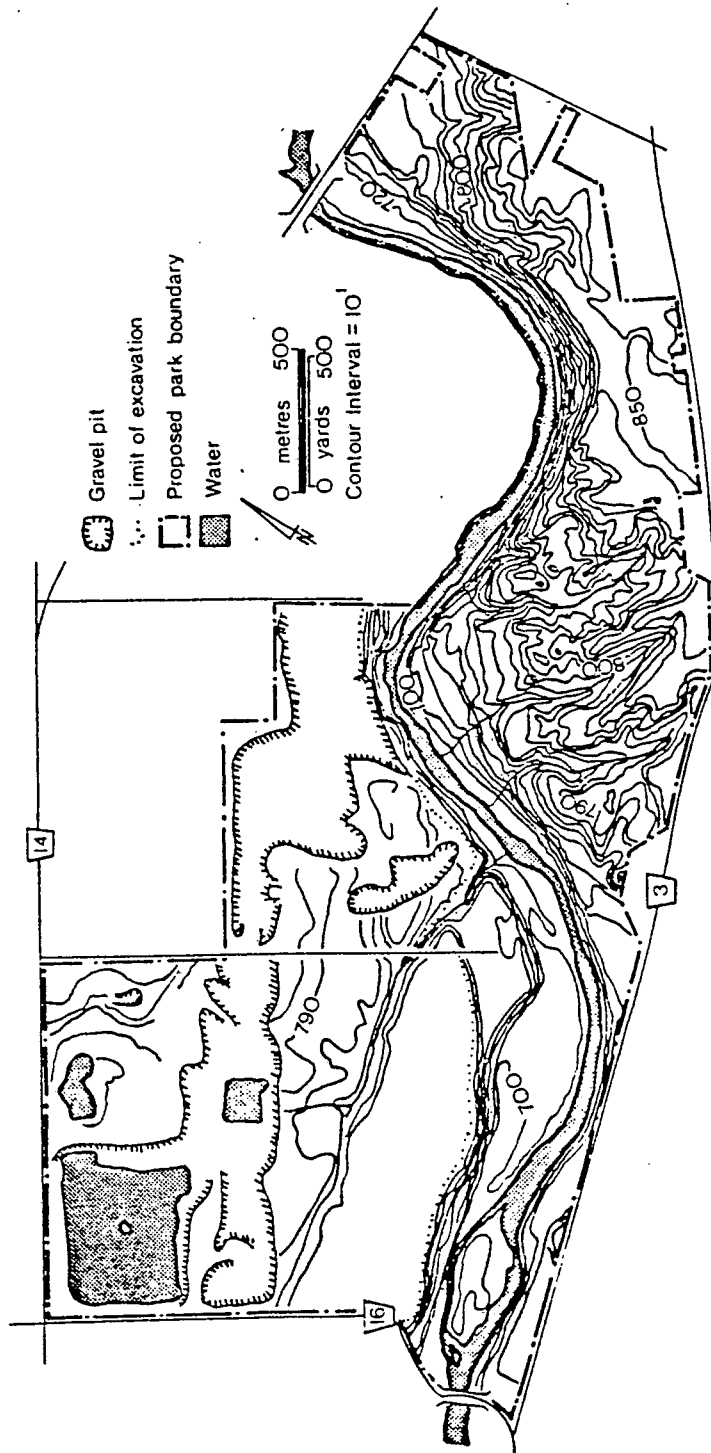


Figure 9 - Topography of Proposed Komoka/Kilworth Provincial Park

NAME Komoka Park Reserve	MAP NAME St. Thomas	MAP NUMBER 40I/14W	UTM REFERENCE 660550
-----------------------------	------------------------	-----------------------	-------------------------

COUNTY Middlesex	LAT. 42°57'	LONG. 81°24'	ALT. MIN. MAX. 750' 850'										
TOWNSHIP Lobo	1:50,000 NTS MAP SHOWING AREA BOUNDARIES												
LOT CONCESSION													
AREA 149 acres 60 ha.													
OWNERSHIP MNR and Private													
ADMINISTRATION													
MNR REGION & DISTRICT SW/Aylmer.				CONSERVATION AUTH. Upper Thames									
AERIAL PHOTOGRAPHS - BASEMAPS													
<table border="1"> <thead> <tr> <th>YEAR</th> <th>ROLL</th> <th>FLIGHT LINE</th> <th>NUMBERS</th> </tr> </thead> <tbody> <tr> <td>1972</td> <td>30</td> <td>4240</td> <td>10-15</td> </tr> <tr> <td></td> <td>12</td> <td>4239</td> <td>187-192</td> </tr> </tbody> </table>				YEAR	ROLL	FLIGHT LINE	NUMBERS	1972	30	4240	10-15		12
YEAR	ROLL	FLIGHT LINE	NUMBERS										
1972	30	4240	10-15										
	12	4239	187-192										

## EARTH SCIENCE FEATURES

This park reserve contains deposits of the Komoka delta formed between 14,800 and 12,500 years ago. Deposits of the post glacial Lake Maumee II delta and the post glacial Lake Whittlesey shoreline and deltaic deposits are well exposed. The reserve is bisected by the Thames River flood plain.

## SENSITIVITY

Gullying and slumping have occurred in the southside of the reserve. This area should be left as little disturbed as possible. The northern sections should be developed in a way so that construction will not have an effect on the river. Park development should not degrade the stratigraphic sections at Kilworth Bridge and Komoka.

## SIGNIFICANCE

The glacial history of the Komoka delta and the interaction of the Huron and Erie lobes in the London area is extremely intricate and has only been partially documented. This would be considered a regionally significant site.

## MAJOR REFERENCES

Dreimanis, 1964                      Terasmae, et al, 1972  
Hewitt, 1972

DATE COMPILED  
February 1977

COMPILER E.T. Harvey

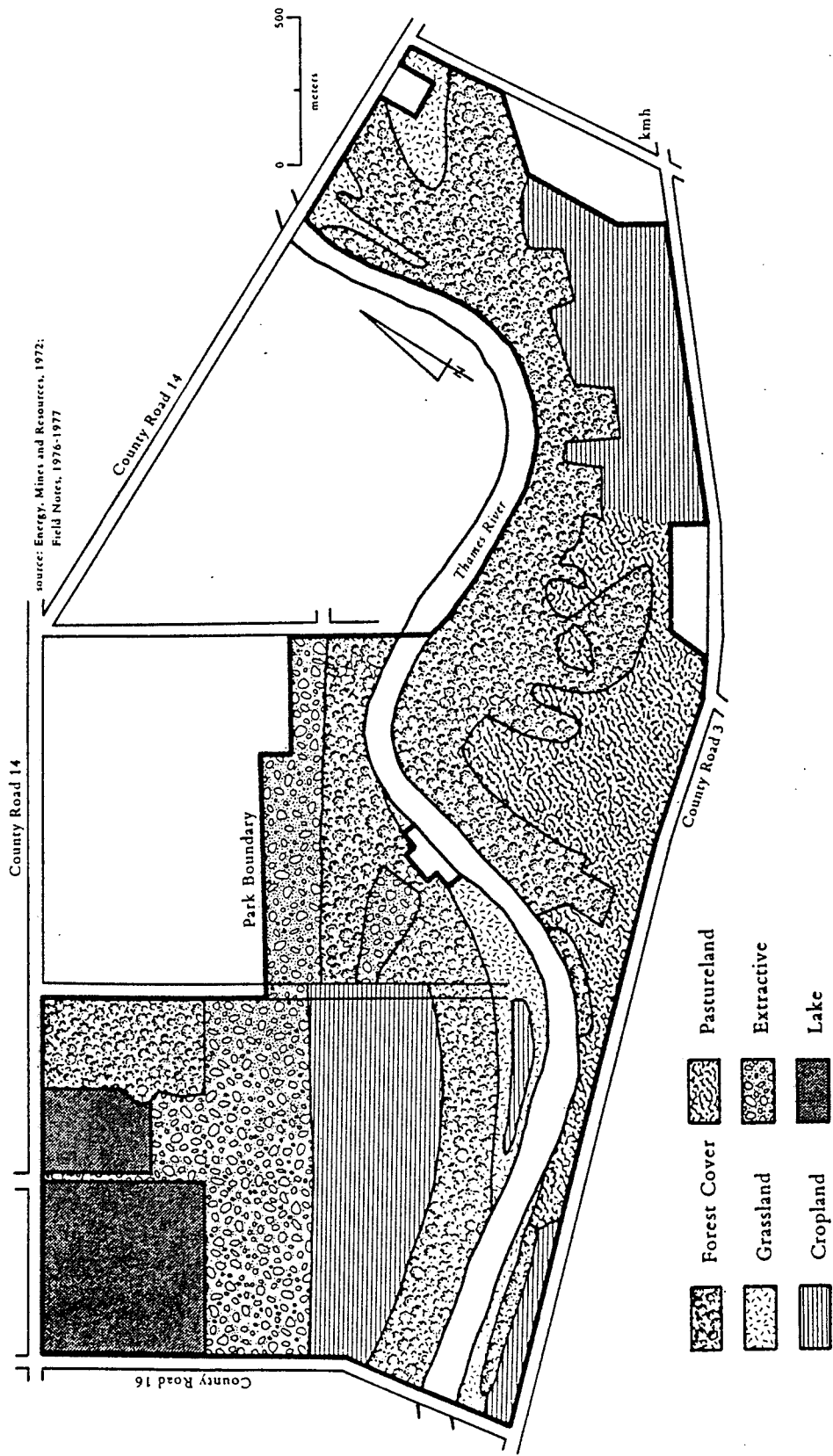
#### 1.4 Present Land Uses

A diversity of land uses presently exist in the study area (Figure 10), including gravel extraction, pasturing, crop growing, and forest management. Crops grown in the area include corn and tobacco, on both the north and south sides of the river, and cattle and horse pasturing on the south side (Otago Investments Property). Forest management occurs on the south side of the river, and include the recent establishment (1976) of a walnut-white pine plantation on crown land (Guest/Restoration Realty Property). In 1982 this area was converted to a Black Walnut Seed Orchard (van Vrouwerff, 1983). Three large white pine trees have been identified and marked as 'plus trees' in the area (van Vrouwerff, 1983).

Grazing in the wooded sections of the Otago Investments property was stopped in 1979 (pers. comm. D. Ward).

The MNR Earth Science Checklist for the Komoka Park Reserve is presented in Figure 9b.

Figure 10 - Present Land Use (as of 1978)



Source: Hawthorne, 1978

## CHAPTER 2: VEGETATION AND FLORISTICS

### 2.1 Introduction

The vegetation of the study area is remarkably diverse -- a result of extreme variations in topography, drainage, soil moisture and physiography. 24 major plant communities have been identified in the study area within four main physiognomic units, and these are listed below. One plant community (white cedar) occurs in all four physiognomic units. A vegetation matrix showing the correlation of plant communities with site features is presented in Figure 11.

#### A FLOODPLAIN (INCLUDING FREQUENTLY FLOODED LOWER TERRACES

1. riverbank communities
2. sandbar willow-nettle (Salix exigua-Urtica dioica) communities
3. white cedar (Thuja occidentalis) communities
4. black willow-sycamore-poplar (Salix nigra-Platanua occidentalis-Populus deltoides/P. tremuloides) communities
5. black walnut-staghorn sumac (Juglans nigra-Rhus typhina) communities
6. anthropogenic open fields

#### B TERRACES (NOT FLOODED--GLACIAL FLOODPLAIN TERRACES)

1. goldenrod-bluestem (Solidago-Andropogon) communities
2. staghorn sumac (Rhus typhina) communities
3. white oak-red oak-sugar maple-basswood (Quercus alba-Q. rubra-Acer saccharum-Tilia americana) communities
4. white cedar (Thuja occidentalis) communities
5. white cedar-red-osier dogwood (Thuja occidentalis-Cornus stolonifera) communities
6. black ash-grey dogwood (Fraxinus nigra-Cornus racemosa) communities
7. blue ash-black maple (Fraxinus quadrangulata-Acer nigrum) communities

C RIVER VALLEY SLOPES

1. sugar maple-witch hazel (Acer saccharum-Hamamelis virginiana) dry to mesic slope forest communities
2. white cedar (Thuja occidentalis) wet seepage slope forest communities
3. white cedar-red maple (Thuja occidentalis-Acer rubrum) wet seepage slope forest communities
4. red maple-white birch-trembling aspen (Acer rubrum-Betula papyrifera-Populus tremuloides) mesic to wet slope forest communities
5. coltsfoot-sedge (Tussilago-Carex) open seepage slope communities
6. eroded disturbed slopes

D TABLELAND

1. sugar maple-beech (Acer saccharum-Fagus grandifolia) dry to mesic upland forest communities
2. hemlock (Tsuga canadensis) mesic upland forest communities
3. trembling aspen-hawthorn (Populus tremuloides-Crataegus spp.) dry early successional communities
4. black oak-white oak (Quercus velutina-Quercus alba) dry to mesic upland forest communities
5. shagbark hickory-white oak (Carya ovata-Quercus alba) dry to mesic upland forest communities
6. red oak (Quercus rubra) dry to mesic upland forest communities
7. white cedar (Thuja occidentalis) wet swamp forest communities
8. white cedar-tamarack (Thuja occidentalis-Larix laricina) wet swamp forest communities
9. hawthorn-goldenrod (Crataegus-Solidago) old field communities
10. poplar-goldenrod (Populus-Solidago) old field communities
11. goldenrod-bluestem (Solidago-Andropogon) prairie old field communities
12. a. floating sedge meadow  
b. fen-like sedge meadow
13. Anthropogenic fields and pastures

Figure 10: Vegetation Matrix - Komoka Study Area

Moisture Sub-regime substrate & Temp.		Arid	Very Dry	Dry	Dry Mesic	Mesic	Wet Mesic	Wet	Very Wet	Saturated	Open Water
Colder	Rock										
	Sand										
	Loam					D2	B4, B5	D7			
	Clay						A3			C5, C6	
	Organic						↓	D7	←---D8---	D12b	D12a
Normal	Rock						Tuffa				
	Sand										
	Loam										
	Clay										
	Organic									B6	
Warmer	Rock										
	Sand				D11----->	B2	B1				
	Loam						↓				
	Clay							←-----C4----->			
	Organic					A4, A5 A6		A1, A2			

For the Legend to above symbols, please refer to pages 18 and 19 (Vegetation Community Outline)

## E ABANDONED GRAVEL PITS

Supports an early successional complex of vegetation.

Vegetation mapping is presented in Figure 12 (back pocket). Although a total of 24 plant community types were identified in the study area, the extreme variability of the site has made it difficult to identify all plant communities which occur on the site. The physiognomic units and major vegetation types are discussed below.

### 2.2 Plant Community Descriptions

#### A. Floodplain (including frequently flooded lower terraces)

Although there are several large areas of floodplain represented in the study area, only a small portion occurs on Public Land and this does not represent the full array of floodplain community types. Floodplain communities occur on both sides of the river, and community types range from early successional field and scrub areas to mature floodplain forest.

##### 1. Disturbed Riverbank Communities.

- occurs all along the river throughout the study area
- flooded each spring and during times of high water
- dominants vary, but species such as purple loosestrife are abundant in many spots

##### 2. sandbar willow - nettle (Salix interior - Urtica dioica) wet to wet-mesic scrub communities

- occurs throughout floodplain areas and on islands
- silt
- normal microclimate



Dominants

Salix interior	sandbar willow
Urtica dioica	stinging nettle

Associates

Salix nigra	black willow
Vitis riparia	riverbank grape
Impatiens capensis	jewelweed
Cornus racemosa	panicked dogwood
Epilobium hirsutus	hairy willow herb

3. white cedar (Thuja occidentalis) wet-mesic to wet communities

- sparse understorey
- trampled and compacted by horses in the past
- organic soil layer

4. Black willow - Sycamore - Poplar (Salix nigra - Platanus occidentalis - Populus tremuloides /P. deltoides) wet to wet-mesic bottomland forest communities

- occurs on floodplain throughout the study area
- sometimes just marginal riverbank communities
- in some areas forms extensive coverage
- cooler than normal
- silt/muck
- dominants vary
- often underwater in spring

Dominants

Salix nigra	black willow
Platanus occidentalis	sycamore
Populus tremuloides	trembling aspen
P. deltoides	cottonwood
Betula papyrifera	white birch

Associates

Fraxinus nigra	black ash
Thuja occidentalis	white cedar
Acer negundo	Manitoba maple

Solanum dulcumara	deadly nightshade
Impatiens capensis	jewelweed
Erythronium albidum	white trout lily
E. americanum	yellow trout lily
Symphiocarpus alba	skunk cabbage
Iris versicolor	blue flag
Caltha palustris	marsh marigold

5. black walnut - sumac (*Juglans nigra* - *Rhus typhina*)  
dry-mesic to dry savannah communities

- drier floodplain areas
- cleared in past; abandoned
- silt
- infrequently flooded

Dominants

<i>Juglans nigra</i>	black walnut
<i>Rhus typhina</i>	staghorn sumac

Associates

<i>Celtis occidentalis</i>	hackberry
<i>Morus alba</i>	white mulberry
<i>Vitis riparia</i>	riverbank grape
<i>Rubus hirta</i>	black-eyed susan

Notes

- some prairie influences

6. anthropogenic open fields

- previously cleared
- dry to mesic
- numerous non-native species/cultivars

Dominants

<i>Physocarpus opulifolia</i>	ninebark
<i>Crataegus</i> spp.	hawthorn
<i>Cornus stolonifera</i>	red-osier dogwood

Associates

Clematis virginiana	virgin's bower
Pinus spp.	planted pines
Picea spp.	planted spruces
Thuja occidentalis	white cedar
Rosa spp.	planted roses?

B. Terraces (not flooded -- glacial floodplain terraces)

1. Goldenrod - Bluestem (Solidago - Andropogon) dry to wet old field communities

- occurs in abandoned clearings in floodplains throughout the site; similar communities occur in the tablelands in the study area.
- moisture conditions range from dry to wet in pockets
- topography is flat to gently undulating and sloping
- warmer than normal microclimate
- variable areas dominated by either Solidago or Andropogon

Dominants

Andropogon gerardi	turkeyfoot
A. scoparius	little bluestem
Solidago canadensis	Canada goldenrod

Associates

Apios americana	groundnut
Echinocystis lobata	wild cucumber
Aster ericoides	bushy aster
A. nova-anglia	New England aster
Hypericum punctatum	common St. Johnswort

Notes

- notable prairie influence

2. staghorn sumac (Rhus typhina) dry to mesic thicket communities

- narrow strips of sumac growth occur on the south side

- of the river
- elsewhere occurs in thickets in previously disturbed sites
- grades into walnut grove in A6
- dry to mesic
- warmer than normal

Dominants

Rhus typhina	staghorn sumac
Rubus strigosus	red raspberry
Pteridium aquilinum	bracken fern

Associates

Equisetum arvense	field horsetail
Potentilla recta	rough-fruited cinquefoil
Poa compressa	bluegrass
Populus tremuloides (seedlings)	trembling aspen

3. white oak-red oak-sugar maple-basswood mesic communities
- a complex of interspersed upland forest communities occurring on old river terraces
  - 6 terraces levels with relatively sharp changes in elevation, 4' to 20' changes in height
  - species composition varies slightly on each
  - some areas of peaty wet soil with skunk cabbage occur in areas where clay underlies the loamy soil of the
  - terraces
  - in these wet sections, under a 80-90% canopy, ostrich fern dominates the understorey
  - bur oak on lower terraces
  - otherwise generally mesic communities
  - this is the best part of the study area; it is in good condition (no recent grazing, no recent logging) and shows the greatest variation in topography and associated species diversity
  - the most esthetically appealing section of the study area
  - small and large ravine systems here support populations of yellow lady's slipper orchids in muck soil and along the drier edges of the ravine banks
  - some sections of the terraces near the laneway are disturbed and support a mixture of species (i.e. shagbark hickory, white birch, white cedar, apple, and hawthorn)

Dominants

Quercus alba	white oak
Quercus rubra	red oak
Acer saccharum	red maple
Tilia americana	basswood

Associates

Overstorey

Quercus velutina	black oak
Quercus alba	white oak
Prunus serotina	black cherry
Corylus americana	hazelnut
Carya ovata	shagbark hickory
Carya cordiformis	bitternut hickory
Prunus serotina	black cherry
Fraxinus pennsylvanica	green ash
Fagus grandifolia	American beech
Carpinus caroliniana	ironwood

Understorey (mesic)

Asarum canadense	wild ginger
Thelypteris novaboracensis	New York fern
Carex sprengei	sedge
Sambucus canadensis	Canada elderberry
Adiantum pedatum	maidenhair fern
Viburnum rafinesquianum	downy arrow-wood

Understorey (perched water tables)

Onoclea sensibilis	sensitive fern
Osmunda cinnamomea	cinnamon fern
Osmunda regalis	royal fern
Lindera benzoin	spicebush

4. white cedar (Thuja occidentalis) wet to saturated communities

- occurs on low terraces and riverbank slopes; adjacent to horse pasture
- clay
- poor drainage; often on perched water tables and around seepage areas
- cooler than normal

Dominants

Thuja occidentalis                      white cedar

Associates

Acer rubrum                              red maple  
Fraxinus pennsylvanica                green ash/red ash  
Cornus rugosa                            rough-leaved dogwood  
Carex pensylvanica                    woodland sedge  
Frenanthes alba                         tall white lettuce

Notes

- almost all cedar; other species occur sparsely

5. white cedar-red-osier dogwood wet to saturated communities

- adjacent to horse pasture
- thicket growth, dense
- on clay
- seepage areas

Dominants

Thuja occidentalis                      white cedar  
Cornus stolonifera                      red-osier dogwood

Associates

Lycopus americana                      cut-leaf water horehound  
Rudbeckia laciniata                    green-headed coneflower  
Cypripedium calceolus                 yellow lady's slipper

6. black ash-grey dogwood saturated communities

- area 4 -- slough area below old terraces and adjacent to next community
- muck accumulation with dense growth of sedges, bedstraw and grasses
  - open community, 10-20% cover
  - slough like areas below old dry terraces, perched water table

Dominants

Fraxinus nigra                            black ash  
Cornus racemosa                         grey dogwood

Associates

Lycopus americana	cut-leaf water horehound
Mentha arvensis	wild mint
Galium palustre	marsh bedstraw
Iris versicolor	southern blue flag
Carex lupulina	sedge
Symphiocarpus foetidus	skunk cabbage

7. blue ash-black maple mesic to wet-mesic communities

along river in area 4

- this community follows the riverbank in a narrow strip
- it is at a higher elevation than the black ash-grey dogwood community immediately adjacent on the south-east
- it occurs on the first terrace level
- the riverbank occurs at a lower elevation immediately adjacent to this community on the north-west

Dominants

Fraxinus quadrangulata	blue ash
Acer nigrum	black maple

Associates

Populus deltoides	cottonwood
Fraxinus pennsylvanica	green ash
Collinsonia canadensis	horse balm
Carex sprengei	sedge
Ribes cynosbati	prickly gooseberry

C. River Valley Slopes

The river valley slopes in the study area support variable vegetation cover. Often, because of the presence of seepage areas, slumpage, steepness and aspect, the vegetation types intergrade. Where possible distinct vegetation types are mapped, but often groupings of vegetation types are noted.

1. sugar maple - witch hazel (Acer saccharum - Hamamelis virginiana) dry to mesic slope forest communities

- dry to mesic slopes which support boulder erratics
- normal microclimate
- in some areas has succeeded from old apple orchards on terrace slopes
- regenerating second growth forest

Dominants

Acer saccharum	sugar maple
Hamamelis virginiana	witch hazel

Associates

Viburnum lentago	wild raisin
Carex rosea	sedge
C. pennsylvanica	sedge

2. white cedar (Thuja occidentalis) wet seepage slope forest communities

- colder than normal
- wet to saturated
- mucky bare areas frequent
- often in seepage areas

Dominants

Thuja occidentalis	white cedar
--------------------	-------------

Associates

Mitella nudicaulis	foamflower
Polystichum acrostichoides	Christmas fern
Adiantum pedatum	maidenhair fern
Betula lutea	yellow birch
Fraxinus pennsylvanica	red/green ash
Acer rubrum	red maple

Notes

- mostly cedar, other species are sparse
- species of Carex common in seepage areas under cedar

3. white cedar - red maple - white birch (Thuja occidentalis - Acer rubrum - Betula papyrifera) wet seepage slope forest communities



- more open than preceding community type
- occurs on old slumpage areas
- early successional
- mesic to wet or saturated

Dominants

Thuja occidentalis  
Acer rubrum  
Betula papyrifera

white cedar  
red maple  
white birch

Associates

Betula lutea  
Fraxinus pennsylvanica  
Populus deltoides  
P. tremuloides  
Carpinus caroliniana  
Tussilago farfara

yellow birch  
red/green ash  
cottonwood  
trembling aspen  
ironwood  
coltsfoot

4. Red maple - white birch - poplar (Acer rubrum - Betula papyrifera - Populus tremuloides) mesic to wet slope forest communities

- composition resembles above but tends to be drier
- not usually on seepage areas
- white cedar not usually present

5. coltsfoot - sedge (Tussilago farfara - Carex spp.) open seepage slope communities

- variable, mostly open, on clay or cobble till
- vegetation is sparse with usually only a few plants present

Dominants

Tussilago farfara  
Carex spp.

coltsfoot  
sedges

Associates

Juncus spp.  
Cornus racemosa  
Polygonum sp.

rushes  
panicles dogwood  
smartweed

6. Disturbed communities

- areas of slumpage along high bluffs and slopes
- sparse vegetation with high intrusions of weed species
- often the original vegetation slumps and survives for unknown period of time, therefore often get copses of white cedar or red maple
- stablized slumpage areas may support trembling aspen

D. Tableland

1. Maple - beech (Acer saccharum - Fagus americana) dry to mesic upland forest communities

- mesic
- rolling topography
- often on upper dry terrace slopes
- sandy pockets
- predominantly second growth, but undisturbed
- some areas previously grazed, now regenerating
- some areas, recently grazed, are compacted and support no understorey

Dominants

Acer saccharum	sugar maple
Fagus grandifolia	American beech

Associates

Prunus serotina	black cherry
Actaea alba	white baneberry
Actaea rubra	red baneberry
Trillium grandiflorum	white trillium
T. erectum	red trillium

2. hemlock (Tsuga canadensis) mesic upland forest communities

- colder than normal
- overstorey only hemlock; hemlock regeneration
- sparse understorey with lots of open ground
- cold streams at bottoms

Dominant

*Tsuga canadensis* hemlock

Associates

*Polystichum acrostichoides* Christmas fern  
*Carex* spp. sedges

3. trembling aspen - hawthorn (*Populus tremuloides*-*Crataegus*)  
dry early successional communities

- dry
- composition variable, partly because of clumped distribution of many of species
- old clearing and grazed areas

Dominants

*Populus tremuloides* trembling aspen  
*Crataegus* sp. hawthorn  
*Phleum pratense* timothy

Associates

*Betula papyrifera* white birch  
*Rhus typhina* staghorn sumac  
*Solidago canadensis* Canada goldenrod

4. black oak - white oak (*Quercus velutina* - *Q. alba*) dry to  
mesic upland forest communities

- Komoka Sand Plain Forest (Maycock, field data)
- dry communities
- grazed in past
- now regenerating
- most of regeneration is to black cherry and red maple
- gravel and sand
- warmer than normal microclimate
- black oak declining
- rolling topography

Dominants

*Quercus velutina* black oak  
*Q. alba* white oak

Associates

Prunus serotina	black cherry
Acer rubrum	red maple (upland variety)
Lespedeza intermedia	bush-clover
Podophyllum peltatum	mayapple
Carex pennsylvanica	woodland sedge
Geranium maculatum	wild geranium
Carex convoluta	sedge
Populus grandidentata	large-toothed aspen
Acer rubrum (upland variety)	red maple
Cornus alternifolia	alternate-leaved dogwood
Corylus americana	American hazelnut
Geum canadense	avens
Vaccinium myrtilloides	blueberry
Vitis aestivalis*	southern wild grape
Lespedeza intermedia	intermediate bush clover
Carex deweyana	
Viola sororia	

5. shagbark hickory - white oak (Carya ovata - Quercus alba)  
dry to mesic upland forest communities

- a good example occurs directly behind the MNR office
- dry, savannah - like
- is replacing old apple-hawthorn growth
- exhibits good stratification

Dominants

Carya ovata	shagbark hickory
Quercus alba	white oak
Prunus serotina	black cherry

Associates

Fraxinus americana	white ash
Pyrus malus	apple
Crataegus sp.	hawthorn
Rudbeckia hirta	black-eyed susan
Geranium maculatum	wild geranium
Aquilegia americana	wild columbine

6. red oak - shagbark hickory (Quercus rubra - Carya ovata)  
communities

- many variations of this forest types occur throughout the study area

- the dominants vary with variation in microhabitat
- below is a general representation

Dominants

Quercus rubra	red oak
Carya ovata	shagbark hickory
Acer saccharum	sugar maple
Prunus serotina	black cherry

Associates

Viburnum acerifolium	maple-leaved viburnum
Lonicera tatarica	tartarian honeysuckle
Carex rosea	sedge
Desmodium glutinosum	pointed-leaved
	tick-trefoil
Monotropa uniflora	Indian pipe

7. white cedar (Thuja occidentalis) wet swamp forest communities

- the composition of this community type is similar to that which occurs in the Floodplain areas
- understory is sparse to nil
- often occurs at the top of bluffs associated with perched water tables

8. white cedar - tamarack (Thuja occidentalis - Larix laricina) wet swamp forest communities

- occurs in several locations throughout the study area with some representation occurring in the floodplain
- supports northern species
- colder than normal
- muck accumulations, some peat
- spongy with lots of mosses in areas

Dominants

Thuja occidentalis	white cedar
Larix laricina	tamarack

Associates

Symplocarpus foetidus	skunk cabbage
Cyripedium reginae	showy lady's slipper
Betula papyrifera	white birch
Drosera intermedia	intermediate sundew
Coptis groenlandica	goldthread
Mitella nuda	foamflower

9. hawthorn-goldenrod (Crataegus-Solidago) old field communities

- abandoned pastureland grazed extensively by horses but now regenerating
- well-compacted clay soil
- dominated by weed species
- variable in composition because of great variation in the landscape (numerous small rolling hills)

Frequently occurring species

Crataegus spp.	hawthorns
Solidago canadensis	Canada goldenrod
Aster nova-angliae	New England aster
Erigeron pulchellus	robin plantain
Plantago major	common plantain
Poa compressa	Kentucky blue grass
Dianthus armeria	Deptford pink

10. trembling aspen-goldenrod (Populus tremuloides-Solidago) old field communities

- hawthorn present only occasionally
- dry sandy loam

Dominants

Populus tremuloides	trembling aspen
Solidago canadensis	Canada goldenrod

Associates

Trifolium pratense	red clover
Trifolium repens	white clover

11. goldenrod-bluestem (Solidago-Andropogon) old field communities

-

12a. Floating Sedge Meadow

- this community occurs immediately to the east of the MNR office and abuts the cedar-tamarack swamp in that area

- it is primarily a floating sedge mat which supports open meadow communities which grade into dogwood - willow thickets
- some portions of the community, adjacent to the barn, have been mowed, but many of the sedge species still occur

Dominants

Carex schweinitzii	sedge
Lythrum salicaria	purple loosestrife
Typha latifolia	cattail
Carex lanuginosa	sedge
Carex buxbaumii	sedge
Acorus calamus	sweet flag
Eleocharis elliptica	spikerush
Scirpus atrovirens	three-square

12b. Fen-like sedge meadow

- this community type occurs adjacent to the cedar-tamarach swamp in Area 3
- it occurs along the old road which leads into the swamp
- running water on sandy gravel with muck accumulating towards the treed swamp
- standing water to saturated

Dominants

Carex comosa	sedge
Salix sp.	willow
Typha latifolia	cattail

Associates

Parnassia glauca	grass-of-parnassus
Scirpus pendulus	rush
Juncus tenuis	path rush
Juncus dudleyi	Dudley's rush
Juncus nodosus	knotted rush
Carex hystericina	sedge
Carex schweinitzii	
Carex stricta	

13. Anthropogenic old fields and pastures

- this category includes recently grazed and farmed fields throughout the study area

### Ravines associated with Tablelands and Terraces

Although not mapped, these landform units should be discussed. They occur throughout the tableland area and are most interesting in forested portions. They are generally colder than normal and are often deep with coldwater streams at the bottom.

Dominant species vary with aspect and include:

Acer saccharum	sugar maple
Quercus rubra	red oak
Carya ovata	shagbark hickory
Thuja occidentalis	white cedar
Tsuga canadensis	hemlock

Maidenhair fern, Christmas fern, skunk cabbage, sedge and liverworts are common associates. The ravines add to the overall site diversity and provide shelter habitat for birds.

#### E. Abandoned Gravel Pits

The abandoned gravel pit located in Area 5 provides a good example of early successional processes and supports varying successional stages including dogwood/willow thickets, dry poplar groves and open weedy areas. Hypoxis hirsutus (yellow stargrass) occur in this site.

#### 2.3 Floristics

The flora of the study area supports representation of southern (Carolinian), western (prairie) and northern (boreal) floristic elements. Prairie species tend to be associated with the river valley system, a migration corridor for prairie or western species. Northern and southern species occur in close proximity in the area because of the location of the study area at the northern limit of the Carolinian zone in Ontario, and its position in the tension zone between northern and southern vegetation types. Both cooler than normal and warmer than normal microclimatic features are present in the rolling uplands and steep river valley and ravine valley slopes and floodplains of the study area.



## CHAPTER 3: FAUNA

### 3.1 Introduction

The fauna of the study area was briefly assessed following the guidelines laid out in the Life Science Inventory Standard Report Format (OMNR, 1976). In this format, faunal information is considered incidental to the report, and coverage is given to species not covered by other MNR programs. Detailed information on faunal species covered by other MNR programs may be obtained from appropriate program staff.

Incidental faunal sightings in the Komoka Park Reserve and ANSI were recorded during field work, and a background information search was conducted. Knowledgeable individuals and OMNR staff were contacted for information on the study area.

Middlesex County fauna is a mixture of northern and southern species representing two life zones -- the Canadian and the Carolinian Life Zones (Hawkins, 1981). Representatives of the Carolinian Zone include such species as the Blue-gray Gnatcatcher.

### 3.2 Birds

Information on birds of the Komoka area was obtained from the Ontario Breeding Bird Atlas (Peter Read) and the McIlwraith Field Naturalists Bird Records Committee (W. Jarman). A literature search and field observations provided additional information. A preliminary list of the birds of Komoka Park and Reserve and ANSI is presented in Appendix F.

### 3.3 Mammals

Mammal information for the study area is limited to that provided by OMNR Aylmer District Fish and Wildlife Staff, incidental field observation, and literature search. Significant species reported to date include American Badger (Livermore, 1983). Fox Squirrels were introduced in the Komoka Area, but have not been sited for several years. A preliminary mammal checklist for the study area is presented in Appendix F.

### 3.4 Reptiles and Amphibians

Information on reptiles and amphibians was obtained through a preliminary literature search and limited field observation. A brief search for Queen Snakes was conducted in July, 1982. Although this species was not observed, suitable habitat exists along the Thames River from the Kilworth Bridge to the Komoka Bridge, and Campbell (1979) has reported the species from this area.

### 3.5 Fish

This stretch of the Thames River is cited as a significant Walleye fishery, and a significant salmon run has developed recently (Livermore, 1983). Further information on the fishery components of the Komoka Park Reserve and ANSI may be obtained from MNR District Fish and Wildlife Staff.

## CHAPTER 4: SIGNIFICANT FEATURES AND PLANNING CONSIDERATIONS

### 4.1 Significant Features

#### 4.1.1 Significant Vegetation-Landforms

The Komoka Park Reserve ANSI offers provincially significant representation of a terraced forested river corridor and its associated vegetation types. These include vegetation typical of floodplains, river terraces, valley slopes, tablelands, and associated ravine systems. Microclimatic conditions in the ANSI are varied ranging from dry moisture conditions to standing water, cooler than normal temperatures to warmer than normal, and soil types which range from peat to sand to clay.

Portions of this significant feature occur on Public Lands, and most of the feature representation of the ANSI occurs within the boundary of the Park Reserve.

#### 4.1.2 Significant Flora

Twelve species of vascular plants which are considered rare in Ontario (Argus and White, 1982 and 1983; Argus and Keddy, 1984, Argus and White, 1977) have been recorded for the study area (Table 1). Locations of rare species are mapped (Fig. 12), while additional population information is on file with the Ontario Ministry of Natural Resources, Southwestern Region.

An additional five species of vascular plants are considered significant. These species are new to Middlesex County based on ongoing work by McLeod and Cook, and are listed in Table 2.

Calciphilic species of mosses and liverworts occur in open calcareous seepage areas on the north bank of the river in this area. Hawthorne (1978) cites Cook (n.d.) in discussing this feature:

About six bryophytes occur in this area which are unknown from any other area in Middlesex [County]. One of these is a tufa-forming moss, i.e. it deposits large

TABLE 1

---

RARE VASCULAR PLANTS OF THE KOMOKA STUDY AREA  
 (following Argus and White, 1982 and 1983, Argus  
 and Keddy, 1984, and Argus and White, 1977  
 for families not yet covered by the Atlas)

<u>Asclepias exaltata</u>	green milkweed
<u>Asclepias purpurascens</u>	purple milkweed
<u>Athyrium pycnocarpon</u>	narrow leaved spleenwort
<u>Blephilia ciliata</u>	downy wood mint
<u>Collinsonia canadensis</u>	horse balm
<u>Cornus florida</u>	flowering dogwood
<u>Fraxinus quadrangulata</u>	blue ash
<u>Monarda didyma</u>	oswego tea
<u>Quercus bicolor</u>	swamp white oak
<u>Solidago arguta</u>	goldenrod
<u>Solidago patula</u>	goldenrod
<u>Vitis aestivalis</u>	southern wild grape

---

TABLE 2

---

PLANTS NEW TO MIDDLESEX COUNTY

<u>Carex sprengei</u>	sedge
<u>Carex viridula</u>	sedge
<u>Juncus alpinus</u>	rush
<u>Lonicera morrowii</u>	honeysuckle
<u>Rubus odoratus</u>	purple-flowering raspberry

---

amounts of calcium carbonate in porous mounds in the seepage. These have been called 'didymodontoliths' after the moss which forms them. I know of no other such deposits in the area. Other interesting bryophytes grow in large blocks of limestone lying on the river bank.

Tracey and Beechey (1974) cite these features as areas of development constraint (Fig. 13).

#### 4.1.3 Significant Fauna

Several faunal species which are considered rare or significant in the province occur in the study area:

a. Queen Snake (*Regina septemvittata*)

Several publications deal with this species including Campbell (1977); Campbell and Perrin (1979); Cook (1964, 1970, 1977); Gregory (1977); Fromm (1972); Logier (1939); Judd (1955, 1962). Synonyms for the species include: Yellow-bellied Snake (*Tripidonotis leberis*), Leather Snake (*Regina leberis*), Stiffsnake (*Regina ridiga*), and Crayfish Snake. The Queen Snake is related to the Northern Water Snake (*Natrix sipedon sipedon*).

The status of this species is reported by many authors as threatened in Ontario, including Campbell (1977). Habitat loss is considered the major factor in population reduction (Campbell, 1977).

There are 21 Canadian/Ontario stations for the Queen Snake. Four of these are in Middlesex County -- all on the Thames River near London -- with a recent location cited for the Thames River at Kilworth.

At Kilworth, the Queen Snake has been collected from a slab of concrete from an old bridge abutment and in this locale the species is reported to prefer south-facing banks of the river. (Campbell, 1977).

TABLE 3

---

RARE FAUNAL SPECIES OF THE KOMOKA  
STUDY AREA

	<u>Critical Habitat</u>
Eastern Spiny Softshell Turtle	Thames River (critical breeding habitat unknown on site)
Queen Snake	Thames River, rocky shallow water and shoreline, basking habitat -- south-facing slopes along the river.
American Badger	sandy knolls throughout site

---

b. American Badger

Trapping records for this species have been reported for the Komoka/Kilworth area (Livermore, 1983). Brownell (1983) provides a brief overview of the species, indicating that it has not as yet been placed in an official status category by the Committee on the Status of Endangered Wildlife in Canada (C.O.S.E.W.I.C.), although a status report prepared by Stardom (1978) indicates that it is rare in Ontario.

c. Eastern Spiny Softshell Turtle

This species is reported for the Komoka area by Campbell (1977) and is regarded as one of the scarcest species of turtles in the province (Campbell, 1977). Planck (pers. comm.) indicates that it should be considered rare in Canada, and that a status report on the species is currently in preparation. Its Canadian range is confined mainly to Lakes Erie and St. Clair and adjacent rivers, the western end of Lake Ontario, and the upper St. Lawrence drainage area (Campbell, 1977). Further work is required to assess the status of this species in the Komoka area.

4.2 Study Area Evaluation

4.2.1 Introduction

Komoka Park Reserve falls within Hills' (1959) Site District 7-6, Site Region 7. The remaining natural vegetation-landform features of this Site District were assessed for nature reserve potential by Hanna (1980) following guidelines set out by the provincial Life Science Framework (OMNR, 1980). The best quality sites were selected as Candidate Nature Reserves (now called provincially significant ANSIs [Areas of Natural and Scientific Interest]). That area of the Komoka Park Reserve Proposed Acquisition Area which follows the river, including wooded banks and floodplains, was designated as a provincially significant

ANSI (Candidate Nature Reserve) by Hanna. This area contains most of the known significant life science features of the proposed park.

#### 4.2.2 Feature Representation and Boundary Evaluation

This report supports the assessment made by Hanna (1980) that the Komoka Park Reserve and adjacent lands offer good quality representation of a forested river corridor with associated vegetation types, including poplar-willow floodplain; oak-hickory; oak; oak-maple-ash-birch and hemlock upland forests; hawthorn scrub; cedar-tamarack swamp; and sedge meadow. Additional features noted during this survey include old field growth on abandoned floodplain fields which support prairie species (eg: Andropogon gerardii). These features are contained within the proposed ANSI boundary (Hanna, 1980).

Examination of the features of the Park Reserve during this inventory suggests that an additional wooded area north of the existing ANSI boundary would complete the feature representation at this site. The ANSI boundary has been mapped at a scale of 1:5,000 (Figure 12) and the proposed addition is indicated (Figure 13).

The five criteria used in selecting provincially significant ANSIs are discussed in Hanna (1980) and are presented in this report in Appendix G.

#### 4.3 Development Constraints

There are several development constraints which should be applied to the study area because of the sensitivity or recreational unsuitability of physical features of the site and, in some cases, because of the sensitivity of associated vegetation features. Tracey and Beechey (1974) mapped major areas of development constraint in the study area and this map,



with some modification, has been adopted here (Figure 13-- available upon request). In general, areas of development constraints include steep slopes, seepage areas, perched water tables with associated wetland vegetation, wet meadows and areas of clay soil. In addition, sites supporting significant vegetation (eg: prairie old fields) are included in areas of development constraints. Figure 13 maps areas of development constraint and sensitivity.

#### 4.4 Summary

In general, that portion of the Komoka Park Reserve which borders, and includes, the river corridor and adjacent ravine systems, is considered provincially significant and has been designated an ANSI. The ANSI represents the best example of a forested river corridor in Site District 7-6. No other provincial park or ANSI in the southwestern region (OMNR) offers similar feature representation. The Delaware Floodplain area was identified by the Carolinian Canada committee as a significant Carolinian site and it offered some overlap in feature representation (i.e. floodplain savannah). However, this site is not a forested river corridor, and was recently heavily logged. A diversity of vegetation types and the presence of rare species of flora and fauna complement the diverse and regionally significant physical features of the site.

The designation of this site as an ANSI adds a new dimension to planning an area which was initially recommended as a recreation class provincial park.

Because of the physical nature of the steep slopes and seepage areas along the river valley and ravines of the ANSI, these areas are sensitive to development for park use. However, current use of the Park Reserve area, including the ANSI, (primarily for fishing and hunting) appears to have minimal impact. Disturbance has been noted as a result of the use of the

area by horses, particularly in area #3 (see figure 12), where significant fen areas have been used by horses.

Access to the river in the proposed park should be located in areas of low elevation where access is currently obtained by fishermen (eg: southwest corner of the site). Areas of soft ground, such as the fen/swamp areas and areas of clay and clay seepage, are sensitive to compaction and trampling effects and should be avoided during any park development. Areas of development constraints and sensitivity are mapped (Figure 13).

In general, intensive use is not recommended for the provincially significant forested river corridor and slopes. No similar feature representation has been identified in any Provincial Park or other ANSI site in the region.

Two additional areas (Komoka Sand Plain Forest and Springer's Creek Floodplain Forest) are proposed as additions to the ANSI in order to complete the feature representation offered by the ANSI. Komoka Sand Plain Forest is Public Land and is a part of the Park Reserve, while Springer's Creek Floodplain Forest lies outside the Park Acquisition Area. The Springer's Creek area offers representation of early successional floodplain forest, a feature which is not well represented in the ANSI at present.

Additional life science data is required for the Komoka Park Reserve Proposed Acquisition Area and for the ANSI. Detailed information is lacking on significant breeding birds, and virtually no data is available on small mammals and butterflies of the area, particularly on significant species in these groups. The following work is required: 1) data on critical habitat for significant faunal species; 2) baseline information on small mammals and butterflies, 3) a complete breeding bird survey. Vascular plant data should continue to be collected for the area, and a final checklist for the site should approximate 500 plus species.

The above data could be collected by knowledgeable local naturalists under a volunteer agreement with the OMNR, or by

University of Western Ontario researchers.

#### 4.5 Planning Considerations

1. Development along the steep valley slopes and seepage areas (particularly on clay) should be avoided as per Tracey and Beechey, 1974 and following Figure 13 of this report. Developments which could have a significant impact on the natural features in these areas include nature trails, hiking trails, or horseback riding trails down steep slopes; access roads which would affect the integrity of the forested river corridor; campsites which would cause soil compaction and, on clay, would strip the area of vegetation; and the introduction of non-native species.

Because of the steep slopes and clay seepage and slumpage areas, a 100 m buffer area is recommended in areas where the ANSI boundary coincides with the top of the valley slope.

2. Forest management in wooded areas of the Park Reserve and the ANSI which would involve selected tree species removal should be avoided in order to maintain both the existing tree species diversity, and the high diversity of plant associations which currently occur in the area.
3. The current exclusion of grazing from upland areas of Public Land should be continued in order to allow regeneration of forest understorey species, including canopy replacement species. Grazing which is still ongoing should be prohibited in order to allow old field succession to progress. Because of the great variation in topography in some of these areas, the resulting vegetation cover would add to the diversity of the site and would provide some

buffering for creek associations which occur in pastured areas.

4. It is suggested that a volunteer agreement be reached with local naturalists for further data compilation on the study area. Further information is required on breeding birds (to determine significant habitats), small mammals, site distribution information for reptiles and amphibians (particularly critical habitat for queen snakes and softshell turtles), and information on the distribution of rare butterflies and their host plants in the study area. Continued additions to the vascular plant checklist would be of scientific value in documenting successional and floristic changes in the area.
5. The two proposed additions to the ANSI (Figure 12) should be given consideration. The first area (Komoka Sand Flain Forest) is a high priority Carolinian site under the Carolinian Canada project, while the second site (Springer's Creek Floodplain Forest) is an undisturbed representative of early successional and mature floodplain forest and adjacent woods.
6. Examples of Floodplain/Bottomland vegetation currently do not occur on Public Land. Consideration should be given to assigning high priority for acquisition to these features in the event that further acquisition for the proposed park is undertaken. Currently several intact floodplain forests and old fields are found within the ANSI boundary on private lands, and in the adjacent privately owned Springer's Creek area. The Springer's Creek area offers representation of early successional floodplain forest, a feature not represented in the ANSI.

7. The occurrence of an ANSI within the boundaries of the Park Reserve, and the high diversity and sensitivity of the Life Science Features of the river corridor, may require a reevaluation of the proposed provincial park classification for the Komoka Park Reserve.

## GLOSSARY

(based on Curtis, 1959, unless otherwise specified)

### Areas of Natural and Scientific Interest (ANSI)

ANSIs are areas of land and water containing natural landscapes or features which have been identified as having values related to protection, natural heritage, scientific study or education. ANSIs may vary in level of significance. The most significant of these may contribute to the achievement of the Ministry's protection objective. Those which do not contribute to the provincial protection objective are referred to as Significant Sites in Site District Reports.

- Association A term which is used to describe a plant community that is presumably distinct and has discrete boundaries.
- Community A studiable group of organisms which grow together in the same general place and have mutual interactions.
- Canopy The aerial branches of terrestrial plants together with their complement of leaves. Said to be a complete canopy when the ground is completely hidden by the leaves when viewed from above.
- Dominant A species which is of great importance in a community through size, number, or other characters which enable it to receive the brunt of external environmental forces and modify them before they affect the lesser members of the community.
- Flora The entire complement of plant species which grows spontaneously in a particular region. The size of a flora is determined by the number of such species and is uninfluenced by the number of individuals of each.
- Floristic Element A group of species in a particular flora which has a common origin or a uniform geographical center.
- Groundlayer The herbs, shrubs and woody vines found beneath the trees in a forest. Excludes seedlings and saplings of the overhead trees.

Site A place or location. Not used here in the special sense employed by foresters.

Site District A subdivision of a site region, with a characteristic pattern of physiographic features (Hills, 1959). Site districts are small scale map units that segregate substantial areas from each other on the basis of broad landform patterns (Hanna, 1984)

Site Region An area of land within which the response of the vegetation to the features of the landform follows a consistent pattern (Hills, 1959).

Tension Zone A band between two floristic provinces, marked by the intermingling of species from both.

Vegetation The total of the plant communities of a region. Differs from the flora because quantitative aspects are considered; numerous or large species are given more attention than rare and inconspicuous species.

Vegetation-landform feature

A distinct unit of vegetation which can be easily defined based on the landform of occurrence (i.e. upland woods) (based on Lindsay, 1984, etc.)

Vegetation Matrix

Devised by Dr. P. F. Maycock, University of Toronto to classify the vegetation of Ontario based on broad site features (moisture, temperature, etc.).

## APPENDIX A: TERMS OF REFERENCE

### RECONNAISSANCE LIFE SCIENCE INVENTORY KOMOKA PARK RESERVE AND AREA OF NATURAL AND SCIENTIFIC INTEREST

#### PURPOSE

To conduct a reconnaissance life science inventory of the Crown Land Properties of the Komoka Park Reserve, and to assess the boundary of the Komoka Park Reserve Area of Natural and Scientific Interest, following the guidelines presented in the Standard Report Format (OMNR, 1976).

#### TASKS

1. To describe and map the major vegetation communities of the Crown Land Areas of the Komoka Park Reserve.
2. To initiate a vascular plant checklist for the Park Reserve area.
3. To initiate, based on available information provided by the Aylmer District Office, faunal checklists for the Park area.
4. To summarize the significant life science features of the Crown Land Areas.
5. To map the location of the significant life science features of the park area.
6. To assess the boundaries of the ANSI and to recommend changes to the existing preliminary boundary.

In addition to the above, the major plant communities of the ANSI area have been mapped where possible.

Note: The scope of this study includes assessment and coverage of life science features which are not dealt with directly by other MNR programs.



## APPENDIX B: METHODOLOGY

The vegetation of the study area was surveyed qualitatively following the general guidelines of the Standard Report Format (OMNR, 1976) modified to accommodate a reconnaissance-level survey, and a floral checklist was prepared. The diverse habitats of the study area were traversed on foot during peak flowering times over the season in 1981 for a total of six field days. Plant community delineations were made using air photo analysis followed by on-site confirmation during a total of four field days in 1983 and 1984. Quantitative data on the vegetation of the Komoka Sand Plain Forest was made available by Dr. P. F. Maycock, University of Toronto.

In addition to a literature search and discussions with local knowledgeable individuals, data on breeding birds and other fauna on the site was noted incidentally during other field work. A breeding bird checklist was provided by Peter Read of the McIlwraith Field Naturalists.

A specific search for the Queen Snake was made along the Thames River in one field day in 1983, while an assessment of the environmental impact of on-going land uses was made during three additional field days in 1985.

Plant identification and verification was provided by several qualified botanists, and voucher specimens are deposited in three major herbaria (MICH, UWO, and TRTE).

Assessment of the Komoka ANSI boundary was made during 3 field days in 1985 using air photo interpretation and field confirmation. In 1985, an additional two field days were spent reconfirming plant community boundary delineations.

APPENDIX C: CHECKLIST OF VASCULAR PLANTS

KOMOKA PARK RESERVE AND AREA OF NATURAL  
AND SCIENTIFIC INTEREST

R. Klinkenberg  
1985

This checklist was initiated in 1981 and completed in 1984. Sources of information for the list include field work and literature search including:

Klinkenberg, R. 1981-1984, field notes  
Klinkenberg, B. 1981-1984, field notes  
McLeod, D. pers. comm.  
Maycock, P. F. unpublished field notes  
Hanna, R. 1984  
Smith and Strebe, 1981, unpublished field notes  
Hawthorn, 1976  
Rhodes, 1982, field notes  
Cook, pers. comm.

Nomenclature used in the checklist generally follows Fernald (1950). Luer (1975) was used for orchids, Voss (1972) for sedges, Dore and McNeill (1980) for grasses, Soper and Heimberger (1982) for shrubs.

Voucher collections for Komoka have been deposited at the Herbarium of the University of Western Ontario (UWO), the University of Michigan Herbarium (MICH), and the Herbarium of Erindale College, University of Toronto (TRTE).

Several people contributed to plant identification/verification in this project including: W. Crins (University of Toronto), Dr. A. A. Reznicek (University of Michigan), D. McLeod (OMNR), M. J. Oldham (Essex Region Conservation Authority), D. Sutherland (Metro Toronto and Region Conservation Authority) and G. Allan (OMNR).

Plant records for the Komoka area obtained during the 1981 field work of M. Smith and E. Strebe (assisted by E. Stewart) have been incorporated.

PRELIMINARY CHECKLIST OF VASCULAR PLANTS  
 KOMOKA PARK RESERVE  
 AND  
 AREA OF NATURAL AND SCIENTIFIC INTEREST

R. Klinkenberg  
 1985

P = Prairie species  
 N = Northern species  
 C = Carolinian species

RO = Rare in Ontario  
 RC = Rare in Canada

U = Unconfirmed  
 M = New to Middlesex County

Species name followed by an asterisk (\*) indicates a specimen record.

EQUISETACEAE

HORSETAIL FAMILY

*Equisetum arvense* L.  
*E. scirpoides* Michx.  
*E. variegatum* Scheich.\*  
*E. fluviatile* L.

field horsetail  
 dwarf scouring rush  
 variegated horsetail  
 water horsetail

P

LYCOPODIACEAE

CLUBMOSS FAMILY

*Lycopodium lucidulum* Michx.

shining club-moss

SELAGINELLACEAE

SPIKEMOSS FAMILY

*Selaginella apoda*

meadow spikemoss

OPHIOGLOSSACEAE

ADDER'S TONGUE FAMILY

*Botrychium dissectum* Spreng.  
*B. virginianum* (L.) SW.

cut-leaved grape fern  
 rattlesnake fern

POLYPODIACEAE

*Adiantum pedatum* L.  
*Athyrium filix-femina*  
(L.) Roth  
*Athyrium pycnocarpon*  
*Athyrium thelypteroides*  
(Michx.) Desv.  
*Cystopteris bulbifera*  
(L.) Bernh.\*  
*Cystopteris fragilis*  
(L.) Bernh.  
*Dryopteris spinulosa*  
(O.F. Muell.) Watt  
*Dryopteris thelypteris*  
(L.) Gray\*  
*Onoclea sensibilis* L.  
*Osmunda cinnamomea* L.  
*Osmunda regalis* L.  
*Polystichum acrostichoides*  
(Michx.) Schott\*  
*Pteridium aquilinum* (L.)  
Kuhn  
*Pteritis pensylvanica*  
(Willd.) Fern.  
*Thelypteris novaboracensis*  
(L.) Gray

FERN FAMILY

maidenhair fern  
lady fern  
silvery spleenwort  
bulblet fern  
fragile fern  
spinulose wood fern  
marsh fern  
sensitive fern  
cinnamon fern  
royal fern  
christmas fern  
bracken fern  
ostrich fern  
New York fern

U,RO

PINACEAE

*Juniperus virginiana* L.  
*Larix laricina* (DuRoi)  
K. Koch  
*Pinus banksiana* Lamb.  
*Pinus strobus* L.  
*Pinus sylvestris* L.  
*Thuja occidentalis* L.  
*Tsuga canadensis* (L.) Carr

PINE FAMILY

red cedar  
eastern larch  
jack pine  
white pine  
scotch pine  
white cedar  
eastern hemlock

TYPHACEAE

*Typha angustifolia* L.  
*Typha latifolia* L.

CATTAIL FAMILY

narrow-leaved cattail  
common cattail

ALISMATACEAE

*Alisma triviale* Pursh.  
*Sagittaria latifolia* Willd.\*

WATER PLANTAIN FAMILY

large-flowered water plantain  
broad-leaved arrowhead

GRAMINEAE

*Agrostis gigantea* Roth\*  
*Andropogon gerardii* Vitman\*  
*Bromus ciliatus* L.\*  
*Dactylis glomerata* L.  
*Echinochloa crus galli*  
 (L.) Beauv.  
*Festuca pratensis* Hudson\*  
*Glyceria striata*  
 (Lam.) A. S. Hitchc.  
*Leersia oryzoides* (L.)\*  
 Swartz.  
*Panicum cf. depauperatum*  
*Panicum implicatum* Scribn.\*  
*Panicum lanuginosum* Elliott  
*Phleum pratense* L.  
*Sphenopholis intermedia*

GRASS FAMILY

redtop  
 big bluestem P  
 fringed brome grass  
 barnyard grass  
 barnyard grass  
 meadow fescue  
 fowl manna grass  
 rice cut grass  
 panic grass  
 panic grass  
 panic grass  
 timothy  
 dropseed

CYPERACEAE

*Carex annectens* (Bickn.)  
 Bickn.  
*Carex arctata* Boott\*  
*Carex aurea* Nutt.  
*Carex bebbii* (Bailey) Fern.\*  
*Carex cephalophora* Willd.\*  
*Carex comosa* Boott\*  
*Carex convoluta* Mack.\*  
*Carex cristatella* Britton  
*Carex deweyana* Schw.\*  
*Carex eburnea* Boott.\*  
*Carex flava* L.\*  
*Carex gracillima* Schw.\*  
*Carex granularis* Willd.\*  
*Carex hystericina* Willd.\*  
*Carex interior* Bailey\*  
*Carex laevivaginata*  
 (Kuck.) Mack.\*  
*Carex lanuginosa* Michaux\*  
*Carex leptalea* Wahl.\*  
*Carex leptonervia* (Fern)\*  
*Carex pennsylvanica* Lam.\*  
*Carex rosea* Willd.\*  
*Carex rostrata* Stokes  
*Carex schweinitzii* Willd.\*  
*Carex c.f. sprengei*  
*Carex stricta* Lam.\*  
*Carex viridula*\*  
*Carex vulpinoidea*

SEDGE FAMILY

sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge  
 sedge

<i>Eleocharis elliptica</i> *	sedge
<i>Eleocharis erythropoda</i> Steudel*	spikerush
<i>Scirpus atrovirens</i> Willd.*	bulrush
<i>Scirpus cyperinus</i> (L.) Kunth*	bulrush
<i>Scirpus lineatus</i> *	
<i>Scirpus pendulus</i> Muhl.	bulrush
<i>Scirpus validus</i> Vahl.	bulrush

ARACEAE

ARUM FAMILY

<i>Acorus calamus</i> L.*	sweet flag
<i>Arisaema atrorubens</i> (Ait.) Blume	Jack-in-the-pulpit
<i>Symplocarpus foetidus</i> (L.) Nutt.	skunk cabbage

JUNCACEAE

RUSH FAMILY

<i>Juncus alpinus</i> Vill.*	rush
<i>Juncus articulatus</i> L.*	jointed rush
<i>Juncus brachycephalus</i> (Engelm.) Buch.*	rush
<i>Juncus dudleyi</i> Wieg.*	Dudley's rush
<i>Juncus effusus</i> L.*	common rush
<i>Juncus nodosus</i> L.*	knotted rush
<i>Juncus tenuis</i> Willd.	path rush
<i>Juncus torreyi</i> Coville*	Torrey's rush
<i>Luzula acuminata</i> Raf.*	wood rush

LILIACEAE

LILY FAMILY

<i>Allium tricoccum</i> Ait.	wild leek
<i>Asparagus officinalis</i> L.	asparagus
<i>Erythronium albidum</i> Nutt.	white trout lily
<i>Erythronium americanum</i> Ker	yellow trout lily
<i>Lilium philadelphicum</i> L.	wood lily
<i>Maianthemum canadensis</i> Desf.	Canada mayflower
<i>Medeola virginiana</i> L.	Indian cucumber-root
<i>Polygonatum pubescens</i> (Willd.) Pursh	hairy solomon's seal
<i>Smilacina racemosa</i> (L.) Desf.	false solomon's seal
<i>Smilacina stellata</i> (L.) Desf.	starry false solomon's seal
<i>Smilax herbacea</i> L.	carrion flower
<i>Smilax hispida</i> Muhl.	catbrier
<i>Smilax tamnoides</i> L.	china root

<i>Trillium erectum</i> L.	red trillium	
<i>Trillium grandiflorum</i> (Michx.) Salisb.	white trillium	
<i>Uvularia grandiflora</i> Sm.	large-flowered bellwort	

DIOSCOREACEAE

YAM FAMILY

<i>Dioscorea villosa</i> L.*	wild yam	
------------------------------	----------	--

IRIDACEAE

IRIS FAMILY

<i>Iris versicolor</i> L.	wild iris	
<i>Sisyrinchium montanum</i> Greene	blue-eyed grass	

ORCHIDACEAE

ORCHID FAMILY

<i>Cypripedium acaule</i> Ait.	stemless lady's slipper	
<i>Cypripedium calceolus</i> var. <i>parviflorum</i>	small yellow lady's slipper	
<i>Cypripedium reginae</i>	showy lady's slipper	
<i>Goodyera pubescens</i> (Willd.) R. Br.	downy rattlesnake plantain	U
<i>Goodyera tessellata</i> Lodd.	checkered rattlesnake plantain	

SALICACEAE

WILLOW FAMILY

<i>Populus alba</i> L.	white poplar	
<i>Populus balsamifera</i> L.	balsam poplar	
<i>Populus deltoides</i> Marsh.	cottonwood	Ca
<i>Populus grandidentata</i> Michx.	large-toothed aspen	Ca
<i>Populus tremuloides</i> Michx.	trembling aspen	
<i>Salix bebbiana</i> Sarg.*	Bebb's willow	
<i>Salix exigua</i> Nutt.*	sandbar willow	
<i>Salix nigra</i> Marsh	black willow	

JUGLANDACEAE

WALNUT FAMILY

<i>Carya cordiformis</i> (Wang.) K. Koch	bitternut hickory	
<i>Carya ovata</i> (Mill.) K. Koch	shagbark hickory	
<i>Juglans nigra</i> L.	black walnut	

CORYLACEAE

HAZEL FAMILY

<i>Betula lutea</i> Michx.	yellow birch	Ca
<i>Betula papyrifera</i> Marsh.	white birch	N

<i>Carpinus caroliniana</i> Walt.*	blue beech	
<i>Corylus americana</i> Walt.*	hazelnut	Ca
<i>Corylus cornuta</i> Marsh.	beaked hazelnut	Ca
<i>Ostrya virginiana</i> (Mill.) K. Koch	hop hornbeam	

FAGACEAE

BEECH FAMILY

<i>Fagus grandifolia</i> Ehrh.	American beech	
<i>Quercus alba</i> L.	white oak	
<i>Quercus macrocarpa</i> Michx.*	burr oak	
<i>Quercus rubra</i> L.	red oak	
<i>Quercus bicolor</i>	swamp white oak	O,C

ULMACEAE

ELM FAMILY

<i>Celtis occidentalis</i> L.	hackberry	Ca
<i>Ulmus americana</i>	white elm	

MORACEAE

MULBERRY FAMILY

<i>Morus alba</i> L.*	white mulberry	
-----------------------	----------------	--

URTICACEAE

NETTLE FAMILY

<i>Boehmeria cylindrica</i> (L.) Sw.	false nettle	
<i>Pilea pumila</i> (L.) Gray	clearweed	
<i>Urtica dioica</i> L. ssp. <i>gracilis</i> (Ait.)	nettle slender nettle	

SANTALACEAE

SANDALWOOD FAMILY

<i>Comandra richardsiana</i> Fern.*	bastard toadflax	
-------------------------------------	------------------	--

ARISTOLOCHIACEAE

BIRTHWORT FAMILY

<i>Asarum canadense</i> L.	wild ginger	
----------------------------	-------------	--

POLYGONACEAE

BUCKWHEAT FAMILY

<i>Polygonum lapathifolium</i> L.*	pale smartweed	
<i>Rumex crispus</i> L.	curled dock	
<i>Rumex acetosella</i> L.	sheep sorrel	
<i>Rumex obtusifolius</i> L.	broad dock	



CHENOPODIACEAE

*Atriplex patula* L.  
*Chenopodium album* L.  
*Chenopodium capitatum* (L.)  
Aschers

AMARANTHACEAE

*Amaranthus albus* L.  
*Amaranthus retroflexus* L.

PORTULACACEAE

*Claytonia virginica* L.

CARYOPHYLLACEAE

*Cerastium arvense* L.  
*Dianthus armeria* L.  
*Lychnis alba* Mill.  
*Saponaria officinalis* L.  
*Silene cucubalus* Wibel  
*Silene nivea* (Nutt.) Otth.

RANUNCULACEAE

*Actaea pachypoda* Ell.  
*Actaea rubra* (Ait.) Willd.  
*Anemone canadensis* L.\*  
*Anemone quinquefolia* L.  
*Anemone riparia* Fern.\*  
*Aquilegia canadensis* L.  
*Caltha palustris* L.  
*Clematis virginiana* L.  
*Hepatica acutiloba* DC  
*Hepatica americana* (DC) Ker  
*Ranunculus abortivus* L.  
*Ranunculus acris* L.\*  
*Ranunculus recurvatus* Poir.\*  
*Thalictrum dioicum* L.\*  
*Thalictrum polygamum* Muhl.

GOOSEFOOT FAMILY

spreading atriplex  
lamb's quarters  
strawberry blite

AMARANTH FAMILY

tumbleweed  
common pigweed

PURSLANE FAMILY

spring beauty

PINK FAMILY

field chickweed  
deptford pink  
evening lychnis  
bouncing bet  
bladder campion  
snowy campion

CROWFOOT FAMILY

white baneberry  
red baneberry  
Canada anemone  
wood anemone  
thimbleweed  
wild columbine  
marsh marigold  
virgin's bower  
sharp-lobed hepatica  
round-lobed hepatica  
kidney-leaf buttercup  
tall buttercup  
hooked buttercup  
early meadow-rue  
tall meadow-rue

P

BERBERIDACEAE

<i>Berberis thunbergii</i> DC	Japanese barberry
<i>Berberis vulgaris</i> L.*common	barberry
<i>Caulophyllum thalictroides</i> (L.) Michx.	blue cohosh
<i>Podophyllum peltatum</i> L.	mayapple

BARBERRY FAMILYMENISPERMACEAE

<i>Menispermum canadense</i> L.	moonseed	Ca
---------------------------------	----------	----

MOONSEED FAMILYLAURACEAE

<i>Lindera benzoin</i> (L.) Blume*	spicebush	Ca
------------------------------------	-----------	----

LAUREL FAMILYPAPAVERACEAE

<i>Sanguinaria canadensis</i> L.	bloodroot
----------------------------------	-----------

POPPY FAMILYCRUCIFERAE

<i>Arabis laevigata</i> (Muhl.) Poir	rockcress*
<i>Arabis cf. lyrata</i> L.	rock cress
<i>Alliaria officinalis</i> Andrz.	garlic mustard
<i>Barbarea vulgaris</i> R. Br.	yellow rocket
<i>Brassica kaber</i> (DC) L. C. Wheeler	field mustard
<i>Capsella bursa-pastoris</i> (L.) Medic.	shepherd's purse
<i>Dentaria diphylla</i> Michx.	toothwort
<i>Dentaria laciniata</i> Muhl.	cut-leaved toothwort
<i>Erysimum cheiranthoides</i> L.	wormseed mustard
<i>Hesperis matronalis</i> L.	dame's rocket
<i>Lepidium campestre</i> (L.) R. Br.	field peppergrass
<i>Nasturtium officinale</i> R. Br.	watercress
<i>Rorippa islandica</i> (Deder) Borbas	yellow cress

MUSTARD FAMILYDROSERACEAE

<i>Drosera rotundifolia</i> L.	round-leaved sundew
--------------------------------	---------------------

SUNDEW FAMILY

SAXIFRAGACEAE

*Mitella diphylla* L.  
*Parnassia glauca* Raf.  
*Ribes americanum* Mill.  
*Ribes cynosbati* L.  
*Tiarella cordifolia* L.

SAXIFRAGE FAMILY

mitrewort  
grass-of-Parnassus  
wild black currant  
prickly gooseberry  
foam flower

HAMAMELIDACEAE

*Hamamelis virginiana* L.\*

WITCH HAZEL FAMILY

witch hazel Ca

PLATANACEAE

*Platanus occidentalis* L.

PLANE TREE FAMILY

sycamore Ca

ROSACEAE

*Agrimonia gryposepala* Wallr.\*  
*Amelanchier arborea* Michx.  
Fern.

ROSE FAMILY

agrimony  
serviceberry

*Crataegus mollis*  
*Crataegus monogyna* Jacq.\*  
*Crataegus punctata* Jacq.\*  
*Fragaria vesca* L.  
*Fragaria virginiana* Duchesne\*  
*Geum aleppicum* Jacq.\*  
*Geum canadense* Jacq.  
*Physocarpus opulifolius*  
(L.) Maxim.\*

hawthorn  
English hawthorn  
dotted hawthorn  
woodland strawberry  
wild strawberry  
yellow avens  
white avens  
ninebark

*Potentilla recta* L.  
*Potentilla simplex*  
*Prunus pensylvanica* L.  
*Prunus serotina* Ehrh.\*  
*Prunus virginiana* L.\*  
*Pyrus coronaria* L.\*  
*Pyrus malus* L.  
*Rosa multiflora* Thunb.  
*Rosa palustris* Marsh.  
*Rubus hispidus* L.  
*Rubus occidentalis* L.  
*Rubus odoratus* L.  
*Rubus pubescens* Raf.\*  
*Rubus strigosus* L.\*

rough-fruited cinquefoil  
field cinquefoil  
pin cherry U  
black cherry  
choke cherry  
wild crab U  
apple  
multiflora rose  
swamp rose  
running swamp blackberry  
black raspberry  
purple flowering raspberry  
dwarf swamp raspberry  
red raspberry

LEGUMINOSAE

PEA FAMILY

<i>Amygdalopsis bracteata</i> (L.) DC	hog peanut	
<i>Apios americana</i> Medic.*	groundnut	P
<i>Desmodium canadense</i> (L.) DC*	showy tick-trefoil	P
<i>Desmodium glutinosum</i> Muhl.*	pointed-leaved tick-trefoil	
<i>Medicago lupulina</i> L.	black medic	
<i>Medicago sativa</i> L.	alfalfa	
<i>Melilotus alba</i> Desr.	white sweet clover	
<i>Melilotus officinalis</i> (L.) Lam.	yellow sweet clover	
<i>Trifolium hybridum</i> L.	alsike clover	
<i>Trifolium pratense</i> L.	red clover	
<i>Trifolium repens</i> L.	white clover	
<i>Vicia cracca</i> L.	tufted vetch	

OXALIDACEAE

WOOD-SORREL FAMILY

<i>Oxalis stricta</i> L.	yellow wood-sorrel	
--------------------------	--------------------	--

GERANIACEAE

GERANIUM FAMILY

<i>Geranium maculatum</i> L.	wild geranium	
<i>Geranium robertianum</i> L.	herb robert	

RUTACEAE

RUE FAMILY

<i>Xanthoxylum americanum</i> Mill.	northern prickly ash	A
--	----------------------	---

POLYGALACEAE

MILKWORT FAMILY ??

<i>Polygala paucifolia</i>	gaywings	
----------------------------	----------	--

ANACARDIACEAE

CASHEW FAMILY

<i>Rhus radicans</i> L.	poison ivy	
<i>Rhus typhina</i> L.	staghorn sumac	

CELASTRACEAE

STAFF-TREE FAMILY

<i>Celastrus scandens</i> L.	climbing bittersweet	Ca
<i>Euonymus obovatus</i> Nutt.	running strawberry-bush	Ca

ACEARACEAE

*Acer negundo* L.  
*Acer nigrum* L.\*  
*Acer rubrum* L.  
*Acer saccharinum* L.  
*Acer saccharum* Marsh.

MAPLE FAMILY

Manitoba maple  
black maple  
red maple  
silver maple  
sugar maple

Ca

BALSAMINACEAE

*Impatiens capensis* Meerb.  
*Impatiens pallida* Nutt.

TOUCH-ME-NOT FAMILY

spotted touch-me-not  
yellow jewelweed

RHAMNACEAE

*Rhamnus cathartica* L.\*  
*Rhamnus frangula* L.

BUCKTHORN FAMILY

common buckthorn  
alder buckthorn

VITACEAE

*Parthenocissus inserta* L.  
*Vitis riparia* Michx.\*

VINE FAMILY

virginia creeper  
riverbank grape

TILIACEAE

*Tilia americana* L.

LINDEN FAMILY

basswood

GUTTIFERAE

*Hypericum boreale* (Britt.)  
Bickn.  
*Hypericum perforatum* L.  
*Hypericum punctatum* Lam.

ST. JOHN'S-WORT FAMILY

northern St. John's-wort  
common St. John's-wort  
spotted St. John's-wort

VIOLACEAE

*Viola canadensis* L.  
*Viola papilionacea* L.\*  
*Viola pubescens* Ait.  
*Viola rostrata* Pursh\*

VIOLET FAMILY

common blue violet  
downy yellow violet  
long-spurred violet

THYMELAEACEAE

*Dirca palustris* L.

MEZEREUM FAMILY

leatherwood

ELAEAGNACEAE

*Elaeagnus umbellata* Thunb.  
*Shepherdia canadensis* (L.)  
Nutt.

LYTHRACEAE

*Lythrum salicaria* L.\*

ONAGRACEAE

*Circaea quadrisulcata*  
(Maxim.) Franch & Sav.\*  
*Epilobium hirsutum* L.  
*Epilobium leptophyllum*  
*Oenothera biennis* L.  
*Oenothera parviflora* L.

ARALIACEAE

*Aralia nudicaulis* L.

UMBELLIFERAE

*Daucus carota* L.  
*Zizia aurea* (L.) W.D.J. Koch\*

CORNACEAE

*Cornus alternifolia* L.\*  
*Cornus florida* L.  
*Cornus obliqua* Raf.\*  
*Cornus racemosa* Lam.  
*Cornus rugosa* L.\*  
*Cornus stolonifera* Michx.

PYROLACEAE

*Monotropa uniflora* L.  
*Pyrola elliptica* Nutt.\*  
*Pyrola rotundifolia* L.

ERICACEAE

OLEASTER FAMILY

autumn olive  
soapberry

LOOSESTRIFE FAMILY

purple loosestrife

EVENING-PRIMROSE FAMILY

enchanter's nightshade  
great hairy willow-herb  
evening primrose  
small-flowered evening  
primrose

GINSENG FAMILY

wild sarsaparilla

PARSLEY FAMILY

wild carrot  
golden alexanders

DOGWOOD FAMILY

alternate-leaved dogwood  
flowering dogwood  
silky dogwood  
grey dogwood  
round-leaved dogwood  
red-osier dogwood

O,C,Ca

WINTERGREEN FAMILY

indian pipe  
shinleaf  
round-leaved pyrola

HEATH FAMILY

*Vaccinium corymbosum* L. northern high-bush blueberry  
*Vaccinium myrtilloides* Michx.\* bilberry

PRIMULACEAE

PRIMROSE FAMILY

*Lysimachia ciliata* L. fringed loosestrife  
*Lysimachia nummularia* L. moneywort  
*Trientalis borealis* Raf. starflower

OLEACEAE

OLIVE FAMILY

*Fraxinus americana* L. white ash  
*Fraxinus nigra* Marsh. black ash  
*Fraxinus pennsylvanica* Marsh. green ash  
*Syringa vulgaris* L. common lilac

GENTIANACEAE

GENTIAN FAMILY

*Menyanthes trifoliata* L. buckbean

APOCYNACEAE

DOGBANE FAMILY

*Apocynum androsaemifolium* L. spreading dogbane  
*Apocynum cannabinum* L.\* indian hemp  
*Apocynum medium* Greene intermediate dogbane

P

ASCLEPIADACEAE

MILKWEED FAMILY

*Asclepias exaltata* L.\* poke milkweed  
*Asclepias incarnata* L. swamp milkweed  
*Asclepias purpurascens* L. purple milkweed  
*Asclepias syriaca* L. common milkweed  
*Asclepias tuberosa* butterflyweed

O,C

O,C,U

P

P

CONVOLVULACEAE

MORNING-GLORY FAMILY

*Convolvulus arvensis* L. field bindweed

HYDROPHYLLACEAE

WATERLEAF FAMILY

*Hydrophyllum virginianum* L. virginia waterleaf

BORAGINACEAE

*Echium vulgare* L.

VERBENACEAE

*Verbena hastata* L.

LABIATAE

*Agastache foeniculum*  
(Pursh) Ktze

*Blephilia ciliata* L.

*Collinsonia canadensis* L.  
Ca, O, C

*Glechoma hederacea* L.

*Leonurus cardiaca* L.

*Lycopus americanus* Muhl.\*

*Lycopus uniflorus* Michx.\*

*Mentha arvensis* L.

*Mentha piperita* L.

*Monarda didyma* L.

*Monarda fistulosa* L.

*Nepeta cataria* L.

*Prunella vulgaris* L.

*Satureja vulgaris* (L.)  
Fritsch

*Scutellaria epilobiifolia*  
A. Hamilton

SOLANACEAE

*Solanum dulcamara* L.

*Solanum nigrum* L.

SCROPHULARIACEAE

*Chelone glabra* L.

*Gerardia tenuifolia* Vahl.\*

*Linaria vulgaris* Hill

*Mimulus ringens* L.

*Pedicularis canadensis*

*Penstemon hirsutus* L.

*Scrophularia lanceolata*

*Verbascum thapsus* L.

*Veronica serpyllifolia* L.

BORAGE FAMILY

blueweed

VERVAIN FAMILY

blue vervain

MINT FAMILY

blue giant hyssop

downy wood mint

horse balm

ground-ivy

motherwort

cut-leaved water-horehound

bugleweed

wild mint

peppermint

bee-balm

wild bergamot

catnip

heal-all

wild basil

common skullcap

O, C, U

O, C

NIGHTSHADE FAMILY

climbing nightshade

common nightshade

FIGWORT FAMILY

turtlehead

slender gerardia

toadflax

monkeyflower

figwort

figwort

common mullein

thyme-leaved speedwell



PHRYMACEAE

*Phryma leptostachya* L.\*

LOPSEED FAMILY

lopseed

DROBANCHACEAE

*Conopholis americana* (L.)  
Wallr.  
*Epifagus virginiana* (L.)  
Bart.

BROOM RAPE FAMILY

squaw root  
beechdrops

PLANTAGINACEAE

*Plantago lanceolata* L.  
*Plantago major* L.  
*Plantago c.f. rugelii* Dcne.

PLANTAIN FAMILY

English plantain  
common plantain  
Rugel's plantain

RUBIACEAE

*Galium asprellum* Michx.  
*Galium c.f. boreale* L.\*  
*Galium circaezans* Michx.  
*Galium mollugo* L.\*  
*Galium palustre* L.\*  
*Galium triflorum* Michx.\*  
*Mitchella repens* L.

MADDER FAMILY

rough bedstraw  
northern bedstraw  
wild licorice  
wild madder  
marsh bedstraw  
sweet-scented bedstraw  
partridge-berry

CAPRIFOLIACEAE

*Diervilla lonicera* Mill.  
*Lonicera canadensis* Bartr.\*  
*Lonicera dioica* L.  
*Lonicera morrowii*  
*Lonicera tatarica* L.\*  
*Sambucus canadensis* L.  
*Sambucus pubens* Michx.  
*Viburnum acerifolium* L.\*  
*Viburnum cassinoides* L.  
*Viburnum lentago* L.  
*Viburnum opulus* L.  
*Viburnum rafinesquianum*  
Schultes\*  
*Viburnum trilobum* L.\*

HONEYSUCKLE FAMILY

bush honeysuckle  
fly-honeysuckle  
glaucous honeysuckle  
honeysuckle  
tartaraian honeysuckle  
common elderberry  
red-berried elder  
maple-leaved viburnum  
wild raisin  
nannyberry  
high-bush cranberry  
downy arrow-wood  
highbush cranberry

DIPSACACEAE

*Dipsacus sylvestris* Huds.

TEASEL FAMILY

teasel

CUCURBITACEAE

*Echinocystis lobata* Michx.  
T. & G.  
*Sicyos angulatus* L.

CUCUMBER FAMILY

wild cucumber  
bur cucumber

CAMPANULACEAE

*Lobelia inflata* L.  
*Lobelia siphilitica* L.

BLUEBELL FAMILY

Indian tobacco  
great lobelia

COMPOSITAE

*Achillea millefolium* L.  
*Ambrosia artemisiifolia* L.  
*Ambrosia trifida* L.  
*Antennaria neglecta* Greene  
*Anthemis cotula* L.\*  
*Arctium minus* (Hill) Bernh.  
*Aster cordifolius* L.  
*Aster junciformis* Rydb.  
*Aster laevis* L.\*  
*Aster lateriflorus* (L.) Britt.  
*Aster macrophyllus* L.  
*Aster nova-anglia* L.  
*Aster sagittifolius*  
Wedemeyer  
*Aster simplex* Willd.  
*Bidens frondosa* L.  
*Centaurea maculosa* L.\*  
*Chrysanthemum leucanthemum* L.  
*Crisium arvense* (L.) Scop.  
*Crepis capillaris* L.\*  
*Echium vulgare* L.  
*Erigeron annuus* (L.) Pers.  
*Erigeron canadensis* L.  
*Erigeron philadelphicus* L.  
*Erigeron strigosus* Muhl.  
*Erigeron pulchellus* L.\*  
*Eupatorium maculatum* L.  
*Eupatorium perfoliatum* L.  
*Eupatorium rugosum* Houtt.  
*Helianthus divaricatus* L.  
*Helianthus gigantea* L.\*  
*Helianthus tuberosus* L.  
*Hieracium canadense* (Michx).  
*Hieracium florentinum* All.\*  
*Hieracium pratense* Tausch

DAISY FAMILY

common yarrow  
common ragweed  
giant ragweed  
field pussytoes  
stinking mayweed  
common burdock  
heart-leaved aster  
rush aster  
smooth aster  
calico aster  
large-leaved aster  
New England aster  
arrow-leaved aster  
  
panicled aster  
sticktight  
knapweed  
ox-eye daisy  
bull thistle  
hawk's beard  
viper's bugloss  
daisy fleabane  
horseweed  
Philadelphia fleabane  
narrow-leaved fleabane  
robin plantain  
joe-pye-weed  
boneset  
white snakeroot  
woodland sunflower  
tall sunflower  
Jerusalem artichoke  
hawkweed  
king devil  
field hawkweed

P  
  
P

<i>Inula helenium</i> L.	elecampane
<i>Lactuca canadensis</i> L.	Canada lettuce
<i>Prenanthes alba</i> L.*	white lettuce
<i>Prenanthes altissima</i> L.	tall white lettuce
<i>Rudbeckia hirta</i> L.	black-eyed Susan
<i>Rudbeckia laciniata</i> L.*	green-headed coneflower
<i>Rudbeckia triloba</i> L.	thin-leaved coneflower
<i>Senecio plattensis</i>	ragwort
<i>Senecio c.f. pauperculus</i> L.	ragwort
<i>Senecio aureus</i> L.	ragwort
<i>Solidago arguta</i> L.	goldenrod
<i>Solidago canadensis</i> L.*	goldenrod
<i>Solidago caesia</i> L.	woodland goldenrod
<i>Solidago flexicaulis</i> L.*	zig-zag goldenrod
<i>Solidago gigantea</i> L.	goldenrod
<i>Solidago graminifolia</i> (L.) Salisb.	lance-leaved goldenrod
<i>Solidago juncea</i> Ait.	early goldenrod
<i>Solidago nemoralis</i> Ait.	gray goldenrod
<i>Solidago patula</i> L.*	prairie goldenrod
<i>Solidago rugosa</i> Ait.	rough-stemmed goldenrod
<i>Solidago ulmifolia</i> L.	elm-leaved goldenrod
<i>Sonchus arvensis</i> L.	perennial sow thistle
<i>Sonchus asper</i> (L.) Hill	spiny-leaved sow thistle
<i>Sonchus oleraceus</i> L.	annual sow thistle
<i>Taraxacum officinale</i> Weber	common dandelion
<i>Tragopogon pratensis</i> L.	meadow goat's beard
<i>Tussilago farfara</i> L.	coltsfoot

APPENDIX F2: PRELIMINARY CHECKLIST OF MAMMALS

KOMOKA PARK RESERVE AND ANSI  
1984

The following list was compiled from field notes taken during inventory work, literature search and discussions with local knowledgeable individuals.

\* Significant Species

+ Introduced Species, no recent records

Eastern Cottontail	Sylvilagus floridanus	
Groundhog	Marmota monax	
American Badger	Taxidea taxus	*
Eastern Grey Squirrel	Sciurus carolinensis	
Fox Squirrel	Sciurus niger	+
Southern Flying Squirrel	Glaucomys volans	
Muskrat	Ondatra zibethicus	
Meadow Yole	Microtus pennsylvanicus	
Red Fox	Vulpes vulpes	
Raccoon	Procyon lotor	
Striped Skunk	Mephites mephites	
White-tailed Deer	Odocoileus virginianus	

APPENDIX F3: PRELIMINARY CHECKLIST OF REPTILES AND AMPHIBIANS

KOMOKA PARK RESERVE AND ANSI  
1984

This list was compiled from field notes taken during inventory work, from literature search, and from discussions with local knowledgeable individuals.

\*Significant Species

Turtles

* Painted Turtle	<i>Chrysemys picta</i>
* Eastern Spiny Softshell Turtle	<i>Trionyx spiniferus</i>

Snakes

* Queen Snake	<i>Regina septemvittata</i>
Eastern Garter Snake	<i>Thamnophis sirtalis</i>

Frogs and Toads

American Toad	<i>Bufo americana</i>
Spring Peeper	<i>Hyla crucifer</i>
Western Chorus Frog	<i>Pseudacris triseriata</i>
Green Frog	<i>Rana clamitans</i>
Leopard Frog	<i>Rana pipiens</i>

APPENDIX F1: PRELIMINARY CHECKLIST OF BIRDS

KOMOKA PARK RESEVE

1983

The majority of birds records and status information for this checklist was provided by Peter Reade, McIlwraith Field Naturalists. Additional information was received from W. Jarman, while literature and limited field work provided additional data.

+ migrants  
 P probably breeding  
 O Ontario Nest Records information  
 \* breeding  
 S from Saunders and Dale (1931)

+ Common Loon	+ Ruddy Duck
+ Horned Grebe	+ Hooded Merganser
+ Pied-Billed Grebe	+ Turkey Vulture
+ Double-Crested Cormorants	+ Northern Goshawk
O Great Blue Heron	P Sharp-Shinned Hawk
O Green Heron	+ Cooper's Hawk
S Little Blue Heron	O Red-Shouldered Hawk
O American Bittern	+ Broad-Winged Hawk
+ Whistling Swan	+ Rough-Legged Hawk
* Canada Goose	+ Bald Eagle
+ Mallard	+ Northern Harrier
+ American Black Duck	+ Osprey
+ Gadwall	+ Merlin
+ Common Pintail	+ American Kestrel
+ Green-Winged Teal	* Ruffed Grouse
+ Blue-Winged Teal	* Ring-Necked Pheasant
+ American Widgeon	+ American Coot
+ Northern Shoveler	* Killdeer
+ Redhead	+ Greater Yellowlegs
+ Ring-Necked Duck	+ Lesser Yellowlegs
+ Canvasback	* Spotted Sandpiper
+ Greater Scaup	* American Woodcock
+ Lesser Scaup	+ Common Snipe
+ Common Goldeneye	+ Great Black-Backed Gull
+ Bufflehead	+ Herring Gull
+ White-Winged Scoter	S Common Tern

S	Common Tern	P	Red-Eyed Vireo
+	Black Tern	+	Philadelphia Vireo
*	Rock Dove	P	Warbling Vireo
*	Mourning Dove	+	Black-and-White Warbler
O	Yellow-Billed Cuckoo	+	Golden-Winged Warbler
*	Black-Billed Cuckoo	*	Blue-Winged Warbler
O	Common Screech Owl	+	Tennessee Warbler
P	Great Horned Owl	+	Nashville Warbler
O	Whip-Poor-Will	*	Yellow Warbler
+	Common Nighthawk	+	Magnolia Warbler
+	Chimney Swift	+	Cape May Warbler
P	Ruby-Throated Hummingbird	+	Black-Throated Blue Warbler
P	Belted Kingfisher	+	Yellow-Rumped Warbler
*	Common Flicker	+	Black-Throated Green Warbler
O	Pileated Woodpecker	+	Blackburnian Warbler
+	Red-Bellied Woodpecker	+	Chestnut-Sided Warbler
P	Hairy Woodpecker	+	Bay-Breasted Warbler
+	Downy Woodpecker	+	Ovenbird
+	Eastern Kingbird	+	Northern Waterthrush
*	Great Crested Flycatcher	P	Common Yellowthroat
*	Eastern Phoebe	+	Wilson's Warbler
+	Willow Flycatcher	+	Canada Warbler
+	Least Flycatcher	*	American Redstart
*	Eastern Peewee	*	House Sparrow
+	Horned Lark	P	Bobolink
P	Tree Swallow	P	Eastern Meadowlark
*	Bank Swallow	*	Red-Winged Blackbird
*	Rough-Winged Swallow	P	Common Grackle
*	Barn Swallow	O	Brown-Headed Cowbird
*	Cliff Swallow	P	Scarlet Tanager
*	Blue Jay	*	Northern Cardinal
*	American Crow	*	Rose-Breasted Grosbeak
*	Black-Capped Chickadee	P	Indigo Bunting
P	White-Breasted Nuthatch	+	Evening Grosbeak
+	Red-Breasted Nuthatch	+	Purple Finch
+	Brown Creeper	+	Pine Grosbeak
*	House Wren	+	Common Redpoll
P	Winter Wren	+	Pine Siskin
+	Carolina Wren	*	American Goldfinch
*	Gray Catbird	P	Rufous-Sided Towhee
*	Brown Thrasher	P	Savannah Sparrow
*	American Robin	P	Vesper Sparrow
*	Wood Thrush	+	Northern Junco
+	Swainson's Thrush	+	American Tree Sparrow
P	Veery	*	Chipping Sparrow
P	Blue-Gray Gnatcatcher	P	Field Sparrow
+	Golden-Crowned Kinglet	+	White-Crowned Sparrow
+	Ruby-Crowned Kinglet	+	White-Throated Sparrow
+	Cedar Waxwing	+	Fox Sparrow
*	European Starling	P	Swamp Sparrow
+	Yellow-Throated Vireo		
+	Solitary Vireo		

\* Song Sparrow



## APPENDIX G: ANSI SELECTION CRITERIA

(Source: Hanna, 1980)

- (a) Representation - Representation of the remaining natural features of the site district was of primary importance. The dominant vegetation-landform features of the site districts were given special emphasis.
- (b) Diversity - Diversity was appraised in terms of the number and range of vegetation-landform features or habitats found within a site. The representation value of a site usually increases in proportion to the diversity of habitats contained within the site.
- (c) Condition - The degree of past disturbance to the main feature(s) of the site was assessed. Logging, grazing, fire, drainage, flooding, mining, housing developments, transportation and utility corridors and recreation were some of the impacts that were considered. Because all of southern Ontario has been effected by human disturbance to varying degrees, none of the sites selected are pristine.
- (d) Ecological Considerations - Ecological consideration such as size, shape, buffering from adjacent land use and watershed location were also weighed. Generally, larger sites, which would be more likely to maintain stable and diverse natural communities, were chosen over smaller sites. However, for certain life science features only small remnant sites are left, especially in the extreme southern part of Ontario (Site Region 7). In such cases, sites that were close together or linked were ranked higher than widely spaced, small area. Recent work on island biogeography (Diamond, 1975) suggests that species extinctions are less likely to occur in larger sites, linked sites or closely spaced sites than small, isolated sites. Headwater areas and watershed units where some degree of control over inputs would be possible were given special attention.
- (e) Special Features - Allowance was also made for special features such as the presence of rare and endangered species, species of phytogeographical interest (significant species), nesting sites for colonial birds such as heronries, and concentrations of breeding and/or migratory

waterfowl. The special features criterion was of secondary importance; it was applied only after representation, diversity, condition and ecological considerations had been assessed. Because detailed and complete biological data was lacking for most sites, caution was exercised in comparing the special features of sites with different levels of background data.

SITE DISTRICT 7-6: RIVER VALLEY SYSTEMS  
 ONTARIO NATURE RESERVES PROGRAM - LIFE SCIENCE INVENTORY CHECK-SHEET

NAME Komoka Park Reserve and adjacent lands		MAP NAME St. Thomas		MAP NUMBER 40 I/14	UTM REF. 670550
COUNTY, DISTRICT or REGIONAL MUNICIPALITY		LAT. 42 ° 57' N	LONG. 81 ° 25' W	ALT. MIN. MAX. ca. 700 ft.-800 ft.	
LOCALITY Thames River between Kilworth and Komoka		1:50,000 NTS MAP SHOWING AREA BOUNDARIES 1:250,000			
TOWNSHIP LOTS CONCESSIONS					
AREA ca.500 acres ca.200 ha					
OWNERSHIP private/MNR					
ADMINISTRATION					
FOREST REGION AND DISTRICT D-1					
SITE REGION AND DISTRICT 7 - 6		Kilworth Nursing Home Golf Course Kings			
MNR REGION AND DISTRICT St-Aylmer		CONSERVATION AUTHORITY Upper Thames			
AERIAL PHOTOGRAPHS		BASE MAP:			
YEAR	ROLL	FLIGHT LINE	NUMBERS		
1972	12	4239	191-194		
1972	30	4240	14-15		

**PHYSICAL AND BIOLOGICAL FEATURES**

A forested corridor remains along both sides of the Thames River between Kilworth and Komoka. Within this corridor are a variety of habitats, ranging from river floodplains and terraces, to steep valley slopes, valley tablelands and upland woodlots. Some of the typical vegetation types include: poplar-willow floodplains, oak-hickory, oak, oak-maple-ash-white birch and hemlock upland forests, hawthorn scrub, cedar-tamarack swamps and small areas of prairie grassland.

Campbell (1977) noted that Queen Snakes have been observed near Kilworth on the Thames River. Important Queen Snake habitat may be found within the park reserve. Also of note are the records for Eastern Spiny Softshell Turtles along this stretch of the Thames River.

The Ministry of Natural Resources owns about 120 ha of this 450 ha park proposal. Much of the proposal north of the river is licensed for gravel extraction, with three pits currently in operation. A subdivision adjoins the northern floodplain near Kilworth.

DATA SHEETS ATTACHED	SUMMARY SPECIES LISTS	MAJOR INFORMATION SOURCES
PHYSICAL DESCRIPTION <input type="checkbox"/>	<input type="checkbox"/>	Hanna, 1980. Airphoto Interpretation;
VEGETATION SUMMARY <input type="checkbox"/>	PHYSICAL FEATURES MAP <input type="checkbox"/>	Lindsay, 1979; Tracey and Beechey, 1974;
EVALUATION SHEET <input type="checkbox"/>	VEGETATION MAP <input type="checkbox"/>	Hawthorne, 1978; Campbell, 1977.
COMMUNITY DESCRS. <input type="checkbox"/>	BIBLIOGRAPHY <input type="checkbox"/>	
COMMUNITY COMR. LISTS <input type="checkbox"/>	PHOTOGRAPHS <input type="checkbox"/>	

**EVALUATION AND PRIORITIES**

Komoka Park Reserve offers a good example of a typical forested river corridor in this site district and supports a variety of relatively undisturbed vegetation types.

DATE COMPILED December 12, 1980	COMPILER R. Hanna and K. Lindsay
------------------------------------	-------------------------------------

## Bibliography

- Campbell, C. A. 1977. The range, ecology and status of the Queen Snake (*Regina septemvittata*) in Canada. Canadian Wildlife Service, Unpublished Report.
- Cook, Francis R. 1980. Checklist of Amphibians and Reptiles of Canada. Canadian Amphibian and Reptile Conservation Society 18 (2): 1 - 6.
- Cook, Frank. 1977. A Checklist of the Mosses of Southwestern Ontario: Counties of Essex, Kent Lambton, Elgin, Middlesex, Norfolk, Oxford, Perth, Huron and Wellington. Department of Plant Sciences, University of Western Ontario (Unpublished).
- Golder Associates. 1976. Report to South Winds Sand and Gravel, Geotechnical Investigation, Proposed Gravel Pit, Part of Lots 5, 6, and 7, Concession I, Township of Lobo, County of Middlesex, Ontario.
- Hanna, R. 1980. An Identification and Evaluation of Life Science Candidate Nature Reserve in Site District 7-6. (Draft Report). Ontario Ministry of Natural Resources, Central and Southwestern Regions.
- Hawkins, Leslie Ann. 1981. Draft #3, Appendix One, Mammal list for Middlesex County, ----- complete reference???
- Hawthorne, Kevin Michael. 1978. Near Urban Recreation: A study of the proposed Kilworth-Komoka Provincial Park, Middlesex County, Ontario. MA Thesis, Department of Geography, University of Western Ontario.
- Hayman, T. 1981. Unusual Birds Spotted in Komoka Swamp visit. London Free Press, Thursday, June 11, 1981.
- Jarmaine, W. R. 1981. Birds by family, Komoka/Kilworth Area. McIlwraith Field Naturalists.
- Jarmaine, W. R. 1981. Middlesex County Bird List --1980. The Cardinal October 1981, No. 105.
- Judd, W. W. 1962. Observations on some snakes and turtles captured in southwestern Ontario. Ontario Field Biologist 16: 15 - 28.
- Meathrel, C. 1981. Zoological Notes -- Komoka Park Reserve. Ontario Ministry of Natural Resources, Southwestern Region.
- McLeod, D. 1981-84. Personal Communication.

- McLeod, D. and F. Cook. Middlesex lists.
- McLeod, D. n.d. Unpublished notes on the plants of Middlesex County
- Ontario Ministry of Natural Resources. 1979. Kilworth/Komoka Public Lands (Park Reserve): Interim Management Plan. Aylmer District Planning Committee.
- Pinder, George F. 1965. The Study of A Composite Pleistocene Delta at Komoka, Ontario. Senior Thesis, Department of Geology, University of Western Ontario.
- Read, Peter. 1982. Breeding Bird Atlas Checklist for the Komoka Park Reserve Area.
- Saunders, W. E. and E. M. S. Dale. 1933. A history and list of the birds of Middlesex County, Ontario, Canada (to December 31st, 1931). Transactions of the Royal Canadian Institute 42 (19) part 2: 161 - 249.
- Small, John and R. McBurney. 1977. Komoka Bluff: Sensitive Areas Report. Ontario Ministry of Natural Resources, Southwestern Region.
- Small, John and R. McBurney. 1977. Kilworth Tuffa Deposits: Sensitive Areas Report. Ontario Ministry of Natural Resources, Southwestern Region.

**FIG. 12**  
**VEGETATION COMMUNITIES & SIGNIFICANT FEATURES**

**VEGETATION COMMUNITIES**

**A. Floodplain (including frequently flooded lower terraces)**

1. disturbed liveoak communities
2. sander willow-wet meadow (Salix sp.) communities
3. black willow-wet meadow (Salix nigra) communities
4. black willow-wet meadow (Salix nigra) communities
5. white willow-wet meadow (Salix glauca) communities
6. anthropogenic open fields

**B. Terraces (not flooded—glacial floodplain terraces)**

1. sander willow-wet meadow (Salix sp.) communities
2. black willow-wet meadow (Salix nigra) communities
3. white willow-wet meadow (Salix glauca) communities
4. black oak-wet meadow (Quercus sp.) communities
5. white oak-wet meadow (Quercus sp.) communities
6. white oak-wet meadow (Quercus sp.) communities
7. anthropogenic open fields

**C. River Valley Slopes**

1. sander willow-wet meadow (Salix sp.) communities
2. black willow-wet meadow (Salix nigra) communities
3. white willow-wet meadow (Salix glauca) communities
4. black oak-wet meadow (Quercus sp.) communities
5. white oak-wet meadow (Quercus sp.) communities
6. anthropogenic open fields

**D. Tableland**

1. sander willow-wet meadow (Salix sp.) communities
2. black willow-wet meadow (Salix nigra) communities
3. white willow-wet meadow (Salix glauca) communities
4. black oak-wet meadow (Quercus sp.) communities
5. white oak-wet meadow (Quercus sp.) communities
6. anthropogenic open fields
7. anthropogenic open fields
8. anthropogenic open fields
9. anthropogenic open fields
10. anthropogenic open fields
11. anthropogenic open fields
12. anthropogenic open fields
13. anthropogenic open fields

**E. Abandoned Gravel Pits**

Supports an early successional complex of vegetation.

**SIGNIFICANT FEATURES**

**Significant Flora**

- Fg *Fragaria virginiana* (wild strawberry)
- Ae *Asclepias tuberosa* (purple milkweed)
- Ab *Abutilon tomentosum* (velvet leaf)
- cc *Collinsia canadensis* (horse hair)
- md *Mimulus discolor* (scarlet gilia)
- ob *Onoclea sensibilis* (sensitive fern)
- sa *Salix alba* (white willow)
- sp *Salix purpurea* (purple willow)
- va *Vitis rotundifolia* (American grape)
- ca *Carex sp.* (sedge)
- ci *Cirsium sp.* (thistle)

**Significant Fauna**

- BWV blue-winged teal
- Queen Scaup/Guy Scaup (not mapped - includes entire river)

**Significant Vegetation**

- PE Prairie elements
- SM Sedge meadows

**LEGEND**

- Crown Land Boundary
- - - Proposed Park Boundary
- P Plantation
- Hydro Lines
- A.N.S.I. Boundary
- - - Proposed Addition to the A.N.S.I.

Ministry of Natural Resources

**KOMOKA PARK RESERVE AND AREA OF NATURAL AND SCIENTIFIC INTEREST**

DATE 83-09-20  
SCALE 1 : 5000

Source: 1978 Aerial Photos





# Komoka

An Updated Survey and Evaluation of  
Life Science Resources



Prepared by: John Ambrose, Gerry Waldron,  
Lindsay Rodger and Dave Martin

2003, Queen's Printer for Ontario

Printed in Ontario, Canada

Cover Photo: Cut-leaved Coneflower (*Rudbeckia laciniata*)

Additional copies of this publication are obtainable from:

Port Burwell Provincial Park  
P.O. Box 9  
Port Burwell, Ontario N0J 1T0

Telephone: (519) 874-4601



## PREFACE

This report documents the updated information on Komoka Provincial Park and adjacent provincially acquired lands, some of which have been designated as an Area of Natural and Scientific Interest (ANSI). A reconnaissance life science inventory for the ANSI was conducted by Klinkenberg in 1985. However, in the intervening time much has changed in the adjacent lands: to the north, gravel extraction continues and housing developments are expanding. On site, previously cultivated fields are maturing into shrub meadows, and public use and appreciation of the site by the people of London and nearby communities is increasing.

A need to assess the changing conditions of the park and adjacent lands led to this study, which was conducted during the late summer of 2001 and spring to early summer of 2002. These changing conditions have come about both through natural processes and from human activity. By up-dating the life science data and making recommendations for land classification and management, this study is expected to assist in developing a management plan to balance the protection of the natural values of the site while encouraging public use suitable to the site's different sensitivities.

Past vegetation mapping, file information and current aerial photographs were compared with field observations, noting changes in plant communities, negative impacts of nearby activity, trail use within the park, and the occurrence of invasive exotic organisms. A complete list of vascular plant diversity and maps of vegetation communities are provided from 2001-02 fieldwork, as well as a compilation of faunal records and summary analyses from recent observations.

The connections of Komoka Provincial Park to the larger natural Carolinian landscape are considered and opportunities to work with other agencies and organisations are noted, providing opportunities to make co-operative activities for the protection and restoration of natural features greater than the sum of the individual parts.

## ACKNOWLEDGEMENTS

Pete Read of the Komoka Provincial Park Advisory Committee provided much information from his years of observations, especially bird information, and joined us in the field on a few occasions. Ann White provided reams of material on the butterflies of Middlesex County including a county list, species lists from the best butterflying locations, her field notes from Komoka, the results of the Middlesex Butterfly Count and commented on an early draft of the section on butterflies. Other members of the McIlwraith Field Naturalists, including Winnie and Dave Wake, Jack and Shirley Lorimer, Stan and Anita Caveney, Doug Bocking, Gail McNeil and Olive Ireland agreed to be interviewed and/or provided access to their years of field observations. Bill Judd sent newspaper and journal references from many years of reptile sightings of the London area. Scott Gillingwater of the Eastern Spiny Softshell Recovery Team provided sightings for Eastern Spiny Softshell, Queen Snake, and Eastern Hognose Snake and added much information about the habitat needs of the first two species. John Schwindt of the Upper Thames River Conservation Authority provided a fish species list from Ontario Ministry of Natural Resources (OMNR) and Royal Ontario Museum records and commented on whether these might be found at the park. Ron Gould, Species at Risk Biologist at Aylmer, collated various OMNR data and drafted a lengthy memo on the status and distribution of the American Badger in the Komoka area. Mike Oldham of the Natural Heritage Information Centre provided element occurrence reports on significant species in the park and nearby region; Don Gordon of Carolinian Canada provided us with a Big Picture map for Komoka area; Ted Briggs, Upper Thames River Conservation Authority, provided us with a copy of their Thames Strategy; Bill DeYoung provided us with a copy of A Blueprint for Action: A Resource and Strategy Guide for the Thames Talbot Land Trust; James Phipps (hawthorns), and Jane Bowles (other plants), Plant Sciences, University of Western Ontario, and Tony Reznicek (sedges) University of Michigan, provided us determinations of difficult groups and information on the local flora; Ian Seddon shared ideas from his concurrent study and provided comments on a draft of this report; OMNR staff provided support and comments: Henry Valks, Park Superintendent, and especially the staff of the London office: Angie Horner, Tim Marchand, Julie Rosenthal and the direction from Brian Huis and Peter Sturdy.

# CONTENTS

PREFACE .....	2
ACKNOWLEDGEMENTS.....	3
SUMMARY.....	6
INTRODUCTION... ..	7
METHODOLOGY .....	10
RESOURCE INVENTORY .....	13
Geology and Geomorphology.....	13
Vegetation Communities .....	13
Flora .....	14
Fauna .....	15
SIGNIFICANT FEATURES.....	18
Ecological Communities .....	18
Significant Flora.....	19
Significant Fauna.....	19
Significant Habitats.....	19
Physical Features .....	21
PLANNING CONSIDERATIONS.....	22
Natural Values Protection.....	22
Proposed Park Boundary .....	22
Land Securement .....	23
Park Classification .....	23
Research and Monitoring .....	24
Park Management .....	25
Community Outreach.....	30
FIGURES	
1. Regional Setting .....	8
2. The Big Picture – Cores and Connections in Carolinian Canada .....	9
3. The Study Area and Land Uses .....	12
TABLES	
1. Number of Species per Taxonomic Group.....	15
2. Summary of Significant Fauna, Komoka Provincial Park .....	19
3. Number of Significant Faunal Species by Habitat Type.....	20
4. Invasive Exotic Plants of Komoka Provincial Park.....	26
APPENDICES	
A. Natural Heritage Area – Life Science Checksheet .....	31
B. Ecological Land Classification (ELC) Community Description of Komoka Provincial Park.....	35
C. Vascular Plant List of Komoka Provincial Park.....	40
D. Birds of Komoka Provincial Park .....	53
E. Amphibians and Reptiles of Komoka Provincial Park.....	67
F. Fish of Komoka Provincial Park.....	71

G. Invertebrates of Komoka Provincial Park .....	73
H. Mammals of Komoka Provincial Park.....	80
I. Significant Species of Komoka Provincial Park .....	83
J. Explanation of Codes used in Tables .....	88
 BIBLIOGRAPHY .....	 91
 APPENDED MAP	
1. Ecological Land Classification (ELC) Vegetation Communities.....	94

## **SUMMARY**

Komoka Provincial Park and adjacent areas have high geomorphological and biotic diversity. The park is in a near-urban area and is much appreciated by area residents. Several problems are becoming apparent from visitor use patterns and nearby influences, including impacted trails, disturbance in sensitive sites, alteration of land form and function from past activities, and invasive exotic plants that threaten to degrade some plant communities. Management challenges include protecting sensitive areas, enhancing visitor use and quality experiences of nature in a low impact manner, taking timely action to reverse site degradation, and restoring the complex of plant communities and the diverse animals they support, both within the park and in the connections to the regional natural landscape.

## INTRODUCTION

Komoka Provincial Park is a significant natural site west of the expanding metropolis of London (Figure 1) in the Township of Middlesex Centre (formerly Delaware and Caradoc Townships), Middlesex County. The scenic Thames River runs through the site, providing geomorphological and hydrological diversity. The park is an asset to the people of London for experiences and appreciation of nature. It is an important site worthy of protection due to its special natural systems and processes, including Carolinian forests, prairie assemblages, open grasslands, northern elements in deep conifer forests, geological formations and archaeological sites (the latter two summarised in Seddon and Usher, 2003). There is a concern for maintaining the integrity of these attributes as well as connecting them to the larger Carolinian<sup>1</sup> landscape with its high biological diversity. Carolinian Canada's Big Picture Project (Jalava *et al.*, 2000) recognises this site as a significant core natural area and provides optimal corridors for linking it with other cores in the regional landscape (Figure 2). Komoka Provincial Park is also identified as a key area of forest cover in the Middlesex Natural Heritage Strategy for the upcoming Middlesex County Official Plan.

The significance of the Komoka site is based on its high landform diversity, which gives rise to a wide array of habitats with a high level of biodiversity. It is also a significant as one of only a few non-lakeshore provincial parks in the Carolinian Zone of southern Ontario. The Thames River is home to a high diversity of aquatic life; with its broad natural shores and floodplains it provides an important corridor for not just aquatic organisms but also terrestrial plants and animals, aerial vertebrates (i.e., birds and bats), and insects.

This site is an important part of the natural heritage of the people of the London area; the challenge is how to protect and improve the ecological integrity of the site while making it accessible for the experience and appreciation of its natural features.

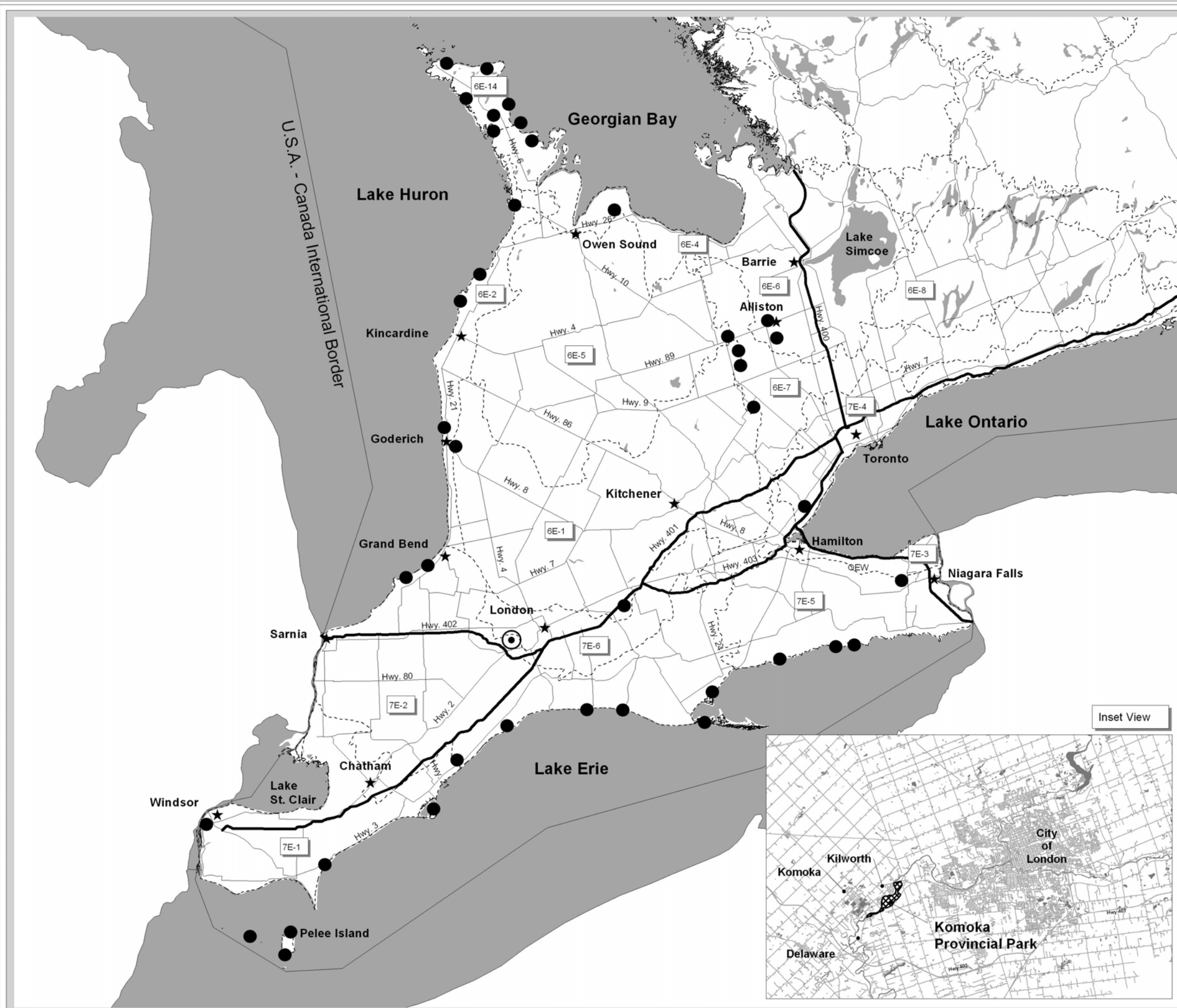
---

<sup>1</sup> The zone of moderate climate and southern species, roughly from Grand Bend, through London to Toronto and south to Lake Erie.









# Komoka

**Figure 1:  
Regional Setting**



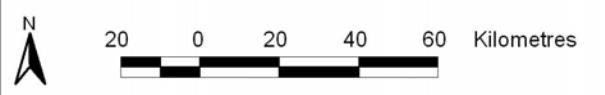
### Legend

-  Komoka Provincial Park
-  Provincial Parks (Southwest Zone)
-  Ecodistrict Boundary
-  Highways
-  Roads
-  Waterbodies

Produced by Ontario Parks, Southwest Zone.  
Copyright 2003, Queen's Printer for Ontario.

This map is for illustrative purposes only. Do not rely on it as being a precise indicator of routes, locations or features nor as a guide to navigation.

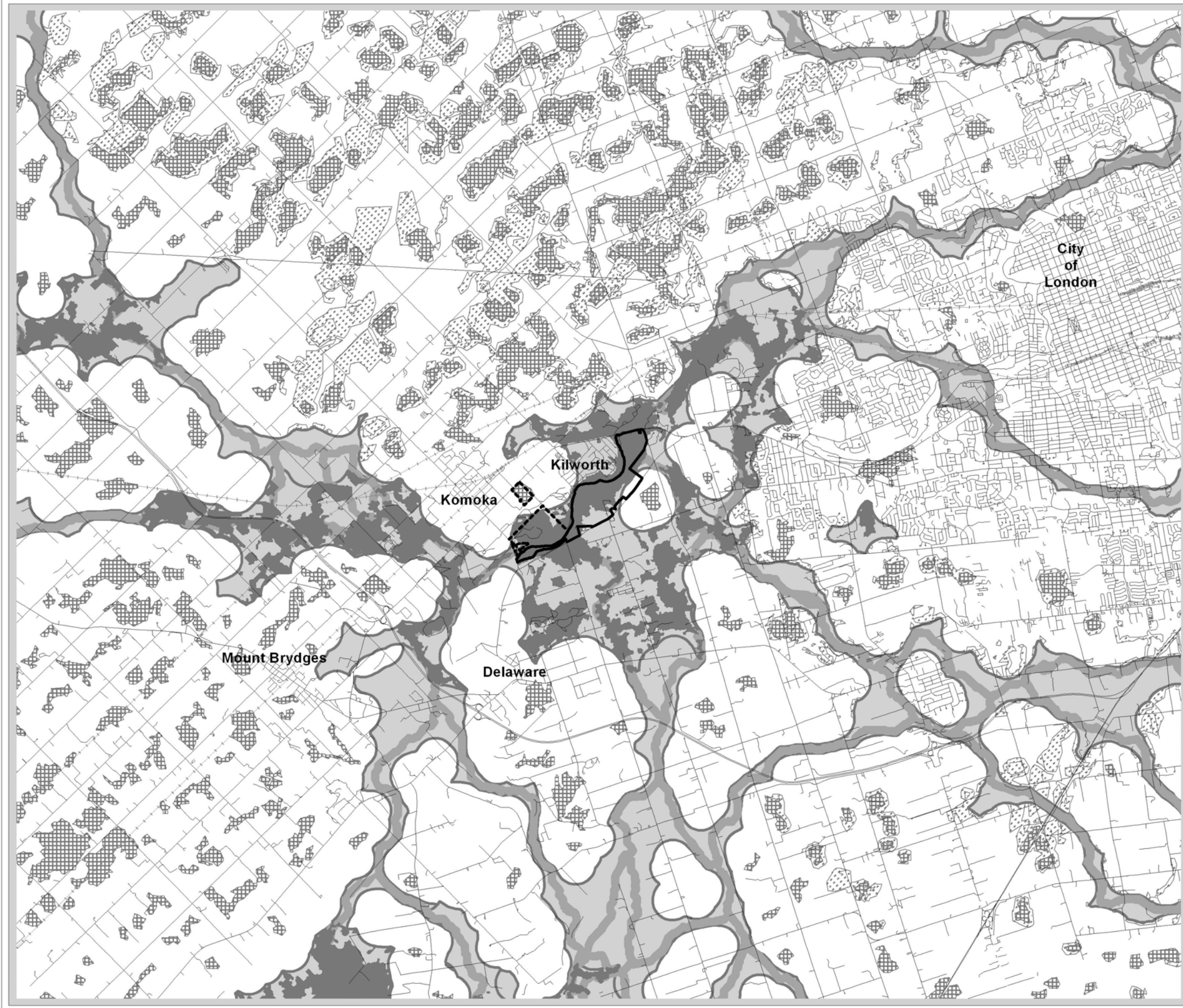
Inset View





# Komoka

**Figure 2:  
The Big Picture -  
Cores and Connections  
in Carolinian Canada**



### Legend

-  Regulated Park Area
-  Provincially Acquired Lands
-  Natural Cores
-  Corridors
-  Isolated Natural Areas
-  Meta-Cores and Meta-Corridors
-  Soil Representation Features
-  Road Segment
-  Railway

Natural Cores - primarily existing "natural" features and natural areas with legislated protection along with rare species and significant vegetation occurrences, water-ways, and forest cover.

Corridors - created using a "cost" layer that allows a Geographic Information System (GIS) to select an optimal path between natural areas based on lower "resistance" by different weightings of incompatible land uses.

For a description of the Big Picture Project of Carolinian Canada, please visit:

<http://www.carolinian.org/Big%20Picture.htm>

The Big Picture Project of Carolinian Canada technical paper can be found at:

[http://www.carolinian.org/technical\\_paper.htm](http://www.carolinian.org/technical_paper.htm)

Produced by Ontario Parks, Southwest Zone.  
Copyright 2003, Queen's Printer for Ontario.

This map is for illustrative purposes only. Do not rely on it as being a precise indicator of routes, locations or features nor as a guide to navigation.



1 0 1 2 3 Kilometres





## METHODOLOGY

Before and at the beginning of the fieldwork in mid July 2001, relevant documents were reviewed, especially Klinkenberg (1985) and the current and historical maps that were provided by the Ontario Ministry of Natural Resources (OMNR). Discussions were conducted with local naturalists, professional biologists and OMNR staff. The study area covered in this report includes all the land within the boundaries of Komoka Provincial Park and the adjacent provincially acquired lands (Figure 3), some of which are within the Komoka ANSI. Not all of the lands within the ANSI were studied in this report because access to some private properties was denied.

An Ecological Land Classification (ELC) assessment and mapping, following Lee *et al.* (1998) was carried out, using current and historical aerial photographs, topographic/trails maps, and the vegetation communities mapped by Klinkenberg in 1985. Polygon boundaries were ground-truthed with Garmin-12 global position system (GPS) readings to generate Map 1, provided at the end of this document.

An ELC Community Description & Classification Data Card (Lee *et al.*, 1998, p. 186) was filled out for each polygon, including site description, both physical and biotic, dominant species listing for each layer, and classification. In addition, an ELC Management/Disturbance Data Card (Lee *et al.*, 1998, p. 187) was completed for any polygon showing notable evidence of disturbance, such as exotic species, trails, rubbish dumping, and evidence of tree disease. Areas of high disturbance, such as erosion associated with horse trails on sensitive land, were noted when found.

Significant plant species were noted within polygons and exact locations were determined with GPS readings for several species. Significant communities (e.g., prairie assemblages) were likewise documented.

Invasive exotic plant species (e.g., Garlic Mustard, Norway Maple, Common Buckthorn, Black Alder) were noted and those of localised occurrences and most serious concern for immediate management were mapped. A complete listing of species, their locations and abundance is included in the ELC chart (Appendix B). An initial assessment was noted as to whether invasive species needed immediate or timely management action. A discussion of control measures is provided in the section on Park Management.

Faunal records were compiled primarily from interviews with, and field notes from, local naturalists (birds, butterflies) or from published and unpublished reports of surveys done on a larger scale (fish, turtles). Records were collected from local naturalists and personnel from the OMNR, Upper Thames River Conservation Authority (UTRCA), Natural Heritage Information Centre (NHIC) and the Eastern Spiny Softshell Recovery Team. In the spring of 2002, surveys of calling amphibians and searches for salamanders were undertaken. Enough information was gathered to get a fairly good picture of what the significant habitats are from the perspective of many faunal groups and even to offer species-specific

planning considerations for many of the significant fauna. The NHIC provided a table of Element Occurrences<sup>2</sup>.

The Komoka study area was also reviewed in the context of the surrounding region, using such tools as Carolinian Canada Cores and Corridors mapping (Figure 2 and Jalava *et al.*, 2000) and the local application in the Thames Talbot Land Trust Blueprint for Action (McIlwraith Field Naturalists, 2001).

The survey was conducted during the driest summer on record for the area, with a few consecutive days of record high temperatures. Robust native meadow species, such as goldenrods and colonising tree seedlings, were noticed in conditions of severe wilt. These conditions may have influenced the list of forb species that were recorded and the resulting list of dominant forb layer species in ELC determinations.

For the project team, Dave Martin compiled and analysed the faunal records and prepared the faunal appendices, Lindsay Rodger conducted the ELC determinations, Gerry Waldron provided his expertise of vegetation identification and assisted with the ELC, and John Ambrose was the primary author of the report and assisted with the vegetation analysis.

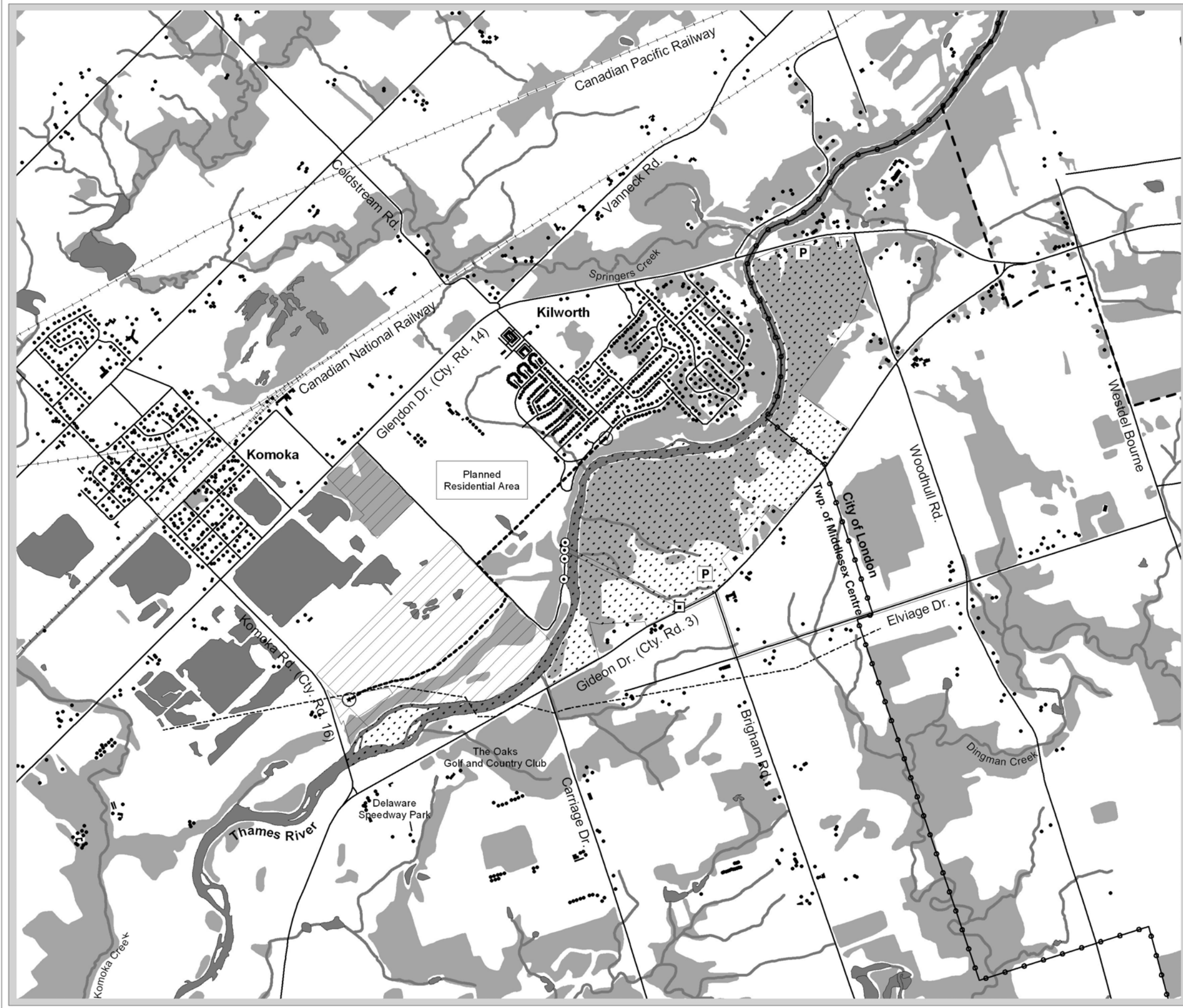
---

<sup>2</sup> An Element Occurrence is an area of land and/or water in which a unit of natural biological diversity (e.g. species, plant community, hibernaculum) is, or was, present.



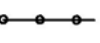










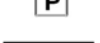


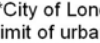



# Komoka

### Figure 3: Study Area and Land Uses



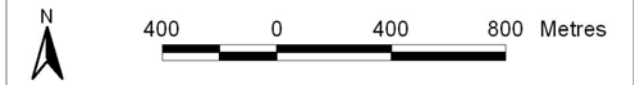
#### Legend

-  Regulated Park Area
-  Provincially Acquired Lands
-  Municipal Boundary
-  City of London Urban Growth Boundary\*
-  Water and Hydro Easement
-  Municipal Water Wells
-  Sewage Treatment Facilities
-  Union Gas High Pressure Transmission Line
-  Proposed Rechlorination Facility
-  Proposed Trunk Sanitary Sewer Easement
-  Wooded Area
-  Streams/Creeks
-  Waterbody
-  Road
-  Railway
-  Parking Lot
-  Large Structure
-  Small Structure

\*City of London Urban Growth Boundary - delineates the westerly limit of urban development for a 20 year planning period (1996-2016).

Produced by Ontario Parks, Southwest Zone.  
Copyright 2003, Queen's Printer for Ontario.

This map is for illustrative purposes only. Do not rely on it as being a precise indicator of routes, locations or features nor as a guide to navigation.



## RESOURCE INVENTORY

### ***Geology and Geomorphology***

The earth science attributes are well summarised in Klinkenberg (1985, pp. 8-14) and in Seddon and Usher (2003). The complexities of well preserved glacial features, including the two moraines that define the river valley, the river terraces and deltas from the different lake levels in early post glacial times give this site a special earth science importance. In addition, the matrix of different topographic, drainage and soils features provides the context for high biological diversity. Seepage areas abound, within deep conifer forests as well as highly calcareous seeps on the north river bank, producing a tufa<sup>3</sup> formation and supporting calciphilic<sup>4</sup> vegetation.

### ***Vegetation Communities***

The descriptions of vegetation communities follow the Ecological Land Classification (ELC) system of Lee *et al.* (1998). Below is a list of communities found on the site by their ELC relationship, with a short description for each unit. These codes appear on the polygons of the appended map of Ecological Land Classification communities.

#### Riparian

BBO 1-3: Reed-canary Grass, Mineral Open Beach/ Bar.

BBS 1-2: Willow Gravel Shrub Beach/ Bar.

BBT 1: Mineral Treed Beach/ Bar.

#### Marsh and Meadow

##### *- Marshes and ponds*

SAS 1-7: Water Stargrass Submerged Shallow Aquatic.

MAM 3-8: Jewelweed Organic Meadow Marsh.

MAM 3-9: Forb Organic Meadow Marsh.

##### *- Cultural meadows*

CU: Cultural (Limestone gravel road with a fen-like component).

CUM: Cultural Meadow.

CUM 1-1: Dry - Moist Old Field Meadow.

CUS 1: Mineral Cultural Savanna (Black Walnut).

CUS 1-1: Hawthorn Cultural Savanna.

CUT 1-1: Sumac Cultural Thicket.

#### Forests

##### *- Swamps*

SWC 3-2: White Cedar - Conifer Organic Coniferous Swamp.

SWM 4-1: White Cedar - Hardwood Organic Mixed Swamp.

SWD 6-1: Red Maple Organic Deciduous Swamp.

---

<sup>3</sup> Calcareous, limestone-like formations

<sup>4</sup> Calcium-loving

- *Upland forests*

FOC 2-2: Dry - Fresh White Cedar Coniferous Forest.  
FOC 4-1: Fresh - Moist White Cedar Coniferous Forest.  
FOC 3-1: Fresh - Moist Hemlock Coniferous Forest.  
FOM 4-1: Dry - Fresh White Cedar - White Birch Mixed Forest.  
FOM 7-1: Fresh - Moist White Cedar - Sugar Maple Mixed forest.  
FOM 7-2: Fresh - Moist White Cedar - Hardwood Mixed Forest.  
FOD 6-2: Fresh - Moist Sugar Maple - Black Maple Deciduous Forest.  
FOD 6-4: Fresh - Moist Sugar Maple - White Elm Deciduous Forest.  
FOD 1-3: Dry - Fresh Black Oak Deciduous Forest.  
FOD 2-2: Dry - Fresh Oak - Hickory Deciduous Forest.  
FOD 3-1: Dry - Fresh Poplar Deciduous Forest.  
FOD 4-2: Dry - Fresh White Ash Deciduous Forest.  
FOD 5-3: Dry - Fresh Sugar Maple - Oak Deciduous Forest.  
FOD 5-8: Dry - Fresh Sugar Maple - White Ash Deciduous Forest.

- *Plantations*

CUP 3-2: White Pine Coniferous Plantation.  
CUP 2-1: Black Walnut - White Pine Mixed Plantation.

This extensive list of communities reflects the high diversity of vegetation on this site. While these 31 communities are similar in number to Klinkenberg's 32 communities, they are not directly comparable due to different criteria for defining them. However, some conspicuous changes were documented in this study: agricultural fields and gravel pits have grown into old fields and shrub meadows (CUM1-1), including a large thicket of young Manitoba Maple on the river flats; edges of forests have expanded with aspens and other pioneer species; forests on the slopes above the river on the north side have become noticeably drier (FOM7-1). Some forest habitat of the ANSI has been lost adjacent to new housing developments on the north side of the river; the wet seepage slope with Eastern White Cedar/ Red Maple is no longer present and the remaining forest is of a different composition. Many of the mature forests remain similar to how they were described in 1985. However, what is surprising is that some of the open communities that would have been expected to be transitional and subject to greater forest tree incursions have remained open, including the two areas noted as "prairie elements" and hawthorn savannas (CUS1-1) on Map 1.

Of these, several significant habitats are noted for their occurrences of flora, fauna and ecological processes, including prairie elements within CUS1-1, cedar-tamarack and other swamps (SW series), and the mature forests. In addition to the specific communities, the combination of both open and forested communities are important for their diverse habitats for native butterflies and other insects, amphibians, reptiles, birds and mammals.

**Flora**

Overall, 686 species of vascular plants were recorded, including 265 species previously unreported for the site. This represents 44.3% of the Middlesex County flora (Oldham,

1993). It includes 67 significant plant species (Appendix I, part 1). A complete list of vascular plants is provided in Appendix C. This list includes the results of mid-summer to fall 2001 and spring to early summer 2002 floral inventories.

**Table: 1 Number of Species per Taxonomic Group**

Taxonomic Group	# of species in Komoka study area	# of species in Middlesex County	Komoka species list as a % of Middlesex list	Level of knowledge
Vascular Plants	686	1548	44.3	High
All Birds	230	330	70	High
Breeding Birds	100	155	65	High
Conservation Priority (CP) Birds*	55	112	49	High
CP Forest Birds	29	65	45	High
CP Marsh Birds	6	22	27	High
CP Open Country Birds	20	25	80	High
Amphibians	9	16	56	High
Reptiles	8	19	42	Medium
Butterflies	58	86	67	High
Dragonflies and Damselflies	13	~ 43	~ 30	Very low
Freshwater Mussels	4	26	15	Very low
Mammals	15	~ 40	~ 38	Medium
Fish	39	60-65	~ 60	Medium

\* Birds that have a significant proportion of their breeding range in Middlesex County, according to Bird Studies Canada (Couturier, 1999)

## ***Fauna***

The Komoka study area provides a great diversity of habitats, vegetation communities, habitat structure and varied topography and consequently hosts a great diversity of fauna from most faunal groups. Table 1 reflects what and how much is currently known about several taxonomic groups in the study area and compares the number of species at Komoka to Middlesex County. The last column in Table 1 shows how much is known about the presence of various taxonomic groups in the Komoka study area. For example, very little is known about groups such as freshwater mussels and the dragonflies and damselflies.

Extensive information about the fauna of the Komoka study area is provided in Appendices D-H. Each appendix starts with a general discussion of the level of knowledge for that group followed by at least four other sections: a section summarising the number of species; a detailed section including tables on the rare and significant species from that faunal group; extensive notes on management considerations for the species at risk. Finally, there is a checklist for each faunal group. What follows is a short summary and overview for each faunal group.

### Birds (Appendix D)

Birds are the best studied faunal group at the park with 230 species reported representing about 70% of the bird checklist for Middlesex County. Close to 100 species have some level of breeding evidence within park boundaries and there is suitable habitat for perhaps 10 additional species. Among breeding birds there is a high representation of grassland, old field, woodland and edge species, but not wetland species. There is a high diversity of

migrants (129 species) including waterfowl, shorebirds, marsh species and warblers. Although not regular visitors to the site, some of the rarest species ever recorded in Middlesex County (e.g., American White Pelican, Ross's Goose) have been observed in the study area.

### Amphibians and Reptiles (Appendix E)

After the spring 2002 amphibian surveys there is a fairly complete picture for amphibians in the Komoka study area: 56% of the amphibians and 42% of the reptiles of Middlesex County have been recorded. Three new amphibian species were added in 2002. More is known about the rarer species of reptiles at the park than about the more common species. Komoka Provincial Park appears to be the most important side in Middlesex for the Eastern Hognose Snake. The Eastern Spiny Softshell turtle is also often reported from the park.

### Fish (Appendix F)

Fish surveys carried out over the years for the river bend basin (Springbank Dam to Delaware) indicate that at least 39 species are present. This represents about 60% of the Middlesex County checklist. Apparently no studies specific to the park have been carried out, but the species list for this stretch of the Thames River should be similar.

### Invertebrates (Appendix G)

#### *- Butterflies*

Fifty-eight species comprising about 67% of the Middlesex County butterfly list have been recorded to date. Over the last five years enough fieldwork has been carried out by local naturalists to provide a fairly good picture of butterflies and their habitat at the park. This site has the third highest species list to date for any area of similar size in Middlesex County. Only Skunk's Misery with 75 species and the Kilally Environmentally Sensitive Area with 62 species have more butterflies.

#### *- Dragonflies and Damselflies*

Thirteen species have been recorded out of a possible 43 species (30%) reported for Middlesex County, but next to no work has been done on dragonflies and damselflies at this site, and even the Middlesex County list is considered preliminary. In comparison, the noted Elgin County naturalist Bill Stewart recorded 59 species for that county. The species recorded to date at the park are the most conspicuous and common species; akin to American Robins and Red-winged Blackbirds in the bird world.

#### *- Freshwater Mussels*

Very little is known about freshwater mussels at the park. A few mussel surveys have been carried out over the years, especially during the last five years, in both the Thames and Sydenham Rivers but not specifically at Komoka. This group is recognised as one of the most at-risk groups of animals in southern Ontario, as reflected by the number of species listed as extirpated and endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). More needs to be known about which species are present and what host fish are present because many mussel species are entirely dependent on fish for the larval portion of their life cycle.

### Mammals (Appendix H)

Fifteen species have been recorded representing about 38% of the possible total for the county. Very little is known about mammals in the park. Naturalists rarely record their mammal sightings unless it is something seldom seen such as a Mink or Red Fox. Even less is known about the numbers of individuals or whether certain habitats of the park site are more important than others.



## SIGNIFICANT FEATURES

### ***Ecological Communities***

The study area provides provincially significant representation of a terraced, forested river corridor and its associated vegetation types (Klinkenberg, 1985). Provincially, three of the plant communities identified through ELC analysis are listed by NHIC as S3 or a higher level of rarity or jeopardy (S1 being the rarest and S5 being most common). These are two forest communities: FOD1-3 (dry-fresh black oak deciduous forest, the block of forest in the northern section of the provincial lands) ranked as “S3”, and FOD6-2 (fresh-moist sugar maple-black maple deciduous forest, along the south river terrace within the park, also including the population of blue ash) ranked as “S3?”; and one wetland community: SAS1-7 (water stargrass submerged shallow aquatic, in the low portion of the provincial lands) ranked as “S3S4.” Several of the sites have partial assemblages that could develop or be restored into significant communities. At the highest level of significance are the prairie assemblages (TPO1-1 or TPO 2-1) ranked as “S1”; as well as the black walnut community possibly becoming FOD7-4 (fresh-moist black walnut lowland deciduous forest) ranked as “S2S3” and the fen-like community becoming FEO1-1 (twig-rush open fen) or MAM5 (mineral fen meadow marsh) ranked as “S3?” and “S3”.

Several plant communities or occurrences of species assemblages were recorded and recognised as significant. While the species of these assemblages may not be listed as significant on their own, together they are significant as indicators of more complete communities that likely occurred here in the past. Some of these assemblages may have potential for restoration, others may represent relics from the past that persist in the special microclimates of this diverse site. Many serve as habitat for a number of listed significant faunal species, for which there is further discussion in the following sections. Some are favourite sites for hiking and observing nature by local naturalists.

Mature conifer groves: *Thuja occidentalis*, *Tsuga canadensis* (SWM4-1, FOM4-1 and groves within FOM7-1).

Mature Carolinian forest: *Fraxinus quadrangulata*, *Platanus occidentalis*, *Hamamelis virginiana*, *Lindera benzoin*, *Staphylea trifolia*, *Viburnum acerifolium*, *Symplocarpus foetidus* (FOD5-3, FOD6-2, FOD4-2 and across river from this community as well as around the Komoka wells).

Wetlands: swamps/marshes: *Larix laricina*, *Thuja occidentalis*, *Betula alleghaniensis*, *Symplocarpus foetidus*, *Aralia racemosa*, *Lobelia siphilitica*, (SWC3-2, SWM4-1, SWD6-1 and wet areas with FOM7-1 and FOD4-2).

Small wetland with floating *Carex* mat (within FOC4-1), cattail marsh by county road 14 (MAM3-9) wet meadow in river flats (MAM3-8) and cultural marshes (SAS1-7); Fen elements: *Parnassia glauca*, *Spiranthes cernua*, *Selaginella eclipes* (CU).

Hawthorn savannas: significant *Crataegus* spp., *Prunus americana*, *Malus coronaria* (CUS1-1).

Prairie elements: *Andropogon gerardii*, *Schizachyrium scoparium*, *Sorghastrum nutans*, *Asclepias tuberosa*, *Monarda fistulosa*, *Desmodium canadense*, *Helianthus giganteus*, *Heliopsis helianthoides* (CUM1-1 and on the township land across the river).

Northern elements: *Cornus canadensis*, *Pyrola elliptica*, *Equisetum scirpoides*, *Rhamnus alnifolia*, *Larix laricina*, *Betula alleghaniensis* (SWC3-2, SWM4-1).

Forests and interior forest habitat are often considered of high significance in landscape analysis, management, and restoration planning to improve connectivity. However, open vegetation communities such as prairies and persistent meadows, and the fauna they support, are often poorly represented and need to be considered in the matrix of natural vegetation. Here we have documented varied open communities and provide considerations for management in the Planning Considerations section.

### **Significant Flora**

In addition to a high total number of vascular plant species, 67 species have been recorded as nationally, provincially or regionally significant, between Klinkenberg’s 1985 report and this 2001-2 inventory (Table 2). Further details are provided in Appendix I, Table 1.

### **Significant Fauna**

As to be expected with high species totals there are high numbers of significant species at the national, provincial and regional levels. A summary by taxa is listed below in Table 2. The complete significant species list is found in Appendix I, Tables 2 – 8. Significant species are also discussed in the appropriate appendix, with comments on their status, distribution in the park and habitat needs from a management perspective.

**Table 2: Summary of Significant Flora and Fauna, Komoka Provincial Park**

<b>Faunal Group</b>	<b>COSEWIC STE</b>	<b>OMNR VTE</b>	<b>NHIC S1-S3</b>	<b>MIDDLESEX Very Rare to Rare</b>
Vascular Plants	1 species	1 species	8 species	51 species
Birds	7	10	36	24 (breeding birds only)
Amphibians & Reptiles	4	3	4	5
Butterflies	1	-	5	19
Dragonflies	-	-	1	?
Freshwater Mussels	-	-	2	?
Mammals	2	-	2	2
Fish	4	1	6	2
Total	19	15	64	103+

### **Significant Habitats**

There is a good diversity of macro-habitats at the park from a significant fauna perspective. The macro-habitats include the Thames River, woodlands, grasslands, meadows and old fields, and open wetlands and ponds. Each contains a complement of significant species at the national, provincial and regional levels. For example, the Thames River in the park provides habitat for seven species that are designated nationally as Special Concern,

Threatened, or Endangered species (STE) or provincially as Vulnerable, Threatened or Endangered species (VTE), eleven species ranked as S1 to S3 by NHIC as well as large numbers of regionally very rare to rare Middlesex species, especially birds.

Table 3 gives an impression of the importance of all the macro-habitats at this site. What can't be shown in Table 3, however, is the significance of the grasslands, meadows and old fields to the guild of birds that breed in this habitat. This can best be expressed by looking at the Conservation Priority (CP) birds of Middlesex County (explained in Appendix D). Of all the possible Middlesex County Open Country CP birds 80% are found at Komoka Provincial Park indicating how important these open areas are. In contrast, the park only provides habitat for some 45% of the Middlesex County Forest CP birds and only 27% of the Middlesex County CP Marsh birds. Many of the significant butterfly species are also dependent on these grasslands, meadows and old fields.

Another significant feature that is not adequately shown by just listing STE/VTE species or rarities is how many pairs of a species are supported by the park's habitats. The best examples of this are the sparse grasslands on the old gravel pit lands. This site would not typically be thought of as high quality wildlife habitat but provides habitat for 10 to 12 Grasshopper Sparrow pairs. This is the largest known colony of this rare Middlesex County breeder and perhaps even in southwestern Ontario. The colony has been present since 1986 suggesting that it has been sustainable on a long-term basis in significant numbers.

**Table 3: Number of Significant Faunal Species by Habitat Type**

<b>MACRO-HABITAT</b>	<b>COSEWIC-OMNR STE/ VTE species</b>	<b>NHIC S1 to S3 species</b>	<b>Middlesex Very Rare to Rare species</b>
<b>Thames River</b>	Birds: 1 Reptiles: 2 Fish: 4	Mussels: 2 Reptiles: 2 Fish: 7	Birds: many Reptiles: 1 Fish: 2
<b>Woodlands</b>	Birds: 4 Reptiles: 1 Mammals: 2	Birds: 5 Butterflies: 5 Mammals: 2	Birds: many Butterflies: 7 Mammals: 2
<b>Grasslands, Meadows, Old Fields</b>	Birds: 1 Butterflies: 1 Reptiles: 1 Mammals: 1	Birds: 2 Butterflies: 3 Reptiles: 1 Mammals: 1 Dragonflies: 1	Birds: many Butterflies: 11 Reptiles: 1
<b>Open wetlands, ponds</b>	Birds: 3	Birds: 21 Dragonflies: 1	Birds: many Amphibians: 1

### ***Physical Features***

There are several notable geomorphological features. The variable topography of the significant Pleistocene deltas, lake terraces, moraines and dissections as the lakes and river levels changed has led to the formation of an intriguingly complex topography, including wetlands in the poorly drained areas, as well as seeps and springs that were providing running water to the small woodland streams even during the height of the extreme summer drought of 2001. The historical seeps on the north bank of the Thames (the provincial land and township land to the east), that drained from the calcareous deposits to the north, led to the deposition of the tufa formation (Hilts and Cook, 1982). With the removal of the source material to the north during aggregate extraction, water no longer seeps through the bank, leaving the vegetation drier and terminating most or all of the tufa deposition. The Wishing Well cascade that left a lime coating on nearby vegetation from its spray (Klinkenberg, 1985) was not evident in 2001. The vegetation appears to be in transition with many of the large cedars falling over and species typical of drier conditions colonising into openings. It is questionable if the calciphilic mosses and liverworts known in the cascade and seep areas in the past (Klinkenberg, 1985) have survived the now drier conditions.

The matrix of different soils of the site reflects the past glacial events, the river activity, variability in drainage and resulting moisture levels, and subsequent action of the vegetation. More details on soils and geomorphology are provided in Seddon and Usher's recent report (2003).

## PLANNING CONSIDERATIONS

The observations and analyses relevant to planning for this site are summarised in the categories below, with recommendations. The faunal appendices contain species-specific planning considerations related to habitat needs for each of the significant or sensitive species. Because there are so many significant birds, the planning considerations are summarised for guilds of species.

### ***Natural Values Protection***

This site is significant for its distinctive and diverse vegetation, highly complex topography and soil conditions, ecological functions, and the resulting matrix of plant communities and habitat types that support a high diversity of native plants and animals. These values should be protected through park classification, special designations within the park, other management agreements on adjoining public lands, and securement processes on private lands, such as conservation easements through non-governmental organisations (NGOs). Follow-up research and monitoring are valuable tools in formulating meaningful restoration prescriptions and continuing adaptive management.

On the park site, impacts of non-sustainable trail use have been observed and planning should address reducing impacts from horses and trail bikes, for example, on sensitive substrates, and reducing the number of trails, limiting them to areas where trails can sustain regular use, or where the trails are equipped with boardwalks or other means to reduce erosion and wear.

Community natural area management schemes on private lands adjacent to the park are worthy of investigation. High impacts have been documented at boundaries to private lands to the north and south, such as loss or change in vegetation communities and invasive exotics spreading into the park. Co-operative stewardship actions to reduce these impacts and engage the local community in a positive relationship are worth pursuing (e.g., the Dorchester Mill Pond Stewardship Program).

There are opportunities to work with other projects or groups in the broader landscape, such as the Thames Talbot Land Trust (McIlwraith Field Naturalists, 2001), the Upper Thames River Conservation Authority (Maaskant *et al.*, 2001) and the Carolinian Canada Big Picture project (Jalava *et al.*, 2000), to extend the value of this core area park.

### ***Proposed Park Boundary***

There are significant areas west of the river within the provincially acquired, unregulated lands that should be considered for inclusion in the park boundary. These areas are important for both their existing natural values as well as their potential for habitat diversification and linkages. These linkages could be formed through natural succession or active management; however, it is important to consider retaining significant open habitats. There are also public township lands that would make an important addition to the park north of the river in the central part of the park, perhaps through land trades or co-operative management agreements. These would help protect significant features, extend the boundary beyond the river's edge and be part of a bigger connection with Carolinian Canada's Big Picture core areas.

Some of the private gravel pit lands adjacent to the Komoka Wells north of the river would make a very important connection with forested lands to either side and would give the opportunity for forest and wetland restoration to link isolated units and restore ecological functioning.

### ***Land Securement***

There are several peripheral private lands that are important for the integrity of the park in maintaining connections to the surrounding natural landscape. Seeking conservation easements or other forms of stewardship agreements with these landowners would make a significant landscape connection to the park and help buffer it from non-supportive land use activities. The large forested tract along Springers Creek northwest of the park is no doubt the most significant one (Figure 1). Closer to the park, the smaller private lands west of the river at the north end of the park together make a significant component of natural lands, as well as the township lands extending south and west along the river, up to the block of provincial land. Additional private lands east of the north part of the park are another extension of the natural landscape of the park area. All of the private lands might best be considered for securement or stewardship agreements; developing partnerships with NGOs (e.g., the Thames Talbot Land Trust or the Nature Conservancy of Canada) for such securement is suggested. Other arrangements should be considered as well, such as co-operative management of township lands and lands that might be acquired by another party (e.g., wetland acquisition by Ducks Unlimited for the securement and/or restoration of wetland habitats adjacent to provincial wetlands to create a larger wetland system). A landscape level assessment, perhaps as part of the Thames Talbot Land Trust Blueprint for Action process, is needed to determine priorities for landscape linkages and restoration.

### ***Park Classification***

#### Recommended park classification and zoning

Natural Environment Park appears to be the best fit to protect significant natural values and ecological functions in a high use area, considering both the significant natural features and the close proximity to an urban area. This would be more restrictive than its current designation as a Recreation Class park. Sensitive sites should be further protected with Nature Reserve zoning (e.g., the communities listed in the Significant Features section plus other wetlands, the tufa slopes and the steep riverbank with its natural erosion dynamics). This is in general agreement with the approved Komoka Provincial Park Management Plan Terms of Reference (OMNR, 2001).

Several disturbed zones in the park offer the possibility of allowing new activities or continued low impact activities. These are the conifer plantations, the old gravel pit and the recently abandoned agricultural lands. Only marginally significant vegetation communities were found in these zones. However, a review of the faunal data shows that there are some significant and sensitive elements. Hence, before any new activities or increased usage is contemplated, a more detailed site-specific faunal survey should be undertaken.

### Permitted activities

Activities for the park could include hiking on defined trails or boardwalks, and outdoor education programming. Horseback riding and mountain biking could continue if better control measures are instituted and if these activities are limited to designated areas, away from sensitive species, and where soils are less subject to erosion and compaction.

### Development considerations

Improvements to the trails plus trail bridges and boardwalks are needed, but only on substrates that can support them and should be directed around sensitive areas. An interpretative centre or kiosks could be developed, especially on the fields recently released from cultivation, perhaps considered as part of a restoration, trail, and interpretative plan.

The provincial land with the worked-out gravel pit to the north (Map 1) has significant grassland habitat and early successional wetlands, which attract significant species and large numbers of waterfowl and shorebirds. This area could provide the focus for grassland and wetland viewing and active learning, with limited peripheral trails, boardwalks, blinds, viewing platforms and possibly limited canoe access. However, any development here with provision for human access will need to assess the hazard of the artificially impounded waters upstream (the large ponds to the north retained by a structure of uncertain integrity).

Before any development or alteration to the site is planned the site should receive a comprehensive assessment of significant habitats and how the site could be managed to ensure their sustainability on the site. The functioning of the watershed should be assessed, from the remnants of the aggregate extraction landscape and its connections to the river, and whether alterations are called for to improve the sustainability of significant habitats and their connectivity with other like habitats. For any development considered appropriate from these assessments, the landscape plan should take into account these mentioned habitats and how any site alterations could improve their sustainability (reducing the need for more than minimal management), and how other potential ecological functions, habitats or linkages, (e.g., a restored tributary stream, connections to the isolated forest block to the north) could be brought about without diminishing the recognised significant habitats on the site.

### ***Research and Monitoring***

Further studies on the hydrology, ecological functions and whether they could and should be restored would be worthwhile for the greatly altered landform of the old gravel pit lands. The former agricultural fields to the south (off Gideon Drive) offer an opportunity to do trials of different restoration techniques, both forest restoration where buffering or connecting forests is warranted as well as meadow and prairie restoration where soil conditions appear appropriate to sustain them. With the known significance of the gravel pit grasslands to the north and the known natural prairie remnants nearby and on site, there is the potential here to increase this type of significant habitat, but it is important to do a thorough assessment so the results will be relatively self-sustaining and not require more than routine management (e.g., periodic prescribed burning of prairies). An examination of early

surveyors' notes would help determine the historical vegetation of the immediate area and provide guidance to vegetation management.

Ongoing monitoring is important to assess the integrity of this site and guide what management or change in activity might be warranted. This should include key indicator plant species for different plant communities, changes in the plant communities, both natural succession as well as apparent response to impacts (e.g., prairie elements, tufa slopes and associated vegetation, interior forest, fen-like community on gravel road base); significant or sensitive faunal species, such as in hawthorn meadows, interior forest, seeps; impact of deer grazing (by establishing exclosures); and the state of invasive exotic species. The proximity of the University of Western Ontario makes that institution a valuable resource for the above activities. The Middlesex Stewardship Council has been involved with restoration projects at Komoka Provincial Park in the past and could be an important partner for further resource management activities. Organisations such as Tallgrass Ontario and the Ontario chapter of the Society for Ecological Restoration might also be interested in participating in prairie restoration and monitoring on the site.

## ***Park Management***

### Sensitive Areas

Trails, activities or structures need to be avoided in any sites designated as being sensitive. However, some could be accessed via boardwalks along the edge as a means to allow experience of some habitats while minimising impact. Some very localised significant species occur very near existing trails (e.g., *Saxifraga virginensis*, *Ranunculus hispidus* var. *hispidus*, precise locations provided to OMNR separately) and trail routing should be altered to avoid impact to these species. Some wet, sandy, or organic substrates are also prone to damage, especially erosion. These areas should have special protective structures constructed to create a low impact passage or should be avoided or all together. Horses and mountain bikes must be excluded from these areas.

Examples of sensitive areas include those listed in the Significant Features section plus seeps, ponds and associated watershed and water courses; tufa formations on the north slope of the Thames; bluffs of the Thames on the south side; dry, sandy sites.

### Invasive Exotic Species

Species that have been recognised as invasive in White *et al.* (1993) are noted with an **X** in the third column of Table 4 below. The other species are considered invasive based on the experience of the authors of this report, totalling 47 based on late summer 2001 and the following spring to early summer inventories (the full listing by polygon and abundance is contained in the ELC chart provided separately to OMNR). Those marked with an \* were not noted in Klinkenberg's (1985) inventory. Some of these were likely missed by that inventory, but the majority certainly represents a recent and expanding problem requiring management attention. Reed Canary Grass (*Phalaris arundinacea*), Common Reed (*Phragmites australis*), and Kentucky Bluegrass (*Poa pratensis*) -also not on her plant list- are believed to have both native and exotic forms, the latter of which behave as invasive species. Canada Bluegrass (*Poa compressa*), is generally considered exotic, although the



Ontario Plant List does not so indicate it to be, and in our opinion, it is not a serious invasive of natural communities on this site.

**Table 4. Invasive Exotic Plants of Komoka Provincial Park**

Species	Common Name	White et al. 1993
1. * Potamogeton crispus	Curly Pondweed	X
2. * Bromus inermis	Smooth Brome	X
3. * Phalaris arundinacea	Reed Canary Grass	X
4. * Phragmites australis	Common Reed	
5. * Poa pratensis	Kentucky Bluegrass	X
6. * Iris pseudacorus	Yellow Flag	X
7. * Alnus glutinosa	Black Alder	X
8. * Betula pendula	European Weeping Birch	X
9. * Salix alba/ fragilis; S. X rubens	White & Crack Willow + hybrids	
10. * Polygonum cuspidatum	Japanese Knotweed	X
11. * Ranunculus repens	Creeping Buttercup	
12. * Chelidonium majus	Celandine	X
13. Morus alba	White Mulberry	X
14. Berberis vulgaris	Common Barberry	
15. Alliaria petiolata	Garlic Mustard	X
16. * Berteroa incana	Hoary Alyssum	X
17. Rosa multiflora	Multiflora Rose	X
18. * Coronilla varia	Variable Crown-vetch	X
19. * Lotus corniculatus	Birds-foot Trefoil	
20. * Robinia pseudoacacia	Black Locust	X
21. Rhamnus cathartica	Common Buckthorn	X
22. Rhamnus frangula	Glossy Buckthorn	X
23. Elaeagnus umbellata	Autumn Olive	
24. * Ailanthus altissima	Tree-of-heaven	
25. * Celastrus orbiculatus	Oriental Bittersweet	
26. * Euphorbia esula	Leafy Spurge	X
27. * Acer platanoides	Norway Maple	X
28. * Aegopodium podagraria	Goutweed	X
29. * Anthriscus sylvestris	Wild Chervil	
30. Vinca minor	Periwinkle	X
31. * Lysimachia vulgaris	Garden Loosestrife	
32. Lythrum salicaria	Purple Loosestrife	
33. * Ligustrum vulgare	Common Privet	
34. * Myosotis scorpioides	Field Forget-me-not	
35. * Acinos arvensis	Mother-of-thyme	X
36. * Galeopsis tetrahit	Common Hemp Nettle	X
37. * Lamium purpureum	Purple Dead-nettle	
38. * Mentha spicata	Spearmint	
39. * Origanum vulgare	Wild Majorum	X
40. * Veronica anagallis-aquatica	Water Speedwell	
41. Veronica serpyllifolia	Thyme-leaved Speedwell	
42. * Galium verum	Yellow Bedstraw	
43. * Campanula rapunculoides	Creeping Bellflower	
44. * Artemisia vulgaris	Mugwort	
45. * Cirsium arvense	Canada Thistle	X
46. * Onopordum acanthium	Scotch Thistle	
47. * Tanacetum vulgare	Tansy	

Several invasive exotic plant species of the site that are or can become serious problems are described in detail below:

- Norway Maple (*Acer platanoides*)

This European tree species is colonising the understorey forested areas adjacent to housing developments and in the river flats. It will in time replace the dominant forest species by reducing the regeneration of native forest species in its dense shade. The same conditions of heavy shading reduce the ground flora to the extent that soil erosion increases on slopes. The source of the tree seeds must be addressed (dumping of garden refuse from the nearby back yards, observed while on site, likely also blowing in or drifting down the river). This and other tree species can be controlled by cutting and then treating the stump with herbicide. These should be removed immediately, before they begin reproducing.

- White Mulberry (*Morus alba*)

This Eurasian tree colonises open areas, hedgerows and open forests. It is readily spread by birds, so as long as seed sources are in the landscape it will be a continuing coloniser. It is more of a concern within the range of the native Red Mulberry (*M. rubra*) with which it freely hybridises, but elsewhere it can change the aspect of meadows, savannas and developing forests.

- Garlic Mustard (*Alliaria petiolata*)

This European biennial herb colonises woodlands. Here it is most evident in disturbed-forested areas. Prevention of expansion into new areas should be a priority, especially with regard to trails and other activities that could move seeds from source areas. Where established, eradication by cutting at flowering time or spot spraying of overwintering rosettes late in the fall (to reduce impact on native ground flora) will require several years of treatment due to the seed bank in the soil.

- Goutweed (*Aegopodium podagraria*)

Likely from garden waste dumped in park and spreading vegetatively. Treat with herbicide at a time when native species dormant (e.g., late fall). This may seem like a less significant invasive plant due to its slow vegetative spread, but it is a serious problem in this region.

- Tree of Heaven (*Ailanthus altissima*)

A problem in local areas. Seeds appear to be dispersed only short distances, but it can become a problem without management.

- Oriental Bittersweet (*Celastrus orbiculatus*)

Just beginning to show its presence, but potentially a very serious problem (e.g., as it has become at Turkey Point Provincial Park and surrounding oak savanna).

- Common Buckthorn (*Rhamnus cathartica*)

This European species is displacing native shrubs, especially in old field situations. Common Buckthorn is dispersed by berry-eating birds. It should be controlled by cutting trees and treating stumps to prevent re-sprouting. Where especially plentiful

it would be desirable to integrate with a native berried shrub planting to maintain a food source for birds that have become dependent on this species.

- Autumn Olive (*Elaeagnus umbellata*)

This Asian species was deliberately introduced for wildlife 20-30 years ago. It is occupying similar habitats and has a similar dispersal mechanism to buckthorn and can be controlled in a similar manner.

- Black Alder (*Alnus glutinosa*)

This European species was introduced for wetland planting but has become invasive along many rivers in southern Ontario. Seeds are wind borne and no doubt also are transported on spring ice or water flows.

- Purple Loosestrife (*Lythrum salicaria*)

With the widespread occurrence of this European invasive in southern Ontario wetlands, it is questionable if the effort of control measures, and their associated damage to habitats, is warranted, unless isolated invasions are seen when the population is still small. With the current trials of insects for bio-control, for large stands it is best to assess how this species responds rather than launching a large control effort. For small occurrences, cutting at ground level at flowering time is usually successful. Pulling or digging should not be done since it brings dormant seeds to the surface and causes habitat damage.

- Chervil (*Anthriscus sylvestris*)

This European garden escape is an annual plant that reproduces by seed. Cutting at flowering time is recommended, but soil disturbance (which brings dormant seeds to the surface) should be avoided.

There are a number of other exotic garden escapes that are a minor or localised problem at this time, especially adjacent to the houses on the north shore forested lands. Some of these are slow spreaders. The emphasis here might be on preventing the source of the propagules of these and more aggressive species from entering the park or ANSI, primarily as garden waste dumped in the park. Those plants in this category include: Lily-of-the-valley (*Convallaria majalis*), Periwinkle, (*Vinca minor*), and Sweet Cherry (*Prunus avium*), which is also dispersed by birds.

### Restoration

With the history of the site including agricultural fields and conifer plantations, there are opportunities to restore the overall ecological integrity and connectivity of the site and significantly address identified landscape level problems and potential solutions (Jalava *et al.*, 2000; Maaskant *et al.*, 2001; McIlwraith Field Naturalists, 2001). For example, connecting fragments of forest and improving the amount of interior forest may be considered. However, the importance of open habitats and site conditions that are best for meadow or prairie restoration versus forest restoration should be taken into account.

The pine plantations, for example, could be thinned to allow natural regeneration of native hardwoods or managed for conversion to savanna, depending on the site conditions. There are particular locations where succession to forest cover is going very quickly, such as the dense stand of young Manitoba Maple on the river terrace on the provincial land. Recognising the ecological role this stand is serving, with some management (e.g., minor thinning, seeding or planting of other local tree species) it could form the nucleus of a more diverse riparian forest, joining with that adjacent to it. This succession to greater diversity may happen on its own. Monitoring should be done to see what changes take place without intervention over the next several years.

Some of the maturing old fields already have a good diversity of hawthorns and other shrubs as well as some pockets of meadow and prairie elements. Those that have been identified as remaining open for more than 20 years and having some prairie elements should be considered prime candidates for trial prescribed burns and monitoring to indicate if management alone could bring back such species assemblages. Other openings and old fields that have a suitable combination of soil and other physical attributes could also be considered for restoration of prairie vegetation, from propagules of the nearby natural sites (e.g., this site plus the Komoka Feed Mill Prairie). However, part of a restoration plan should include a detailed site analysis and review of historical accounts, such as survey records. For details on how to establish prairie and meadow communities see Delaney *et al.* (2000).

Fields that have been in cultivation more recently and fill landscape connectivity and site suitability criteria for forest establishment should be examined for natural forest regeneration from nearby seed sources. If there is little evidence of seedling establishment but suitable seed trees are present, site preparation near the seed sources may be all that is necessary to encourage seedling establishment. If the site now has a heavy grass and forb cover, turning this over at the time of seed release can be effective, in small spots or strips. If the cultivated fields have little relief, creating pits and mounds (Waldron, 2002), which restores the micro-topography to that of a typical hardwood forest, can diversify the physical site sufficiently to result in a higher diversity of species regenerating on the site. Some trees have been planted by community groups in some of the fields. These should be inventoried and examined to see how they fit into an overall management and restoration plan. In these old fields there is also the potential for restoring meadow and prairie communities. Significant meadow or prairie species should be watched for as an indication of a general suitability for prairie or meadow communities and their restoration. A restoration plan is essential to outline the long term objectives, including a site assessment, the determination of the mix of vegetation types matching the site conditions, opportunities to improve landscape connectivity and habitat diversity objectives. One should keep in mind that habitat restoration is a natural process and our role may only need be to remove hindrances (e.g., invasive exotic species) or start a process that has been stalled by lack of nearby seed plants or an inhospitable medium (e.g., a tight cover of exotic grasses and forbs). When actively restoring a forest, consider successional processes and start with pioneer species. Once a forest cover is established the species of the mature forest will likely come in on their own from nearby, now connected seed

sources. Consider the best configuration for grouping of plantings, such as cluster planting, buffers for existing forest, and/or connections between existing forests versus planting the entire forest designated space uniformly. In addition to a mixed matrix of forest, grasslands and wetlands, having different stages of succession adds to the landscape diversity and thus habitat diversity.

Sourcing of planting stock is important to ensure that the stock will thrive and reproduce on site. A directory of nurseries dealing with source appropriate stock is maintained by the Society for Ecological Restoration (Ontario Chapter) and the Forest Gene Conservation Association. It can be accessed at: [www.serontario.org](http://www.serontario.org).

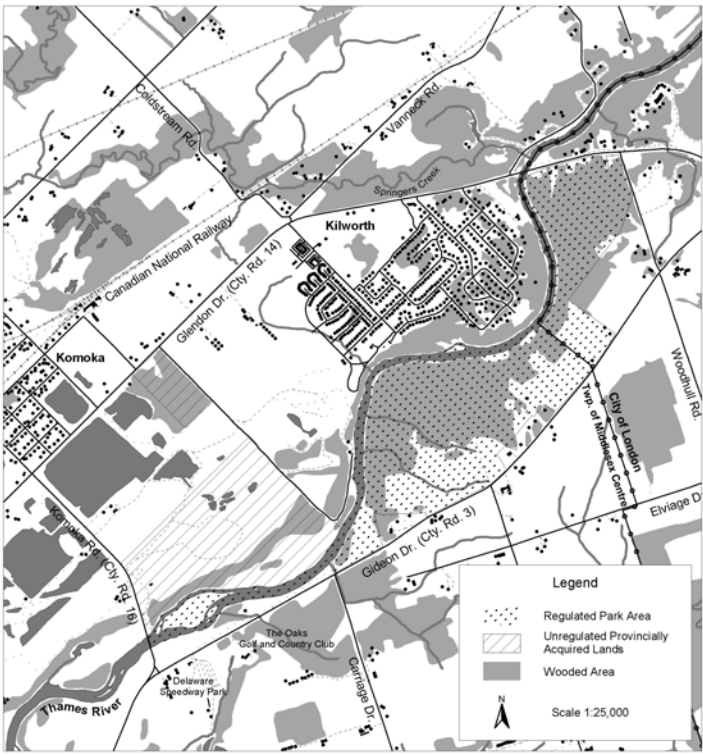
The aggregate extraction areas have restoration potential based on their past form and function. Restoration planning should consider using various base materials from the immediate area, a modified physical watershed configuration, forest connections from the river to the isolated block of forest to the north, as well as the different grassland and wetland habitats in the matrix. This planning should look at past function and lost habitats as well as current habitats on the provincial land site as a guide for how best to manage and restore them. The adjoining wetlands should also be examined with the idea of potential partnering with a conservation oriented NGO, considering the opportunity to create a complex of wetland habitats with both high value for native aquatic communities and passive recreational and learning opportunities.

### ***Community Outreach***

In the adjacent private lands there is the opportunity to work with nearby communities to reduce negative impacts (e.g., dumping garden waste with invasive garden plants, nutrient and herbicide/pesticide runoff). There is a need for a public outreach initiative: e.g., a 'friends of the park', stewardship council, or local land trust. An example that should be examined is the Dorchester Mill Pond Stewardship Program for working with community members in a positive manner.

## APPENDIX A:

### Natural Heritage Area – Life Science Checksheet

<u>Name</u> <b>Komoka Provincial Park</b> and adjacent unregulated provincially acquired lands		<u>Map Name</u> Komoka Provincial Park		<u>Map Number</u> 040114	<u>UTM Ref.</u> 17 4645 47525
<u>County</u> Middlesex		<u>Lat.</u> 42° 56' 45"	<u>Long.</u> 81° 23' 50"	<u>NAD</u> 83	<u>Min. Alt.</u> 208m <u>Max. Alt.</u> 264m
<u>Locality</u> Western boundary of the City of London on the Thames River					
<u>Township</u> Middlesex Centre					
<u>Area</u> ca. 198 hectares (regulated under Provincial Parks Act), 123 hectares (unregulated, provincially acquired)					
<u>Ownership</u> OMNR					
<u>OMNR Region</u> Southcentral	<u>Ecoregion and Ecodistrict</u> 7E-6				
<u>Landform Unit(s)</u> River floodplain, raised beaches, bluffs and terraces; tufa deposits; moraines (Arva and Ingersoll), glacial deltas, other glaciofluvial deposits and erosional valleys					
<u>OMNR District</u> Alymer					
<u>Aerial Photographs</u> <u>Year – Roll – Flight Line – Numbers</u>					
2000-17464-010-017-083					
2000-17466-010-017-082					
2000-17468-010-017-081					
2000-18466-010-018-097					
2000-18468-010-018-098					
<u>Physical and Biological Features</u> The complexity of well preserved glacial features, including the two moraines that define the river valley, and the river terraces and deltas from different lake levels in early post glacial times, give this site a special earth science importance. The matrix of different topographic, drainage, and soil features provides a context for high biological diversity. Seepage areas abound, within deep conifer forests as well as highly calcareous seeps on the north river bank, the latter producing a tufa formation that supports calciphilic vegetation. A diversity of upland forest occurs here: deciduous, mixed and coniferous, as well as areas of swamps. Open meadows, hawthorn savannas and marshes have occupied areas once under cultivation or altered for aggregate extraction. This diverse matrix of habitats hosts a large array of faunal groups and species. The entire site is significant faunal habitat, including the grasslands and wet meadows that were previously under cultivation or aggregate extraction.					
<u>Representation</u> This site provides provincially significant representation of a terraced, forested river corridor and its associated vegetation types. The site contains some rare plant communities such as black oak and sugar maple-black maple deciduous forests, and cultural areas developing into significant communities: water stargrass marsh and black walnut deciduous forest. There are small assemblages of the highly significant prairie communities.					
<u>Condition</u> Being near an urban area with a history of land altering activities, there are large areas of young forest, hawthorn savanna, grasslands, marshes and open water. Some of these increase the site habitat diversity and thus the diversity of flora and fauna. In the case of the aggregate extraction, the water source that once sustained a large perched swamp and a tufa formation on the north bank of the Thames has been cut off so that the swamp has become degraded and there appears to be no current deposition of tufa.					

### Condition (cont'd)

High use of the park without well-controlled trails has resulted in local erosion problems and the potential for continuing site degradation. Invasive plants are becoming well established in some areas and could spread further along trails. Visitors have been observed leaving with bags of wildflowers, further depleting the diversity of the site.

### Diversity

Komoka Provincial Park and acquired lands contain 31 different Ecological Land Classification vegetation types. The species diversity of the area includes 686 vascular plants, 230 birds (including 100 breeding), 9 amphibians, 8 reptiles, 58 butterflies, 13 dragonflies and damselflies, 4 freshwater mussels, 15 mammals, and 39 fish.

### Ecological Considerations

Some of the early successional grassland, hawthorn savanna and wetland communities support significant plant and animal species. Maintaining a diversity of habitats, including early successional communities, should be considered in management planning. With the Komoka Prairie just north of this site and the number of prairie elements occurring within the park in a few of the open grassland habitats, trial prairie restoration management in small areas would be worthwhile. However, restoration as a tool should only be used in the context of an overall vegetation and habitat management plan.

Invasive exotic plants are locally common in a number of areas. Management should consider means to reduce future incursions, such as from garden waste of adjacent landowners and along trails. Those invasives that are now established should be reviewed for measures to control or remove them if they appear to pose a threat of spreading and negatively impacting the park.

### Special Features

Three of the ELC vegetation types at Komoka are provincially rare: FOD1-3 dry-fresh black oak deciduous forest (SRank: S3 01-Jan-97), FOD6-2 fresh-moist sugar maple – black maple deciduous forest (SRank: S3? 01-Jan-97), and SAS1-7 water stargrass submerged shallow aquatic (SRank: S3S4 01-Jan-97).

Nine provincially significant plants, Emory's Sedge *Carex emoryi* (SRank: S3 31-Mar-00), Handsome Sedge *Carex Formosa* (SRank: S3S4 31-Mar-00), Schweinitz's Sedge \* *Carex schweinitzii* (SRank: S3 31-Mar-00), Hispid Buttercup *Ranunculus hispidus* var. *hispidus* (SRank: S3 31-Mar-00), Blue Ash *Fraxinus quadrangulata* (COSEWIC: SC 30-Nov-00; MNR: vul 12-May-96; SRank: S3 31-Mar-00), Purple Milkweed \*<sup>?</sup> *Asclepias purpurascens* (SRank: S2 31-Mar-00), Downy Wood Mint\*<sup>?</sup> *Blephilia ciliate* (SRank: S1 31-Mar-00), Sharp-leaved Goldenrod \* *Solidago arguta* (SRank: S3 31-Mar-00), and Elm-leaved Goldenrod\*<sup>?</sup> *Solidago ulmifolia* (SRank: S1 31-Mar-00), were located at Komoka.

Thirty-two significant birds visit Komoka along their migration: Red-necked Grebe *Podiceps grisegena* (SRank: S3B,SZN 22-Oct-98), Horned Grebe *Podiceps auritus* (MNR: ind 12-May-96, SRank: S1B,SZN 24-Feb-00), Red-necked Grebe *Podiceps grisegena* (SRank: S3B,SZN 22-Oct-98), American White Pelican *Pelecanus erythrorhynchos* -one record: May 24-25, 1996 (MNR: end-r 12-May-96, SRank: S2B,SZN 22-Oct-98), Least Bittern *Ixobrychus exilis* (COSEWIC: THR 12-Mar-01, MNR: vul, SRank: S3B,SZN 22-Oct-98), Great Egret *Ardea alba* (SRank: S2B,SZN 19-Jan-00), Black-crowned Night-heron *Nycticorax nycticorax* (SRank: S3B,SZN 22-Oct-98), Tundra Swan *Cygnus columbianus* (SRank: S3B,SZN 22-Oct-98), Canvasback *Aythya valisineria* (SRank: S1B,S2N 22-Oct-98), Redhead *Aythya americana* (SRank: S2B,SZN 22-Oct-98), Greater Scaup *Aythya marila* (SRank: S2B,SZN 22-Oct-98), Surf Scoter *Melanitta perspicillata* (SRank: S1B,SZN 22-Oct-98), White-winged Scoter *Melanitta fusca* (S1S2B,SZN 22-Oct-98), Long-tailed Duck *Clangula hyemalis* (SRank: S2S3B,SZN 22-Oct-98), Bufflehead *Bucephala albeola* (SRank: S3B,SZN 22-Oct-98), Ruddy Duck *Oxyura jamaicensis* (SRank: S2B,SZN 22-Oct-98), Red-shouldered Hawk *Buteo lineatus* (COSEWIC: SC 19-Jun-00, MNR: vul 12-May-96), Rough-legged Hawk *Buteo lagopus* (SRank: S1B,SZN 22-Oct-98), Golden Eagle *Aquila chrysaetos* (MNR: end 12-May-96, SRank: S1B,SZN 22-Oct-98), Bald Eagle *Haliaeetus leucocephalus* (MNR: end 12-May-96, SRank: S4B,SZN 22-Oct-98), Peregrine Falcon *Falco peregrinus* -not recorded after 1997 (COSEWIC: THR May-00, MNR: end-r 12-May-96, SRank: S2S3B,SZN 22-Oct-98), American Golden-plover *Pluvialis dominica* (SRank: S1B,SZN 24-Feb-00), Hudsonian Godwit *Limosa haemastica* -not recorded in past 15 years (SRank: S2S3B,SZN 24-Feb-00), Dunlin *Calidris alpina* (SRank: S3B,SZN 22-Oct-98), Short-billed Dowitcher *Limnodromus griseus* (SRank: S2S3B,SZN 22-Oct-98), Wilson's Phalarope *Phalaropus tricolor* (SRank: S3B,SZN 22-Oct-98), Caspian Tern *Sterna caspia* (SRank: S3B,SZN 22-Oct-98), Forster's Tern *Sterna forsteri* (COSEWIC: DD 13-Nov-02, MNR: IND 12-May-96 SRank: S2S3B,SZN 22-Oct-98), Black Tern *Chlidonias niger* (MNR: vul 12-May-96, SRank: S3B,SZN 22-Oct-98), Northern Shrike *Lanius excubitor* (SRank: S2S3B,SZN 05-Dec-95), Cerulean Warbler *Dendroica cerulea* (COSEWIC: SC 19-Jun-00, MNR: vul 12-May-96, SRank: S3B,SZN 06-Dec-95), and Louisiana Waterthrush *Seiurus motacilla* (COSEWIC: SC 19-Jun-00, MNR: vul 12-May-96, SRank: S3B,SZN 06-Dec-95).

\* indicates the species was reported by Klinkenberg (1985) but not observed by Ambrose *et al.* in 2002.

? indicates that the species may have been misidentified.

### Special Features (cont'd)

Two significant birds formerly bred in the area of Komoka Provincial Park: Red-shouldered Hawk *Buteo lineatus* (COSEWIC: SC 19-Jun-00, MNR: vul 12-May-96) and Red-headed Woodpecker *Melanerpes erythrocephalus* (COSEWIC: SC 19-Jun-00, MNR: vul 12-May-96, SRank: S3B,SZN 04-Dec-95). Bald Eagles *Haliaeetus leucocephalus* (MNR: end 12-May-96, SRank: S4B,SZN 22-Oct-98) attempted to breed within 5 km of the park in 2000 and 2002.

The following significant birds have been observed during the winter at Komoka: Redhead *Aythya americana* (SRank: S2B,SZN 22-Oct-98), Bufflehead *Bucephala albeola* (SRank: S3B,SZN 22-Oct-98), Rough-legged Hawk *Buteo lagopus* (SRank: S1B,SZN 22-Oct-98), Bald Eagle *Haliaeetus leucocephalus* (MNR: end 12-May-96, SRank: S4B,SZN 22-Oct-98), Great Black-backed Gull *Larus marinus* (SRank: S2B,SZN 22-Oct-98) and Tufted Titmouse *Baeolophus bicolor* -not recorded in past 5 years (SRank: S2S3 03-Jan-89). Northern Bobwhite *Colinus virginianus* (COSEWIC: END Apr-94, SRank: S1S2 02-Dec-95) was observed twice during Christmas Bird Counts in the late 1980s.

Between 1976 and 1998, several sightings of American Badger *Taxidea taxus* (COSEWIC: END 19-Jun-00, SRank: S2 13-Dec-95) were reported within 15 km of Komoka Provincial Park. A Southern Flying Squirrel\* *Glaucomys volans* (COSEWIC: SC 19-Jun-00, MNR: vul 14-Nov-02, SRank: S3 16-Oct-97) was reported in the park in 1985.

Four significant reptiles were found at Komoka: Eastern Spiny Softshell *Apalone spinifera spinifera* (COSEWIC: THR 05-Jan-91, MNR: THR 12-May-96, SRank: S3 31-Oct-99), Common Map Turtle *Graptemys geographica* (COSEWIC: SC 05-Jan-02, SRank: S3 31-Oct-99), Eastern Hognose Snake *Heterodon platirhinos* (COSEWIC: THR 12-Mar-01, MNR: vul 12-May-96, SRank: S3 31-Oct-99), and Queen Snake *Regina septemvittata* (COSEWIC: THR 23-Apr-99, MNR: thr 25-Jan-00, SRank: S2 31-Oct-99).

Seven significant fish, Eastern Sand Darter *Ammocrypta pellucida* (GRank: G3 24-Sep-96, COSEWIC: THR Nov-00, SRank: S2 22-Nov-88), Greenside Darter *Etheostoma blennioides* (COSEWIC: SC 19-Jun-00, SRank: S4 09-Oct-97), Silver Shiner *Notropis photogenis* (COSEWIC: SC 19-Jun-00, SRank: S2S3 06-Oct-97), Pugnose Minnow *Opsopoeodus emiliae* (COSEWIC: SC 19-Jun-00, MNR: vul, SRank: S2 22-Nov-88), Golden Redhorse *Moxostoma erythrurum* (SRank: S3 09-Oct-97), Striped Shiner *Luxilus chrysocephalus* (SRank: S3? 06-Oct-97), Central Stoneroller *Campostoma anomalum* (SRank: S3 07-Oct-99), were identified in the Thames River within or near Komoka Provincial Park.

Nine significant butterflies were found in the study area: Monarch *Danaus plexippus* (COSEWIC: SC 19-Jun-00), Giant Swallowtail *Papilio cresphontes* (SRank: S2 03-Oct-97), Hickory Hairstreak *Satyrrium caryaevorum* (SRank: S3S4 19-Dec-95), Hackberry *Asterocampa celtis* (SRank: S2 20-Dec-95), Tawny Emperor *Asterocampa clyton* (SRank: S2S3 20-Dec-95), Southern Cloudywing *Thorybes bathyllus* (SRank S2S3 02-Nov-99), Wild Indigo Duskywing *Erynnis baptisiae* (SRank: S1 18-Dec-95).

Two provincially significant dragonflies, Eastern Amberwing *Perithemis tenera* (SRank: S3 16-Oct-97) and Halloween Pennant *Celithemis eponina* (SRank: S3 09-Jun-00), were identified in the study area.

Two provincially significant freshwater mussels were identified: Black Sandshell *Ligumia recta* (SRank: S3 12-Dec-96) and Pink Heelsplitter *Potamilus alatus* (SRank: S3 12-Dec-96).

Other important features include the tufa formation on the North slope of the Thames River, the diverse glacial and erosional landforms, calcareous seepage areas and local wetlands.

### Major Information Sources

- Ambrose, J., G. Waldron, L. Rodger, & D. Martin, 2003. Komoka: An Updated Survey and Evaluation of the Life Science Resources. Ministry of Natural Resources, London.
- Hilts, S.G. & F.S. Cook (eds.), 1982. Significant Natural Areas of Middlesex County. Mcllwraith Field Naturalists and University of Guelph.
- Klinkenberg, R. 1985. A Reconnaissance Life Science Inventory of the Komoka Park Reserve and the Komoka Park Area of Natural and Scientific Interest. Ministry of Natural Resources, Alymer District.
- Maaskant, K., C. Quinlan & I. Taylor, 2001. The Upper Thames River Watershed Report Cards. Upper Thames River Conservation Authority, London.
- Natural Heritage Information Centre, 2003. Natural Heritage Information Database. Ministry of Natural Resources, Peterborough.
- Seddon, I., & A. Usher, 2003. Komoka Provincial Park: Background Information, Issues and Options. Ontario Ministry of Natural Resources, Ontario Parks Southwest Zone, London.



Significance Level (Provincial/Regional/Local) and Brief Summary of Major Representative Values  
Komoka Provincial Park and acquired unregulated lands contain large proportions of the provincially significant Komoka Earth Science ANSI and Life Science ANSI. Several of the plant communities have provincial significance. In addition, there are numerous nationally, provincially and regionally significant species of flora and fauna.

Date Compiled  
July 9, 2003

Compiler  
John D. Ambrose

**Ontario Ministry of Natural Resources  
[Ontario Parks and Protected Areas]  
Peterborough**

## **APPENDIX B:**

### **Ecological Land Classification (ELC) Community Description of Komoka Provincial Park**

ELC code	ELC code on Map 1	ELC code description	Dominant canopy species	Dominant sub-canopy species	Dominant understorey species	Dominant ground layer species	Exotic species concern	Other disturbance concerns	Notes
BBO1-3	BBO1-3a,b	Reed-canary grass mineral open beach type	Cover<25%. Acer negundo, Salix spp.	n/a	Acer platanoides	Urtica dioica, Bromus inermis, Alliaria petiolata, Aegopodium podagraria	Dominant x extensive. Bromus inermis, Alliaria petiolata, Aegopodium podagraria, Acer platanoides.	Tracks/trails well marked x local: eroding trails along sand at riverbank edge. Erosion moderate x local.	ELC code represents best available fit; however, Phalaris arundinacea present but not a dominant in the polygon
BBO1-3	BBO1-3c	Reed-canary grass mineral open beach type	n/a	n/a	Acer negundo	Phalaris arundinacea, Solidago spp., Dipsacus fullonum, Tanacetum vulgare	Occasional x local. Tanacetum vulgare.		
BBS1-2	BBS1-2	Willow gravel shrub beach type	Cover<25%. Salix alba, Populus deltoides, Acer negundo, Platanus occidentalis	n/a	Acer negundo, Salix exigua	Urtica dioica, Alliaria petiolata, Lythrum salicaria, Phalaris arundinacea	Dominant x extensive. Acer negundo, Alliaria petiolata, Lythrum salicaria, Saponaria officinalis.	ATV trail near east end of island, coming across from north side of mainland. Signs of light, local recreational use (likely fishing).	
BBT1	BBT1a,	Mineral treed beach/bar ecosite	Acer negundo, Salix nigra, Salix alba, Platanus occidentalis	n/a	Rhamnus cathartica, Lonicera tatarica, Juglans nigra, Vitis riparia	Bromus inermis, Solidago spp., Aegopodium podagraria	Widespread x extensive. Saponaria officinalis, Rhamnus cathartica, Hesperis matronalis, Lythrum salicaria, Alliaria petiolata, Galium mollugo, Aegopodium podagraria	Tracks/trails: widespread roads. Car track down to river, parking area, and along river, extensive trails to river edge. Recreation: campfire pits. Dumping: light x widespread. Litter, beer bottles, some rubbish dumping.	
BBT1	BBT1b,c	Mineral treed beach/bar ecosite	Acer negundo, Salix nigra, Juglans nigra	n/a	n/a	Urtica dioica, Alliaria petiolata, Phalaris arundinacea	Dominant x extensive. Acer negundo, Hesperis matronalis, Alliaria petiolata.		
CU	CU	Cultural (see notes)	n/a	n/a	Tsuga canadensis, Thuja occidentalis, Salix spp., Physocarpus opulifolius.	Lythrum salicaria, Juncus nodosus, Carex spp., Equisetum spp.	Dominant x Extensive. Lythrum salicaria.		This polygon is a cultural feature; it is an old gravel road. However, an unique plant community, which we will refer to as "cultural mineral fen meadow marsh" has naturally succeeded on the gravel road.
CUM	CUMa	Cultural meadow	n/a	n/a	n/a	Medicago sativa, Brassicaceae spp., Trifolium hybridum			agricultural field
CUM	CUMb	Cultural meadow	n/a	n/a	n/a	Dactylis glomerata, Medicago sativa, Trifolium hybridum			agricultural field
CUM1-1	CUM1-1a	Dry-moist old field meadow type	Cover<25%. Populus tremuloides, P. grandidentata, Pinus sylvestris, P. strobus	n/a	n/a	Solidago spp., Centaurea maculosa, Lythrum salicaria, Carex spp.	Occasional x widespread. Lythrum salicaria, Centaurea maculosa, Galium mollugo		prairie elements: several hundred clumps Schizachyrium scoparium; Desmodium canadense, Asclepias tuberosa; one clump Sorghastrum nutans
CUM1-1	CUM1-1b	Dry-moist old field meadow type	Cover<10%. Ulmus americana, Thuja occidentalis, Fraxinus americana, Carya ovata.	n/a	Cornus foemina, Rhus typhina, Vitis riparia, Crataegus sp.	Poa pratensis, Solidago canadensis, Clinopodium vulgare	Occasional x local. Saponaria officinalis, Galium mollugo, Lythrum salicaria, Rhamnus cathartica, Elaeagnus umbellata		
CUM1-1	CUM1-1c	Dry-moist old field meadow type	Cover<25%. Juglans nigra, Populus tremuloides, Morus alba	n/a	n/a	Poa pratensis, Solidago spp., other graminea spp., Saponaria officinalis	Occasional x widespread. Galium mollugo, Saponaria officinalis, Morus alba, Hemerocallis fulva	Tracks/trails: local roads. Dumping: light x local.	
CUM1-1	CUM1-1d	Dry-moist old field meadow type	n/a	n/a	n/a	Poa compressa, Erigeron strigosus, Aster spp., Chrysanthemum leucanthemum, Solidago spp.			
CUM1-1	CUM1-1e	Dry-moist old field meadow type	Cover<25%. Juglans nigra, Thuja occidentalis, Pinus strobus, Quercus alba	n/a	Rhus typhina, Lonicera tatarica, Pinus strobus	Poa pratensis, Solidago canadensis	Occasional x local. Alliaria petiolata, Lonicera tatarica, Forsythia sp.	Dumping: moderate x widespread. Remains of bonfires, beer bottles, cement tile drains, fencing. Browse: moderate x local on cedars and pines.	
CUM1-1	CUM1-1f	Dry-moist old field meadow type	n/a	n/a	Acer negundo	Solidago spp., Equisetum arvense, Daucus carota	Abundant x local. Acer negundo.		Large area of very vigorous Acer negundo regeneration, being seeded in from adjacent treed floodplain.
CUM1-1	CUM1-1g	Dry-moist old field meadow type	n/a	n/a	Crataegus spp., Elaeagnus umbellata, Vitis riparia	Poa pratensis, Solidago canadensis, Clinopodium vulgare, Monarda fistulosa	Dominant and extensive. Clinopodium vulgare forms a thick mat over much of the polygon.		Several prairie-affinity forbs, but no native prairie grasses located.
CUM1-1	CUM1-1h	Dry-moist old field meadow type	Cover<10%. Salix alba	n/a	Cornus foemina, Crataegus spp., Physocarpus opulifolius, C. stolonifera, Salix spp.	Solidago canadensis, Carex spp., Agrostis gigantea	Abundant x widespread. Lythrum salicaria, Galium mollugo.		much moister than adjacent M1-10
CUM1-1	CUM1-1i	Dry-moist old field meadow type	Cover<10%. Populus tremuloides, Ulmus americana, Morus alba, Carya ovata.	n/a	Rhus typhina, Cornus foemina, Crataegus sp.	Poa pratensis, Solidago canadensis, Bromus inermis, Clinopodium vulgare	Morus alba.	tracks/trails well marked x local: running on south edge, linking up with Blue Trail.	small inclusion of a tree grove (FOD4-2, Dry-fresh white ash deciduous forest type)
CUM1-1	CUM1-1j	Dry-moist old field meadow type	Cover<10%. Betula papyrifera, Morus alba, Fraxinus americana, Acer negundo, Ulmus americana.	n/a	Crataegus sp., Hamamelis virginiana	Bromus inermis, Solidago spp., Poa pratensis, Achillea millefolium	Occasional x local. Morus alba.		

ELC code	ELC code on Map 1	ELC code description	Dominant canopy species	Dominant sub-canopy species	Dominant understorey species	Dominant ground layer species	Exotic species concern	Other disturbance concerns	Notes
CUM1-1	CUM1-1k	Dry-moist old field meadow type	n/a	n/a	Acer negundo, Pinus strobus, Fraxinus spp., Quercus rubra	Solidago canadensis, Bromus inermis, Lotus corniculatus, Erigeron spp.	Abundant x widespread. Galium mollugo.	Tracks/trails: well-marked x widespread. Horse trails through field, well used and marked with flagging tape.	very young mixed tree plantation on sizable portion of polygon (inclusion CUP2, mixed plantation)
CUP2-1	CUP2-1 a,b,c	Black walnut-white pine mixed plantation type	Pinus strobus, Juglans nigra, Carya cordiformis, Malus sp.	n/a	Cornus foemina, Vitis riparia	Alliaria petiolata, Rubus idaeus, R. occidentalis, Circaea lutetiana, Clinopodium vulgare	Dominant x widespread. Alliaria petiolata, Clinopodium vulgare.		Pinus strobus >75% canopy, so more exactly codes as CUP3-2, but CUP2-1 code better describes the polygon as Juglans nigra also present
CUP3-2	CUP3-2	White pine coniferous plantation type	Pinus strobus, Fraxinus americana, Carya ovata	n/a	Crataegus sp.	Fraxinus americana, Alliaria petiolata, Symphoricarpos albus	Occasional x widespread. Alliaria petiolata	Dumping: occasional x local. Rolls of old wire, cement slab, discarded vegetable debris (nearby seasonal fruit and vegetable stand).	
CUS1	CUS1	Mineral cultural savanna ecosite (black walnut)	Juglans nigra	n/a	Juglans nigra, Viburnum lentago, Rhus typhina	Bromus inermis, Solidago spp., Monarda fistulosa, Poa pratensis	Occasional x local. Syringa vulgaris, Lonicera tatarica.	Tracks/trails: car track down to river. Recreation: campfire pits. Dumping: piles of old building material.	Stream runs through, forms narrow inclusion of moist riparian vegetation.
CUS1-1	CUS1-1a	Hawthorn cultural Savanna type	Crataegus sp., Malus sp., Populus tremuloides, Pinus strobus	n/a	Cornus foemina, Vitis riparia	Solidago spp., Graminea spp.			
CUS1-1	CUS1-1b	Hawthorn cultural Savanna type	Crataegus spp., Malus sp., Carya ovata, Prunus sp.	n/a	n/a	Poa pratensis, Elymus repens, Solidago spp., Galium mollugo, Clinopodium vulgare	Abundant and widespread. Galium mollugo.		
CUS1-1	CUS1-1c	Hawthorn cultural Savanna type	Cover<10%. Populus tremuloides, Fraxinus americana.	n/a	Crataegus spp., Elaeagnus umbellata, Cornus foemina, Acer negundo, Malus sp.	Solidago canadensis, Bromus inermis, Poa pratensis			East end of polygon, separating two pine plantations, does have some Pinus strobus, but it appears to have been planted quite thinly or had poor success.
CUS1-1	CUS1-1d	Hawthorn cultural Savanna type	Cover<25%. Populus tremuloides, Ulmus americana, Carya ovata, Pinus strobus	n/a	Crataegus spp., Corylus americana, Cornus foemina, Malus coronaria	Poa pratensis, Dactylis glomerata, Phleum pratense, Bromus inermis, Solidago spp., Clinopodium vulgare			
CUT1-1	CUT1-1	Sumac cultural thicket type	Cover<10%. Acer negundo, Ulmus americana, Betula papyrifera, Pinus strobus.	n/a	Crataegus spp., Rhus typhina, Malus sp., Elaeagnus umbellata	Poa pratensis, Bromus inermis, Solidago spp., Achillea millefolium, Clinopodium vulgare			
FOC2-2	FOC2-2	Dry-fresh white cedar coniferous forest type	Thuja occidentalis, Pinus strobus, Fraxinus americana, Populus grandidentata	n/a	Fraxinus americana, Crataegus sp., Acer saccharum, Quercus rubra	Fraxinus americana, Maianthemum canadense, Equisetum arvense			
FOC3-1	FOC3-1	Fresh-moist hemlock coniferous forest type	Tsuga canadensis	Tsuga canadensis	Fagus grandifolia	Fraxinus americana, Maianthemum racemosum, Polystichum acrostichoides	Occasional x local. Alliaria petiolata, Populus alba.	Trails: through wet gully. Bridge should be installed. Earth displacement: erosion on valley slopes, exposed roots and deadfall.	
FOC4-1	FOC4-1a	Fresh-moist white cedar coniferous forest type	Thuja occidentalis, Betula papyrifera, Malus sp., Fraxinus americana	n/a	Physocarpus opulifolius, Cornus rugosa	Fraxinus americana			
FOC4-1	FOC4-1b	Fresh-moist white cedar coniferous forest type	Thuja occidentalis, Pinus strobus, Fraxinus americana	n/a	Thuja occidentalis, Physocarpus opulifolius, Crataegus sp., Cornus foemina	Fraxinus americana, Carex spp.		Browse: light and local on cedar.	
FOD1-3	FOD1-3	Dry-fresh black oak deciduous forest type	Quercus velutina, Q. alba, Prunus serotina, Acer rubrum	P. serotina, A. rubrum, A. saccharum, Cornus alternifolia	P. serotina, P. virginiana	Podophyllum peltatum, Circaea lutetiana, Alliaria petiolata	Occasional x widespread. Alliaria petiolata, Hesperis matronalis, Rhamnus cathartica, Convallaria majalis.		Notable deadfall from windthrow. A few very large Pinus strobus present. Klinkenberg 1985 separated small polyon in southeast section as old field meadow, but it is succeeding to forest.
FOD2-2	FOD2-2	Dry-fresh oak-hickory deciduous forest type	Carya ovata, Quercus alba, Fraxinus americana, Pinus strobus	Prunus serotina, Pinus strobus, Fraxinus americana, Carpinus caroliniana	Fraxinus americana, Staphylea trifolia, Prunus virginiana, P. serotina	Fraxinus americana, Maianthemum racemosum, Parthenocissus inserta, Carex spp.	Occasional x widespread. Rhamnus cathartica, Acer platanoides, Syringa vulgaris	Disease: light x widespread. Marked ash wilt.	Open forest; vigorous Prunus and Fraxinus regeneration. A change in the dominant ground flora from Klinkenberg, 1985 suggests succession underway from savanna too more closed forest.
FOD3-1	FOD3-1	Dry-fresh poplar deciduous forest type	Populus grandidentata, Carya ovata, Fraxinus americana, Betula papyrifera, Pinus strobus	n/a	Fraxinus americana, Crataegus sp.	Fraxinus americana, Circaea lutetiana, Hesperis matronalis	Abundant x local. Hesperis matronalis, Alliaria petiolata.		
FOD4-2	FOD4-2a	Dry-fresh white ash deciduous forest type	Fraxinus americana, Pinus strobus, Betula papyrifera	Crataegus sp., Prunus virginiana, Carpinus caroliniana	Fraxinus americana, Viburnum lentago, Cornus alternifolia, Physocarpus opulifolius	Maianthemum racemosum, Parthenocissus inserta, Fraxinus americana, Rhus radicans	Occasional x local. Rhamnus cathartica, Hesperis matronalis.		

ELC code	ELC code on Map 1	ELC code description	Dominant canopy species	Dominant sub-canopy species	Dominant understory species	Dominant ground layer species	Exotic species concern	Other disturbance concerns	Notes
FOD4-2	FOD4-2b,c	Dry-fresh white ash deciduous forest type	Fraxinus americana, Betula papyrifera, Populus grandidentata, P. tremuloides	n/a	Cornus foemina, Lindera benzoin, Acer saccharum	Solidago spp., Senecio aureus, Podophyllum peltatum, Maianthemum racemosum			
FOD5-3	FOD5-3a	Dry-fresh sugar maple-oak deciduous forest type	Acer saccharum, A. rubrum, Quercus rubra, Q. alba, Populus grandidentata	Acer saccharum, Carya ovata	Carpinus caroliniana, Cornus alternifolia, Hamamelis virginiana, Prunus virginiana	Aralia nudicaulis, fern spp., Maianthemum racemosum, Fraxinus americana		Evidence of horse use.	several inclusions of FOC4-2 (Fresh-moist white cedar-hemlock coniferous forest type)
FOD5-3	FOD5-3b	Dry-fresh sugar maple-oak deciduous forest type	Acer saccharum, Quercus rubra, Betula papyrifera, Fraxinus americana, Q. alba	Hamamelis virginiana, Carpinus caroliniana, Ostrya virginiana	Fraxinus americana	Podophyllum peltatum, Aster cordifolius, Carex pensylvanica, Euonymus obovata			This polygon includes a complex of mixed, moist forest (FOM7-2, Fresh-moist White Cedar-hardwood mixed forest type)
FOD5-3	FOD5-3c	Dry-fresh sugar maple-oak deciduous forest type	Acer saccharum, Quercus alba, Q. rubra, Betula papyrifera	Hamamelis virginiana, Fraxinus americana, Fagus grandifolia, Carpinus caroliniana	Acer saccharum, Fraxinus americana, Viburnum acerifolium	Polystichum acrostichoides, Podophyllum peltatum, Maianthemum canadense, Carex pensylvanica			Very vigorous Acer saccharum and Fraxinus americana regeneration at seedling and sapling stage. West edge of polygon is younger forest; it is succeeding into adjacent old field to the west.
FOD5-3	FOD5-3d	Dry-fresh sugar maple-oak deciduous forest type	Acer saccharum, Quercus rubra, Prunus serotina, Fraxinus americana, Tilia americana	Acer saccharum, A. rubrum, Ulmus americana, Ostrya virginiana	Fraxinus americana, Cornus spp., Amelanchier sp., Hamamelis virginiana	Uvularia grandiflora, Alliaria petiolata, Maianthemum racemosum, Acer saccharum	Abundant x local. Alliaria petiolata, Rhamnus frangula, Rosa multiflora.		
FOD5-3	FOD5-3e	Dry-fresh sugar maple-oak deciduous forest type	Acer saccharum, Quercus rubra, Betula papyrifera	(not surveyed due to steep slopes)	(not surveyed due to steep slopes)	(not surveyed due to steep slopes)			Steep slope; slides with young Populus tremuloides, P. deltoides and Betula papyrifera
FOD5-8	FOD5-8a	Dry-fresh sugar maple - white ash deciduous forest type	Acer saccharum, Fraxinus americana, Fagus grandifolia, Thuja occidentalis	Fagus grandifolia, Ostrya virginiana	Fagus grandifolia, Acer saccharum	Carex pensylvanica, Rhus radicans, Fraxinus americana, Acer saccharum	Occasional x local. Alliaria petiolata.	Notable windthrow.	
FOD5-8	FOD5-8b	Dry-fresh sugar maple-white ash deciduous forest type	Acer saccharum, Fraxinus americana, Quercus rubra, Betula papyrifera	n/a	Fraxinus americana, Cornus alternifolia, Cornus rugosa	(not surveyed due to steep slopes)	Abundant x local. Alnus glutinosa.		Cool spots have Thuja occidentalis, Tsuga canadensis, Pinus strobus. Unstable/steep slopes have young pioneer species, indicating recent slide activity.
FOD6-2	FOD6-2	Fresh-moist sugar maple-black maple deciduous forest	Acer nigrum, A. saccharum, Fraxinus americana, F. quadrangulata	Ostrya virginiana	Carpinus caroliniana, Hamamelis virginiana, Staphylea trifolia	Matteuccia struthiopteris, Maianthemum racemosum, Podophyllum peltatum, Allium tricoccum	Occasional x widespread. Hesperis matronalis, Acer negundo, Epipactis helleborine.		Some parts of this polygon show no regeneration in terms of a cohort of young trees (perhaps due to flooding events in the past); however, some parts show good Fraxinus quadrangulata regeneration at the seedling/sapling stage.
FOD6-4	FOD6-4	Fresh-moist sugar maple-white elm deciduous forest type	Fraxinus americana, Acer saccharum, Thuja occidentalis	n/a	Ulmus americana, Fraxinus nigra, Lindera benzoin, Cornus alternifolia	Parthenocissus inserta, Urtica dioica, Rubus idaeus		Windthrow heavy and widespread.	ELC code a poor fit. This forest appears to have undergone both severe windblow and marked moisture changes (likely due to adjacent quarry operation) and is succeeding to a drier forest type.
FOM4-1	FOM4-1a,b	Dry-fresh white cedar-white birch mixed forest type	Thuja occidentalis, Pinus strobus, Betula papyrifera	(not surveyed due to steep slopes)	(not surveyed due to steep slopes)	(not surveyed due to steep slopes)			Steep slope; slides with young Populus tremuloides, P. deltoides and Betula papyrifera
FOM7-1	FOM7-1a	Fresh-moist white cedar-sugar maple mixed forest type	Thuja occidentalis, Betula alleghaniensis, Fraxinus americana, Tilia americana	n/a	F. americana, Cornus alternifolia, Lindera benzoin, Physocarpus opulifolius	Symplocarpus foetidus, Cystopteris bulbifera, Arisaema triphyllum	Occasional x local. Alliaria petiolata.	Windthrow heavy and widespread. Rubbish dumping.	Notable windthrow, most old Thuja occidentalis. Some surviving T. occidentalis >50 cm dbh. Old tufa formation; old seeps high on slope are dry, likely due to change in hydrology caused by quarry operations.
FOM7-1 (see notes)	FOM7-1b	Fresh-moist white cedar-sugar maple mixed forest type	Fraxinus americana, Betula alleghaniensis, Thuja occidentalis, Acer saccharum	n/a	Cornus alternifolia, Fraxinus americana, Physocarpus opulifolius, Lindera benzoin	Parthenocissus inserta, Podophyllum peltatum, Rhus radicans, Dryopteris spp., Cystopteris bulbifera			ELC code a poor fit; this is essentially a mid-age Fraxinus americana forest, with clumps of old-growth Thuja occidentalis growing in small clusters along slope (visible on aerial). In transition to a drier forest. Eventual conversion to FOD4-2 predicted.
FOM7-2	FOM7-2	Fresh-moist white cedar-hardwood mixed forest type	Fraxinus americana, Thuja occidentalis, Populus spp., Prunus serotina	n/a	Cornus foemina, Physocarpus opulifolius, Cornus alternifolia	Solidago canadensis, Symplocarpus foetidus, Fraxinus americana, Circaea lutetiana	Occasional x local. Alliaria petiolata.		Very heavy deadfall most downed trees Thuja occidentalis. Appears this polygon heavily impacted in past by windstorm.
MAM3-8	MAM3-8	Jewelweed organic meadow marsh type	Fraxinus nigra, Ulmus americana	n/a	Cornus foemina, Physocarpus opulifolius, Lindera benzoin	Impatiens capensis, Symplocarpus foetidus, Onoclea sensibilis, Matteuccia struthiopteris	Abundant and widespread. Lythrum salicaria, Hesperis matronalis, Glechoma hederacea, Lysimachia nummularia.		Numerous standing snags and deadfalls, at least some of which are Ulmus americana.
MAM3-9	MAM3-9	Forb organic meadow marsh type	Cover<10%. Betula papyrifera, Acer negundo, Thuja occidentalis	n/a	Salix discolor, Cornus stolonifera, Ribes americanum	Typha latifolia, Lythrum salicaria, Carex spp.	Abundant x extensive. Lythrum salicaria		Likely a cultural marsh, flooding likely due to high placement of drainage tile at roadside.

ELC code	ELC code on Map 1	ELC code description	Dominant canopy species	Dominant sub-canopy species	Dominant understorey species	Dominant ground layer species	Exotic species concern	Other disturbance concerns	Notes
SAS1-7	SAS1-7	Water stargrass submerged shallow aquatic type	n/a	(see notes) Salix exigua, Lythrum salicaria, S. eriocephala, Phragmites australis, Typha latifolia	(see notes) Eleocharis erythropoda, E. acicularis	(see notes) Najas flexilis, Heteranthera dubia	Abundant x local. Lythrum salicaria, Phragmites australis.		Cultural ponds from quarrying activities. In this polygon, "ground layer" denotes in-pond (submergent) vegetation, while "understorey" and "sub-canopy" denote two height layers of wetland vegetation found in a very narrow band around pond edges.
SWC3-2	SWC3-2a	White cedar-conifer organic coniferous swamp type	Thuja occidentalis, Pinus strobus, Tsuga canadensis, Fraxinus americana	Betula alleghaniensis	Cornus foemina, Rhamnus alnifolia, Corylus americana, R. frangula	Symplocarpus foetidus, Thelypteris palustris, Lythrum salicaria, Carex spp.	Abundant x local. Lythrum salicaria, Aegopodium podagraria, Rhamnus frangula.	Deer trails: well marked x widespread. Browse: light x widespread low height stripping of cedar bark.	Polygon is a patchy network of dense cedar grove with open stream/wet meadow areas. Oh=54cm, therefore qualifies under ELC as swamp.
SWC3-2	SWC3-2b,c	White cedar-conifer organic coniferous swamp type	Larix laricina, Thuja occidentalis, Betula papyrifera	n/a	Lindera benzoin, Thuja occidentalis	Symplocarpus foetidus, fern spp., Equisetum arvense, Lythrum salicaria	Abundant x widespread. Lythrum salicaria.		Numerous standing snags (many Thuja occidentalis, some Larix laricina).
SWD6-1	SWD6-1	Red maple organic deciduous swamp type	Fraxinus americana, Acer rubrum, Populus grandidentata, Betula alleghaniensis	Cornus alternifolia, Ulmus americana	Lindera benzoin, Prunus virginiana, Fraxinus americana, Hamamelis virginiana	Symplocarpus foetidus, Maianthemum canadense, Podophyllum peltatum, fern spp.		tracks: faint x local (possibly deer). Tree disease: one small (~10 cm dbh) Juglans cinerea with blight.	Notable deadfall, dying/dead Thuja occidentalis, Crataegus sp. Very moist lowland, permanent stream runs through, water-logged soil.
SWM4-1	SWM4-1a	White cedar-hardwood organic mixed swamp type	Thuja occidentalis, Pinus strobus, Betula alleghaniensis, B. papyrifera, Fraxinus americana	Acer rubrum, A. saccharum, Fraxinus americana	Lindera benzoin, Cornus alternifolia	Symplocarpus foetidus, Osmunda cinnamomea			no soil sample taken, but definitely >40cm organics and saturated soils
SWM4-1	SWM4-1b	White cedar-hardwood organic mixed swamp type	Thuja occidentalis, Pinus strobus, Betula alleghaniensis, B. papyrifera, Fraxinus americana	Acer rubrum, A. saccharum, Fraxinus americana	Lindera benzoin, Cornus alternifolia	Symplocarpus foetidus, Osmunda cinnamomea			no soil sample taken, but definitely >40cm organics and saturated soils
SWM4-1	SWM4-1c	White cedar hardwood organic mixed swamp type	Thuja occidentalis, Tsuga canadensis, Betula alleghaniensis, Fraxinus nigra	n/a	Betula alleghaniensis, Fraxinus americana, Lonicera sp., Lindera benzoin	Symplocarpus foetidus, Onoclea sensibilis, other fern spp., Equisetum arvense, Rhus radicans			Some areas, especially on drier slopes, are covered with inclusions of ~100% Tsuga canadensis (FOC3-1, Fresh-moist Hemlock Coniferous Forest Type). Notable deadfall, mostly Thuja occidentalis. Decaying deadfall covered with moss and liverwort species.

#### SOIL SAMPLE RESULTS

ELC Code on Map 1	Moisture	Organic/Mineral	Notes
FOM7-1a	Fresh	mineral	
FOM7-1a	moderate-very wet	organic	
FOM7-2	Wet	organic	Oh >100 cm; sand @ 110 cm; strong mottles @ 110 cm; possibly gravel@130 cm; silty sand intrusion @45-55 cm
FOC4-1a	Moderately fresh-moderately moist	mineral	loamy fine sands; only dug to 42 cm because of gravel. Ah 1-20 cm; Bh 20-33 cm; Bm 33-42 cm
SWM4-1b			sample not taken, but at least 40 cm organics, saturated soil + underground water running, which qualifies polygon for "swamp" status
FOD6-2	Moderately fresh	mineral	Ah 1-8 cm; Ae 8-18 cm; Bha 18-37 cm; Bh2 37-53 cm; Bhm3 53-76 cm; C 76 cm+. Ah= loamy medium sand; Bh1 = medium sand; all else loamy fine sand
MAM3-8	Wet	organic	Oh =110 cm; gleyed soil starts at 110 cm; at 30-50 cm, small mineral particles mixed in
SWC3-2a	Moderately wet	organic	Oh = 54 cm
SWC3-2b	Very moist	mineral	South half of polygon
SWC3-2b	Moderately wet	organic	North half of polygon
CU		mineral	anthropogenic -- gravel likely brought in
FOC2-2	Moderately fresh – fresh		
FOD5-3d	Moist		
MAM3-9	Moderately wet	organic	
SWM4-1c	Moderate-very wet	organic	qualifies as swamp with these characteristics

## **APPENDIX C:**

### **Vascular Plant List for Komoka Provincial Park**

The following vascular plant list is a compilation of species observed by Klinkenberg (1985) and species observed during site visits in mid-summer to fall of 2001 and in spring to early summer in 2002. A total of 685 vascular plant species have been recorded in the study area. The list was current as of August 22, 2002; however, additional species are likely to occur in the Komoka study area that were not observed by Klinkenberg in 1985 nor by the authors of this report in 2001 and 2002.

For species that were identified in 1985 by Klinkenberg, an X is indicated in the column with the heading "1985". Those that were observed during the site visits in 2001 or 2002 have an X in the column with the heading "2001-2". The "Rank" column indicates the level of significance of the species, in accordance with the species codes explained in Appendix J.

**Table C1: Vascular Plant List for Komoka Provincial Park**

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
Equisetaceae	Horestail Family	<i>Equisetum arvense</i> L.	Field Horsetail	X	X	C
		<i>Equisetum fluviatile</i> L.	Water Horsetail	X		U
		<i>Equisetum hyemale</i> L.	Scouring-Rush		X	C
		<i>Equisetum scirpoides</i> Michx.	Dwarf Scouring Rush	X	X	R5
		<i>Equisetum variegatum</i> Schleich. ex Fried.	Variegated Horsetail	X	X	U
Lycopodiaceae	Clubmoss Family	<i>Lycopodium lucidulum</i> Michx.	Shining Clubmoss	X		X
Selaginellaceae	Spikemoss Family	<i>Selaginella eclipses</i> W.R. Buck	Meadow Spike-moss		X	X
		<i>Selaginella rupestris</i> (L.) Spring	Rock Spike-moss	X		R1
Ophioglossaceae	Adder's Tongue Family	<i>Botrychium dissectum</i> Spreng.	Cut-Leaved Grape Fern	X		X
		<i>Botrychium virginianum</i> (L.) Swartz	Rattlesnake Fern	X	X	X
Aspleniaceae	Spleenwort Family	<i>Asplenium platyneuron</i> (L.) Oakes ex Eaton	Ebony Spleenwort		X	R4
Pteridaceae	Maidenhair Fern	<i>Adiantum pedatum</i> L.	Maidenhair Fern	X	X	C
Dennstaedtiaceae	Bracken Fern Family	<i>Pteridium aquilinum</i> (L.) Kuhn	Bracken Fern	X	X	X
Dryopteridaceae	Wood Fern Family	<i>Athyrium filix-femina</i> (L.) Roth	Lady Fern	X	X	X
		<i>Deparia acrostichoides</i> (Swartz) M. Kato	Silvery Spleenwort	X		X
		<i>Cystopteris bulbifera</i> (L.) Bernh.	Bulbet Fern	X	X	X
		<i>Cystopteris fragilis</i> (L.) Bernh.	Fragile Fern	X		?
		<i>Cystopteris tenuis</i> (Michx.) Desv.	Mackay's Brittle Fern		X	X
		<i>Diplazium pycnocarpon</i> (Spring.) M. Brown	Narrow-leaved Spleenwort	X	X	R1
		<i>Dryopteris carthusiana</i> (Villars) H.P. Fuchs	Spinulose Wood Fern	X	X	X
		<i>Dryopteris cristata</i> (L.) A. Gray	Crested Wood Fern		X	X
		<i>Dryopteris marginalis</i> (L.) A. Gray	Marginal Shield Fern		X	X
		<i>Matteuccia struthiopteris</i> (L.) Tod.	Ostrich Fern	X	X	X
		<i>Onoclea sensibilis</i> L.	Sensitive Fern	X	X	X
		<i>Polystichum acrostichoides</i> (Michx.) Schott	Christmas Fern	X	X	X
		Osmundaceae	Royal Fern Family	<i>Osmunda cinnamomea</i> L.	Cinnamon Fern	X
<i>Osmunda regalis</i> L.	Royal Fern			X	X	X
Thelypteridaceae	Marsh Fern Family	<i>Thelypteris noveboracensis</i> (L.) Gray	New York Fern	X		X
		<i>Thelypteris palustris</i> (Salisb.) Schott	Marsh Fern	X	X	X
Cupressaceae	Cedar Family	<i>Juniperus virginiana</i> L.	Red Cedar	X	X	X
		<i>Thuja occidentalis</i> L.	White Cedar	X	X	X
Pinaceae	Pine Family	<i>Larix laricina</i> (DuRoi) K. Koch	Eastern Larch	X	X	X
		<i>Picea abies</i> (L.) Karsten	Norway Spruce		X	I
		<i>Picea glauca</i> (Moench) Voss	White Spruce		X	I
		<i>Pinus banksiana</i> Lamb.	Jack Pine	X		I
		<i>Pinus resinosa</i> Sol. ex Aiton	Red Pine		X	Ir
		<i>Pinus strobus</i> L.	White Pine	X	X	X
		<i>Pinus sylvestris</i> L.	Scotch Pine	X	X	Ir
		<i>Tsuga canadensis</i> (L.) Carr	Eastern Hemlock	X	X	X
Alismataceae	Water-plantain Family	<i>Alisma plantago-aquatica</i> L.	Water-plantain	X	X	C
		<i>Sagittaria latifolia</i> Willd.	Broad-leaved Arrowhead	X	X	C
Hydrocharitaceae	Frog's-bit Family	<i>Elodea canadensis</i> Rich. ex Michx.	Canada Waterweed		X	X
Potamogetonaceae	Pondweed Family	<i>Potamogeton crispus</i> L.	Curly-leaved Pondweed		X	I
		<i>Potamogeton nodosus</i> Poir.	Knotty Pondweed		X	R1
Najadaceae	Naiad Family	<i>Najas flexilis</i> (Willd.) Rostkov & W. Schmidt	Bushy Naiad		X	R1
Araceae	Arum Family	<i>Acorus calamus</i> L.	Sweet Flag	X		Ir
		<i>Arisaema triphyllum</i> (L.) Schott	Jack-in-the-pulpit	X	X	C
		<i>Symplocarpus foetidus</i> (L.) Salisb.	Skunk Cabbage	X	X	C
Lemnaceae	Duckweed Family	<i>Lemna minor</i> L.	Common Duckweed		X	X
Poaceae	Grass Family	<i>Agrostis gigantea</i> Roth	Redtop	X	X	Ic
		<i>Agrostis stolonifera</i> L.	Creeping Bent Grass		X	C
		<i>Andropogon gerardii</i> Vitman	Big Bluestem	X	X	C
		<i>Brachyelytrum erectum</i> P. Beauv.	Bearded Shorthusk		X	X
		<i>Bromus ciliatus</i> L.	Fringed Brome Grass	X	X	X
		<i>Bromus inermis</i> Leysser	Smooth Brome		X	Ic
		<i>Bromus tectorum</i> L.	Down Chess		X	I
		<i>Calamagrostis canadensis</i> (Michx.) P. Beauv.	Canada Blue-joint		X	X
		<i>Dactylis glomerata</i> L.	Barnyard Grass	X	X	Ic



Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Danthonia spicata</i> (L.) P. Beauv.	Poverty Oat Grass		X	X
		<i>Digitaria sanguinalis</i> (L.) Scop.	Large Crab Grass		X	I
		<i>Echinochloa crusgalli</i> (L.) Beauv.	Barnyard Grass	X	X	Ic
		<i>Elymus hystrix</i> L.	Bottle-brush Grass		X	X
		<i>Elymus repens</i> (L.) Gould	Quack Grass		X	Ic
		<i>Elymus villosus</i> Muhlenb.	Hairy Wild Rye		X	X
		<i>Elymus virginicus</i> L.	Virginia Wild-rye		X	X
		<i>Eragrostis frankii</i> C.A. Meyer	Frank's Love Grass		X	X
		<i>Eragrostis hypnoides</i> (Lam.) B.S.P.	Tall Love Grass		X	R2
		<i>Eragrostis pectinacea</i> (Michaux) Nees	Tufted Love Grass		X	X
		<i>Festuca arundinacea</i> Schreber	Tall Fescue		X	Ic
		<i>Festuca pratensis</i> Hudson	Meadow Fescue	X	X	I
		<i>Festuca trachyphylla</i> (Hack.) Krajina	Sheep Fescue		X	I
		<i>Glyceria grandis</i> S. Watson	Tall Manna Grass		X	X
		<i>Glyceria striata</i> (Lam.) A. S. Hitchc.	Fowl Mana Grass	X	X	X
		<i>Hordeum jubatum</i> L.	Foxtail Barley		X	I
		<i>Leersia oryzoides</i> (L.) Swartz.	Rice Cut Grass	X	X	X
		<i>Leersia virginica</i> Willd.	White Grass		X	X
		<i>Lolium perenne</i> L.	Perennial Rye Grass		X	I
		<i>Muhlenbergia frondosa</i> (Poir.) Fern.	Wire-Stemmed Muhly		X	X
		<i>Muhlenbergia glomerata</i> (Willd.) Trin.	Marsh Muhly		X	X
		<i>Muhlenbergia schreberi</i> J.F. Gmelin	Nimble Will		X	X
		<i>Oryzopsis asperifolia</i> Michx.	Rough-leaved Rice Grass		X	X
		<i>Panicum acuminatum</i> Sw.	Acuminate Panic Grass	X	X	C
		<i>Panicum capillare</i> L.	Witch Grass		X	X
		<i>Panicum linearifolium</i> Nash	Narrow-leaved Panic Grass		X	VU
		<i>Panicum depauperatum</i> Muhlenb.	Impoverished Panic Grass	X		R1
		<i>Phalaris arundinacea</i> L.	Reed Canary Grass		X	X
		<i>Pheum pratense</i> L.	Timothy	X	X	Ic
		<i>Phragmites australis</i> (Cav.) Trin.	Common Reed		X	X
		<i>Poa annua</i> L.	Annual Blue Grass		X	I
		<i>Poa compressa</i> L.	Canada Blue Grass		X	X
		<i>Poa palustris</i> L.	Fowl Meadow Grass		X	X
		<i>Poa pratensis</i> L.	Kentucky Blue Grass		X	C
		<i>Schizachyrium scoparium</i> (Michx.) Nees	Little Bluestem		X	X
		<i>Setaria viridis</i> (L.) P. Beauv.	Green Foxtail		X	I
		<i>Sorghastrum nutans</i> (L.) Nash	Indian Grass		X	X
		<i>Sphenopholis intermedia</i> (Rydb.) Rydb.	Slender Wedge Grass	X		X
		<i>Sporobolus vaginiflorus</i> Torrey ex A. Wood	Ensheathed Dropseed		X	X
Cyperaceae	Sedge Family	<i>Carex albursina</i> E. Sheld.	White Bear Sedge		X	C
		<i>Carex arctata</i> Boott	Compressed Sedge	X	X	C
		<i>Carex aurea</i> Nutt.	Golden-fruit Sedge	X	X	C
		<i>Carex bebbii</i> (Bailey) Olney ex Fern.	Bebb's Sedge	X	X	C
		<i>Carex blanda</i> Dewey	Woodland Sedge		X	C
		<i>Carex bromoides</i> Schkukr ex Willd.	Brome-like Sedge		X	C
		<i>Carex cephaloidea</i> (Dewey) Dewey	Thin-leaved Sedge		X	U
		<i>Carex cephalophora</i> Muhlenb. ex Willd.	Oval-leaf Sedge	X		C
		<i>Carex comosa</i> Boott	Bearded Sedge	X	X	C
		<i>Carex cristatella</i> Britton	Crested Sedge	X		C
		<i>Carex deweyana</i> Schw.	Short-scale Sedge	X		C
		<i>Carex disperma</i> Dewey	Soft-leaf Sedge		X	VU
		<i>Carex eburnea</i> Boott	Bristle-leaf Sedge	X	X	VU
		<i>Carex emoryi</i> Dewey	Emory's Sedge		X	US3
		<i>Carex flava</i> L.	Yellow Sedge	X	X	C
		<i>Carex formosa</i> Dewey	Handsome Sedge		X	R4S3S4
		<i>Carex gracillima</i> Schw.	Graceful Sedge	X	X	C
		<i>Carex granularis</i> Muhlenb. ex Willd.	Meadow Sedge		X	C
		<i>Carex grisea</i> Wahlenb.	Narrow-leaved Sedge		X	C
		<i>Carex hystericina</i> Muhlenb. ex Willd.	Porcupine Sedge	X	X	C

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		Carex interior Bailey	Inland Sedge	X	X	C
		Carex laevivaginata (Kükenth.) Mackenzie	Smooth-sheathed Sedge	X		U
		Carex lacustris Willd.	Lake Sedge		X	C
		Carex laxiflora Lam.	Distant-flowered Sedge		X	C
		Carex leptalea Wahlenb.	Bristle-stalked Sedge		X	U
		Carex pedunculata Muhlenb. ex Willd.	Peduncled Sedge		X	C
		Carex pellita Willd.	Wooly Sedge		X	C
		Carex pennsylvanica Lam.	Pennsylvania Sedge	X	X	C
		Carex plantaginea Lam.	Plantain-leaved Sedge		X	C
		Carex prairea Dewey	Prairie Sedge		X	R3
		Carex retrorsa Schwein.	Retrose Sedge		X	C
		Carex rosea Schkuhr ex. Willd.	Curly-styled Wood Sedge	X	X	C
		Carex scabrata Schwein.	Rough Sedge		X	U
		Carex schweinitzii Willd.	Schweinitz's Sedge	X		R1S3
		Carex spicata Hudson	Spiked Sedge		X	Ic
		Carex spengelii Dewey ex Sprengel	Sprengel's Sedge	X		U
		Carex stipata Muhlenb. ex Willd.	Awl-fruited Sedge		X	C
		Carex stricta Lam.	Tussock Sedge	X	X	C
		Carex tenera Dewey	Slender Sedge		X	U
		Carex trichocarpa Muhlenb. ex Willd.	Hairy-fruited Sedge		X	US3
		Carex utriculata Boott	Beaked Sedge		X	U
		Carex viridula Michx.	Greenish Sedge	X		VU
		Carex vulpinoidea Michx.	Fox Sedge	X	X	C
		Cyperus esculentus L.	Yellow Nut Sedge		X	C
		Eleocharis acicularis (L.) Roemer & Schultes	Needle Spike-rush		X	VU
		Eleocharis elliptica Kunth	Elliptic Spike-rush	X		R4
		Eleocharis erythropoda Steudel	Red-Based Spike-rush	X	X	C
		Scirpus atrovirens Willd.	Dark-green Bulrush	X	X	C
		Scirpus cyperinus (L.) Kunth	Wool-grass	X	X	C
		Scirpus pendulus Muhl.	Nodding Bulrush	X	X	C
		Scirpus pungens M. Vahl	Threesquare		X	U
		Scirpus validus L.	Soft-stem Bulrush	X	X	C
Juncaceae	Rush Family	Juncus alpinoarticulatus Chaix	Scatter Rush	X		VU
		Juncus articulatus L.	Jointed Rush	X	X	VU
		Juncus brachycephalus (Engelm.) Buch.	Short-fruited Rush	X		VU
		Juncus bufonius L.	Toad Rush		X	U
		Juncus dudleyi Wieg.	Dudley's Rush	X	X	C
		Juncus effusus L.	Common Rush	X		X
		Juncus nodosus L.	Knotted Rush	X	X	X
		Juncus tenuis Willd.	Path Rush	X	X	X
		Juncus torreyi Coville	Torrey's Rush	X		VU
		Luzula acuminata Raf.	Wood Rush	X	X	X
Sparganiaceae	Burr-reed Family	Sparganium eurycarpum Engelm. ex A.Gray	Giant Bur-reed		X	X
Typhaceae	Cattail Family	Typha angustifolia L.	Narrow-leaved Cattail	X	X	X
		Typha X glauca Godron	Hybrid Cattail		X	R1
		Typha latifolia L.	Common Cattail	X	X	X
Pontederiaceae	Pickerel-Weed Family	Heteranthera dubia (Jacq.) MacMillan	Water Star-grass		X	R2
Liliaceae	Lily Family	Allium canadense L.	Canada Wild Onion		X	U
		Allium tricoccum Ait.	Wild Leek	X	X	C
		Asparagus officinalis L.	Asparagus	X	X	Ic
		Clintonia borealis (Aiton) Raf.	Bluebead-lily		X	X
		Convallaria majalis L.	Lily-of-the-valley		X	Ir
		Erythronium albidum Nutt.	White Trout Lily	X		X
		Erythronium americanum Ker Gawler	Yellow Trout Lily	X		X
		Hemerocallis fulva (L.) L.	Orange Day Lily		X	I
		Lilium michiganense Farw.	Michigan Lily		X	U
		Lilium philadelphicum L.	Wood Lily	X		R3
		Maianthemum canadense Desf.	Canadian Mayflower	X	X	X
		Maianthemum racemosum (L.) Link	False Solomon's Seal	X	X	X
		Maianthemum stellatum (L.) Link	Starry False Soloman's Seal	X	X	X
		Medeola virginiana L.	Indian Cucumber-root	X		X

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Polygonatum pubescens</i> (Willd.) Pursh	Hairy Solomon's Seal	X	X	X
		<i>Tofieldia glutinosa</i> (Michx.) Pers.	Sticky False Asphodel		X	[]
		<i>Trillium erectum</i> L.	Red Trillium	X		X
		<i>Trillium grandiflorum</i> (Michx.) Salisb.	White Trillium	X		X
		<i>Uvularia grandiflora</i> Sm.	Large-flowered Bellwort	X	X	X
Smilacaceae	Catbrier Family	<i>Smilax herbacea</i> L.	Carrion Flower	X		X
		<i>Smilax hispida</i> Muhl.	Catbrier	X	X	X
		<i>Smilax lasioneura</i> Hook.	Common Carrion Flower		X	X
Dioscoreaceae	Yam Family	<i>Dioscorea quaternata</i> J. Gmel.	Wild Yam	X	X	X
Iridaceae	Iris Family	<i>Iris germanica</i> L.	German Iris		X	I
		<i>Iris pseudoacorus</i> L.	Yellow Flag		X	Ir
		<i>Iris versicolor</i> L.	Wild Iris	X	X	X
		<i>Sisyrinchium montanum</i> Greene	Blue-eyed Grass	X	X	X
Orchidaceae	Orchid Family	<i>Cypripedium acaule</i> Ait.	Stemless Lady's Slipper	X		R3
		<i>Cypripedium calceolus</i> var. <i>parviflorum</i> L.	Small Yellow Lady's Slipper	X	X	X
		<i>Cypripedium calceolus</i> var. <i>pubescens</i> (Willd.) Correll.	Large Yellow Lady's Slipper		X	X
		<i>Cypripedium reginae</i> Walter	Showy's Lady's Slipper	X	X	VU
		<i>Epipactis helleborine</i> (L.) Crantz	Helleborine	X	X	I
		<i>Goodyera pubescens</i> (Willd.) R. Br.	Downy Rattlesnake Plantain	X		R2
		<i>Goodyera tessellata</i> Lodd.	Checkered Rattlesnake Plantain	X		?
		<i>Liparis loeselii</i> (L.) Rich. ex Lindl.	Loesel's Twayblade		X	X
		<i>Spiranthes cernua</i> (L.) Rich.	Nodding Ladies' Tresses		X	X
		<i>Spiranthes lucida</i> (Eaton) Ames	Shiny Ladies' Tresses		X	R1
Salicaceae	Willow Family	<i>Populus alba</i> L.	White Poplar	X	X	I
		<i>Populus balsamifera</i> L.	Balsam Poplar	X	X	X
		<i>Populus deltoides</i> Bartram ex Marsh.	Cottonwood	X	X	X
		<i>Populus grandidentata</i> Michx.	Large-toothed Aspen	X	X	X
		<i>Populus tremuloides</i> Michx.	Trembling Aspen	X	X	X
		<i>Salix alba</i> L.	White Willow		X	I
		<i>Salix amygdaloides</i> Andersson	Peach-leaved Willow		X	X
		<i>Salix bebbiana</i> Sarg.	Bebb's Willow	X	X	X
		<i>Salix discolor</i> Muhlenb.	Pussy Willow		X	X
		<i>Salix eriocephala</i> Michx.	Heart-leaved Willow		X	X
		<i>Salix exigua</i> Nutt.	Sandbar Willow	X	X	C
		<i>Salix fragilis</i> L.	Crack Willow		X	I
		<i>Salix lucida</i> Muhlenb.	Shining Willow		X	X
		<i>Salix nigra</i> Marsh.	Black Willow	X	X	X
		<i>Salix petiolaris</i> J.E. Smith	Slender Willow		X	X
		<i>Salix X rubens</i> Schrank	Reddish Willow		X	Ir
Juglandaceae	Walnut Family	<i>Carya cordiformis</i> (Wang.) K. Koch	Bitternut Hickory	X	X	X
		<i>Carya ovata</i> (Mill.) K. Koch	Shagbark Hickory	X	X	X
		<i>Juglans nigra</i> L.	Black Walnut	X	X	X
Betulaceae	Birch Family	<i>Alnus glutinosa</i> (L.) Gaertner	Black Alder		X	Iu
		<i>Betula alleghaniensis</i> Britton	Yellow Birch	X	X	X
		<i>Betula papyrifera</i> Marsh.	White Birch	X	X	X
		<i>Betula pendula</i> Roth	European White Birch		X	Ir
		<i>Carpinus caroliniana</i> Walt.	Blue Beech	X	X	C
		<i>Corylus americana</i> Walt.	Hazelnut	X	X	C
		<i>Corylus cornuta</i> Marsh.	Beaked Hazelnut	X		X
		<i>Ostrya virginiana</i> (Mill.) K.Koch	Hop Hornbeam	X	X	C
Fagaceae	Beech Family	<i>Fagus grandifolia</i> Ehrh.	American Beech	X	X	C
		<i>Quercus alba</i> L.	White Oak	X	X	C
		<i>Quercus bicolor</i> Willd.	Swamp White Oak	X		X
		<i>Quercus macrocarpa</i> Michx.	Burr Oak	X	X	C
		<i>Quercus rubra</i> L.	Red Oak	X	X	C
		<i>Quercus velutina</i> Lam.	Black Oak		X	X
Ulmaceae	Elm Family	<i>Celtis occidentalis</i> L.	Hackberry	X	X	X
		<i>Ulmus americana</i> L.	White Elm	X	X	X
		<i>Ulmus rubra</i> Muhl.	Slippery Elm		X	X
Moraceae	Mulberry Family	<i>Morus alba</i> L.	White Mulberry	X	X	I

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
Cannabaceae	Hemp Family	<i>Humulus japonicus</i> Siebold & Zucc.	Japanese Hops		X	lr
		<i>Cannabis sativa</i> L.	Marijuana		X	lr
Urticaceae	Nettle Family	<i>Boehmeria cylindrica</i> (L.) Sw.	False Nettle	X	X	X
		<i>Laportea canadensis</i> (L.) Wedd.	Wood Nettle		X	X
		<i>Pilea pumila</i> (L.) Gray	Clearweed	X	X	X
		<i>Urtica dioica</i> L. ssp. <i>gracilis</i> (Ait.) Seland	Nettle	X	X	C
Santalaceae	Sandalwood Family	<i>Comandra umbellata</i> (L.) Nutt.	Bastard Toadflax	X	X	U
Aristolochiaceae	Birthwort Family	<i>Asarum canadense</i> L.	Wild Ginger	X	X	C
Polygonaceae	Buckwheat Family	<i>Polygonum aviculare</i> L.	Prostrate Pigweed		X	lc
		<i>Polygonum cuspidatum</i> Siebold & Zucc.	Japanese Knotweed		X	lu
		<i>Polygonum lapathifolium</i> L.	Pale Smartweed	X	X	X
		<i>Polygonum pensylvanicum</i> L.	Pinkweed		X	X
		<i>Polygonum persicaria</i> L.	Lady's-thumb		X	l
		<i>Polygonum punctatum</i> Elliot	Smartweed		X	X
		<i>Polygonum scandens</i> L.	Climbing False Buckwheat		X	X
		<i>Rumex acetosella</i> L.	Sheep Sorrel	X	X	lc
		<i>Rumex crispus</i> L.	Curled Dock	X	X	lc
		<i>Rumex longifolius</i> DC.	Long-leaved Dock		X	lr
		<i>Rumex obtusifolius</i> L.	Broad Dock	X	X	l
		<i>Rumex orbiculatus</i> A. Gray	Great Water Dock		X	X
		Chenopodiaceae	Goosefoot Family	<i>Atriplex patula</i> L.	Spreading Atriplex	X
<i>Atriplex prostrata</i> Boucher ex DC.	Halberd-leaved Atriplex				X	X
<i>Chenopodium album</i> L.	Lamb's Quarters			X	X	l
<i>Chenopodium capitatum</i> (L.) Aschers.	Strawberry Blite			X	X	R2
Amaranthaceae	Amaranth Family	<i>Amaranthus albus</i> L.	Tumbleweed	X		lu
		<i>Amaranthus retroflexus</i> L.	Common Pigweed	X		lc
		<i>Amaranthus tuberculatus</i> (Moq.) J.D. Sauer	Water-hemp		X	R4
Portulacaceae	Purslane Family	<i>Claytonia virginica</i> L.	Spring Beauty	X		C
		<i>Portulaca oleracea</i> L.	Common Purslane		X	X
Caryophyllaceae	Pink Family	<i>Arenaria serpyllifolia</i> L.	Thyme-leaved Sandwort		X	lc
		<i>Cerastium arvense</i> L.	Field Chickweed	X	X	lvu
		<i>Cerastium fontanum</i> Baumg.	Mouse-eared Chickweed		X	lc
		<i>Dianthus armeria</i> L.	Deptford Pink	X	X	l
		<i>Myosoton aquaticum</i> (L.) Moench	Giant Chickweed		X	lr
		<i>Saponaria officinalis</i> L.	Bouncing Bet	X	X	l
		<i>Silene vulgaris</i> (Moench) Garcke	Bladder Champion	X		l
		<i>Silene latifolia</i> Poir.	Bladder Champion		X	l
		<i>Silene nivea</i> (Nutt.) Otth.	Snowy Champion	X		?
		<i>Silene noctiflora</i> L.	Night-flowering Catchfly		X	l
		<i>Stellaria graminea</i> L.	Grass-leaved Stichwort		X	l
		<i>Stellaria longifolia</i> Muhlenb. ex Willd.	Long-leaved Chickweed		X	X
		Ranunculaceae	Crowfoot Family	<i>Actaea pachypoda</i> Ell.	White Baneberry	X
<i>Actaea rubra</i> (Ait.) Willd.	Red Baneberry			X	X	C
<i>Anemone acutiloba</i> (DC.) G. Lawson	Sharp-lobed Hepatica			X	X	X
<i>Anemone americana</i> (DC.) H. Hara	Round-lobed Hepatica			X		X
<i>Anemone canadensis</i> L.	Canada Anemone			X	X	C
<i>Anemone quinquefolia</i> L.	Wood Anemone			X	X	C
<i>Anemone virginiana</i> L.	Thimbleweed			X	X	C
<i>Aquilegia canadensis</i> L.	Wild Columbine			X	X	C
<i>Caltha palustris</i> L.	Marsh Marigold			X	X	C
<i>Clematis virginiana</i> L.	Virgin's Bower			X	X	C
<i>Coptis trifolia</i> (L.) Salisb.	Goldthread				X	X
<i>Ranunculus abortivus</i> L.	Kidney-leaf Buttercup			X	X	C
<i>Ranunculus acris</i> L.	Common Buttercup				X	lc
<i>Ranunculus aquatilis</i> L.	White Water-crowfoot				X	R2
<i>Ranunculus hispidus</i> Michx. Var. <i>caricetorum</i> (Greene) T. Duncan	Swamp Buttercup				X	C
<i>Ranunculus hispidus</i> Michx. var. <i>hispidus</i>	Hispid Buttercup				X	S3 ]
<i>Ranunculus recurvatus</i> Poir.	Hooked Buttercup			X	X	X
<i>Ranunculus repens</i> L.	Creeping Buttercup				X	lh
<i>Ranunculus sceleratus</i> L.	Cursed Crowfoot				X	X
<i>Thalictrum dasycarpum</i> Fisher & Ave-Lall.	Purple Meadow-Rue				X	R1

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Thalictrum dioicum</i> L.	Early Meadow-rue	X	X	X
		<i>Thalictrum pubescens</i> Pursh	Tall Meadow-rue	X	X	X
Berberidaceae	Barberry Family	<i>Berberis thunbergii</i> DC.	Japanese Barberry	X	X	I
		<i>Berberis vulgaris</i> L.	Common Barberry		X	I
		<i>Caulophyllum thalictroides</i> (L.) Michx.	Blue Cohosh	X	X	X
		<i>Podophyllum peltatum</i> L.	Mayapple For.	X	X	X
Menispermaceae	Moonseed Family	<i>Menispermum canadense</i> L.	Moonseed	X	X	X
Lauraceae	Laurel Family	<i>Lindera benzoin</i> (L.) Blume	Spicebush	X	X	X
Papaveraceae	Poppy Family	<i>Chelidonium majus</i> L.	Celandine		X	I
		<i>Sanguinaria canadensis</i> L.	Bloodroot	X	X	X
Brassicaceae	Mustard Family	<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	Garlic Mustard	X	X	Ic
		<i>Alyssum alyssoides</i> (L.) L.	Yellow Alyssum		X	Iu
		<i>Arabidopsis thaliana</i> (L.) Heynh.	Mouse-ear Cress		X	[I]
		<i>Arabis laevigata</i> (Muhl.) Poir.	Smooth Rock-cress	X		VU
		<i>Arabis lyrata</i> L.	Lyre-Leaved Rock-cress	X		R3
		<i>Barbarea vulgaris</i> R. Br.	Yellow Rocket	X	X	Ic
		<i>Capsella bursa-pastoris</i> (L.) Medik.	Shepherd's Purse	X	X	Ic
		<i>Cardamine bulbosa</i> (Schreb. ex Muhl.) B.S.P.	Bulbous Cress		X	X
		<i>Cardamine concatenata</i> (Michx.) Schwein.	Cut-leaved Toothwort	X		X
		<i>Cardamine diphylla</i> (Michx.) Alph. Wood	Two-leaved Toothwort	X		X
		<i>Cardamine douglasii</i> Britton	Purple Cress		X	X
		<i>Cardamine hirsuta</i> L.	Hairy Bitter-cress		X	Ir
		<i>Descurainia pinnata</i> (Walter) Britton	Pinnate Tansy-mustard		X	[ ]
		<i>Diplotaxis muralis</i> (L.) DC.	Wall-rocket		X	I
		<i>Erophila verna</i> (L.) Chevall.	Spring Whitlow-grass		X	I
		<i>Erysimum cheiranthoides</i> L.	Wormseed Mustard	X		I
		<i>Hesperis matronalis</i> L.	Dame's Rocket	X	X	I
		<i>Lepidium campestre</i> (L.) R. Br.	Field Peppergrass	X	X	I
		<i>Nasturtium officinale</i> R. Br.	Watercress	X	X	I
		<i>Rorippa palustris</i> (L.) Besser	Marsh Yellow Cress	X	X	X
		<i>Sinapis arvensis</i> L.	Charlock	X		I
		<i>Sisymbrium altissimum</i> L.	Tall Tumble-mustard		X	I
Droseraceae	Sundew Family	<i>Drosera rotundifolia</i> L.	Round-leaved Sundew	X		R5
Saxifragaceae	Saxifrage Family	<i>Mitella diphylla</i> L.	Mitrewort	X	X	X
		<i>Mitella nuda</i> L.	Naked Mitrewort		X	X
		<i>Parnassia glauca</i> Raf.	Grass-of-parnassus	X	X	X
		<i>Saxifraga virginiana</i> Michx.	Early Saxifrage		X	R2
		<i>Tiarella cordifolia</i> L.	Foamflower	X	X	X
Hydrangeaceae	Hydrangea Family	<i>Philadelphus coronarius</i> L.	Philadelphia Mock-orange		X	Ir
Grossulariaceae	Gooseberry Family	<i>Ribes americanum</i> Mill.	Wild Black Currant	X	X	C
		<i>Ribes cynosbati</i> L.	Prickly Gooseberry	X	X	C
		<i>Ribes rubrum</i> L.	Garden Red Currant		X	Ir
		<i>Ribes triste</i> Pallas	Swamp Red Currant		X	X
Hamamelidaceae	Witch Hazel Family	<i>Hamamelis virginiana</i> L.	Witch Hazel	X	X	X
Platanaceae	Plane Tree Family	<i>Platanus occidentalis</i> L.	Sycamore	X	X	X
		<i>Platanus x acerifolia</i> (Aiton) Willd.	London Plane Tree		X	[I]
Rosaceae	Rose Family	<i>Agrimonia gryposepala</i> Wallr.	Agrimony	X	X	C
		<i>Amelanchier arborea</i> (Michx. f.) Fern.	Downy Serviceberry	X	X	C
		<i>Crataegus coccinea</i> L. (= <i>C. pedicellata</i> Sarg.)	Scarlet Hawthorn		X	R3
		<i>Crataegus cognata</i> Sarg. (= <i>C. pruinosa</i> var. <i>cognata</i> )	Waxy-fruited Thorn		X	X
		<i>Crataegus dodgei</i> Ashe	Dodge's Hawthorn		X	U
		<i>Crataegus holmesiana</i> Ashe	Holmes Hawthorn		X	X
		<i>Crataegus macracantha</i> Lodd.	Large-thorned Hawthorn		X	X
		<i>Crataegus macrosperma</i> Ashe	Variable Thorn		X	X
		<i>Crataegus mollis</i> (Torrey & Gray) Scheele	Downy Hawthorn	X		X
		<i>Crataegus monogyna</i> Jacq.	English Hawthorn	X	X	I
		<i>Crataegus populnea</i> Ashe (= <i>C. iracunda</i> Beattie)			X	?
		<i>Crataegus pringlei</i> Sarg.	Pringle's Hawthorn		X	X

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Crataegus pruinosa</i> (H.F. Wendl.) K. Koch var. <i>pruinosa</i>	Waxy-fruited Hawthorn		X	X
		<i>Crataegus pruinosa</i> (H.F. Wendl.) K. Koch var. <i>rugosa</i> (Ashe) Kruschke			X	?
		<i>Crataegus punctata</i> Jacq.	Dotted Hawthorn	X	X	C
		<i>Crataegus schuettei</i> Ashe	Schuette's Hawthorn		X	X
		<i>Crataegus succulenta</i> Schrader ex Link	Hawthorn		X	X
		<i>Fragaria vesca</i> L.	Woodland Strawberry	X		X
		<i>Fragaria virginiana</i> Miller	Wild Strawberry	X	X	C
		<i>Geum aleppicum</i> Jacq.	Yellow Avens	X	X	X
		<i>Geum canadense</i> Jacq.	White Avens	X	X	X
		<i>Geum rivale</i> L.	Water Avens		X	R2
		<i>Geum triflorum</i> Pursh	Prairie Smoke		X	R3
		<i>Malus baccata</i> (L.) Borkh.	Siberian Crabapple		X	[I]
		<i>Malus coronaria</i> (L.) Miller	Wild Crab	X	X	X
		<i>Malus pumila</i> Miller	Apple	X	X	I
		<i>Physocarpus opulifolius</i> (L.) Maxim.	Ninebark	X	X	X
		<i>Potentilla anserina</i> L.	Silverweed		X	X
		<i>Potentilla norvegica</i> L.	Rough Cinquefoil		X	X
		<i>Potentilla recta</i> L.	Rough-fruited Cinquefoil	X	X	I
		<i>Potentilla simplex</i> Michaux	Field Cinquefoil	X	X	X
		<i>Prunus americana</i> Marshall	Wild Plum		X	X
		<i>Prunus avium</i> (L.) L.	Sweet Cherry		X	Ir
		<i>Prunus pensylvanica</i> L.	Pin Cherry	X	X	X
		<i>Prunus serotina</i> Ehrh.	Black Cherry	X	X	C
		<i>Prunus virginiana</i> L.	Choke Cherry	X	X	C
		<i>Pyrus communis</i> L.	Pear		X	I
		<i>Rosa blanda</i> Aiton	Smooth Wild Rose		X	X
		<i>Rosa multiflora</i> Thunb.	Multiflora Rose	X	X	I
		<i>Rosa palustris</i> Marsh.	Swamp Rose	X	X	X
		<i>Rubus flagellaris</i> Willd.	Prickly Raspberry		X	R4
		<i>Rubus hispidus</i> L.	Running Swamp Blackberry	X		R4
		<i>Rubus idaeus</i> (Dieck) Focke	Wild Red Raspberry	X	X	X
		<i>Rubus occidentalis</i> L.	Black Raspberry	X	X	X
		<i>Rubus odoratus</i> L.	Purple Flowering Raspberry	X	X	R4
		<i>Rubus pubescens</i> Raf.	Dwarf Swamp Raspberry	X	X	X
		<i>Spiraea alba</i> Duroi	Meadow Sweet		X	X
		<i>Waldsteinia fragarioides</i> (Michx.) Tratt	Barren Strawberry		X	R4
Fabaceae	Pea Family	<i>Amphicarpaea bracteata</i> (L.) Fern.	Hog Peanut	X	X	C
		<i>Apios americana</i> Medik.	Groundnut	X	X	C
		<i>Coronilla varia</i> L.	Crown-Vetch		X	I
		<i>Desmodium canadense</i> (L.) DC.	Showy Tick-trefoil	X	X	X
		<i>Desmodium glutinosum</i> Alph. Wood	Pointed-leaved Tick-trefoil	X	X	X
		<i>Desmodium paniculatum</i> (L.) DC var. <i>paniculatum</i>	Panicled Tick-trefoil		X	R?
		<i>Lotus corniculatus</i> L.	Birdfoot Trefoil		X	I
		<i>Medicago lupulina</i> L.	Black Medic	X	X	lc
		<i>Medicago sativa</i> L.	Alfalfa	X	X	lc
		<i>Melilotus alba</i> Desr.	White Sweet Clover	X	X	lc
		<i>Melilotus officinalis</i> (L.) Pall.	Yellow Sweet Clover	X	X	lc
		<i>Robinia pseudo-acacia</i> L.	Black Locust		X	lc
		<i>Trifolium hybridum</i> L.	Alsike Clover	X	X	I
		<i>Trifolium pratense</i> L.	Red Clover	X	X	I
		<i>Trifolium repens</i> L.	White Clover	X	X	I
		<i>Vicia cracca</i> L.	Tufted Vetch	X	X	I
		<i>Vicia sativa</i> L.	Common Vetch		X	I
		<i>Vicia tetrasperma</i> (L.) Schreb.	Slender Vetch		X	I
Oxalidaceae	Wood-Sorrel Family	<i>Oxalis stricta</i> L.	Yellow Wood-sorrel	X	X	X
Geraniaceae	Geranium Family	<i>Geranium maculatum</i> L.	Wild Geranium	X	X	X
		<i>Geranium pusillum</i> L.	Small-flowered Crane's-bill		X	Ir

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Geranium robertianum</i> L.	Herb Robert	X	X	Ic
Simaroubaceae	Ailanthus Family	<i>Ailanthus altissima</i> (Miller) Swingle	Tree-of-heaven		X	Ir
Rutaceae	Rue Family	<i>Zanthoxylum americanum</i> Miller	Northern Prickly Ash	X	X	C
Polygalaceae	Milkwort Family	<i>Polygala paucifolia</i>	Gaywings	X	X	VU
		<i>Polygala senega</i> L.	Seneca-snakeroot		X	VU
Euphorbiaceae	Spurge Family	<i>Acalypha rhomboidea</i> Raf.	Three-seeded Mercury		X	C
		<i>Euphorbia esula</i> L.	Leafy Spurge		X	I
Anacardiaceae	Cashew Family	<i>Rhus glabra</i> L.	Smooth Sumac		X	VU
		<i>Rhus radicans</i> L.	Poison Ivy	X	X	X
		<i>Rhus typhina</i> L.	Staghorn Sumac	X	X	C
Celastraceae	Staff-Tree Family	<i>Celastrus orbiculatus</i> Thunb.	Oriental Bittersweet		X	[I]
		<i>Celastrus scandens</i> L.	Climbing Bittersweet	X	X	X
		<i>Euonymus europaea</i> L.	Spindle-tree		X	Ir
		<i>Euonymus obovata</i> Nutt.	Running Strawberry-bush	X	X	C
Staphyleaceae	Bladder-Nut Family	<i>Staphylea trifolia</i> L.	Bladdernut		X	X
Aceraceae	Maple Family	<i>Acer negundo</i> L.	Manitoba Maple	X	X	C
		<i>Acer nigrum</i> L.	Black Maple	X	X	C
		<i>Acer platanoides</i> L.	Norway Maple		X	Iu
		<i>Acer rubrum</i> L.	Red Maple	X	X	C
		<i>Acer saccharinum</i> L.	Silver Maple	X	X	C
		<i>Acer saccharum</i> Marsh.	Sugar Maple	X	X	C
		<i>Acer spicatum</i> Lam.	Mountain Maple		X	VU
Balsaminaceae	Touch-me-not Family	<i>Impatiens capensis</i> Meerb.	Spotted Touch-me-not	X	X	C
		<i>Impatiens pallida</i> Nutt.	Yellow Jewelweed	X	X	X
Rhamnaceae	Buckthorn Family	<i>Ceanothus americanus</i> L.	New Jersey Tea		X	R2
		<i>Rhamnus alnifolia</i> L'Her.	Alder-leaved Buckthorn	X	X	X
		<i>Rhamnus cathartica</i> L.	Common Buckthorn	X	X	Ic
		<i>Rhamnus frangula</i> L.	Glossy Buckthorn	X	X	Iu
Vitaceae	Vine Family	<i>Parthenocissus inserta</i> L.	Virginia Creeper	X	X	X
		<i>Vitis aestivalis</i> Michx.	Summer Grape		X	VU
		<i>Vitis riparia</i> Michx.	Riverbank Grape	X	X	C
Tiliaceae	Linden Family	<i>Tilia americana</i> L.	Basswood	X	X	C
Guttiferae	St. John's Wort Family	<i>Hypericum ascyron</i> L.	Great St. John's-wort		X	VU
		<i>Hypericum mutilum</i> L.	Northern St. John's-wort	X		R3
		<i>Hypericum perforatum</i> L.	Common St. John's-wort	X	X	Ic
		<i>Hypericum punctatum</i> Lam.	Spotted St. John's-wort	X	X	X
Violaceae	Violet Family	<i>Viola arvensis</i> Murray	Wild Violet		X	I
		<i>Viola canadensis</i> L.	Common Blue Violet	X		X
		<i>Viola conspersa</i> Reichb.	Dog Violet		X	X
		<i>Viola cucullata</i> Aiton (= <i>V. papilionacea</i> L.)	Marsh Blue Violet	X	X	X
		<i>Viola pubescens</i> Ait.	Downy Yellow Violet	X	X	C
		<i>Viola rostrata</i> Pursh	Long-Spurred Violet	X	X	X
		<i>Viola sororia</i> Willd.	Woolly Blue Violet		X	X
Thymelaeaceae	Mezereum Family	<i>Dirca palustris</i> L.	Leatherwood	X	X	X
Elaeagnaceae	Oleaster Family	<i>Elaeagnus umbellata</i> Thunb.	Autumn Olive	X	X	Ir
		<i>Shepherdia canadensis</i> (L.) Nutt.	Soapberry	X	X	R2
Lythraceae	Loosestrife Family	<i>Lythrum salicaria</i> L.	Purple Loosestrife	X	X	Ic
Onagraceae	Evening-Primrose Family	<i>Circaea alpina</i> L.	Small Enchanter's-nightshade		X	X
		<i>Circaea lutetiana</i> (L.) Aschers. & Magnus.	Enchanter's-nightshade	X	X	X
		<i>Epilobium hirsutum</i> L.	Great Hairy Willow-herb	X	X	I
		<i>Epilobium leptophyllum</i> Raf.	Narrow-leaved Willow-herb	X		X
		<i>Oenothera biennis</i> L.	Evening Primrose	X		R1
		<i>Oenothera parviflora</i> L.	Small-flowered Evening Primrose	X	X	X
Araliaceae	Ginseng Family	<i>Aralia nudicaulis</i> L.	Wild Sarsaparilla	X	X	C
		<i>Aralia racemosa</i> L.	Spikenard	X	X	C
Apiaceae	Parsley Family	<i>Aegopodium podagraria</i> L.	Goutweed		X	Iu
		<i>Angelica atropurpurea</i> L.	Angelica		X	C
		<i>Anthriscus sylvestris</i> (L.) Hoffm.	Wild Chervil		X	Ir
		<i>Cicuta maculata</i> L.	Spotted Water-hemlock		X	X
		<i>Cryptotaenia canadensis</i> (L.) DC.	Honewort		X	X
		<i>Daucus carota</i> L.	Wild Carrot	X	X	Ic

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Hydrocotyle americana</i> L.	Marsh Pennywort		X	X
		<i>Heracleum lanatum</i> Michx.	Cow-parsnip		X	X
		<i>Osmorhiza claytonii</i> (Michx.) C.B. Clarke	Woolly Sweet-cicely		X	X
		<i>Pastinaca sativa</i> L.	Wild Parsnip		X	I
		<i>Sanicula marilandica</i> L.	Black Snakeroot		X	X
		<i>Taenidia integerrima</i> (L.) Drude	Yellow Pimpernel		X	VU
		<i>Zizia aurea</i> (L.) Koch	Golden Alexanders	X	X	X
Cornaceae	Dogwood Family	<i>Cornus alternifolia</i> L.	Alternate-leaved Dogwood	X	X	X
		<i>Cornus canadensis</i> L.	Bunchberry		X	X
		<i>Cornus florida</i> L.	Flowering Dogwood	X		X
		<i>Cornus amomum</i> Miller	Silky Dogwood	X	X	X
		<i>Cornus foemina</i> Miller	Grey Dogwood	X	X	X
		<i>Cornus rugosa</i> L.	Round-leaved Dogwood	X	X	X
		<i>Cornus stolonifera</i> Michx.	Red-osier Dogwood	X	X	C
Monotropaceae	Indian Pipe Family	<i>Monotropa uniflora</i> L.	Indian Pipe	X		X
Pyrolaceae	Wintergreen Family	<i>Pyrola americana</i> Sweet	Shinleaf	X		R2
		<i>Pyrola elliptica</i> Nutt.	Round-leaved Pyrola	X	X	X
Ericaceae	Heath Family	<i>Vaccinium corymbosum</i> L.	Northern High-bush Blueberry	X	X	X
		<i>Vaccinium myrtilloides</i> Michx.	Bilberry	X	X	R4
Primulaceae	Primrose Family	<i>Lysimachia ciliata</i> L.	Fringed Loosestrife	X	X	X
		<i>Lysimachia nummularia</i> L.	Moneywort	X	X	I
		<i>Lysimachia vulgaris</i> L.	Garden Loosestrife		X	Ir
		<i>Trientalis borealis</i> Raf.	Starflower	X	X	X
Oleaceae	Olive Family	<i>Fraxinus americana</i> L.	White Ash	X	X	C
		<i>Fraxinus nigra</i> Marsh.	Black Ash	X	X	X
		<i>Fraxinus pennsylvanica</i> Marsh.	Red/Green Ash	X	X	C
		<i>Fraxinus quadrangulata</i> Michx.	Blue Ash	X	X	VUS3SC vul
		<i>Ligustrum vulgare</i> L.	Common Privet		X	I
		<i>Syringa vulgaris</i> L.	Common Lilac	X	X	I
Gentianaceae	Gentian Family	<i>Gentianopsis crinita</i> (Froelich) Ma	Fringed Gentian		X	VU
Menyanthaceae	Buckbean Family	<i>Menyanthes trifoliata</i> L.	Buckbean	X		R5
Apocynaceae	Dogbane Family	<i>Apocynum androsaemifolium</i> L.	Spreading Dogbane	X	X	C
		<i>Apocynum cannabinum</i> L.	Indian Hemp	X	X	C
		<i>Apocynum x floribundum</i> Greene	Intermediate Dogbane	X		R3
Asclepiadaceae	Milkweed	<i>Asclepias exaltata</i> L.	Poke Milkweed	X		VU
		<i>Asclepias incarnata</i> L.	Swamp Milkweed	X	X	C
		<i>Asclepias purpurascens</i> L.	Purple Milkweed	X		R1S2
		<i>Asclepias syriaca</i> L.	Common Milkweed	X	X	C
		<i>Asclepias tuberosa</i> L.	Butterflyweed	X	X	U
Convolvulaceae	Morning-Glory Family	<i>Calystegia sepium</i> (L.) R. Br.	Hedge Bindweed		X	X
		<i>Convolvulus arvensis</i> L.	Field Bindweed	X	X	I
Polemoniaceae	Phlox Family	<i>Phlox divaricata</i> L.	Blue Phlox		X	X
Hydrophyllaceae	Waterleaf Family	<i>Hydrophyllum virginianum</i> L.	Virginia Waterleaf	X	X	C
Boraginaceae	Borage Family	<i>Echium vulgare</i> L.	Blueweed	X	X	Ic
		<i>Lithospermum officinale</i> L.	European Gromwell		X	I
		<i>Myosotis scorpioides</i> L.	True Forget-me-not		X	I
		<i>Symphytum officinale</i> L.	Common Comfrey		X	I
Verbenaceae	Vervain Family	<i>Verbena hastata</i> L.	Blue Vervain	X	X	C
		<i>Verbena stricta</i> Vent.	Hoary Vervain		X	R4
		<i>Verbena urticifolia</i> L.	White Vervain		X	X
Lamiaceae	Mint Family	<i>Acinos arvensis</i> (Lam.) Dandy	Mother-of-thyme		X	Ir
		<i>Agastache foeniculum</i> (Pursh) Kuntze	Blue Giant Hyssop	X		?
		<i>Blephilia ciliata</i> L.	Downy Wood Mint	X		S1
		<i>Clinopodium vulgare</i> L.	Wild Basil	X	X	X
		<i>Collinsonia canadensis</i> L.	Horse Balm	X	X	X
		<i>Galeopsis tetrahit</i> L.	Common Hemp Nettle		X	I
		<i>Glechoma hederacea</i> L.	Ground Ivy	X	X	I
		<i>Lamium purpureum</i> L.	Purple Dead-nettle		X	Ir
		<i>Leonurus cardiaca</i> L.	Motherwort	X	X	Ic
		<i>Lycopus americanus</i> Muhl.	Cut-leaved Water-horehound	X	X	C



Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Lycopus uniflorus</i> Michx.	Bugleweed	X	X	C
		<i>Mentha arvensis</i> L.	Wild Mint	X	X	X
		<i>Mentha piperita</i> L.	Peppermint	X	X	I
		<i>Mentha spicata</i> L.	Spearmint		X	I
		<i>Monarda didyma</i> L.	Bee-balm	X		US3
		<i>Monarda fistulosa</i> L.	Wild Bergamot	X	X	C
		<i>Nepeta cataria</i> L.	Catnip	X	X	Ic
		<i>Origanum vulgare</i> L.	Wild Marjoram		X	Iu
		<i>Physostegia virginiana</i> (L.) Benth.	False Dragonhead		X	R2
		<i>Prunella vulgaris</i> L.	Heal-all	X	X	C
		<i>Scutellaria galericulata</i> L.	Common Skullcap	X	X	X
		<i>Teucrium canadense</i> L.	Wild Germander		X	R3
Solanaceae	Nightshade Family	<i>Lycopersicon esculentum</i> Miller	Tomato		X	[I]
		<i>Physalis heterophylla</i> Nees	Clammy Ground-cherry		X	X
		<i>Solanum dulcamara</i> L.	Climbing Nightshade	X	X	Ic
		<i>Solanum ptychanthum</i> Dunal ex DC.	Black Nightshade	X	X	X
Scrophulariaceae	Figwort Family	<i>Agalinis tenuifolia</i> (M.Vahl.) Raf.	Slender-leaved Agalinis	X	X	VU
		<i>Aureolaria flava</i> (L.) Farw.	Yellow False Foxglove		X	R2S3
		<i>Chelone glabra</i> L.	Turtlehead	X	X	X
		<i>Linaria vulgaris</i> Hill	Yellow Toadflax	X	X	Ic
		<i>Lindernia dubia</i> (L.) Pennell	False Pimpernel		X	VU
		<i>Mimulus ringens</i> L.	Monkey Flower	X		X
		<i>Pedicularis canadensis</i> L.	Wood-betony	X	X	X
		<i>Penstemon digitalis</i> Nutt.	Foxglove Beard-tongue		X	X
		<i>Penstemon hirsutus</i> (L.) Willd.	Hairy Beard-tongue	X		R3
		<i>Scrophularia lanceolata</i> Pursh	Lance-leaved Figwort	X		R1
		<i>Scrophularia marilandica</i> L.	Carpenter's-square		X	X
		<i>Verbascum blattaria</i> L.	Moth Mullein		X	Ic
		<i>Verbascum thapsus</i> L.	Common Mullein	X	X	Ic
		<i>Veronica anagallis-aquatica</i> L.	Water Speedwell		X	Ic
		<i>Veronica arvensis</i> L.	Corn Speedwell		X	I
		<i>Veronica filiformis</i> Smith	Slender Speedwell		X	Ir
		<i>Veronica peregrina</i> L.	Purslane Speedwell		X	VU
		<i>Veronica persica</i> Poir.	Persian Speedwell		X	Ir
		<i>Veronica serpyllifolia</i> L.	Thyme-leaved Speedwell	X	X	I
		<i>Veronica officinalis</i> L.	Common Speedwell		X	I
Phrymaceae	Lopseed Family	<i>Phryma leptostachya</i> L.	Lopseed	X	X	X
Orobanchaceae	Broom Rape Family	<i>Conopholis americana</i> (L.) Wallr.	Squawroot	X		R4
		<i>Epifagus virginiana</i> (L.) Bart.	Beechdrops	X	X	C
		<i>Orobanche uniflora</i> L.	One-flowered Broom-rape		X	R5
Plantaginaceae	Plantain Family	<i>Plantago lanceolata</i> L.	English Plantain	X	X	Ic
		<i>Plantago major</i> L.	Common Plantain	X	X	Ic
		<i>Plantago rugelii</i> Decne.	Rugel's Plantain	X	X	C
Rubiaceae	Madder Family	<i>Galium asprellum</i> Michx.	Rough Bedstraw	X	X	X
		<i>Galium boreale</i> L.	Northern Bedstraw	X		X
		<i>Galium circaezans</i> Michx.	Wild Licorice	X	X	X
		<i>Galium mollugo</i> L.	White Bedstraw	X	X	I
		<i>Galium palustre</i> L.	Marsh Bedstraw	X	X	X
		<i>Galium triflorum</i> Michx.	Sweet-scented Bedstraw	X		X
		<i>Galium verum</i> L.	Yellow Bedstraw		X	I
		<i>Mitchella repens</i> L.	Creeping Partridge-berry	X		X
Caprifoliaceae	Honeysuckle Family	<i>Diervilla lonicera</i> Mill.	Bush Honeysuckle	X	X	X
		<i>Lonicera canadensis</i> Bartr.	Fly Honeysuckle	X	X	X
		<i>Lonicera dioica</i> L.	Glaucous Honeysuckle	X	X	X
		<i>Lonicera morrowii</i> A. Gray	Morrow's Honeysuckle	X	X	Ir
		<i>Lonicera tatarica</i> L.	Tartarian Honeysuckle	X	X	I
		<i>Sambucus canadensis</i> L.	Common Elderberry		X	X
		<i>Sambucus racemosa</i> ssp. <i>pubens</i> (Michx.) House	Red-berried Elderberry	X	X	X
		<i>Symphoricarpos albus</i> (L.) S. F. Blake	Snowberry		X	X
		<i>Triosteum aurantiacum</i> E. Bickn.	Scarlet-fruited Horse-gentian		X	X
		<i>Viburnum acerifolium</i> L.	Maple-leaved Viburnum	X	X	X

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		Viburnum cassinoides L.	Wild Raisin	X		X
		Viburnum lentago L.	Nannyberry	X	X	C
		Viburnum opulus L.	High-bush Cranberry	X	X	lr
		Viburnum rafinesquianum Schultes	Downy Arrow-wood	X	X	X
		Viburnum trilobum L.	Highbush Cranberry	X	X	X
Valerianaceae	Valerian Family	Valeriana officinalis L.	Common Valerian		X	lr
Dipsacaceae	Teasel Family	Dipsacus fullonum L.	Wild Teasel	X	X	lc
Cucurbitaceae	Cucumber Family	Echinocystis lobata (Michx.) T. & G.	Wild Cucumber	X	X	X
		Sicyos angulatus L.	Angled Bur-cucumber	X		X
Campanulaceae		Campanula rapunculoides L.	Creeping Bellflower		X	lr
		Lobelia inflata L.	Indian Tobacco	X		X
		Lobelia kalmii L.	Kalm's Lobelia		X	R3
		Lobelia siphilitica L.	Great Lobelia	X	X	X
Asteraceae	Aster Family	Achillea millefolium L.	Common Yarrow	X	X	C
		Ambrosia artemisiifolia L.	Common Ragweed	X	X	C
		Ambrosia trifida L.	Giant Ragweed	X	X	C
		Antennaria neglecta Greene	Field Pussytoes	X	X	X
		Anthemis cotula L.	Stinging Mayweed	X		lu
		Arctium lappa L.	Great Burdock		X	lr
		Arctium minus (Hill) Bernh.	Common Burdock	X	X	lc
		Artemisia vulgaris L.	Mugwort		X	lr
		Aster borealis (Torrey & Gray) Prov.	Rush Aster	X		R3
		Aster cordifolius L.	Heart-leaved Aster	X		C
		Aster ericoides L.	White Heath Aster		X	C
		Aster laevis L.	Smooth Blue Aster	X	X	C
		Aster lanceolatus Willd.	Panicled Aster	X	X	C
		Aster lateriflorus (L.) Britt.	Calico Aster	X	X	C
		Aster macrophyllus L.	Large-leaved Aster	X	X	C
		Aster novae-angliae L.	New England Aster	X	X	C
		Aster pilosus Willd.	Hairy Aster		X	U
		Aster puniceus L.	Purple-stemmed Aster		X	X
		Aster umbellatus Miller	Flat-top White Aster		X	R5
		Aster urophyllus Lindley	Arrow-leaved Aster	X	X	X
		Bidens cernua L.	Nodding Beggar-ticks		X	X
		Bidens frondosa L.	Sick-tight	X	X	X
		Centaurea maculosa Lam.	Knapweed	X	X	I
		Chrysanthemum leucanthemum L.	Ox-eye Daisy	X	X	I
		Cichorium intybus L.	Chicory		X	lc
		Cirsium arvense (L.) Scop.	Canada Thistle	X	X	lc
		Cirsium muticum Michx.	Swamp Thistle		X	X
		Cirsium vulgare (Savi.) Tenore	Bull Thistle		X	I
		Conyza canadensis (L.) Cronq.	Horseweed	X	X	C
		Cosmos bipinnatus Cav.	Black Cosmos		X	[I]
		Crepis capillaris (L.) Wallr.	Smooth Hawk's Beard	X		I
		Crepis tectorum L.	Hawk's Beard		X	I
		Erigeron annuus (L.) Pers.	Daisy Fleabane	X	X	C
		Erigeron philadelphicus L.	Philadelphia Fleabane	X	X	C
		Erigeron pulchellus Michx.	Robin's-plantain	X	X	X
		Erigeron strigosus Muhl. ex Willd.	Rough Fleabane	X	X	C
		Eupatorium maculatum L.	Spotted Joe-pye-weed	X	X	C
		Eupatorium perfoliatum L.	Boneset	X	X	C
		Eupatorium rugosum Houtt.	White Snakeroot	X	X	C
		Euthamia graminifolia (L.) Nutt.	Grass-leaved Goldenrod	X	X	C
		Helianthus divaricatus L.	Rough Woodland Sunflower	X	X	X
		Helianthus giganteus L.	Tall Sunflower	X	X	X
		Helianthus tuberosus L.	Jerusalem Artichoke	X	X	I
		Hieracium canadense Michx.	Canada Hawkweed	X		R3
		Hieracium caespitosum Dumort.	Field Hawkweed	X	X	I
		Hieracium piloselloides Vill.	Glaucous King Devil	X	X	lr
		Inula helenium L.	Elecampane	X	X	I
		Lactuca canadensis L.	Canada Lettuce	X	X	X
		Lapsana communis L.	Nipplewort		X	lr
		Onopordum acanthium L.	Scotch Thistle		X	I

Family	Common Family	Botanical Name	Common Name	1985	2001-2	Rank
		<i>Polymnia canadensis</i> L.	Small-Flowered Leap-cup		X	R3
		<i>Prenanthes alba</i> L.	White Lettuce	X		X
		<i>Prenanthes altissima</i> L.	Tall White Lettuce	X		X
		<i>Rudbeckia hirta</i> L.	Black-eyed Susan	X	X	C
		<i>Rudbeckia laciniata</i> L.	Cut-leaved Coneflower	X	X	X
		<i>Rudbeckia triloba</i> L.	Thin-leaved Coneflower	X	X	lr
		<i>Senecio aureus</i> L.	Golden Ragwort	X	X	X
		<i>Senecio pauperculus</i> Michx.	Balsam Ragwort	X		VU
		<i>Solidago altissima</i> L.	Tall Goldenrod		X	U
		<i>Solidago arguta</i> Ait.	Sharp-leaved Goldenrod	X		R1S3
		<i>Solidago canadensis</i> L.	Canada Goldenrod	X	X	X
		<i>Solidago caesia</i> L.	Woodland Goldenrod	X	X	X
		<i>Solidago flexicaulis</i> L.	Zig-zag Goldenrod	X	X	X
		<i>Solidago gigantea</i> L.	Giant Goldenrod	X	X	X
		<i>Solidago juncea</i> Ait.	Early Goldenrod	X	X	X
		<i>Solidago nemoralis</i> Ait.	Gray Goldenrod	X	X	X
		<i>Solidago patula</i> L.	Rough-leaved Goldenrod	X	X	X
		<i>Solidago rugosa</i> Ait.	Rough Goldenrod	X	X	X
		<i>Solidago ulmifolia</i> L.	Elm-leaved Goldenrod	X		RhS1
		<i>Sonchus arvensis</i> L.	Perennial Sow-thistle	X	X	I
		<i>Sonchus asper</i> (L.) Hill	Spiny-Leaved Sow-thistle	X	X	I
		<i>Sonchus oleraceus</i> L.	Annual Sow-thistle	X	X	I
		<i>Tanacetum vulgare</i> L.	Tansy		X	I
		<i>Taraxacum officinale</i> Weber	Common Dandelion	X	X	Ic
		<i>Tragopogon pratensis</i> L.	Yellow Goat's-beard	X	X	I
		<i>Tussilago farfara</i> L.	Coltsfoot	X	X	I
		<i>Xanthium strumarium</i> L.	Cocklebur		X	C

## **APPENDIX D:**

### **Birds of Komoka Provincial Park**

#### **Introduction**

There is more known about the birds of Komoka study area than any other faunal group. Most of the credit for Komoka Provincial Park bird records goes to Pete Read. For the 1985 Life Science Inventory, Klinkenberg relied primarily on records from Read for her bird checklist. For this report, Read created the checklist of species and status through three time periods from various sources including:

- his own personal records from the 1<sup>st</sup> Breeding Bird Atlas (1981-1985);
- several years of running a Forest Bird Monitoring Plot at the north end of the park;
- casual observations;
- records submitted by birdwatchers and naturalists to Read as the Migration Secretary for the McIlwraith Field Naturalists; and
- a literature search of *The Cardinal*, which is the journal of the McIlwraith Field Naturalists.

#### **Birds of Komoka Provincial Park**

Over the years, 230 species of birds have been reported from Komoka Provincial Park and in habitats immediately adjacent to and contiguous with park habitats. This is a very high total for any one location in Middlesex representing 70% of the Middlesex County List. The Middlesex County bird list of 330 species is quite high because it contains over 100 years of records including many species that have occurred only once or twice in the last century.

#### **Breeding Birds**

Of the 230 species of birds recorded at Komoka there is or has been breeding evidence for 100 species, which is 65% of the breeding birds of Middlesex County. The 100 breeding species includes several former breeding species including Ring-necked Pheasant, Northern Bobwhite, Red-shouldered Hawk, Red-headed Woodpecker and Golden-winged Warbler. The breeding total also includes a few species that have bred close by but not yet in the park even though there is suitable habitat. These are Tufted Titmouse, Carolina Wren, Purple Martin and Wild Turkey. There are also a few species that have not yet been recorded breeding in the park or nearby but for which there is suitable habitat. These include species such as Chestnut-sided Warbler, Mourning Warbler, Brown Creeper and Sharp-shinned Hawk.

#### **Migrants and Visitors**

Given that 100 of the 229 species recorded are breeding species, an impressive 129 of the species recorded are either migrants that use the park during their spring or fall migration or as summer or winter visitors. Migrants and visitors may use the park for resting, roosting, feeding, as staging areas, and/or avoidance of predators. Winter visitors are northern breeding species that spend all of or part of the winter in the park. Examples include Dark-eyed Junco, American Tree Sparrow and Northern Shrike. Summer visitors are birds that may breed nearby but not in the park. Examples include Great Blue Heron and Bald Eagle that come to the park to feed.

#### **Area Sensitive Breeding Bird Species**

Seventeen species of the breeding birds of Komoka Provincial Park are considered to be Area Sensitive (OMNR, 2000). Area sensitive species require large areas of suitable habitat in order to sustain their population numbers. Most of the area sensitive birds are woodland species such as Ovenbird, Veery and Scarlet Tanager, but some are field birds such as the Savanna Sparrow and Grasshopper Sparrow. The Least Bittern is an example of a wetland bird that is area sensitive.

#### **Conservation Priority (CP) Breeding Bird Species**

CP birds are those for which a given jurisdiction should have high responsibility because that jurisdiction has a significant percentage of that species' breeding range (Couturier, 1999). This scheme was developed in 1999 by the Ontario Ministry of Natural Resources, Canadian Wildlife Service (CWS) and Bird Studies Canada to offer protection to species not just because they are rare. In fact, some CP species can be quite common in a

given jurisdiction. Komoka Provincial Park provides breeding habitat for 55 of the 112 species (49%) that are considered to be CP species in Middlesex County. CP species can be grouped as forest, marsh or open country birds. Examining the CP birds of Komoka by habitat is very revealing. Some 45% of the Middlesex County CP Forest birds are found at Komoka. For marsh birds it is 27%. And most significant, 80% of the Open Country CP birds of Middlesex County are found in the Komoka study area. That means that the study area plays a very significant role for Open Country birds (i.e., grassland, meadow, old field, and hawthorn savanna species).

### Rare and Significant Bird Species of Komoka Provincial Park

There are various schemes for determining the rarity or significance of bird species. These are COSEWIC, OMNR, and the NHIC's S1 to S5 ranking system, the recent Conservation Priority (CP) species levels 1 to 4 and County rarity. Some species have high rankings in more than one category. Because of the river corridor, the gravel pit ponds, and the large size of the woodland and fields, the study area also attracts large numbers of breeding birds and a great diversity of migrants. Thus, migrants, visitors, wintering and breeding birds are included in all the tables and summaries. First, rare and significant bird species are summarized by the number of designated species in each classification scheme (Table D1). Then in Table D2 the most significant are listed with comments on their use of the park. Next, all other S1 to S3 species are listed and separated into migrants and breeding birds. Finally, all CP birds are listed by level.

**Table D1: #s of Rare and Significant Birds by ranking scheme**

COSEWIC:	7 species
OMNR:	10 species
NHIC S1-S3	38 species
NHIC S1:	7 species
NHIC S2:	14 species
NHIC S3:	15 species
CP Level 1-4	54 species
CP level 1:	15 species
CP level 2:	13 species
CP level 3:	20 species
CP level 4:	7 species
Very Rare Middlesex:	10 species
Rare Middlesex:	23 species

**Table D2: COSEWIC and/or OMNR listed Bird Species at Komoka Provincial Park**

Species	COSEWIC STE	OMNR VTE	NHIC S1-S3	CP	Use of Komoka Provincial Park
American White Pelican	NAR	end	S2	-	One record of a migrant on May 24-25, 1996. No breeding habitat.
Bald Eagle	NAR	end	S4	1	An uncommon migrant and winter visitor. In 2000, a breeding pair built a nest < 5 km to the west but did not breed. They were present again in 2002 although the nest failed.
Black Tern	NAR	vul	S3	1	Known only as a rare migrant. No breeding habitat.
Cerulean Warbler	SC	vul	S3	1	Known only as a rare migrant. Some possible breeding habitat is available in the mature deciduous woods.
Golden Eagle	NAR	end	S1	-	Known only as a very rare migrant; once in the last 10 years. No breeding habitat
Least Bittern	SC	vul	S3	1	Known only as a very rare migrant. Will use very small cattail marshes so is a possible breeder to ponds on the north side of the Thames.
Louisiana Waterthrush	SC	vul	S3	1	Very rare migrant. There is some apparently suitable habitat at the northeast end of the park where this species was recorded between 1981 and 1986. Birds bred in nearby Kee-mo-kee woods through the 1980s.
Northern Bobwhite	END	-	S1	1	Recorded on 2 Christmas Bird Counts in the late 1980s but not reported since.
Peregrine Falcon	THR	end	S2	-	Very rare migrant. Not reported in last 5 years. No breeding habitat.
Red-headed Woodpecker	SC	vul	S3	1	Former breeder but not recorded in last 5 years. There is suitable breeding habitat.
Red-shouldered Hawk	SC	vul	S4	1	Formerly bred. Now a rare migrant. Suitable habitat still available if the species recovers and expands its range again.

## **S1 to S3 Bird Species**

The following list shows all S1 to S3 birds found in the Komoka study area.

### **S1 to S3 Migrants and Visitors**

S1 Migrants and Visitors: Horned Grebe, Canvasback, Surf Scoter, Rough-legged Hawk, Golden Eagle, American Golden-plover

S2 Migrants and Visitors: American White Pelican, Great Egret, Redhead, Greater Scaup, White-winged Scoter, Long-tailed Duck, Ruddy Duck, Peregrine Falcon, Hudsonian Godwit, Short-billed Dowitcher, Great Black-backed Gull, Forster's Tern, Northern Shrike

S3 Migrants and Visitors: Red-necked Grebe, Least Bittern, Black-crowned Night-Heron, Tundra Swan, Bufflehead, Semipalmated Sandpiper, Dunlin, Wilson's Phalarope, Caspian Tern, Black Tern, Gray-cheeked Thrush, Cerulean Warbler

### **S1 to S3 Breeding Birds (past and present)**

S1 Breeding Birds: Northern Bobwhite

S2 Breeding Birds: Tufted Titmouse

S3 Breeding Birds: Red-headed Woodpecker, Carolina Wren, Louisiana Waterthrush

### **Conservation Priority (CP) Breeding Birds**

The following list shows all CP breeding birds in the Komoka study area by Priority Level.

Level 1: Red-shouldered Hawk (formerly bred), Northern Bobwhite (may have formerly bred), Virginia Rail, Sora, Red-headed Woodpecker (former breeder), Red-bellied Woodpecker, Bank Swallow, Eastern Bluebird, Brown Thrasher, Northern Mockingbird (may have bred 1999), Blue-winged Warbler, Golden-winged Warbler (former breeder), Louisiana Waterthrush (possible breeding 1981-86), Clay-coloured Sparrow (likely bred in 95), Savannah Sparrow

Level 2: American Kestrel, Black-billed Cuckoo, Ruby-throated Hummingbird, Pileated Woodpecker, Northern Rough-winged Swallow, Sedge Wren, American Redstart, Scarlet Tanager, Eastern Towhee, Vesper Sparrow, Swamp Sparrow, Bobolink, Eastern Meadowlark

Level 3: Green Heron, Cooper's Hawk, Ruffed Grouse, Spotted Sandpiper, Yellow-billed Cuckoo, Alder Flycatcher, Least Flycatcher, Eastern Phoebe, Eastern Kingbird, Yellow-throated Vireo, Horned Lark, Cliff Swallow, Barn Swallow, Red-breasted Nuthatch (may breed in conifer plantations), Carolina Wren (known to breed immediately adjacent to park), Veery, Pine Warbler (may breed in conifer plantations), Field Sparrow, Grasshopper Sparrow, American Goldfinch

Level 4: Wood Duck, American Woodcock, Black-capped Chickadee, Blue-gray Gnatcatcher, Wood Thrush, Gray Catbird, Ovenbird

### **Habitat Needs of Rare and Significant Birds of Komoka Provincial Park**

Because there are so many rare and significant birds at in the study area it is easier to discuss habitat needs by guilds of species rather than by individual species. Comments will be made about deciduous woodland species, conifer plantation species, edge species, grassland species, old field species (including meadow/hawthorn savanna), moist shrub thicket species, cattail marsh species, mudflat species, river edge species and large, open pond species.

#### **Deciduous Woodlands**

Deciduous Woodlands exist mainly on the uplands and the more gentle slopes in the park although there is some floodplain forest. Forest cover is mainly continuous along both shores of the river, although in sections it is quite narrow. Nevertheless, this continuous forest cover provides a corridor for migrant woodland birds including 29 species of warblers. On the south side of the park the main woodlands have a closed canopy, for the most part, and attract forest interior breeding birds such as Ovenbird, Scarlet Tanager and Wood Thrush. The large amount of wooded cover attracts area sensitive species such as the forest interior species already

mentioned and others such as the Pileated Woodpecker, Veery and American Redstart. Of the 65 Middlesex County Conservation Priority Forest birds Komoka attracts 29 species (45%). **Management Considerations:** In general, most woodland birds are not considered to be highly disturbed by activities such as hiking. Indeed, a Pileated Woodpecker nest was found along one of the trails in 2001 although its breeding success was not monitored. Nevertheless, less rather than more trails in the woodlands would be a consideration from a breeding bird perspective. That way there would be some refuges within the woodlands for those species that might be disturbed by constant trail traffic.

### Forested Ravines

A few steep-sided ravines exist in the deep woods at the north end of the park on the south side of the river. These are shaded by Eastern Hemlock among other tree species. These ravines are where the Louisiana Waterthrush was found during the first Ontario Breeding Bird Atlas in the early 1980s. This species has not been found during the 1990s. The Louisiana Waterthrush has also disappeared from similar ravines in the nearby Camp Kee-mo-kee woodlot. **Management Considerations:** Read (pers. comm.) suggests that it may be the movement and actions of people (hikers and bikers) and animals (horse riders) through the ravines and the resulting erosion that has caused this species to disappear. The Louisiana Waterthrush is a species of clear, cold water streams feeding on invertebrates that need the clear water conditions. It would be prudent, then, to route trails around the steep-sided ravines or take measures to reduce non-natural erosion.

### Conifer Plantations

A current paradigm is to denigrate conifer plantations because either they are not natural or have not been managed. In fact, conifer plantations do attract different sets of wildlife at different stages of their maturation. At a younger stage American Robins, Mourning Doves, Common Grackles and Chipping Sparrows nest in high densities in pine and spruce plantations. After about 30 years or so when the trees are starting to reach an older growth stage they are colonized by species such as Pine Warbler, Red-breasted Nuthatch, Golden-crowned Kinglet and Sharp-shinned Hawk, all of which are rare breeding species in Middlesex County. At times they play an important role in the life cycle of various species – Ruffed Grouse and Long-eared Owl in winter, many species during migration and so forth. In years when the conifers bear cones, seed eating finches such as crossbills can be found. These conifers also provide habitat for other wildlife. The White Pine plantations at Komoka Provincial Park are the only place in Middlesex County where the Eastern Pine Elfin (a butterfly) has been found. **Management Considerations:** As a general statement, conifer plantations should be seen as a valuable habitat in themselves. From a human perspective, these plantations are very attractive to walk in or ski through in winter. If thinning of the pine plantations is deemed ecologically acceptable and more trails for the park are desired, perhaps these would best be placed in the thinned rows of the plantations rather than in the deciduous woodlands or in the grassland habitats.

### Tamarack Swamp

A tamarack swamp is found northwest of the main parking lot off Gideon Drive. On the sloping land to the south, there is seepage into the area, with cedars, and Yellow Birch and Skunk Cabbage in the muck areas. Besides this drainage, a creek runs by on the north side of the lowland area, draining the area further east. The drier slopes on that side harbour White Pine, where Pine Warblers are frequently found. This is a species not recorded nesting in the county in the last breeding bird atlas. In the lowland area itself, where water tends to drain through from south seepage to north creek, there is a fen-like area, with calciferous soil, where tamarack trees and sedges are located. In this area the Pine Warbler was also singing, and in the past, the rare Golden-winged Warbler was found to be nesting. During migration, because of its somewhat northern forest character, species such as the rare Olive-sided Flycatcher have been found there. One Black-backed Woodpecker overwintered here a number of years ago. The swamp also provides habitat for the Baltimore Checkerspot (a rare butterfly in Middlesex) and a good population of several species of orchids. For all of the above reasons it is also a favourite location of local naturalists. **Management Considerations:** This swamp should be protected and, because it is a favourite site for naturalists, some consideration should be given to retaining the trail. There is evidence of impact from heavy traffic including horses. Perhaps the horses should be excluded and a narrow boardwalk considered for the wet and heavily impacted portions of the trail. A longer-term concern is that natural succession is occurring. Naturalists suggest that the area is developing into a shrub community. Perhaps a more detailed study of this specific area could assess how fast the area is regenerating, where the significant and interesting flora and fauna occur and whether it is possible to manage this site to retain the features that are of such great interest to naturalists.

## River Banks

High, exposed banks are present throughout the Park on both sides of the river. The exposed slopes are where species such as Bank Swallow, Northern Rough-winged Swallow and Belted Kingfisher burrow nest sites into the exposed soil. The two swallows are CP Level 1 and Level 2 species respectively. Because there is natural, periodic erosion events (soil slippage, heavy rainfalls) these species are adapted to building new nests each year or even during the same breeding season. **Management Considerations:** The eroding banks are a natural process that these three bird species exploit for nesting burrows so should not be seen as a problem even with respect to the loss of trails near the bank edge. While bank edge trails provide spectacular views, park managers should accept the loss of parts of the trail as part of a natural process and accept the occasional trail repair costs, or move the trails inland and only provide the occasional lookout at the top of bank. It should also be noted here that the erosion of banks provides a supply of material that builds up shoreline bars and islands downstream which are essential components of the life cycle of river turtles (i.e., nesting and basking sites).

## Old Field

Old fields from a bird perspective are usually abandoned cropland or pasture that are at some stage of succession. They may still be in the meadow stage with various grass species or somewhat more advanced with various herbaceous species such as goldenrods and asters. Later still, they may be at a stage where hawthorns, small trees and clumps of trees are present. An analysis of Conservation Priority species in the study area shows that 80% of all the possible Open Country birds for Middlesex County are breeding in Old Field habitats in the park. Clearly, the old field habitats are a very significant component of the vegetation communities in the park. The grassland sections attract Bobolink and Savannah Sparrow. In areas with hawthorn, one can find a greater diversity of species including Field Sparrow, Eastern Meadowlark, Brown Thrasher and Eastern Bluebird. In moister clumps the Gray Catbird is most obvious. Rare-in-Middlesex species such as Blue-winged Warbler are present in good numbers with several pairs annually. At the ecotone between the old field and woodland edge the dominant species are Eastern Towhee, Song Sparrow and Indigo Bunting. On the rare side, a Clay-coloured Sparrow was found one year in the area where a few Pines are growing in the open field. Back in the 1980s Northern Bobwhite and Ring-necked Pheasant were located in this habitat. **Management Considerations:** Most of the old field species nest on the ground or near the ground. They are easily disturbed by off-leash dogs. Many people assume that these old fields are good places to let dogs roam but the species that live in this habitat (including snakes) are more easily disturbed than those in woodlands, for example. Old field habitat is a rare commodity anywhere in southwestern Ontario because it will revert back to forest eventually. That is one reason why old field species are on the decline. This type of habitat is either developed, cleared for agriculture or reverts back to forest. Park managers will have to decide whether this habitat type is worthy of long-term protection realising that there has to be active management to arrest succession (burning, tree clearing, mowing, etc).

## Sparse Grasslands

The grasslands that cover the drier areas of the old gravel pit on the north side of the river might be considered a subset of the old field habitat but from a bird (and butterfly) perspective they are distinctive. Bird species that are particularly attracted to this very sparse grassland habitat include the Grasshopper Sparrow, Vesper Sparrow, Savannah Sparrow and Horned Lark. All are considered to be Conservation Priority species for Middlesex County. The Grasshopper Sparrow is the rarest of the four as a breeding bird in Middlesex County. In 2001, a colony of at least 10 pairs was present. Indeed, as it turns out, this colony was present as long ago as 1986 when Martin and Read surveyed the gravel pits for the first Ontario Breeding Bird Atlas. And so, given that the species has been present for at least 15 years in multiple numbers it would seem that this colony is one of the most sustainable anywhere in Middlesex and, perhaps even for southwestern Ontario. **Management Considerations:** Old gravel pits are prime candidates for "rehabilitation" but in some cases the natural regeneration (or lack thereof) proves to be much more interesting from at least a faunal perspective. Old gravel pits are also sometimes considered as suitable locations for recreational activities that can cause impacts (e.g., dirt bikes). Given the long time presence of a large colony of Grasshopper Sparrows and the presence of at least three other CP breeding species this habitat should left alone or maintained in its present state if natural succession speeds up.



### Floodplain Thickets

Dense thickets in the floodplain are the prime-breeding habitat for species such as Common Yellowthroat, Gray Catbird, Swamp Sparrow and Northern Cardinal. Baltimore Orioles and Warbling Vireos nest in the tall cottonwoods along the riverbanks. Middlesex rarities that can be found in this habitat include the Alder Flycatcher, which prefers moist thickets. This habitat is also very attractive to migrant passerines and to overwintering sparrows. **Management Considerations:** As shown this is a valuable bird habitat and as such should be considered to be worth protecting as part of the diverse mosaic of the park.

### Large Gravel Pit Ponds

The large, open ponds on the north side of the park attract many species of waterfowl, gull and other water birds. Most are migrants or visitors including Common Loons, which are recorded on a regular basis, and many county rarities ranging from American White Pelican to Greater White-fronted Goose. Many of the waterbirds travel back and forth between the ponds and the Thames River so there is a year round connection between the river and the peripheral ponds. For example, gulls will move down to the river in November and December to feed on the spawning fish. In turn, the gulls, large numbers of waterfowl and spawning fish attract Bald Eagles with up to 5 birds recorded in the early winter of 2000. Fish-eating ducks such as Common Goldeneye, Common and Hooded Mergansers and Bufflehead also move back and forth between the ponds and the river. When the ponds freeze up between late December and early January, Canada Geese, Ruddy Ducks, American Coots and other remaining waterfowl take to the river, which usually remains open. If the river freezes, though, they migrate on or move upstream into London where the river does stay open. **Management Considerations:** The large ponds in the park should be left as is because there is a proven track record of use now. The large pond kiddie-corner from the Little Beaver Restaurant just outside the Northwest corner of the park should be added to the park if possible. It appears to be the most attractive body of water in Middlesex County for waterfowl based on many years of records from the McIlwraith Field Naturalists. Partnerships with the Canadian Wildlife Service and Ducks Unlimited should be explored both to attain ownership of the pond outside of the park boundary and to provide waterfowl management assistance.

### Small Gravel Pit Ponds

There are several small ponds inside the park varying in water depth and in different stages of succession. The largest pond is completely rimmed by cattails and is large enough to attract marsh-breeding species such as Least Bittern, rails, Swamp Sparrow and possibly Marsh Wrens. Some of the smaller ponds are more likely used by amphibians for breeding. Closer to the river is a shallower pond that has been invaded in part by Purple Loosestrife. In 2001, despite the drought this pond still held some water although the edges were mudflats. The mudflats attracted several species of migrant shorebirds. And so, in some years these ponds provide an attractive stopover for shorebirds just as the large ponds do for waterfowl. Over the years the shallow ponds with mudflat edges have attracted 17 species of shorebirds. **Management Considerations:** There are a variety of smaller ponds that are quite variable in depth and vegetation cover. These offer quite a diversity of niches that are used by breeding birds and migrants. The ponds should be left as is with the exception perhaps of controlling the Purple Loosestrife or other invasive species that begin to dominate.

**Table D3: Checklist of the Birds of Komoka Provincial Park**

Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
Common Loon	X	X	X	S4		Uncommon migrant Occasional winter	Rare migrant on ponds
Pied-billed Grebe	X	X		S4	1	Uncommon migrant. Rare breeder. Occasional winter	Uncommon migrant on ponds
Horned Grebe	X	X	X	S1		Uncommon migrant Occasional winter	Rare migrant on ponds
Red-necked Grebe	X	X	X	S3		Rare migrant Rare winter	Very rare migrant on ponds
American White Pelican			X	S2 end-r		Accidental	One record: May 24-25, 1996
Double-crested Cormorant	X	X	X	S4		Common migrant Uncommon summer Rare winter	Rare spring migrant, rare summer visitor, common fall migrant
American Bittern	X	X		S4	1	Rare migrant	Very rare migrant at cattail margined ponds
Least Bittern	X	X		S3 THR vul	1	Rare migrant	Very rare migrant at cattail margined ponds
Great Blue Heron	X	X	X	S5		Uncommon breeder Rare winter	Uncommon spring, summer, fall visitor. Very rare in winter.
Great Egret		X	X	S2		Rare migrant	Very rare summer and fall visitor and migrant to ponds
Little Blue Heron	X			SZN		Accidental	One record: Aug 2, 1930
Green Heron	X	X	X	?	3	Uncommon breeder	Seen in breeding habitat in 2001
Black-crowned Night-Heron	X	X	X	S3		Rare migrant	Very rare migrant to ponds
Turkey Vulture	X	X	X	S4	3	Uncommon migrant Occasional breeder	Uncommon visitor March through November. May breed.
Greater White-fronted Goose	X	X	X	SZN		Accidental	One record: March 19, 1997
Snow Goose	X	X	X	S4		Rare migrant Occasional winter	Very rare migrant to ponds
Ross' Goose			X	SHB		Accidental	One record: March 10, 1996 on Thames River
Canada Goose	X	X	X	S5		Common resident Common breeder	Common resident and breeder
Mute Swan	X	X	X	SE		Occasional breeder	May have bred in gravel pit ponds
Tundra Swan	X	X	X	S3		Uncommon migrant Occasional winter	Uncommon migrant to ponds
Wood Duck	X	X	X	S5	4	Uncommon migrant. Rare breeder. Rare winter	Nested in 2001 near gravel pit
Gadwall	X	X	X	S4	3	Rare migrant Occasional winter	Rare migrant to ponds
American Wigeon	X	X	X	S4	3	Uncommon migrant Occasional winter	Uncommon migrant to ponds
American Black Duck	X	X	X	S5	2	Uncommon migrant and in winter. Occasional breeder	Uncommon migrant at ponds and along river in winter
Mallard	X	X	X	S5		Common resident Common breeder	Nests near pond in gravel pit
Blue-winged Teal	X	X	X	S5	2	Uncommon migrant Occasional breeder	Uncommon migrant to ponds
Northern Shoveler	X	X	X	S4		Rare migrant	Rare migrant to ponds
Northern Pintail	X	X	X	S5	4	Uncommon migrant Occasional winter	Uncommon migrant to ponds
Green-winged Teal	X	X	X	S4		Rare migrant Rare winter	Uncommon migrant to ponds

Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
Canvasback	X	X	X	S1		Rare migrant Occasional winter	Very rare migrant to ponds
Redhead	X	X	X	S2		Uncommon migrant Occasional winter	Uncommon migrant. Very rare along river in winter
Ring-necked Duck	X	X	X	S5		Uncommon migrant Occasional winter	Uncommon migrant. Very rare along river in winter
Greater Scaup	X	X	X	S2		Rare winter Occasional winter	Uncommon migrant to ponds
Lesser Scaup	X	X	X	S4		Rare winter Occasional winter	Uncommon migrant to ponds
Surf Scoter	X	X	X	S1		Very rare migrant	Very rare migrant to ponds
White-winged Scoter	X	X	X	S1S2		Very rare migrant	Very rare migrant to ponds
Long-tailed Duck	X	X	X	S2S3		Occasional migrant	Very rare migrant to ponds
Bufflehead	X	X	X	S3		Uncommon migrant Rare winter	Uncommon migrant Rare in winter along river
Common Goldeneye	X	X	X	S5		Uncommon migrant Rare winter	Uncommon migrant Rare in winter along river
Hooded Merganser	X	X	X	S5	4	Uncommon migrant Rare winter	Uncommon migrant Rare in winter along river
Common Merganser	X	X	X	S5		Common migrant Uncommon winter	Uncommon migrant Rare in winter along river
Red-breasted Merganser	X	X	X	S4		Occasional migrant Occasional winter	Very rare migrant to ponds
Ruddy Duck	X	X	X	S2		Uncommon migrant	Uncommon migrant to ponds
Osprey	X	X	X	S4		Uncommon migrant Very rare summer visitor	Uncommon migrant to ponds and river. Very rare summer visitor along river
Bald Eagle	X	X	X	S4 end-r	1	Rare summer and winter visitor. Rare migrant	Migrants or winter visitors. A pair attempted to breed in 2000/01 <5km W
Northern Harrier	X	X	X	S4		Uncommon migrant. Rare winter. Very rare breeder	Rare migrant grasslands Very rare winter grasslands
Sharp-shinned Hawk	X	X	X	S5	3	Common migrant Occasional breeder Uncommon winter	Uncommon migrant Rare in winter in wooded areas
Cooper's Hawk	X	X	X	S4	3	Uncommon migrant. Rare breeder. Uncommon winter	Uncommon resident seen in breeding habitat in woodland in 2001
Northern Goshawk	X		X	S4		Occasional migrant Occasional winter	Very rare migrant in woodland habitat
Red-shouldered Hawk	X		X	S4 SC vul	1	Rare migrant Occasional winter	Formerly bred in woodland habitat Rare migrant
Broad-winged Hawk	X	X	X	S5	2	Uncommon migrant	Rare spring migrant Uncommon fall migrant
Red-tailed Hawk	X	X	X	S5		Common resident Common breeder	Uncommon resident breeder Uncommon migrant
Rough-legged Hawk	X	X	X	S1		Uncommon migrant Uncommon winter	Rare migrant Rare winter visitor
Golden Eagle	X		X	S1 end-r		Occasional migrant	Very rare fall migrant
American Kestrel	X	X	X	S5	2	Uncommon breeding resident and migrant	Breeding evidence 81-86 Uncommon visitor, migrant
Merlin	X		X	S4		Rare migrant Rare winter	Very rare migrant
Peregrine Falcon			X	S2 THR end-r		Very rare breeding resident; Rare migrant	Very rare migrant
Ring-necked Pheasant	X	X	X	SE		Rare breeding resident	Has bred in past but probably extirpated
Ruffed Grouse	X	X	X	S5	3	Rare breeding resident	Rare breeding resident

Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
Wild Turkey			X	S4		Rare breeding resident	Increasing population in nearby areas likely to colonise park
Northern Bobwhite			X	S1 END	1	Very rare breeding resident; Likely extirpated	Recorded on 2 Christmas Bird Counts in late 1980s but likely now extirpated
Virginia Rail	X		X	S4	1	Rare breeder Rare migrant	Has bred and may still do so in park wetlands, especially in gravel pit
Sora	X		X	S4	1	Rare breeder Rare migrant	Has bred and may still do so in park wetlands, especially in gravel pit
Common Moorhen			X	S4	4	Rare migrant	Very rare migrant not seen in last 10 yrs
American Coot	X	X	X	S4	1	Common migrant Occasional winter	Seen on ponds every fall in large numbers
Sandhill Crane			X	S4		Very rare migrant	One record: date unknown
Black-bellied Plover	X	X	X	SZN		Rare migrant	Rare migrant at pond margins in gravel pit
American Golden-Plover	X		X	S1		Rare migrant	Rare migrant at pond margins in gravel pit
Semipalmated Plover	X	X	X	S4		Uncommon migrant	Uncommon migrant at pond margins in gravel pit
Killdeer	X	X	X	S5		Common migrant Common breeder	Common migrant at pond margins in gravel pit. Likely breeds
Greater Yellowlegs	X	X	X	S4		Uncommon migrant	Rare migrant at pond margins in gravel pit
Lesser Yellowlegs	X	X	X	S4		Uncommon migrant	Uncommon migrant at pond margins in gravel pit
Solitary Sandpiper	X	X	X	S4		Uncommon migrant	Rare migrant at pond margins in gravel pit
Spotted Sandpiper	X	X	X	S5	3	Common migrant Uncommon breeder	Uncommon breeder and migrant
Upland Sandpiper	X			S4		Rare migrant Very rare breeder	Not seen in last 20 years in park
Hudsonian Godwit	X	X		S2S3		Casual migrant	Not recorded in last 15 years in park
Semipalmated Sandpiper	X	X	X	S3S4		Uncommon migrant	Uncommon migrant at pond margins in gravel pit
Least Sandpiper	X	X	X	S4		Uncommon migrant	Uncommon migrant at pond margins in gravel pit
Pectoral Sandpiper	X	X	X	SHB		Uncommon migrant	Uncommon migrant at pond margins in gravel pit
Dunlin	X	X	X	S3		Uncommon migrant	Rare migrant at pond margins in gravel pit
Short-billed Dowitcher	X	X	X	S2S3		Rare migrant	Rare migrant at pond margins in gravel pit
Long-billed Dowitcher			X	SZN		Casual migrant	Very rare migrant at pond margins in gravel pit
Common Snipe	X	X	X	S5	2	Uncommon migrant Occasional winter	Pond margins in gravel pit
American Woodcock	X	X	X	S5	4	Uncommon breeder	Rare breeder in moist woodlands on both sides of river
Wilson's Phalarope	X		X	S3	4	Rare migrant	Rare migrant
Franklin's Gull			X	SZN		Casual migrant	One record: Nov 1997
Bonaparte's Gull	X	X	X	S4		Uncommon migrant	Uncommon migrant at ponds
Ring-billed Gull	X	X	X	S5		Very common migrant	Forages along river, rests at ponds
Herring Gull	X	X	X	S5		Very common migrant	Common along river especially spring and fall. Rests at ponds
Iceland Gull			X	SZN		Occasional winter	Very rare winter visitor
Glaucous Gull			X	SZN		Occasional winter	Very rare winter visitor
Great Black-backed Gull	X	X	X	S2		Uncommon winter	Uncommon along river in late fall and winter
Caspian Tern	X	X	X	S3		Occasional migrant	Rare migrant at ponds
Common Tern	X	X	X	S4	4	Occasional migrant	Rare migrant but not in last five years

Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
Forster's Tern			X	S2S3 DD ind		Rare migrant	Rare migrant but not in last five years
Black Tern	X	X	X	S3 vul	1	Occasional migrant	Rare migrant but not in last five years
Rock Dove	X	X	X	SE		Common breeding resident	Uncommon visitor and probable breeder
Mourning Dove	X	X	X	S5		Common breeding resident	Common breeder
Black-billed Cuckoo	X	X	X	S4	2	Rare breeder	Rare breeder. Pair in habitat in 2001
Yellow-billed Cuckoo	X	X	X	S4	3	Rare breeder	Rare breeder. In habitat in 2001
Eastern Screech-Owl	X	X	X	S5		Uncommon breeding resident	Uncommon breeding resident Territorial in 2001
Great Horned Owl	X	X	X	S5		Uncommon breeding resident	Uncommon breeding resident Confirmed in 2001
Long-eared Owl	X			S4	1	Rare winter visitor	No records in last 20 years; mainly a winter visitor
Common Nighthawk	X	X	X	S4	1	Rare migrant Rare breeder	Uncommon migrant Not known to nest now
Whip-poor-will	X			S4	2	Very rare migrant	No records in last 20 years
Chimney Swift	X	X	X	S5		Common migrant Uncommon breeder	Uncommon migrant No recent breeding records
Ruby-throated Hummingbird	X	X	X	S5	2	Common migrant Uncommon breeder	Uncommon migrant and breeder In suitable woodland habitat in 2001
Belted Kingfisher	X	X	X	S5		Uncommon breeder Uncommon winter	Rare breeder and in winter. Evidence in 2002 at high banks south side of river
Red-headed Woodpecker	X	X		S3 SC vul	1	Rare migrant, breeder Occasional winter	Former breeder but not seen in last 5 years
Red-bellied Woodpecker	X	X	X	S4	1	Uncommon breeding resident	Rare breeding resident. Becoming more common, seen in 3 locations in 2002
Yellow-bellied Sapsucker	X	X	X	S5	2	Uncommon migrant Occasional breeder Occasional winter	Uncommon migrant
Downy Woodpecker	X	X	X	S5		Common breeding resident	Uncommon breeding resident in wooded habitats throughout
Hairy Woodpecker	X	X	X	S5		Uncommon breeding resident	Rare breeding resident. Nest site found in mature woods in 2001
Black-backed Woodpecker	X	X		S4		Occasional winter visitor	Two pre 1986 winter records in "Tamarack swamp"
Northern Flicker	X	X	X	S5		Common breeder and migrant. Rare winter	Uncommon breeder. Found in suitable habitat in 2001
Pileated Woodpecker	X	X	X	S4	2	Rare resident breeder	Rare resident breeder. Nest found in mature woods in 2001
Olive-sided Flycatcher			X	S5		Very rare migrant	Very rare migrant. Seen once in last 5 years in "Tamarack swamp"
Eastern Wood-Pewee	X	X	X	S5		Common breeder	Common breeder. Territorial in mature woods in 2001
Yellow-bellied Flycatcher	X	X	X	S5		Rare migrant	Very rare migrant. Reported once in last 5 years
Alder Flycatcher		X		S5	3	Rare breeder	Noted on west side on river floodplain in suitable habitat in 1980s
Willow Flycatcher	X	X	X	S5		Uncommon breeder	Uncommon breeder. Found in shrubby habitat in 2001
Least Flycatcher	X	X	X	S5	3	Uncommon breeder	Uncommon breeder. Found in mature woods in 2001
Eastern Phoebe	X	X	X	S5	3	Uncommon breeder	Uncommon breeder. Uses structures in and near park, found nesting in 2001
Great Crested Flycatcher	X	X	X	S5		Uncommon breeder	Uncommon breeder. Territorial in mature woods in 2001
Eastern Kingbird	X	X	X	S5	3	Uncommon breeder	Uncommon breeder in hawthorn savanna. Found nesting in 2001
Northern Shrike			X	S2S3		Rare migrant Rare winter	Rare migrant. Overwinters some years.

Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
Yellow-throated Vireo	X	X	X	S4	3	Uncommon migrant Rare breeder	Rare breeder. Territorial in mature woods in 2001
Blue-headed Vireo	X	X	X	S5	3	Uncommon migrant Occasional breeder	Uncommon migrant
Warbling Vireo	X	X	X	S5		Common migrant Common breeder	Uncommon breeder. Various territories 2002
Philadelphia Vireo	X	X	X	S5		Rare migrant	Rare migrant
Red-eyed Vireo	X	X	X	S5		Common migrant Common breeder	Common migrant and breeder. In habitat in mature woods in 2001
Blue Jay	X	X	X	S5		Common migrant Common breeding resident	In a variety of habitats, probable breeder in 2001
American Crow	X	X	X	S5		Common migrant Common breeding resident	In a variety of habitats, probable breeder in 2001
Horned Lark	X	X	X	S5	3	Common migrant Uncommon breeder Uncommon winter	Visitor summer, winter and during migration. Nests in fields nearby and forages in park
Purple Martin	X	X	X	S4	2	Rare migrant Rare breeder	Breeds near park and forages in park
Tree Swallow	X	X	X	S5		Common migrant Uncommon breeder	Uncommon breeder. In habitat in 2001
N. Rough-winged Swallow	X	X	X	S5	2	Uncommon migrant Uncommon breeder	Uncommon breeder. In habitat in 2001, nests along high banks
Bank Swallow	X	X	X	S5	1	Common breeder Common migrant	Uncommon breeder. In habitat in 2001, nests along high banks
Cliff Swallow	X	X	X	S5	3	Uncommon breeder Rare breeder	Colonies at both bridges over Thames River; forages in park
Barn Swallow	X	X	X	S5	3	Common migrant Common breeder	Uses structures in and near park for nesting, seen in 2001
Black-capped Chickadee	X	X	X	S5	4	Common breeding resident	Common breeding resident
Tufted Titmouse	X	X	X	S2S3		Occasional breeder Occasional winter	Not found in park in last 5 years. Found upstream of Kilworth bridge in 2001
Red-breasted Nuthatch	X	X	X	S5	3	Uncommon migrant Rare breeder Uncommon winter	Uncommon winter visitor May breed in older conifer plantations
White-breasted Nuthatch	X	X	X	S5		Uncommon breeding resident	Uncommon resident breeder. Found in habitat in 2001
Brown Creeper	X	X	X	S5	2	Uncommon migrant Uncommon winter	Uncommon migrant Uncommon winter
Carolina Wren	X		X	S3S4	3	Rare breeding resident	Breeding birds found in 2001 just upstream of Kilworth bridge. Likely a visitor to the park.
House Wren	X	X	X	S5		Common migrant Uncommon breeder	Uncommon breeder. In habitat in 2001
Winter Wren	X	X	X	S5	4	Uncommon migrant Very rare winter	Migrates through and winters in very small numbers
Sedge Wren			X	S4	2	Rare migrant Very rare breeder	Very rare breeder. First ever record for Komoka Provincial Park in 2002
Golden-crowned Kinglet	X	X	X	S5	3	Common migrant Uncommon winter	Migrates through and winters in small numbers
Ruby-crowned Kinglet	X	X	X	S5	4	Common migrant Occasional winter	Common spring and fall migrant
Blue-gray Gnatcatcher	X	X	X	S4	4	Rare migrant Rare breeder	Uncommon breeder. Nested in 2001
Eastern Bluebird	X	X	X	S4	1	Uncommon migrant Uncommon breeder Rare winter	Some bred in boxes and tree cavities in park in last few years
Veery	X	X	X	S4	3	Uncommon migrant Uncommon breeder	Likely breeds most years but not recorded in 2001

Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
Gray-cheeked Thrush	X	X	X	S3S4		Rare migrant	Rare migrant
Swainson's Thrush	X	X	X	S5		Uncommon migrant	Uncommon migrant
Hermit Thrush	X	X	X	S5		Uncommon migrant Rare winter	Uncommon migrant. Occasional winter
Wood Thrush	X	X	X	S5	4	Uncommon migrant Uncommon breeder	Uncommon breeder. Found in habitat in 2001
American Robin	X	X	X	S5		Common breeder Common migrant Uncommon winter	Common breeder Common migrant Uncommon winter
Gray Catbird	X	X	X	S5	4	Common migrant Common breeder	Common breeder in moist brushy areas
Northern Mockingbird			X	S4	1	Very rare year round resident some years	Found in park in 1999, possible nesting
Brown Thrasher	X	X	X	S5	1	Uncommon migrant Uncommon breeder	Rare breeders in dry, brushy areas and overgrown pasture. Present in 2002
European Starling	X	X	X	SE		Common breeding resident	Uncommon breeder.
American Pipit	X	X	X	S4		Rare migrant	Rare migrant at pond edges in gravel pit
Cedar Waxwing	X	X	X	S5		Uncommon breeder Uncommon winter	Uncommon breeder. Found in habitat in 2001
Blue-winged Warbler	X	X	X	S4	1	Rare migrant Rare breeder	Up to 10 breeding pairs in overgrown pasture in brushy area on south side
Golden-winged Warbler	X	X	X	S4	1	Very rare migrant Occasional breeder	Not reported from park in last 5 years, formerly nested, especially in "Tamarack swamp" area
Tennessee Warbler	X	X	X	S5		Uncommon migrant	Uncommon spring and fall migrant
Orange-crowned Warbler		X	X	S4		Very rare migrant	Very rare spring and fall migrant
Nashville Warbler	X	X	X	S5	2	Uncommon migrant	Uncommon spring and fall migrant
Northern Parula	X		X	S4		Uncommon migrant	Rare spring and fall migrant
Yellow Warbler	X	X	X	S5		Common migrant Common breeder	Common in thickets along river
Chestnut-sided Warbler	X	X	X	S5	1	Uncommon migrant Rare breeder	Uncommon spring and fall migrant
Magnolia Warbler	X	X	X	S5	1	Uncommon migrant	Uncommon spring and fall migrant
Cape May Warbler	X	X	X	S5		Uncommon migrant	Rare migrant in spring or fall
Black-throated Blue Warbler	X	X	X	S5		Uncommon migrant	Uncommon spring and fall
Yellow-rumped Warbler	X	X	X	S5	3	Common migrant Rare winter	Seen in good numbers in spring, fall
Black-throated Green Warbler	X	X	X	S5	2	Uncommon migrant	Uncommon spring and fall migrant
Blackburnian Warbler	X	X	X	S5	2	Uncommon migrant	Uncommon spring and fall migrant
Pine Warbler	X	X	X	S5	3	Uncommon migrant Rare breeder	Uncommon spring and fall Possible breeding in "Tamarack swamp" in 2001
Palm Warbler	X	X	X	?		Uncommon migrant	Uncommon spring and fall migrant
Bay-breasted Warbler	X	X	X	S5		Uncommon migrant	Uncommon spring and fall migrant
Blackpoll Warbler	X	X	X	S4		Uncommon migrant	Uncommon spring and fall migrant
Cerulean Warbler	X	X	X	S3	1	Rare migrant Very rare breeder	Rare migrant in spring or fall or both
Black-and-white Warbler	X	X	X	S5	3	Uncommon migrant	Uncommon spring and fall migrant

Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
American Redstart	X	X	X	S5	2	Uncommon migrant Uncommon breeder	Uncommon spring and fall migrant On territory in 2001 in wooded areas
Ovenbird	X	X	X	S5	4	Uncommon migrant Uncommon breeder	Uncommon spring and fall migrant, On territory in 2001 in wooded areas
Northern Waterthrush	X	X	X	S5	3	Rare migrant Rare breeder	Rare spring or fall migrant
Louisiana Waterthrush		X	X	S3 SC vul	1	Very rare migrant Very rare breeder	Very rare spring and fall migrant. Formerly bred in woods at Kee-mo-kee. Possible breeding records at Komoka Provincial Park 81-86.
Connecticut Warbler			X	S4		Very rare migrant	First ever park record in spring of 2001
Mourning Warbler	X	X	X	S5	2	Rare migrant Rare breeder	Rare spring or fall migrant
Common Yellowthroat	X	X	X	S5		Common migrant Common breeder	Uncommon breeder. On territory in 2001 in wet areas and along river
Wilson's Warbler		X	X	S5		Uncommon migrant	Uncommon spring and fall migrant
Canada Warbler	X	X	X	S5	2	Uncommon migrant	Uncommon spring and fall migrant
Scarlet Tanager	X	X	X	S5	2	Uncommon migrant Uncommon breeder	Uncommon breeder. On territory in 2002 in wooded areas
Eastern Towhee	X	X	X	S4	2	Rare migrant Rare breeder	Rare breeder On territory in 2002 in brushy areas and overgrown pasture
American Tree Sparrow	X	X	X	S5		Common migrant Common winter	Common winter. Prefers weedy areas
Chipping Sparrow	X	X	X	S5		Common migrant Common breeder Occasional winter	Uncommon breeder. Confirmed in 2001.
Clay-colored Sparrow			X	S4	1	Occasional migrant Occasional breeder	Very rare breeder. On territory once in last 5 years in overgrown pasture
Field Sparrow	X	X	X	S5	3	Uncommon migrant Uncommon breeder Occasional winter	Uncommon breeder. On territory in 2001 in brushy overgrown pasture
Vesper Sparrow	X	X	X	S4	2	Uncommon migrant Uncommon breeder	Rare breeder. On territory in grassy areas in 2001
Savannah Sparrow	X	X	X	S5	1	Common migrant Common breeder	Uncommon breeder. On territory in 2001 in grassy fields
Grasshopper Sparrow	X	X	X	S4	3	Rare migrant Rare breeder	Uncommon breeder. Colony of at least 10 pairs, in old gravel pit, in 2001.
Fox Sparrow	X	X	X	S4		Uncommon migrant Very rare winter	Rare migrant
Song Sparrow	X	X	X	S5		Common breeding resident Uncommon winter	Common breeder. On territory in 2001 throughout the park
Lincoln's Sparrow	X	X	X	S5		Rare migrant	Rare migrant
Swamp Sparrow	X	X	X	S5	2	Uncommon breeder Uncommon migrant Rare winter	Uncommon breeder. On territory in 2001 in wet marshy sites
White-throated Sparrow	X	X	X	S5	2	Common migrant Rare winter	Common migrant. Rare winter
White-crowned Sparrow	X	X	X	S4		Uncommon migrant Very rare winter	Uncommon migrant
Dark-eyed Junco	X	X	X	S5		Common migrant Common winter	Common migrant Common winter
Snow Bunting	X	X	X	S5		Uncommon winter	Uncommon migrant and rare winter visitor
Northern Cardinal	X	X	X	S5		Common breeding resident	Uncommon breeder. Confirmed breeding in 2001
Rose-breasted Grosbeak	X	X	X	S5		Common migrant Common breeder	Uncommon breeder. Confirmed breeding in 2001
Indigo Bunting	X	X	X	S5		Uncommon migrant Uncommon breeder	Uncommon breeder. On territory in 2002



Species Name	pre 81	81-86	87-01	SRank STE/vte	CP	Middlesex Status	Comments on use of Komoka Provincial Park
Bobolink	X	X	X	S4	2	Common migrant Common breeder	Uncommon breeder. On territory in 2001 breeding in grassy meadows
Red-winged Blackbird	X	X	X	S5		Common migrant Common breeder	Common breeder. On territory in 2002
Eastern Meadowlark	X	X	X	S5	2	Uncommon migrant Uncommon breeder	Uncommon breeder. On territory in 2002 nesting in grassy meadows
Rusty Blackbird	X	X	X	S5		Uncommon migrant Occasional winter	Uncommon spring and fall migrant
Common Grackle	X	X	X	S5		Common migrant Common breeder	Common breeder. In habitat in 2002
Brown-headed Cowbird	X	X	X	S5		Common migrant Common breeder Rare winter	Uncommon breeder. Breeding evidence found in 2002
Baltimore Oriole	X	X	X	S5		Uncommon migrant Uncommon breeder	Uncommon breeder. Breeding evidence in 2002
Purple Finch	X	X	X	S5	3	Rare migrant Occasional breeder Rare winter	Uncommon migrant, especially fall Very rare winter
House Finch	X	X	X	SE		Abundant breeding resident	Uncommon breeder. Breeding evidence in 2001
Red Crossbill	X	X		S5		Very rare winter	Very rare winter. Not reported in last 5 years
White-winged Crossbill	X	X	X	S5		Very rare winter	Very rare winter in irruption years
Common Redpoll	X	X	X	S4		Uncommon migrant Rare winter	Rare migrant Very rare in winter
Pine Siskin	X	X	X	S5		Uncommon migrant Rare winter	Rare migrant Very rare in winter
American Goldfinch	X	X	X	S5	3	Common breeding resident Common migrant	Uncommon breeder. Common migrant. Breeding evidence in 2002.
Evening Grosbeak	X	X	X	S5		Rare migrant Very rare winter	Very rare migrant and winter visitor
House Sparrow	X	X	X	SE		Common breeding resident	Uncommon breeder in and around the park in areas with human structures

Checklist order, English names VTE status and S Ranks are from the NHIC List of Ontario Birds. Middlesex and park status is from Read (2001)

### Sources and References:

The vast majority of information contained in this appendix is from Pete Read. (See also Introduction in this appendix). Read is the migration secretary for the Mcllwraith Field Naturalists who summarises all reports his notes and reports which are published in The Cardinal, the journal of the Mcllwraith Field Naturalists. Other bird notes came primarily from Winnie and Dave Wake, Stan and Anita Caveney and from Gail McNeil, all Mcllwraith members.

## APPENDIX E:

### Amphibians and Reptiles of Komoka Provincial Park

#### Introduction

Until 2002 there had been no systematic or formal surveys of amphibians and reptiles at Komoka Provincial Park. From April 17 to July 1, 2002, Dave Martin, Linda Wladarski and Pete Read made 7 visits to Komoka Provincial Park to survey for calling amphibians and to search for salamanders.

Previous work and information collected from naturalists related to amphibians and reptiles include the following. For the 1985 Reconnaissance Life Science Inventory, Klinkenberg compiled a preliminary list from field notes taken during inventory work, from a literature search and from discussions with local, knowledgeable individuals. In July and August of 1999, Kate McIntyre spent five days at Komoka recording vertebrates, with "a specific focus on searching for the Queen Snake." Over the last 8 years, the Eastern Spiny Softshell Recovery Team has conducted surveys along the Thames River, including Komoka Provincial Park at times. In fall 2001, Martin interviewed various naturalists and resource agency personnel specifically to see if they had records for Eastern Spiny Softshell, Queen Snake and Eastern Hognose Snake. Information on calling amphibians has improved greatly. However, there is still a gap in the knowledge base for snakes and turtles, except perhaps, for the Eastern Spiny Softshell and Eastern Hognose Snake.

#### Amphibians and Reptiles of Komoka Provincial Park

Nine species of amphibian and eight species of reptile have been recorded to date within the boundaries of Komoka Provincial Park.

The nine species of amphibian recorded to date represents about 56% of the Middlesex County List (16 species). Three species that are new to Komoka Provincial Park, but expected to occur, were added to the park list by the 2002 amphibian surveys. They were Spotted Salamander (*Ambystoma maculatum*), Northern Redback Salamander (*Plethodon cinereus*), and Tetraploid Gray Treefrog (*Hyla versicolor*). Perhaps because surveys did not start until early May, only one individual of the Spotted Salamander was recorded. There is apparently suitable habitat on the south side of the river in the mature woodlands. Typically this species is best found in early April or in late fall. Although the Northern Redback Salamander was found scattered throughout Komoka Provincial Park on both the north and south sides of the river, only three individuals were found. It is not clear whether this means that this species is uncommon in the park or whether the weather conditions were not conducive to finding many. Martin found large numbers (37 individuals) on a small property just upstream from the Kilworth bridge in the spring of 2001, in the type of valleyland slope habitat that is also present at the park. The Gray Treefrog was expected to occur in large numbers at Komoka and, indeed it was found. Some 24 individuals were encountered at six locations in Komoka Provincial Park, on both the north and south sides of the Thames River.

As expected, with the presence of plenty of amphibian breeding ponds, all of the species that had been recorded previously at Komoka Provincial Park were found in good numbers and at a number of locations in 2002.

Based on the availability of suitable habitat and their widespread occurrence in Middlesex County and southwestern Ontario there are still three additional amphibian species that are possible at Komoka Provincial Park. Two are found only with luck or specialised searching: the Common Mudpuppy (*Necturus maculosus*) and the Red-spotted Newt (*Notophthalmus viridescens*). If not found during its brief calling period in early April the Wood Frog (*Rana sylvatica*) is only found incidentally in the summer and fall.

The eight species of reptile found in Komoka Provincial Park represent about 42% of the Middlesex County list (19 species). Based on the availability of suitable habitat and their widespread occurrence in Middlesex County and southwestern Ontario another three or four species are likely present. The Brown Snake (*Storeria dekayi*) is almost certainly present. The Redbelly Snake (*Storeria occipitomaculata*), Milk Snake (*Lampropeltis triangulum*), and Northern Water Snake (*Nerodia sipedon*) are possibly present. If these species are confirmed, the Komoka Provincial Park reptile checklist would increase to about 63% of the Middlesex County

checklist. A Milk Snake was observed within 1 km of the park in 1988 (Oldham, pers. comm.). No new reptile species were found in 2002. However, while conducting amphibian surveys, Martin encountered a large adult Eastern Hognose Snake (*Heterodon platirhinos*) (May 15, 2002) on the north side of the river. This is the first record of this species on the north side of the river within the park.

### Rare and Significant Amphibians and Reptiles of Komoka Provincial Park

Five species of reptiles (4 species) and amphibians (1 species) considered rare at the local, provincial or national levels have been recorded at Komoka Provincial Park. These are listed in Table E1 with their designations.

**Table E1: Rare and Significant Amphibians and Reptiles of Komoka Provincial Park**

Species	COSEWIC STE	OMNR vte	NHIC S1-S3	Middlesex Status	Use of Park
Eastern Spiny Softshell	THR	thr	G5S3	Uncommon	River
Eastern Hognose Snake	THR	vul	G5S3	Rare	Upland throughout
Queen Snake	THR	thr	G5S2	Rare	River
Bullfrog*	-	-	G5S4	Rare	One pond south side
Common Map Turtle	SC	-	G5S3	Uncommon	River

\* indicates that the record is unconfirmed. Middlesex Status from Oldham 1993.

### Habitat Needs of Rare and Significant Amphibians and Reptiles of the Komoka Study Area

#### Bullfrog (Rare in Middlesex)

Oldham (1993) states that the Bullfrog is known in Middlesex from seven records in two squares during the Ontario Herpetofaunal Atlas. In 1999, MacIntyre found this species in a “pond off the trail near the Kilworth entrance”. Photos were taken but have not been examined by Martin. MacIntyre suggests that her identification may not be correct because it was based on size (pers. comm. Jan 2002). Green Frogs, which can grow to a large size, were also present. Martin and Wladarski visited this pond on May 7, 2002 but didn’t find frogs of any species. The pond is very small and is not long-term suitable habitat for the bullfrog or, for that matter, any species of frog, salamander or turtle that normally overwinters in deep ponds. **Management Considerations:** Retain and protect pond for frog and salamander breeding.

#### Common Map Turtle (Special Concern in Canada, S3, Uncommon in Middlesex)

Oldham (1993) listed 112 records of this species in Middlesex from 16 squares during the Ontario Herpetofaunal Atlas. This species is a river turtle and all records from Middlesex County are from the Thames, Sydenham, or Ausable Rivers or their tributaries. Oldham rated this species as Uncommon despite a large number of records because it is restricted in distribution and habitat. He considers the species to be common in suitable habitat. In 1999, MacIntyre observed 5 individuals of this species basking with Eastern Spiny Softshell in the Thames River. Martin and Wladarski observed one very large specimen basking on the north side of the river along the shoreline on May 16, 2002. **Management Considerations:** see Eastern Spiny Softshell.

#### Eastern Spiny Softshell (Threatened in Canada & Ontario, S3, Uncommon in Middlesex)

The Thames River is a well-known refuge for this Threatened species. There are several concentrations in the London area including Fanshawe Dam, Komoka Provincial Park, and between the Komoka bridge and Delaware. Oldham (1993) collected 89 records from 11 squares for the Ontario Herpetofaunal Atlas (OHS). He considers this species to be Uncommon in Middlesex and restricted to the Thames and Sydenham Rivers and their tributaries. Since the Atlas, there have been almost annual investigations for softshell along the Thames. Records at Komoka Provincial Park go back to at least the early 1980s. Despite the fact that there are many anecdotal records from the park, none were listed on the Element Occurrence sheet provided. Henry Valks, Park Superintendent, states that he has personally seen Eastern Spiny Softshell Turtles twice at the park within the past five years. In 1999, MacIntyre observed 7 individuals basking with Common Map Turtles during her searches. Gillingwater states that softshells have been seen regularly by the Eastern Spiny Softshell Recovery Team whenever searches were carried out along the stretch of the Thames through Komoka Provincial Park. In particular, he states, that there is a very noticeable clay or rock formation on the

west side of the river where softshells have been seen basking on more than one occasion. Gillingwater mentioned that while no softshell nest sites have been found in Komoka Provincial Park, the islands could provide nesting habitat if some of the vegetation was cleared, especially at the downstream end of the islands. When vegetation was cleared from an island between the Komoka and Delaware bridges and a mound of sand built up, there was a dramatic increase in turtle nesting. It would appear that the availability of nesting sites is a major limiting factor for turtles along the river. **Management Considerations:** Eastern Spiny Softshells and Map Turtles are relatively well protected already in Komoka Provincial Park. The most likely impacts on these two species at the park are 1) collecting of young or adults by humans, 2) human disturbance while basking or egg laying, and 3) nest predation by mammals such as raccoons. Disturbance while basking can affect female ability to reach high enough body temperatures to produce eggs. With the foregoing in mind there are several recommendations that will lessen or minimise disturbance to the turtles.

- If existing trails are to be re-routed because of erosion, these should be directed away from the river where possible.
- If new trails are recommended these should not approach the river where turtles are known to bask which means that turtle basking areas will have to be mapped eventually.
- Canoeing should not be encouraged any more than it already is by creating new infrastructure such as boat launches.
- Fishing should not be encouraged any more than it already is because anglers sometimes catch Eastern Spiny Softshells.
- Species such as raccoons are significant egg predators of turtles. An education program directed at park neighbours should discourage any activities that increase raccoon populations.
- If habitat rehabilitation or creation is contemplated then the islands in the river should be partially cleared of vegetation to provide new nesting habitat for turtles.

#### **Eastern Hognose Snake** (Threatened in Canada, Vulnerable in Ontario, S3, Rare in Middlesex)

Klinkenberg (1985) mentioned no records for this species at Komoka Provincial Park. The NHIC Element Occurrence report lists two records of Eastern Hognose Snake from areas near the park. Recently, though, there have been a surprising number of sightings for this species within the park. Generally, snakes are secretive and not readily detected. However, there are enough park users now that the more memorable snakes such as this species are noticed and remembered. Through interviews with naturalists and park users, recent records from within the park and from nearby sites were found. It is likely that the Eastern Hognose Snake has been present for many years in the park and it is the increased usage by naturalists and others that has led to an increase in sightings. Henry Valks, Park Superintendent stated that "I have had about four reports over the last two years." The number of sightings (one to four per year most years) including juveniles in 2001 suggest that there is a significant breeding population of this species in Komoka Provincial Park. This is in contrast to nearby areas outside the park where there are only a few sightings in the last 10 years. Komoka Provincial Park appears to be the most important site in Middlesex for the Eastern Hognose Snake. As mentioned above, in 2002, Martin found an adult on the north side of the river – possibly the first time that this species has been recorded on the north side of the river within the park boundaries. Martin also interviewed several dog-walkers, one of whom had visited the park on a regular basis for several years. This person mentioned having seen Eastern Hognose Snakes on a regular basis during those several years including one instance of finding a small Eastern Hognose Snake (likely juveniles). **Management Considerations:** This species is a terrestrial snake preferring sandy soils. The main prey item is the American Toad. There appears to be a significant reproducing population given the number of sightings. Given the distribution of older sightings from nearby areas the species appears to have ranged throughout the sandy soils of west London but records appear to have declined, except in the park. Management considerations include

- Conduct surveys specifically for this species. Relocating PIT-tagged individuals will determine whether the species ranges throughout the park or is restricted to a specialised habitat in the park.
- Educate users and neighbours about the importance of this species to minimise the number of snakes that might be killed by users, neighbours and dogs. An education campaign must take into account, though, that snakes (and turtles), especially rare species, are still actively collected.

**Queen Snake** (Threatened in Canada & Ontario, S2, Rare in Middlesex)

The Queen Snake is an aquatic snake often found in similar riverine habitat to the Eastern Spiny Softshell. This is not surprising given that crayfish comprise a major part of the diet of both species. The Queen Snake is not as visible as the Eastern Spiny Softshell, which may partially account for fewer records. Klinkenberg (1985) points out that there is at least one record from the Komoka Provincial Park area at the Kilworth bridge. There is suitable habitat for this species along much of the Thames River in Komoka Provincial Park (Gillingwater, pers. comm.). Given that Queen Snakes had been reported from the park over the past few years, MacIntyre spent the better part of five days in 1999 surveying for this species in suitable habitat. Her efforts went unrewarded. Only two recent sightings have come to light. On May 13, 1997, Kim Smith, a Species at Risk Biologist for the Ministry of Natural Resources found one adult basking on a grassy knoll about one metre from the river edge. In 1998, the Eastern Spiny Softshell Recovery Team found two individuals along the east bank of the river opposite the clay/rock formation where softshells were observed basking (Gillingwater, pers. comm.). **Management Considerations:** Given that this snake fills a similar ecological niche to the Eastern Spiny Softshell, most of the considerations listed for that species will also apply to this species. It needs to be emphasised that an education program for park users and neighbours might help to protect the Queen Snake, Eastern Hognose and Eastern Spiny Softshell, but at the same time it alerts collectors to the presence of these rare species in the park. It may be better not to advertise the presence of these three species in the park.

**Table E3: Checklist of the Amphibians and Reptiles of Komoka Provincial Park**

Species	Pre 85	85-01	02	SRank	COSEWIC / OMNR	Middlesex Status	Comments
<b>AMPHIBIANS</b>							
Spotted Salamander ( <i>Ambystoma maculatum</i> )	-	-	X	S4		Uncommon	1 individual on the south side
Northern Redback Salamander ( <i>Plethodon cinereus</i> )	-	-	X	S5		Common	3 individuals scattered
American Toad ( <i>Bufo americanus</i> )	X	X	X	S5		Abundant	scattered
Tetraploid Gray Treefrog ( <i>Hyla versicolor</i> )	-	-	X	S5		Abundant	scattered
Western Chorus Frog ( <i>Pseudacris triseriata</i> )	X	X	X	S5		Abundant	tamarack swamp only
Spring Peeper ( <i>Pseudacris crucifer</i> )	X	X	X	S5		Abundant	mostly north side
Bullfrog ( <i>Rana catesbeiana</i> )	-	X	-	S4		Rare	not found 2002
Green Frog ( <i>Rana clamitans</i> )	X	X	X	S5		Abundant	mostly north side
Northern Leopard Frog ( <i>Rana pipiens</i> )	X	X	X	S5		Abundant	mostly north side
<b>REPTILES</b>							
Snapping Turtle ( <i>Chelydra serpentina</i> )	-	X	-	S5		Common	
Midland Painted Turtle ( <i>Chrysemys picta marginata</i> )	X	X	X	S5		Abundant	
Red-eared Slider ( <i>Trachemys scripta</i> )	-	X	-	SE		unknown	
Common Map Turtle ( <i>Graptemys geographica</i> )	-	X	X	S3	SC	Uncommon	
Eastern Spiny Softshell ( <i>Apalone s. spinifera</i> )	X	X	-	S3	THR - thr	Uncommon	
Eastern Hognose Snake ( <i>Heterodon platirhinos</i> )	-	X	X	S3	THR - vul	Rare	
Queen Snake ( <i>Regina septemvittata</i> )	X	?	-	S2	THR - thr	Rare	
Eastern Garter Snake ( <i>Thamnophis s. sirtalis</i> )	X	X	X	S5		Abundant	

Checklist order, English names, and SRank are from the NHIC List of Ontario Amphibians, 1999, and NHIC List of Ontario Reptiles, 1999. COSEWIC and OMNR designations are from "Index of Vulnerable, Threatened, Endangered, Extirpated or Extinct Species of Ontario" (OMNR, May 2001). Middlesex status is derived from Oldham (1993).

## APPENDIX F:

### Fish of Komoka Provincial Park

#### Introduction

John Schwindt of the Upper Thames River Conservation Authority (October 23, 2001) supplied the following checklist of the fish of the River Bend Basin of the Thames River. The list was created with records from the Royal Ontario Museum and various OMNR surveys over the years.

[\*Note: the checklist is not in taxonomic order, rather it is arranged by the number of samples collected from most to least.]

#### Fish of the River Bend Basin which includes Komoka Provincial Park

Thirty-nine species of fish have been recorded in the River Bend Basin. The River Bend Basin covers the stretch of the Thames River from Delaware to Springbank Dam, which includes Komoka Provincial Park. Although the sampling was done from various locations in the basin, Schwindt considers that all of the species on the list should be found within the park boundaries. The list is not complete, though, because the sampling methodology is biased towards certain species. Missing species, which are almost certainly in this stretch of the Thames River, include Long-nosed Gar and Walleye among others. The 39 species recorded in the River Bend Basin comprise about 65% of the Middlesex County fish list and about 43% of the Thames River list. Many of the 90 species on the Thames list are found only in the lower reaches between Chatham and Lake St Clair.

#### Rare and Significant Fish of River Bend Basin/Komoka Provincial Park

Eight species of fish recorded from the River Bend Basin are considered significant at either the national, provincial or local levels. The significant species of fish are listed on Table F1 with their respective designations. It should be noted that some of the significant fish species and others that are more common are obligate hosts for the larva of freshwater mussels. The larva spends their part of the animal's life cycle in the gills of fish. Some species of freshwater mussel larva are host-specific while others can live on more than one species.

**Table F1: Rare and Significant Fish of River Bend Basin/Komoka Provincial Park**

Species	COSEWIC / OMNR	SRank	Thames River Status	Thames River Distribution
Greenside Darter ( <i>Etheostoma blennioides</i> )	SC-niac	S4	Common	Widespread
Golden Redhorse ( <i>Moxostoma erythrurum</i> )	NAR-niac	S3	Common	Widespread
Striped Shiner ( <i>Luxilus chrysocephalus</i> )	NAR-niac	S3?	Common	Widespread
Central Stoneroller ( <i>Campostoma anomalum</i> )	NAR-niac	S3	Common	Locally common
Eastern Sand Darter* ( <i>Ammocrypta pellucida</i> )	THR	S2	Uncommon	Localised
Silver Shiner ( <i>Notropis photogenis</i> )	SC-niac	S2S3	Uncommon	Localised
Pugnose Minnow ( <i>Opsopoeodus emiliae</i> )	SC-vul	S2	Rare	Localised
Brook Silverside ( <i>Labidesthes sicculus</i> )	NAR-niac	S4	Rare	Localised

\* According to the Association for Biodiversity Information, the Eastern Sand Darter is also Globally Rare to Uncommon (G3). This designation is assigned to species that have between 21 to 100 occurrences worldwide, or fewer if there are large numbers of individuals in some populations. Globally rare to uncommon species may be susceptible to large-scale disturbances.

## Habitat Needs of Rare and Significant Fish of River Bend Basin/Komoka Provincial Park

Habitat needs were not researched for this report.

**Table F2: Preliminary Checklist of the Fish of Komoka Provincial Park**

Common Name	COSEWIC - OMNR	NHIC SRank	Thames River Status	Thames River Distribution
White Sucker ( <i>Catostomus commersoni</i> )		S5	Abundant	Widespread
Spottail Shiner ( <i>Cyprinella spiloptera</i> )		S4	Abundant	Widespread
Greenside Darter ( <i>Etheostoma blennioides</i> )	SC-niac	S4	Common	Widespread
Northern Hog Sucker ( <i>Hypentelium nigricans</i> )		S4	Abundant	Widespread
Mimic Shiner ( <i>Notropis volucellus</i> )		S5	Common	Widespread
Blackside Darter ( <i>Percina maculata</i> )		S4	Common	Widespread
Bluntnose Minnow ( <i>Pimephales notatus</i> )	NAR-niac	S5	Abundant	Widespread
Common Shiner ( <i>Luxilus cornutus</i> )		S5	Abundant	Widespread
Rock Bass ( <i>Ambloplites rupestris</i> )		S5	Abundant	Widespread
Johnny Darter ( <i>Etheostoma nigrum</i> )		S5	Abundant	Widespread
Smallmouth Bass ( <i>Micropterus dolomieu</i> )		S5	Abundant	Widespread
Creek Chub ( <i>Semotilus atromaculatus</i> )		S5	Abundant	Widespread
Golden Redhorse ( <i>Moxostoma erythrurum</i> )	NAR-niac	S3	Common	Widespread
Rosyface Shiner ( <i>Notropis rubellus</i> )	NAR-niac	S4	Abundant	Widespread
Longnose Dace ( <i>Rhinichthys cataractae</i> )		S5	Common	Widespread
River Chub ( <i>Nocomis micropogon</i> )	NAR-niac	S4	Common	Widespread
Striped Shiner ( <i>Luxilus chrysocephalus</i> )	NAR-niac	S3?	Common	Widespread
Quillback ( <i>Carpoides cyprinus</i> )		S4	Common	Widespread
Stonecat ( <i>Noturus flavus</i> )		S4	Common	Widespread
Central Stoneroller ( <i>Campostoma anomalum</i> )	NAR-niac	S3	Common	Locally common
Silver Redhorse ( <i>Moxostoma anisurum</i> )		S4	Uncommon	Localised
Eastern Sand Darter* ( <i>Ammocrypta pellucida</i> )	THR	S2	Uncommon	Localised
Common Carp ( <i>Cyprinus carpio</i> )		SE	Abundant	Widespread
Spottail Shiner ( <i>Notropis hudsonius</i> )		S5	Common	Widespread
Silver Shiner ( <i>Notropis photogenis</i> )	SC-niac	S2S3	Uncommon	localised
Shorthead Redhorse ( <i>Moxostoma macrolepidotum</i> )		S5	Common	Widespread
Rainbow Darter ( <i>Etheostoma caeruleum</i> )		S4	Uncommon	Localised
Freshwater Drum ( <i>Aplodinotus grunniens</i> )		S5	Uncommon	Locally common in spring
Pugnose Minnow ( <i>Opsopoeodus emiliae</i> )	SC – vul	S2	Rare	Localised
Gizzard Shad ( <i>Dorosoma cepedianum</i> )		S4	Common	Widespread in lower Thames
Least Darter ( <i>Etheostoma microperca</i> )	NAR-niac	S4	Common	Widespread
Alewife ( <i>Alosa pseudoharengus</i> )		SE	Uncommon	
Channel Catfish ( <i>Ictalurus punctatus</i> )		S4	Common	Widespread in spring
Brook Stickleback ( <i>Culaea inconstans</i> )		S5	Abundant	Widespread
Brook Silverside ( <i>Labidesthes sicculus</i> )	NAR-niac	S4	Rare	Localised
Yellow Bullhead ( <i>Ameiurus natalis</i> )		S4	Common	Widespread
Northern Redbelly Dace ( <i>Phoxinus eos</i> )		S5	Abundant	Widespread
Blacknose Dace ( <i>Rhinichthys atratulus</i> )		S5	Abundant	Widespread
Fantail Darter ( <i>Etheostoma flabellare</i> )		S4	Common	Widespread

\* According to the Association for Biodiversity Information, the Eastern Sand Darter is also Globally Rare to Uncommon (G3). This designation is assigned to species that have between 21 to 100 occurrences worldwide, or fewer if there are large numbers of individuals in some populations. Globally rare to uncommon species may be susceptible to large-scale disturbances.

## APPENDIX G:

### Invertebrates of Komoka Provincial Park

#### 1.0 Butterflies of Komoka Provincial Park

##### Introduction

Butterfly watching became popular with some members of the Mcllwraith Field Naturalists in the summer of 1996. Ann White and Gavin Platt spearheaded the collection of sightings for Middlesex County and, with Dave Martin, have produced two Middlesex County checklists since 1996. Although butterflies have not yet been systematically surveyed at Komoka Provincial Park there are enough records over a six-year period to create a fairly comprehensive preliminary butterfly checklist for the park.

Local naturalists provided trip lists from 49 visits over a six year period. The number of visits ranged from 4 to 11 per year with an average of about 8 visits per year. The visits were as early as April 10 and as late as October 12 with most visits in the June to early July period when the greatest number and diversity of butterflies are in flight. The naturalists contributing the most records were Ann White, and Dave and Winnie Wake. In the following list of trip dates the Wake records are coded DWW for Dave and Winnie Wake. The initials DM stand for Dave Martin. All other records are from Ann White, whether personal records or those reported to her as the Mcllwraith Field Naturalists' recording secretary for butterfly sightings. Dates when butterfly sightings were recorded at Komoka Provincial Park are listed below:

1996: April 16; May 23 (DWW); July 5, 6, 7 (DWW), 21 (DWW); August 8, 9, 11; (9 visits)  
1997: June 24; July 1(DWW), 6 (DWW), 15, 17, 23; October 8; (7 visits)  
1998: April 22; May 28 (DWW); June 3, 5 (DWW), 8,11; July 5,16, 17; August 5,19; (11 visits)  
1999: April 10; May 4, 20 (DWW); June 11, 19; July 4 (DWW), 17; August 5; October 12; (9 visits)  
2000: April 15; June 15; July 2 (DWW), 21, 26; August 4, 22, 26, 27; September 6; (10 visits)  
2001: April 23; July 25 (DM), 27; Sept 23 (DWW): (4 visits)

##### Butterflies of Komoka Provincial Park

Fifty-eight species of butterflies and skippers have been recorded to date. Hereafter, the term butterfly is used to signify butterflies and skippers, groups usually treated together in field guides. There is suitable habitat at Komoka Provincial Park for an additional five to ten species. And, the occasional vagrant from afar will turn up from time to time. Hence, a butterfly list for the park of about 65 species is possible. As of 2001, the Middlesex County butterfly checklist is 86 species. The current Komoka Provincial Park checklist, then, is about 67% of the Middlesex total. The only other known sites in Middlesex County that have such a high percentage of the county total are Skunk's Misery (75 species), Kilally Environmentally Sensitive Area (62 species), Dorchester Swamp (49 species) and Meadowlily Environmentally Sensitive Area (48 species). The butterflies of Komoka Provincial Park are listed in Table G2.

##### Rare and Significant Butterflies of Komoka Provincial Park

Twenty-four species (41%) of the 58 species of butterfly recorded at Komoka Provincial Park are considered rare or significant at the national, provincial or local level. The Monarch (SC) is the only species designated as at-risk by COSEWIC. No species designated as at-risk by OMNR were found at Komoka Provincial Park. Five species ranked S1 to S3 by NHIC were recorded. These include the S1 Wild Indigo Duskywing, the S2 Giant Swallowtail and Hackberry and the S2S3 Tawny Emperor and Southern Cloudywing. Four additional species, Hickory Hairstreak, Common Sootywing, Little Glassywing, and Delaware Skipper, are considered by NHIC to be somewhere between Rare to Uncommon in Ontario (S3) and Common in Ontario (S4), so they are ranked S3S4. Nineteen of the 58 species (33%) of butterfly recorded at the park are considered to be Very Rare (3 species) or Rare (16 species) in Middlesex County based on the number of sites each species has been recorded at to date by White, Platt and Martin. The rare and significant butterflies of Komoka Provincial Park are summarised in Table G1.



**Table G1: Rare and Significant Butterflies of Komoka Provincial Park**

Species	COSEWIC - OMNR	NHIC SRank	Middlesex Status	Use of Park
Monarch ( <i>Danaus plexippus</i> )	SC-niac	S4	Common	Meadows
Giant Swallowtail ( <i>Papilio cressphontes</i> )	-	S2	Rare	Woodland– Prickly Ash
Spicebush Swallowtail ( <i>Papilio troilus</i> )	-	S4	Rare	Woodlands
Harvester ( <i>Feniseca tarquinius</i> )	-	S4	Rare	Wet, shrubby edges
Edwards' Hairstreak ( <i>Satyrium edwardsii</i> )	-	S4	Very Rare	Woodland edges
Hickory Hairstreak ( <i>Satyrium caryaevorum</i> )	-	S3S4	Common	Woodland edges
Eastern Pine Elfin ( <i>Callophrys niphon</i> )	-	S5	Very rare	Conifer plantations
Variegated Fritillary ( <i>Euptoieta claudia</i> )	-	SZB	Rare	Meadows
Aphrodite Fritillary ( <i>Speyeria aphrodite</i> )	-	S5	Rare	Meadows
Silver-bordered Fritillary ( <i>Boloria selene</i> )	-	S5	Rare	Meadows
Tawny Crescent ( <i>Phyciodes batesii</i> )	-	S4	Rare	Wet meadows
Baltimore Checkerspot ( <i>Euphydryas phaeton</i> )	-	S4	Rare	Wet meadows - Turtlehead
Common Buckeye ( <i>Junonia coenia</i> )	-	SZB	Rare	Meadows
Hackberry ( <i>Asterocampa celtis</i> )	-	S2	Rare	Woodlands - Hackberry
Tawny Emperor ( <i>Asterocampa clyton</i> )	-	S2S3	Rare	Woodlands - Hackberry
Northern Pearly-Eye ( <i>Enodia anthedon</i> )	-	S4	Rare	Moist woodlands
Southern Cloudywing ( <i>Thorybes bathyllus</i> )	-	S2S3	Rare	Meadows
Northern Cloudywing ( <i>Thorybes pylades</i> )	-	S5	Rare	Meadows
Wild Indigo Duskywing ( <i>Erynnis baptisiae</i> )	-	S1	Very rare	Meadows
Common Sootywing ( <i>Pholisora catullus</i> )	-	S3S4	Uncommon	Disturbed areas with Lamb's Quarters
Tawny-edged Skipper ( <i>Polites themistocles</i> )	-	S5	Rare	Meadows
Little Glassywing ( <i>Pompeius verna</i> )	-	S3S4	Uncommon	Moist grassy areas near woods; wet meadows
Delaware Skipper ( <i>Anatrytone logan</i> )	-	S3S4	Uncommon	Dry meadows, open woodland clearings
Dun Skipper ( <i>Euphyes vestris</i> )	-	S5	Rare	Meadows

**Habitat Needs of Rare and Significant Butterflies of Komoka Provincial Park**

In this section, the habitat needs of the most sensitive and significant species are briefly given. Knowledge of habitat needs would help park managers to manage for these species. In most cases the habitat needs are not exclusive to a given species. For example, most adult butterflies nectar on a wide variety of wildflowers including introduced species of wildflowers. And so, the maintenance of wildflower meadows will fulfil the needs of butterflies. The same management strategy will also help to maintain the habitat needs for wildflowers, grassland birds and many of the small mammals, snakes and insects that use this habitat. The caterpillars (larvae) of butterflies can be very specific in their food choices. The Monarch is a good example in that its larva only eats the leaves of various milkweeds. Park managers should develop strategies to manage for adults on a macro scale (i.e., protect wildflower meadows) and for the larva on a micro-scale (i.e., protect or increase populations of the larval food plants).

**Monarch** (Special Concern in Canada)

The Monarch frequents open meadows and the adult nectars on a wide variety of wildflowers. Fall migrants are especially attracted to asters and goldenrods. The eggs are laid on various species of milkweed. When Monarchs lay their eggs on other species of plants the larva do not survive. **Management Considerations:** Maintain open habitats with milkweed species.

**Wild Indigo Duskywing** (S1, Very Rare in Middlesex)

The Wild Indigo Duskywing is a southern species that has adapted to Crown Vetch, has only recently extended its range into southern Ontario and will likely become a much more common species in Ontario given that Crown Vetch is often planted to control erosion especially along the Hwy 401 corridor. There are two site records for Middlesex County including one at Komoka Provincial Park: a single individual on June 3, 1998 by Ann White. **Management Considerations:** To sustain or increase this butterfly Crown Vetch would have to be managed for. Managing for Crown Vetch is probably not desirable in Komoka Provincial Park, however, because it is a non-native species.

**Giant Swallowtail** (S2, Rare in Middlesex)

The Giant Swallowtail was recorded only in 1997. This species spreads out from the prime breeding locations (e.g., Point Pelee, Skunk's Misery) each year after the first brood in May and June. And so, the one record may be of a wanderer searching for second brood habitat. The caterpillar eats the leaves of the Hop-tree (not present at Komoka) and Prickly Ash (scattered throughout in small numbers). **Management Considerations:** Because the caterpillar is dependent on Prickly Ash, this shrub species should be encouraged where ever possible. Hop-tree could be planted or seeded in the park as it is locally found near the Thames River in Middlesex County.

**Hackberry** (S2, Rare in Middlesex) and **Tawny Emperor** (S2S3, Rare in Middlesex)

These two species are treated together because they have almost the same habitat requirements. That is, they are woodland species whose caterpillars only eat the leaves of the Hackberry tree. Because the Hackberry is relatively common along the Thames River valley in the London area these butterflies are recorded annually from various locations. Although rare in the province, there appears to be a stronghold of them along the Thames River and the park may provide a significant local refuge. Although not recorded as present each year, their absence is more likely due to lack of observer effort (i.e., not visiting Komoka during the flight period). When encountered they can sometimes be found in good numbers. For example, Ann White recorded 23 Tawny Emperors on July 23, 1997. Given that hackberry trees are found in Komoka Provincial Park, both of these species should be considered as resident breeders in the park. **Management Considerations:** Because the larva is dependent on the leaves of hackberry trees, this tree species should be protected in the park.

**Tawny Crescent** (S4, Rare in Middlesex)

There is only one sight record (July 15, 1997) for this species at Komoka Provincial Park. Although it prefers dry boreal clearings it has also been found in damp areas in prairie-like settings. There is some apparently suitable habitat at Komoka, especially in the rehabilitating gravel pits. The one adult was found in the clearing in the tamarack swamp. The caterpillars feed on various aster species. **Management Considerations:** Maintain wet meadows where possible for this species and other grass and sedge butterflies and skippers.

**Southern Cloudywing** (S2S3, Rare in Middlesex) and **Northern Cloudywing** (Rare in Middlesex)

There is only one record for each of the two Cloudywings at Komoka Provincial Park. Adults of both species are generally seen in open areas nectaring on flowers or seeking minerals on wet mud. The caterpillars feed on various members of the bean family (Fabaceae). **Management Considerations:** Maintain open habitats for adults and larva.

**Very Rare in Middlesex Butterfly Species**

Three species of butterfly at Komoka Provincial Park are considered Very Rare in Middlesex. Wild Indigo Duskywing has been discussed above.

**Edwards' Hairstreak** (S4, Very Rare in Middlesex) and **Hickory Hairstreak** (S3S4)

Like the emperors these two species also have similar habitat needs. Both are deciduous woodland and woodland edge species. Edward's Hairstreak caterpillars feed on the leaves of Black Oak and White Oak. Hickory Hairstreak caterpillars feed on Bitternut Hickory, Butternut, Red Oak, White Ash and hawthorn sp. Adults of both species feed on a variety of wildflowers especially milkweed and White Sweet Clover. **Management Considerations:** Maintain the larval food trees where ever possible and open meadows adjacent to woodlands.

### **Eastern Pine Elfin**

The only record for this species Middlesex County is from Komoka Provincial Park by Rosemary Scott in 1998. The adult flight period is in May when most naturalists are looking for birds and not butterflies so this species may be more common and widespread than is currently known. The adults are usually active near the tops of pine trees making detection even more difficult. R. Scott found her specimen entangled in a spider web. The habitat for this species is pine woods, along woodland trails and open spaces near woods. The larval food plant is White Pine and Jack Pine needles. **Management considerations:** While there may be some discussion on removing or opening White Pine plantations some patches of this species should be maintained for this butterfly and other faunal species that use conifer plantations.

### **Rare in Middlesex Butterfly Species**

Management considerations for some of the species that are Rare in Middlesex have already been discussed in previous sections. The species not mentioned so far are discussed below with accompanying management considerations.

### **Spicebush Swallowtail**

This is an open woodland species whose caterpillars only eat leaves from Spicebush (the shrub) or Sassafras. The adults nectar on a variety of flowers, including those in meadows adjacent to woodlands. **Management considerations:** Maintain Spicebush wherever possible.

### **Harvester**

This butterfly prefers wet, shrubby habitats; especially where there are alders. Its larva is carnivorous, feeding on woolly aphids. **Management considerations:** Wet, shrubby habitats should be maintained. However, given that the most common alder present in Komoka is a non-native species removal of the alder should perhaps be given a higher priority than the protection of this butterfly.

### **Variegated Fritillary**

This species is considered to be a rare migratory stray in eastern Canada. When present, they prefer very open and sparse grassy habitats. The adults nectar on variety of flowers. **Management considerations:** Maintain open, sparse grasslands. This will also help species such as the Grasshopper Sparrow.

### **Aphrodite Fritillary and Silver-bordered Fritillary**

Both of these species are found in fields, meadows and around woodland whose larva feed on various species of violets. The adults nectar on a range of wildflowers. **Management considerations:** Maintain woodlands with strong components of violets and open wildflower meadows adjacent to woodlands.

### **Baltimore Checkerspot**

This species is so attractive that butterfly enthusiasts always keep an eye out for it and visit the known sites each year at flight time. Komoka Provincial Park has turned out to be the most consistent place in Middlesex County to find this species (5 of 6 years), produces the highest numbers of individuals (1 to 9 per year) and is the only location for this species in Middlesex County that is located on public lands. The first brood larva feed only on Turtlehead. The adults nectar on a variety of wildflowers. At Komoka Provincial Park this species is known only from the wet, open areas near the tamarack swamp. **Management Considerations:** The wet meadow near the tamarack swamp should be protected for this species not just because it is rare in Middlesex but also because this is the best known and most accessible site in Middlesex to see this species.

### **Northern Pearly-Eye**

Adults are most often found at the edge of and in the interior of woodlands. The larval food plants include various grasses including Purple Oat Grass and Reed Canary Grass. The species is often found in colonies. **Management Considerations:** Maintain woodlands with adjacent grassy, meadows.

### **Tawny-edged Skipper**

Adults are found in open grassy fields and along roadsides. The larval food plant is primarily panic grasses. **Management Considerations:** Maintain open grassy meadows.

**Table G2: Checklist of the Butterflies of Komoka Provincial Park**

Species	Middlesex Status	SRank STE	96	97	98	99	00	01
Black Swallowtail ( <i>Papilio polyxenes</i> )	Common	S5		x	x	x	x	x
Giant Swallowtail ( <i>Papilio cresphontes</i> )	Rare	S2		x				
Eastern Tiger Swallowtail ( <i>Papilio glaucus</i> )	Common	S4S5		x	x	x	x	x
Spicebush Swallowtail ( <i>Papilio troilus</i> )	Rare	S4					x	
Cabbage White ( <i>Pieris rapae</i> )	Abundant	SE	x	x	x	x	x	x
Clouded Sulphur ( <i>Colias philodice</i> )	Abundant	S5		x		x		x
Orange Sulphur ( <i>Colias eurytheme</i> )	Abundant	S5		x		x	x	x
Harvester ( <i>Feniseca tarquinius</i> )	Rare	S4					x	
American Copper ( <i>Lycaena phlaeas</i> )	Uncommon	S4	x					
Coral Hairstreak ( <i>Satyrium titus</i> )	Uncommon	S4			x	x		
Edwards' Hairstreak ( <i>Satyrium edwardsii</i> )	Very rare	S4		x				
Banded Hairstreak ( <i>Satyrium calanus</i> )	Common	S4		x				
Hickory Hairstreak ( <i>Satyrium caryaevorum</i> )	Common	S3S4	x	x				
Eastern Pine Elfin ( <i>Callophrys augustinus</i> )	Very rare	S5			x			
Eastern Tailed Blue ( <i>Callophrys niphon</i> )	Common	S5			x			
Spring Azure ( <i>Celastrina ladon</i> )	Common	S5			x	x	x	x
Summer Azure ( <i>Celastrina neglecta</i> )	Common	S5		x	x	x	x	x
Variegated Fritillary ( <i>Euptoieta claudia</i> )	Rare	SZB					x	x
Great Spangled Fritillary ( <i>Speyeria cybele</i> )	Abundant	S5	x	x	x	x	x	x
Aphrodite Fritillary ( <i>Speyeria aphrodite</i> )	Rare	S5	x					
Silver-bordered Fritillary ( <i>Boloria selene</i> )	Rare	S5		x				
Meadow Fritillary ( <i>Boloria bellona</i> )	Common	S5		x		x	x	
Silvery Checkerspot ( <i>Chlosyne nycteis</i> )	Uncommon	S4S5	x	x	x	x	x	
Tawny Crescent ( <i>Phyciodes batesii</i> )	Rare	S4		x				
Pearl Crescent ( <i>Phyciodes tharos</i> )	Abundant	S4	x	x		x	x	x
Northern Crescent ( <i>Phyciodes selenis</i> )	Abundant	S5	x	x	x		x	
Baltimore Checkerspot ( <i>Euphydryas phaeton</i> )	Rare	S4	x	x	x	x	x	
Question Mark ( <i>Polygonia interrogationis</i> )	Common	S5		x			x	x
Eastern Comma ( <i>Polygonia comma</i> )	Common	S5					x	x
Mourning Cloak ( <i>Nymphalis vau-album</i> )	Common	S5	x	x		x	x	
Red Admiral ( <i>Vanessa atalanta</i> )	Common	SZB		x	x	x	x	x
American Lady ( <i>Vanessa virginiensis</i> )	Uncommon	S5		x				x
Common Buckeye ( <i>Junonia coenia</i> )	Rare	SZB					x	
Viceroy ( <i>Limenitis arthemis</i> )	Common	S5		x	x	x	x	x
Hackberry ( <i>Asterocampa celtis</i> )	Rare	S2		x	x			x
Tawny Emperor ( <i>Asterocampa clyton</i> )	Rare	S2S3		x			x	x
Northern Pearly-Eye ( <i>Enodia anthedon</i> )	Rare	S4		x				
Little Wood Satyr ( <i>Megisto cymela</i> )	Abundant	S5	x	x	x	x	x	
Common Ringlet ( <i>Coenonympha tullia</i> )	Abundant	S5			x		x	
Common Wood-Nymph ( <i>Cercyonis pegala</i> )	Abundant	S5	x	x	x	x	x	x
Monarch ( <i>Danaus plexippus</i> )	Common	S4 - SC	x	x		x	x	x
Silver-spotted Skipper ( <i>Epargyreus clarus</i> )	Uncommon	S4	x	x	x	x	x	
Southern Cloudywing ( <i>Thorybes bathyllus</i> )	Rare	S2S3	x					
Northern Cloudywing ( <i>Thorybes pylades</i> )	Rare	S5			x			
Juvenal's Dusky Wing ( <i>Erynnis juvenalis</i> )	Uncommon	S5			x	x	x	
Wild Indigo Duskywing ( <i>Erynnis baptisiae</i> )	Very rare	S1			x			
Common Sootywing ( <i>Pholisora catullus</i> )	Uncommon	S3S4					x	
Least Skipper ( <i>Ancyloxypha numitor</i> )	Common	S5						x
European Skipper ( <i>Thymelicus lineola</i> )	Abundant	SE	x	x	x	x	x	
Peck's Skipper ( <i>Polites peckius</i> )	Common	S5	x				x	
Tawny-edged Skipper ( <i>Polites themistocles</i> )	Rare	S5						x
Long Dash ( <i>Polites mystic</i> )	Uncommon	S5				x		x
Northern Broken Dash ( <i>Wallengrenia egeremet</i> )	Uncommon	S5	x			x		x
Little Glassywing ( <i>Pompeius verna</i> )	Uncommon	S3S4	x	x				
Delaware Skipper ( <i>Anatrytone logan</i> )	Uncommon	S3S4		x	x			
Hobomok Skipper ( <i>Poanes hobomok</i> )	Common	S5			x			
Dun Skipper ( <i>Euphyes vestris</i> )	Rare	S5			x		x	x
Yearly species totals			19	33	28	24	32	24

English names, checklist order and Middlesex status is from White (2000).  
SRanks are from the NHIC List of Ontario Lepidoptera (March 2003).

## 2.0 Dragonflies and Damselflies of Komoka Provincial Park

### Introduction

Other than a few specialists, very few naturalists were interested in studying or were able to identify dragonflies and damselflies until about 1997 when generalised field guides became available. Now that field guides are more readily available, a small number of naturalists have taken up identifying the Odonata and recording their sightings. However, no formal surveys of dragonflies and damselflies (hereafter Odonata) have been carried out at Komoka Provincial Park.

### Dragonflies and Damselflies of Komoka Provincial Park

The following list (Table G3) is a very preliminary attempt to create an Odonata list for Komoka Provincial Park. The list is based on visits by Dave and Winnie Wake (July 1, 6, 1997, July 5, 1998, July 2, 2000); Dave Martin (July 25, 2001); and Ann White (July 27, 2001). The thirteen species found to date at the park are the most common and widespread of the dragonflies; in the bird world these are the equivalent of American Robin, Red-winged Blackbird, American Crow and so forth. By contrast, the Elgin County checklist (Stewart, 1995) comprises some 59 species and the Middlesex checklist (Stewart, 1995) 43 species.

### Rare and Significant Odonata of Komoka Provincial Park

COSEWIC or OMNR has not designated any of Odonata recorded to date at Komoka Provincial Park. Two species, the Halloween Pennant and Eastern Amberwing, are ranked S3 in Ontario. Not enough work has been done to date in Middlesex to determine county status.

### Habitat Needs of Rare and Significant Odonata of Komoka Provincial Park

#### Halloween Pennant (S3)

This species is most often found near ponds, gravel pits, lakes and marshes. Adults forage from the tips of tall weeds in open fields. **Management considerations:** Maintain a variety of wetlands with adjacent upland wildflower meadows.

#### Eastern Amberwing (S3)

This species prefers permanent still or slowly moving waters such as ponds, lakes, ditches, backwaters and stream pools. Adults hunt by day in adjacent upland fields and often rest on flowers such as Bird's-foot Trefoil and goldenrods. **Management considerations:** Maintain a variety of wetlands with adjacent upland wildflower meadows.

**Table G3: Preliminary Checklist of the Odonata of Komoka Provincial Park**

English Name	Latin Name	SRank	Years noted	Observer(s)
Common Green Darner	<i>Anax junius</i>	S5	2001	DM, AW
Calico Pennant	<i>Celithemis elisa</i>	S5	1997, 1998, 2001	DWW, DM
Halloween Pennant	<i>Celithemis eponina</i>	S3	2001	DM
Eastern Pondhawk	<i>Erythemis simplicicollis</i>	S5	2001	DM, AW
Dot-tailed Whiteface	<i>Leucorrhinia intacta</i>	S5	2001	DM
Widow (Pied) Skimmer	<i>Libellula luctuosa</i>	S5	2001	DM, AW
Twelve-spotted Skimmer	<i>Libellula pulchella</i>	S5	2001	DM, AW
Common Whitetail	<i>Libellula lydia</i>	S5	1997, 1998, 2000, 2001	DWW, DM, AW
Eastern Amberwing	<i>Perithemis tenera</i>	S3	2001	AW
Black Saddlebags	<i>Tramea lacerata</i>	SZB	2000, 2001	DWW, DM, AW
Cherry Meadowhawk	<i>Sympetrum internum</i>	S5	2001	AW
Ruby Meadowhawk	<i>Sympetrum rubicundulum</i>	S5	2001	AW
Ebony Jewelwing	<i>Calopteryx maculata</i>	S5	2001	AW

English names are primarily from Dunkle 2000. Checklist order, Latin names and SRank are from the NHIC List of Ontario Odonata 2003.

### 3.0 Freshwater Mussels of Komoka Provincial Park

#### Introduction

More local naturalists are becoming interested in freshwater mussels and have come to realise that the Thames and Sydenham Rivers in southwestern Ontario contain the greatest diversity of this group in Canada including several at-risk species. Nevertheless, generalised field guides are not readily available so what little is known about freshwater mussels has been collected by specialists. Even when shells are collected these are usually turned over to the specialists for confirmation of identity. While conducting fieldwork for this report in the summer of 2001, Lindsay Rodger, Gerry Waldron and John Ambrose collected various shells. Lindsay Rodger forwarded these to Daelyn Woolnough, a master's student studying freshwater mussels in the Sydenham River, for identification. Further research on mussel habitat is being conducted by the Thames River Species at Risk Recovery Team.

#### Freshwater Mussels of Komoka Provincial Park

From the various freshwater mussel shells collected by Rodger et al., four species were identified (Table G4).

#### Rare and Significant Freshwater Mussels of Komoka Provincial Park

Two of the four species of freshwater mussels collected are ranked S3 (rare to uncommon) in Ontario: the Black Sandshell and the Pink Heelsplitter.

#### Habitat Needs of Significant Freshwater Mussels of Komoka Provincial Park

No research was done for this report on the habitat needs of the freshwater mussels of Komoka Provincial Park.

**Table G4: Preliminary checklist of the Freshwater Mussels of Komoka Provincial Park**

Species	Latin name	SRank	Comments
White Heelsplitter	<i>Lasmigona complanata</i>	S4	Identified by shells
Fluted Shell	<i>Lasmigona costata</i>	S5	Identified by shells
Black Sandshell	<i>Ligumia recta</i>	S3	Identified by shells
Pink Heelsplitter	<i>Potamilus alatus</i>	S3	Identified by shells

Checklist order, English names, Latin names and SRanks are from NHIC List of Ontario Molluscs.

## APPENDIX H:

### Mammals of Komoka Provincial Park

#### Introduction

Klinkenberg (1995) stated that information on mammals in her report “is limited to that provided by OMNR Aylmer District Fish and Wildlife Staff, incidental field observation, and literature search”. While no formal surveys have been carried out, new information comes from a number of surveys dedicated to other faunal groups and from incidental sightings by naturalists and park users. Kate MacIntyre spent five days in the field in the summer of 1999 recording all fauna she encountered although the focus of her work was on finding Queen Snakes along the Thames River. Gould provided a detailed memo on his latest understanding of badger frequency and distribution in southwestern Ontario. None of the naturalists who were interviewed or provided written field notes mentioned mammals. On eight visits from April to July 2002, Dave Martin, Linda Wladarski and Pete Read made notes on mammal sightings incidental to amphibian surveys.

#### Mammals of Komoka Provincial Park

The still very preliminary mammal checklist for Komoka Provincial Park contains only fifteen species of mammals. There are at least 13 additional species of mammals for which there is apparently suitable habitat at the park. These are: Virginia Opossum; various shrew species – especially Northern Short-tailed Shrew; Star-nosed Mole and Hairy-tailed Mole; various bat species – especially Big Brown, Red and Little Brown; Red Squirrel; House Mouse; White-footed and/or Deer Mouse; jumping mouse species – especially Meadow Jumping Mouse; Coyote; and Long-tailed Weasel. It is difficult to ascertain whether the missing species are truly absent or whether they are just under-reported because they are secretive or nocturnal, not to mention that most naturalists do not generally record mammal sightings. A couple of naturalists did make a point of suggesting, though, that the apparent absence of small mammals may have something to do with the almost continuous presence of off-leash dogs along and adjacent to the hiking trails.

#### Rare and Significant Mammals of Komoka Provincial Park

Two species of mammals recorded at or near Komoka Provincial Park have been designated as a species at risk by COSEWIC but not by OMNR.

##### **Southern Flying Squirrel** (SC in Canada)

This species was designated as Vulnerable in 1988 by COSEWIC. [The category Vulnerable has since been replaced by Special Concern]. Klinkenberg (1985) included this species on her checklist but presumably because it was not designated in 1985, does not provide any details of numbers or the location of this species in the park.

##### **American Badger – jacksoni subspecies** (END in Canada)

Ron Gould, Species at Risk Biologist Aylmer OMNR, has summarised American Badger reports from the Komoka area. His email memo dated February 4, 2002 follows.

“There are several historical reports of badgers within a 15 km radius of Komoka Provincial Park. Many of these are considered to be accurate, confirmed sightings of both road-killed and live animals that have been compiled into a database of Ontario Badger Records by Don Sutherland of the Ministry of Natural Resources. A brief summary of these records is as follows: 2 records near the town of Lambeth (1978 11.4 km from Komoka PP and 1987 14.2 km from Komoka PP); 2 records near the town of Delaware (1976 and 1978, both 13.5 km from Komoka PP); 2 records east of Lobo (both in 1977, about 4.3 km from Komoka PP); and 3 records from the Caradoc Indian Reserve (1978 and 2 in 1980, 14.2 km from Komoka PP).”

Anecdotal unconfirmed reports to Ron Gould at OMNR Aylmer include a number of badgers and den entrances that were known to occur until 1998 near the corner of Colonel Talbot Road and Southdale at the Southwest edge of the city of London. These reports appear to be quite descriptive and credible. Concerned

residents called in to report that they had observed badgers on a regular basis in the area prior to the development of a large aggregate extraction operation on the property but had not seen any since, fearing badgers have been displaced as a result of related disturbance and habitat loss.

## **Habitat Needs of Significant Mammals of Komoka Provincial Park**

### **Southern Flying Squirrel**

The Southern Flying Squirrel is most often found in mature, deciduous woodland with stands of oak, hickory and maple. Mature woods provide many potential sites for breeding and roosting dens. Breeding dens are usually within 100 m of water. Home range is about 0.5 ha. A major limiting factor in Southern Flying Squirrel habitat is forest fragmentation. **Management considerations:** Maintain older woodlands with plenty of den trees and protect small, woodland streams and ephemeral ponds. Establish corridors between wooded patches where possible. The Southern Flying Squirrel is a “trademark” species for the Carolinian Canada landscape recovery plan.

### **American Badger**

In his February 4, 2002 e-mail memo Ron Gould provides information about the distribution, abundance, home range and behaviour of the American Badger that will be of assistance to park managers when considering the habitat needs of this species.

“Badgers have been known to occupy large home ranges in the Great Lakes region, some maintaining territories up to an estimated 300 to 500 square kilometres. Badgers also require areas of sandy or loamy soils not only to support their own needs for creation and maintenance of denning sites but also to support prey populations of the burrowing rodents. Native grassland areas such as prairies and savannas are particularly important to badgers as they provide the combination of a reliable and productive source of prey as well as characteristic soils to support denning and reproduction. Remnants of these rare habitats and associated linkages also act as significant wildlife corridors for badger migration and dispersal of young, promoting genetic exchange with other populations, as well as providing reliable cover for badgers during their normal travels throughout their home range.

Habitat loss and fragmentation have been the most significant cause of population decline in southern Ontario and any remaining natural corridors provide crucial migration habitat between grassland remnants, possibly helping to reduce the number of badgers killed on roads as they move within very large home ranges. Given the estimated size of badger territories, known habitat requirements and the proximity of the above records, the grasslands of Komoka Provincial Park in all likelihood represent a critical habitat for the maintenance of local (and possibly regional) badger populations in a region where inland prairie environments have become very rare. There are estimated to be less than 200 badgers remaining in the province (1999 COSEWIC Status Report) and organised multi-partner monitoring efforts are now underway in southwestern Ontario to more accurately assess population size and locations to guide future protection and recovery actions for this extremely rare mammal.”



**Table H1: Checklist of the Mammals of Komoka Provincial Park**

Species	Pre 85	85-02	SRank	COSEWIC -OMNR	Comments
Eastern Cottontail ( <i>Sylvilagus floridanus</i> )	X	X	S5		
Southern Flying Squirrel ( <i>Glaucomys volans</i> )	X		S3	SC -vul	
Woodchuck ( <i>Marmota monax</i> )	X	X	S5		
Grey Squirrel ( <i>Sciurus carolinensis</i> )	X	X	S5		
Fox Squirrel ( <i>Sciurus niger</i> )	X		SE	NAR	Introduced species –no recent records (Klinkenberg)
Eastern Chipmunk ( <i>Tamias striatus</i> )	-	X	S5		
Beaver ( <i>Castor canadensis</i> )		X	S5		
Meadow Vole ( <i>Microtus pennsylvanicus</i> )	X	X	S5		
Muskrat ( <i>Ondatra zibethicus</i> )	X	X	S5		
Red Fox ( <i>Vulpes vulpes</i> )	X		S5		
Raccoon ( <i>Procyon lotor</i> )	X	X	S5		
Striped Skunk ( <i>Mephitis mephitis</i> )	X		S5		
Mink ( <i>Mustela vison</i> )	-	X	S5		Fide Scott Gillingwater
American Badger ( <i>Taxidea taxus jacksoni</i> )	X		S2	END	
White-tailed Deer ( <i>Odocoileus virginianus</i> )	X	X	S5		

Species names, checklist order, SRanks and COSEWIC and OMNR status are derived from the NHIC List of Ontario Mammals (2003).

## APPENDIX I:

### Significant Species of Komoka Provincial Park

Summaries of significant species are included in this appendix and arranged by taxa. Many codes are used to indicate type and degree of significance. Explanations of these codes can be found in Appendix J.

**Table I1: Rare and Significant Flora of Komoka Provincial Park**

Botanical Name	Common Name	Rank	Comments	Location: ELC Code
<i>Equisetum scirpoides</i> Michx.	Dwarf Scouring Rush	R5		FOM7-1 SWM4-1
* <i>Selaginella rupestris</i> (L.) Spring	Rock Spike-moss	R1		–
<i>Asplenium platyneuron</i> (L.) Oakes ex Eaton	Ebony Spleenwort	R4		CUS1-1
* <i>Cystopteris fragilis</i> (L.) Bernh.	Fragile Fern		no other records for Middlesex Co.; probably <i>C. tenuis</i> (X) or possibly <i>C. protrusa</i> (R3S2)	–
<i>Diplazium pycnocarpon</i> (Spring.) M. Brown	Narrow-leaved Spleenwort	R1		FOD6-2
<i>Potamogeton nodosus</i> Poir.	Knotty Pondweed	R1	quarry ponds	SAS1-7
<i>Typha X glauca</i> Godron	Hybrid Cattail	R1		BBO1-3
<i>Najas flexilis</i> (Willd.) Rostkov & W. Schmidt	Bushy Naiad	R1	quarry ponds	SAS1-7
<i>Eragrostis hypnoides</i> (Lam.) B.S.P.	Tall Love Grass	R2		BBS1-2 BBO1-3
* <i>Panicum depauperatum</i> Muhlenb.	Starved Panic Grass	R1		–
<i>Carex emoryi</i> Dewey	Emory's Sedge	S3		FOM4-1
<i>Carex formosa</i> Dewey	Handsome Sedge	R4S3S4		CUS1-1
<i>Carex prairea</i> Dewey	Prairie Sedge	R3		CUS1-1
* <i>Carex schweinitzii</i> Willd.	Schweinitz's Sedge	R1S3		–
* <i>Eleocharis elliptica</i> Kunth	Elliptic Spike-rush	R4		–
<i>Heteranthera dubia</i> (Jacq.) MacMillan	Water Star-grass	R2	quarry ponds	SAS1-7
* <i>Lilium philadelphicum</i> L.	Wood Lily	R3		–
<i>Tofieldia glutinosa</i> (Michx.) Pers.	Sticky False Asphodel	[ ]	seeps along eroding banks	FOM4-1
* <i>Cypripedium acaule</i> Ait.	Stemless Lady's Slipper	R3		–
* <i>Goodyera pubescens</i> (Willd.) R. Br.	Downy Rattlesnake-plantain	R2		–
* <i>Goodyera tessellata</i> Lodd.	Checkered Rattlesnake-plantain	?	no other records for Middlesex Co	–
<i>Spiranthes lucida</i> (Eaton) Ames	Shiny ladies' Tresses	R1		CU
<i>Chenopodium capitatum</i> (L.) Aschers	Strawberry-blite	R2		BBS1-2
<i>Amaranthus tuberculatus</i> (Moq.) J.D. Sauer	Water-hemp	R4		BBS1-2 BBO1-3
<i>Ranunculus aquatilis</i> L.	White Water-crowfoot	R2	quarry pond	SAS1-7
<i>Ranunculus hispidus</i> Michx. var. <i>hispidus</i>	Hispid Buttercup	[ ] S3		FOD1-3 FOD4-2
<i>Thalictrum dasycarpum</i> Fischer & Ave-Lall.	Purple Meadow-rue	R1	taxonomically difficult to i.d.	FOD6-2
* <i>Arabis lyrata</i> L.	Lyre-leaved Rock-cress	R3		–
<i>Descurainia pinnata</i> (Walter) Britton	Pinnate Tansy-mustard	[ ]	north riverbank opposite FOM4-1	–
* <i>Drosera rotundifolia</i> L.	Round-leaved Sundew	R5		–
<i>Saxifraga virginensis</i> Michx.	Early Saxifrage	R2		FOD2-2
<i>Crataegus coccinea</i> L. (=C. <i>pedicellata</i> Sarg.)	Scarlet Hawthorn	R3		CUS1-1
<i>Geum rivale</i> L.	Water Avens	R2		CUM1-1
<i>Geum triflorum</i> Pursh	Prairie Smoke	R3	south slope of quarry berm	CU
<i>Rubus flagellaris</i> Willd.	Prickly Raspberry	R4		CUS1-1 SWC3-2
* <i>Rubus hispidus</i> L.	Swamp Dewberry	R4		-

Botanical Name	Common Name	Rank	Comments	Location: ELC Code
Rubus odoratus L.	Purple Flowering Raspberry	R4		CUS1 FOD2-2
Waldsteinia fragarioides (Michx.) Tratt.	Barren Strawberry	R4		FOD5-3
Desmodium paniculatum (L.) DC var. paniculatum	Panicked Tick-trefoil	R ?	Hydro line cut	FOD5-3
*Hypericum mutilum L.	Northern St. John's-wort	R3		-
*Viola papilionacea L.		?	Ont. reports refer to V. affinis (R2), V. cucullata (X) and V. sororia (X)	-
Shepherdia canadensis (L.) Nutt.	Soapberry	R2	on eroding slopes	FOM4-1
*Oenothera biennis L.	Common Evening-primrose	R1	taxonomically difficult to i.d.	-
*Pyrola americana Sweet	Round-leaved Pyrola	R2		-
Vaccinium myrtilloides Michx.	Velvet-leaf Blueberry	R4		SWM4-1
Fraxinus quadrangulata Michx.	Blue Ash	S3 SC vul		FOD6-2
*Menyanthes trifoliata L.	Buckbean	R5		-
Ceanothus americanus L.	New Jersey Tea	R2	Hydro line cut	FOD5-3
*Apocynum x floribundum Greene	Multi-flowered Dogbane	R3		-
*Asclepias purpurascens L.	Purple Milkweed	R1S2	A prairie species similar to several other milkweed species and possibly misidentified. Not known elsewhere in Middlesex County and is a considerable distance from other Ontario records.	FOD4-2
Verbena stricta Vent.	Hoary Vervain	R4		CUM1-1 CUS1-1 CU
*Agastache foeniculum (Pursh) Kuntze	Blue Giant Hyssop	?	Possibly misidentified or non-native. Very few southern Ontario records and no other reports from Middlesex County. If (formerly) present at Komoka, most likely not native since its native Ontario range is typically further north.	-
*Blephilia ciliata L.	Downy Wood Mint	S1	Otherwise known in Ontario only from Pelee Island and an old literature report from Walpole Island. Probably misidentified at Komoka.	FOD4-2 FOD5-3
Physostegia virginiana (L.) Benth.	False Dragonhead	R2		CUM1-1 FOM4-1
Teucrium canadense L.	Wood Germander	R3		BBS1-2
Aureolaria flava (L.) Farw.	Yellow False Foxglove	R2R3		FOD5-3
*Penstemon hirsutus (L.) Willd.	Hairy Beard-tongue	R3		-
*Scrophularia lanceolata Pursh	Lance-leaved Figwort	R1		-
*Conopholis americana (L.) Wallr.	Squawroot	R4		-
Orobanche uniflora L.	One-flowered Broom-rape	R5	widespread over the site	FOD5-3 FOD4-2 CUS1-1 SWC3-2 CUM1-1
Lobelia kalmii L.	Kalm's Lobelia	R3	on eroding slopes	FOM4-1
*Aster borealis (Torrey & Gray) Prov.	Rush Aster	R3		-
Aster umbellatus Miller	Flat-top White Aster	R5		BBO1-3
*Hieracium canadense Michx.	Canada Hawkweed	R3		-
Polymnia canadensis L.	Small-flowered Leap-cup	R3		FOD6-4
*Solidago arguta Ait.	Sharp-leaved Goldenrod	R1S3		CUS1-1
*Solidago ulmifolia L.	Elm-leaved Goldenrod	RhS1	A difficult species to identify, only known from two recent Ontario records. Probably misidentified at Komoka.	-

An asterisk (\*) denotes species recorded by R. Klinkenberg (1985) but not observed in 2001/2002.

## Fauna

The following tables summarise the rare and significant fauna of the Komoka study area. The lists included species recorded from immediately adjacent to and/or contiguous with habitat in Komoka Provincial Park. In the case of birds, the list includes visitors and migrants because the park provides significant wildlife habitat for these species (i.e., roosting, resting, feeding, predator avoidance habitat). In the case of fish the list is for the River Bend Basin which extends from Delaware to Springbank.

**Table I2: Rare and Significant Birds of Komoka Provincial Park – COSEWIC and/or OMNR designated species only**

Species	COSEWIC STE	OMNR vte	NHIC	Middlesex Status	CP Level	Use of Park
American White Pelican	NAR	end - r	S2	Accidental	-	One record: May 24-25, 1996. No breeding habitat.
Least Bittern	THR	vul	S3	Rare migrant	1	Very rare migrant at cattail margined ponds
Bald Eagle	NAR	end - r	S4	Rare migrant & winter visitor; rare breeder	-	Uncommon migrant and winter visitor. A pair attempted to breed in 2000/01 <5km W of Komoka.
Red-shouldered Hawk	SC	vul	S4	Rare migrant Occasional winter Former breeder	1	Formerly bred in woodland habitat. Rare migrant.
Golden Eagle	NAR	end - r	S1	Very rare migrant	-	Very rare fall migrant; once in last 10 years.
Peregrine Falcon	THR	end - r	S2	Very rare breeder Rare migrant	-	Very rare migrant. Not reported in past 5 years.
Northern Bobwhite	END	-	S1	Very rare breeder Likely extirpated	1	Recorded on 2 Christmas Bird Counts in late 1980s but likely now extirpated. Possible former breeder.
Black Tern	NAR	vul	S3	Very rare migrant	1	Rare migrant but not seen in last 5 years
Red-headed Woodpecker	SC	vul	S3	Declining migrant and breeder	1	Former woodland breeder but not seen in last 5 years
Cerulean Warbler	SC	vul	S3	Rare migrant Very rare breeder	1	Migrant. Woodland breeding habitat available
Louisiana Waterthrush	SC	vul	S3	Very rare migrant	1	Very rare migrant. Woodland breeding habitat available

\*Note: An additional twenty-nine S1- S3 Ranked species and thirty-three Very Rare to Rare in Middlesex species have been recorded at Komoka Provincial Park. These are listed and discussed in detail in Appendix D.

**Table I3: Rare and Significant Amphibians & Reptiles of Komoka Provincial Park**

Species	COSEWIC STE	OMNR vte	NHIC	Middlesex Status	Use of Park
Eastern Spiny Softshell	THR	thr	S3	Uncommon	River
Eastern Hognose Snake	SC	vul	S3	Rare	Upland throughout
Queen Snake	THR	thr	S2	Rare	River
Bullfrog*	-	-	S4	Rare	One pond south side
Common Map Turtle	SC	-	S3	Uncommon	River

\* indicates that the record is unconfirmed. Middlesex Status is from Oldham 1993.

**Table I4: Rare and Significant Butterflies of Komoka Provincial Park**

Species	COSEWIC STE	OMNR vte	NHIC	Middlesex Status	Use of Park
Monarch	SC	-	S4	Common	Meadows
Giant Swallowtail	-	-	S2	Rare	Woodland– Prickly Ash
Spicebush Swallowtail	-	-	S4	Rare	Woodlands
Harvester	-	-	S4	Rare	Wet, shrubby edges
Edwards' Hairstreak	-	-	S4	Very Rare	Woodland edges
Hickory Hairstreak	-	-	S3S4	Common	Woodland edges
Eastern Pine Elfin	-	-	S5	Very rare	Conifer plantations
Variiegated Fritillary	-	-	SZB	Rare	Meadows
Aphrodite Fritillary	-	-	S5	Rare	Meadows
Silver-bordered Fritillary	-	-	S5	Rare	Meadows
Tawny Crescent	-	-	S4	Rare	Wet meadows
Baltimore Checkerspot	-	-	S4	Rare	Wet meadows –Turtlehead
Common Buckeye	-	-	SZB	Rare	Meadows
Hackberry	-	-	S2	Rare	Woodlands - Hackberry
Tawny Emperor	-	-	S2S3	Rare	Woodlands-Hackberry
Northern Pearly-Eye	-	-	S4	Rare	Moist woodlands
Southern Cloudywing	-	-	S2S3	Rare	Meadows
Northern Cloudywing	-	-	S5	Rare	Meadows
Wild Indigo Duskywing	-	-	S1	Very rare	Meadows
Common Sootywing	-	-	S3S4	Uncommon	Disturbed areas with Lamb's Quarters
Tawny-edged Skipper	-	-	S5	Rare	Meadows
Little Glassywing	-	-	S3S4	Uncommon	Moist grassy areas near woods; wet meadows
Delaware Skipper	-	-	S3S4	Uncommon	Dry meadows, open woodland clearings
Dun Skipper	-	-	S5	Rare	Meadows

**Table I5: Rare and Significant Dragonflies of Komoka Provincial Park**

Species	COSEWIC STE	OMNR vte	NHIC	Middlesex Status	Use of Park
Halloween Pennant	-	-	S3	?	Ponds, gravel pits, marshes and adjacent upland meadows
Eastern Amberwing	-	-	S3	?	Ponds and adjacent upland meadows

**Table I6: Rare and Significant Freshwater Mussels of Komoka Provincial Park**

Species	COSEWIC STE	OMNR vte	NHIC	Middlesex Status	Use of Park
Black Sandshell	-	-	S3	?	River
Pink Heelsplitter	-	-	S3	?	River

**Table I7: Rare and Significant Mammals of Komoka Provincial Park**

Species	COSEWIC STE	OMNR vte	NHIC	Middlesex Status	Use of Park
Southern Flying Squirrel	SC	-	S3	?	Woodland
American Badger –jacksoni ssp	END	-	S2S3	Very rare	Woodland/ grassland

**Table I8: Rare and Significant Fish of River Bend Basin/Komoka Study Area**

Species	COSEWIC STE	OMNR vte	NHIC	Thames River Status	Thames River Distribution
Greenside Darter	SC	niac	S3	Common	Widespread
Golden Redhorse	NAR	niac	S3	Common	Widespread
Striped Shiner	NAR	-	S3?	Common	Widespread
Central Stoneroller	NAR	-	S2	Common	Locally common
Eastern Sand Darter*	THR	niac	S2	Uncommon	Localised
Silver Shiner	SC	niac	S2S3	Uncommon	Localised
Pugnose Minnow	SC	vul	S2	Rare	Localised
Brook Silverside	NAR	-	S4	Rare	Localised

\* According to the Association for Biodiversity Information, the Eastern Sand Darter is also Globally Rare to Uncommon (G3). This designation is assigned to species that have between 21 to 100 occurrences worldwide, or fewer if there are large numbers of individuals in some populations. Globally rare to uncommon species may be susceptible to large-scale disturbances.

## APPENDIX J:

### Explanation of Codes used in Tables

#### **Provincial Rank (SRANK)**

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. The most important factors considered in assigning provincial ranks are the total number of known, extant sites in Ontario, and the degree to which they are potentially or actively threatened with destruction. Other criteria include the number of known populations considered to be securely protected, the size of the various populations, and the ability of the taxon to persist at its known sites. The taxonomic distinctness of each taxon has also been considered. Hybrids, introduced species, and taxonomically dubious species, subspecies and varieties have generally not been included. By comparing ranks, the status, rarity, and the urgency of conservation needs can be ascertained. Provincial ranks have been assigned using the best available scientific information, and have been reviewed by a group of experts on the flora and fauna of Ontario. The NHIC evaluates provincial ranks on a continual basis and produces updated lists. Generally species ranked as S1-S3 are considered provincially significant. Rank ranges, e.g., S2S3, indicates that the Ontario rank is either S2 or S3, but that the information currently available is insufficient to determine which rank applies.

- S1**     **Extremely rare** in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.
- S2**     **Very rare** in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences; often susceptible to extirpation.
- S3**     **Rare to uncommon** in Ontario; usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- S4**     **Common** and apparently secure in Ontario; usually with more than 100 occurrences in the province.
- S5**     **Very common** and demonstrably secure in Ontario.
- SH**     **Historically** known from Ontario, but not verified recently (typically not recorded in the province in the last 20 years); however, suitable habitat is thought to be still present in the province and there is reasonable expectation that the species may be rediscovered.
- SR**     **Reported** for Ontario, but without persuasive documentation, which would provide a basis for either accepting or rejecting the report.
- SRF**    **Reported falsely** from Ontario.
- SX**     Apparently **extirpated** from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.
- SZN**    **Non-breeding migrants/vagrants**
- SU**     **Unranked.** SU species are possibly rare in Ontario, but there is insufficient information available to assign a more accurate rank.
- ?**       Following a rank indicates some degree of uncertainty.

### **COSEWIC Status**

Status assigned by the Committee on the Status of Endangered Wildlife in Canada.

- EXP**      **Extirpated.** Any indigenous species of fauna or flora no longer known to exist in the wild in Canada, but occurring elsewhere.
- END**      **Endangered.** Any indigenous species of fauna or flora that is threatened with imminent extinction or extirpation throughout all or a significant portion of its Canadian range.
- THR**      **Threatened.** Any indigenous species of flora or fauna that is likely to become endangered in Canada if the factors affecting its vulnerability do not become reversed.
- SC**      **Special Concern (formerly: “Vulnerable”).** Any indigenous species of fauna or flora that is particularly at risk because of low or declining numbers, occurrence at the fringe of its range or in restricted areas, or for some other reason, but is not a threatened species.
- NAR**      **Not at Risk.** A wildlife species that has been evaluated and found to be not at risk.
- DD**      **Data Deficient.** A species for which there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

### **OMNR Status**

Status assigned by the Ontario Ministry of Natural Resources. Designations made by OMNR since January 1995, based on recommendations of a Ministry technical committee called the Committee on the Status of Species at Risk in Ontario (COSSARO). Endangered species (end) and Threatened species (thr) are protected under the province’s Endangered Species Act. To differentiate OMNR designations from COSEWIC designations, in this report the OMNR designations will be written in lower case letters.

- end**      **Endangered.** Any indigenous species of fauna or flora that, on the basis of the best available scientific evidence, is indicated to be threatened with immediate extinction throughout all or a significant portion of its Ontario range.
- end – r** **Endangered – regulated.** An endangered species that has been regulated under the Ontario Endangered Species Act.
- thr**      **Threatened.** Any indigenous species of fauna or flora that, on the basis of the best available scientific evidence, is indicated to be experiencing a definite non-cyclical decline throughout all or a major portion of its Ontario range, and that is likely to become an endangered species if the factors responsible for the decline continue unabated.
- vul**      **Vulnerable.** Any indigenous species of fauna or flora that is represented in Ontario by small but relatively stable population, and/or that occurs sporadically, or in a very restricted area of Ontario, or at the fringe of its range, and that should be monitored periodically for evidence of a possible decline. Vulnerable should now be used for species formerly designated as Rare by OMNR.
- niac**      **Not In Any COSSARO Category.** Any native species evaluated by COSSARO that does not currently meet criteria for assignment to a provincial risk category.
- ind**      **Indeterminate.** Any native species for which there is insufficient scientific information on which to base a status recommendation.



## **MIDDLESEX COUNTY STATUS**

*Presence and status follows Oldham (1993) except where more recent information is available.*

- R** Native and **Rare**, based on 5 or fewer recent stations.  
**R1** **Rare**, 1 recent station.  
**R2** **Rare**, 2 recent stations.  
**R3** **Rare**, 3 recent stations.  
**R4** **Rare**, 4 recent stations.  
**R5** **Rare**, 5 recent stations,  
**Rh** **Rare**, known only from **Historic** (pre-1964) records.
- VU** Native and **Very uncommon**, based on 5 to 8 recent stations.
- U** Native and **Uncommon**, based on 9 to 15 recent stations.
- C** Native and **Common**, based on more that 15 recent stations.
- X** Native and present. Not rare, but status undetermined (i.e., could be VU, U, or C).
- I** **Introduced** and persisting outside cultivation.  
**Ir** **Introduced** and **Rare**, based on 4 or fewer recent stations.  
**Ivu** **Introduced** and **Very Uncommon**, based on 5 to 8 recent stations.  
**Iu** **Introduced** and **Uncommon**, based on 9 to 15 recent stations.  
**Ic** **Introduced** and **Common**, based on more that 15 recent stations.  
**Ih** **Introduced** and known only from **Historic** (pre-1964) records.
- ?** **Questionable** Usually a literature report for which no supporting specimen has been seen.
- [ ]** **New Record** Not previously recorded for the County. If introduced then an "I" will be within the parentheses.

## BIBLIOGRAPHY

- Couturier, A. 1999. Conservation Priorities for the Birds of Southern Ontario. Unpublished Bird Studies Canada Report.
- Delaney, K., L. Rodger, P.A. Woodliffe, G. Rhynard and P. Morris. 2000. Planting the Seed: A Guide to Establishing Prairie and Meadow Communities in Southern Ontario. Environment Canada, Downsview.
- Dunkle, S.W. 2000. Dragonflies through Binoculars. A Field Guide to Dragonflies of North America. Oxford University Press, New York, NY.
- Glassberg, J. 1999. Butterflies through Binoculars - The East: A Field Guide to the Butterflies of Eastern North America. Oxford University Press, New York, NY.
- Havinga, D. and Ontario Invasive Plant Working Group. 2000. Sustaining Biodiversity: A Strategic Plan for Managing Invasive Plants in Southern Ontario. Parks and Recreation, City of Toronto, Toronto, ON.
- Hilts, S.G. and F.S. Cook (eds.). 1982. Significant Natural Areas of Middlesex County. McIlwraith Field Naturalists and University of Guelph.
- Holmes, A.M., Q.R. Hess, R.R. Tasker and A.J. Hanks. 1991. The Ontario Butterfly Atlas. Toronto Entomologists Association, Toronto, ON.
- Jalava, J.V., P.J. Sorrill, J. Henson and K. Brodribb. 2000. The Big Picture Project: Developing a Natural Heritage Vision for Canada's Southernmost Ecological Region. Carolinian Canada, London, ON.
- Klinkenberg, R. 1985. A Reconnaissance Life Science Inventory of the Komoka Park Reserve and the Komoka Park Area of Natural and Scientific Interest. Ontario Ministry of Natural Resources, Aylmer District.
- Layberry, R.A., P.W. Hall and J.D. Lafontaine. 1998. The Butterflies of Canada. University of Toronto Press, Toronto, ON.
- Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhig and S. McMurry. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ministry of Natural Resources. SCSS Field Guide FG-02.
- Legler, K., D. Legler and D. Westover. 1998. Color Guide to Common Dragonflies of Wisconsin. Revised Edition 1998. Self-published.
- Maaskant, K., C. Quinlan and I. Taylor. 2001. The Upper Thames River Watershed Report Cards. Upper Thames River Conservation Authority, London, ON.
- MacIntyre, K. 1999. Vertebrate Life Science Report of Komoka Provincial Park. Unpublished report to Henry Valks, Superintendent Port Burwell Provincial Park.
- McIlwraith Field Naturalists. 2001. A Blueprint for Action: a Resource Strategy Guide for the Thames Talbot Land Trust, London, ON.

Newmaster, S.G., A. Lehela, P.W.C. Uhlig, S. McMurray, & M.J. Oldham. 1998. Ontario Plant List. Forest Research Information Paper No. 123, Ontario Ministry of Natural Resources, Sault Ste. Marie, ON.

Oldham, M.J. 1993. Distribution and Status of Vascular Plants of Southwestern Ontario. Ministry of Natural Resources.

Oldham, M.J. July 1993. Status of Amphibians and Reptiles in Middlesex County. Unpublished memo to Karen Pugh, Upper Thames River Conservation Authority.

Oldham, M. J. 1989. Amphibians and Reptiles of Middlesex County, Ontario: Part 1: The Amphibians. The Cardinal, 135: 18-22.

Oldham, M. J. 1989. Amphibians and Reptiles of Middlesex County, Ontario: Part 2: The Reptiles. The Cardinal, 136: 18-22

OMNR. 2001. Komoka Park Management Plan Terms of Reference. Ontario Parks, Southwest Zone, London, ON.

OMNR. 1992. Ontario Provincial Parks: Planning and Management Policies, 1992 Update. Ontario Parks, Toronto, ON.

OMNR. 2000. Significant Wildlife Habitat Technical Guide. 151 p.

Seddon, I., and A. Uscher, 2003. Komoka Provincial Park: Background Information, Issues and Options. Ontario Ministry of Natural Resources, Ontario Parks, Southwest Zone, London, ON.

Society for Ecological Restoration, Ontario Chapter. 2001. Native Plant Resource Guide, 2001-02

Stewart, W.G. 1995. Odonata (Dragonflies and Damselflies) of Elgin and Middlesex Counties, Ontario in The Cardinal No. 160. McIlwraith Field Naturalists of London, Inc.

Thames River Coordinating Committee. 2000. Thames Strategy: Managing the Thames as a Canadian Heritage River. For the Canadian Heritage Rivers Board. Upper Thames River Conservation Authority, London, ON.

Waldron, G. 2002. Canada's Carolinian Trees. Boston Mills Press, Erin, ON.

White, A. 2000. Butterflies of Middlesex County. McIlwraith Field Naturalists of London Ontario Incorporated and Upper Thames River Conservation Authority. London.

White, D.J., E. Haber and C. Keddy. 1993. Invasive Plants of Natural Habitats in Canada. Canadian Wildlife Service & Canadian Museum of Nature, Ottawa.

Woods, S.E. Jr. 1980. The Squirrels of Canada. National Museums of Canada. Ottawa.

Contacts for the Fauna records:

Caveney, Anita and Stan. The Caveney's forwarded a list of species they found on May 18, 2002 and a trip list for a McIlwraith Field Naturalists field trip on May 22, 2002.

Gillingwater, Scott, pers. comm. February 7, 2002. Scott mentioned that during turtle surveys mink were found along the Thames River.

Gould, Ron, e-mail memo February 4, 2002 on the status and abundance of the American Badger in the Komoka area.

McIntyre, Kate, pers. comm. January 31, 2002. Kate asserted that the Bullfrog, which was on her Vertebrate List (1999), was not a confirmed identity.

Read, Pete, memos, December 2001. Pete Read summarized all the information he had on birds at Komoka Provincial Park in three draft memos: 1) a checklist of birds from 3 time periods; 2) the status of birds in Middlesex County and at Komoka Provincial Park; 3) comments and suggestions about the various bird habitats at Komoka Provincial Park.

Rodger, Lindsay, e-mail dated September 18, 2001 with list of mussels collected.

Schwindt, John, e-mail dated October 23, 2001 with the fish list that is included in Appendix I.

Wake, Winnie and Dave, unpublished field notes from 1993 to 2001 visits to Komoka Provincial Park (butterflies, dragonflies and damselflies, birds, and plants).

White, Ann. Ann White forwarded various trip lists via email and on butterfly checklists from her trips to Komoka Provincial Park going back to 1995.

**APPENDED MAP:**

**Ecological Land Classification (ELC) Vegetation Communities**



# Komoka

## Map 1: Ecological Land Classification (ELC) Vegetation Communities

### Legend

ELC Community Polygons

ELC Code Code Description

#### Riparian

- BBO1-3 Reed-canary grass mineral open beach type
- BBS1-2 Willow gravel shrub beach type
- BBT1 Mineral treed beach/bar ecosite

#### Marsh and Meadow

- CU Cultural
- CUM Cultural meadow
- CUM1-1 Dry-moist old field meadow type
- CUS1 Mineral cultural savannah ecosite (black walnut)
- CUS1-1 Hawthorn cultural savannah type
- CUT1-1 Sumac cultural thicket type
- MAM3-8 Jewelweed organic meadow marsh type
- MAM3-9 Forb organic meadow marsh type
- SAS1-7 Water stargrass submerged shallow aquatic type

#### Forests

- CUP2-1 Black walnut-white pine mixed plantation type
- CUP3-2 White pine coniferous plantation type
- FOC2-2 Dry-fresh white cedar coniferous forest type
- FOC3-1 Fresh-moist hemlock coniferous forest type
- FOC4-1 Fresh-moist white cedar coniferous forest type
- FOD1-3 Dry-fresh black oak deciduous forest type
- FOD2-2 Dry-fresh oak-hickory deciduous forest type
- FOD3-1 Dry-fresh poplar deciduous forest type
- FOD4-2 Dry-fresh white ash deciduous forest type
- FOD5-3 Dry-fresh sugar maple-oak deciduous forest type
- FOD5-8 Dry-fresh sugar maple-white ash deciduous forest type
- FOD6-2 Fresh-moist sugar maple-black maple deciduous forest type
- FOD6-4 Fresh-moist sugar maple-white elm deciduous forest type
- FOM4-1 Dry-fresh white cedar-white birch mixed forest type
- FOM7-1 Fresh-moist white cedar-sugar maple mixed forest type
- FOM7-2 Fresh-moist white cedar-hardwood mixed forest type
- SWC3-2 White cedar-conifer organic coniferous swamp type
- SWD6-1 Red maple organic deciduous swamp type
- SWM4-1 White cedar hardwood organic mixed swamp type

\* Lower case suffixes identify individual vegetation communities as contained in Appendix B: Ecological Land Classification (ELC) Community Description of Komoka Provincial Park.

Produced by Ontario Parks, Southwest Zone.  
Copyright 2003, Queen's Printer for Ontario.

This map is for illustrative purposes only. Do not rely on it as being a precise indicator of routes, locations or features nor as a guide to navigation.



400 0 400 Metres

