

# **Recommended Best Practices Regarding Natural Heritage Protection in the County of Peterborough**

By: Korey Walker

A Masters Report submitted in conformity to the requirements for the degree of  
Master of Urban and Regional Planning

School of Urban and Regional Planning  
Queen's University  
Kingston, Ontario  
2012

Copyright © Korey Walker, 2012

## **Executive Summary**

Natural heritage protection and proper lake planning is of great importance for the County of Peterborough and the province of Ontario. From significant wetlands to significant habitat of endangered and threatened species, natural heritage features provide important environmental and social values, as they are a legacy of the natural landscape (NHRM, 2010). Much of these resources found across southern and eastern Ontario have been lost, which makes the protection of the natural heritage features in the County of Peterborough even more imperative.

An important way to protect the natural environment from incompatible uses and development is through Official Plan (OP) policy and zoning. OPs set out the broad goals, objectives and policies of a municipality, and outlines in schedules each land use designation found within the political boundaries; such as open space, residential, industrial etc. An OPs authority is detailed in the Planning Act. A planning authority also develops a zoning by-law to accompany the OP. A zoning by-law is a legal document that also receives its power under the Planning Act. A zoning by-law accurately breaks down what type of land uses are permitted and how future development will proceed. These two documents work together to guide future growth and are able to protect natural features if desired, especially in lake regions.

The County of Peterborough OP review will be taking place in the summer of 2013. The purpose of this report is to provide a list of recommended best practices for natural heritage and lake planning to the County of Peterborough to consider during the OP review process. The objectives of this research project are:

1. To develop an inventory of initiatives other municipalities are implementing to protect natural heritage features and lakes.

2. Provide the County of Peterborough a tailored list of possible short term and long term recommendations regarding natural heritage planning and lake planning to consider during the OP review process.

*Methods:*

Four research methods were used in this report. These methods were used to gather as much relevant information as possible on the District of Muskoka and the lower tier municipalities of Gravenhurst and Bracebridge, the City of Kawartha Lakes, Parks Canada and the local municipalities of North Grenville and Rideau Lakes, the Region of Waterloo and the lower tier municipality of Cambridge, and the Oak Ridges Moraine Conservation Plan (ORMCP). First, a literature review of existing materials was conducted, focusing on basic concepts of natural heritage systems, provincial policy and academic literature on natural heritage planning and lake planning. Second, a comprehensive examination of all case study location OPs or OP equivalents was performed (such as the ORMCP and the Rideau Canal National Historic Site Management Plan). This document review focused on locating possible best practice initiatives moving forward. The documents were examined for any policy and general information on natural heritage system and lake planning issues. Next, interviews were conducted with the municipalities listed. Twenty-four questions regarding environmental protection policies, implementation and, the use of science were answered by participants. Finally, two information sharing sessions were held to discuss findings and to present the results. The sessions allowed for clear dialogue between stakeholders.

*Results:*

Overall, the County of Peterborough is doing well with regards to protecting natural heritage features and its area lakes according to current OP policy. With that said, document

analysis and interviews revealed that there are many interesting options to consider when updating the OP in 2013. One gap in the County of Peterborough OP relates to shoreline protection. Addressing shoreline development will be a challenge, but information collected from case study locations offers interesting techniques to mitigate impacts. Also, many issues fall within the jurisdiction of the province. Aggregate extraction, fish and wildlife habitat, provincially significant wetlands and species at risk are all protected by provincial and sometime federal legislation. The County can look for ways to strengthen these policies at the local level if political will exists, but for the most part, most municipalities are following the guidelines presented to them. The work the County is doing with fellow stakeholders is encouraging and seems to be the norm across most case study locations. Below is a summary of the short term, long term and supporting recommendations proposed based on the strengths and weaknesses of the current County of Peterborough OP.

*Recommendations:*

Short Term

1. Restrict boathouse height to one storey. Do not allow boathouses to be used for human habitation. (See Section 4.11)
2. Develop a “sliding scale” development policy for all new developments wishing to build along the shoreline. The closer to the water, the smaller the structure and vice versa. (See Section 4.9)
3. Create a policy that restricts resource extraction within at least 200m of all water bodies. (See Section 4.2)

4. Consider developing a policy that requires a 20m shoreline buffer between the high water mark and development. The 20m buffer shall be in 75% of its natural state. (See Section 4.4.4)
5. Protect all wetlands by giving every known wetland locally significant status if it does not already have it. (See Section 4.4.1)
6. Encourage area municipalities to develop a septic re-inspection program. This could be funded through an annual property tax. (See Section 4.8)

#### Long Term

7. Write a Peterborough Cultural Heritage Study and County of Peterborough Significant Landscape Heritage Study. (See Section 4.5)
8. Establish all waterfront sites as site plan control areas. (See Section 4.2)
9. Implement the findings of *The Kawarthas, Naturally Connected* project now being conducted. This project is identifying natural heritage features across the County of Peterborough and City of Kawartha Lakes. (See Section 4.6)

#### Supporting

10. Fund and develop a County of Peterborough Water Strategy, similar to the one used by the District of Muskoka. (See Section 4.1)
11. Work to develop a County of Peterborough EAC to work with lower-tier EACs and the County. (See Section 4.10)

## **Acknowledgements**

I would first like to thank Bryan Weir, Roz Moore, Rob Little, Jasmine Gibson, and Stephen Bocking for their support and input during the entire project; even if we did get stranded in the middle of Clear Lake. You all helped make this project an enjoyable one.

At this time I wish to also thank my supervisor Dr. Graham Whitelaw. Graham's patience and thoroughness allowed for a product that I am truly proud of. His professionalism and attention to detail goes unmatched.

I would like to also thank my wonderful parents for all of their support. My entire university career you have been there for me no matter the situation, thank-you. Another important thank-you goes to Sarah Wallace. She has been a wonderful partner and motivator during our entire time together.

Finally, this project has been an important part of my life over the past year and I hope everyone can take pleasure in the final product!

## Table of Contents

<b>Executive Summary</b> .....	<b>i</b>
<b>Acknowledgements</b> .....	<b>v</b>
<b>Table of Contents</b> .....	<b>v</b>
<b>Chapter 1 - Introduction</b> .....	<b>1</b>
1.1 - Statement of the General Problem.....	1
1.2 - The Planning Questions to be addressed .....	1
1.3 - The Scope of Work.....	2
1.4 - Precedents .....	3
<b>Chapter 2 - Methodology</b> .....	<b>6</b>
<b>Chapter 3 - Literature Review</b> .....	<b>9</b>
3.1 - Land Use Planning Theory and Practice.....	10
3.2 - Conception Through Environmentally Sensitive Areas (ESA) Planning .....	13
3.3 - Main Components of Natural Heritage Planning.....	14
3.4 - Lake Planning and How it is Implemented.....	17
3.5 - Lakeshore Capacity Planning .....	19
3.6 - Relevant Legislation and Policies .....	20
3.7 - Stewardship .....	22
<b>Chapter 4 - Analysis</b> .....	<b>24</b>
4.1 - Environmental Protection Policies: Water Quality .....	24
4.2 - Natural Shorelines.....	26
4.3 - Lake Capacity .....	29
4.4 - Provincially Regulated Environmental Protection Policies .....	31
4.4.1 - Wetlands .....	31
4.4.2 - Fish and Wildlife Habitat.....	32
4.4.3 - SAR Habitat .....	33
4.4.4 - Resource Extraction .....	34
4.5 - Viewscapes and Cultural Sites .....	35
4.6 - Implementation Tools: Natural Heritage .....	38
4.7 - Official Plan Designations and Zoning By-Laws.....	39
4.8 - Septic Re-Inspection .....	41

4.9 - Redevelopment and Building on Footprints .....	43
4.10 - Environmental Advisory Committees and Stewardship .....	45
4.11 - Boathouses.....	48
4.12 - Enforcement and Minor Variances .....	49
<b>Chapter 5 - Role of Science .....</b>	<b>52</b>
5.1 - Findings .....	53
<b>Chapter 6 - Conclusion and Recommendations .....</b>	<b>61</b>
6.1 -Short-Term.....	61
6.2 - Long-Term .....	63
6.3 - Supporting.....	64
<b>Appendix A - Environmental Protection Policies .....</b>	<b>66</b>
7.1 - Water Quality.....	66
7.2 - Natural Shorelines.....	69
7.3 - Species at Risk.....	71
7.4 - Fish Habitat .....	72
7.5 - Wildlife Habitat .....	73
7.6 - Resource Extraction .....	75
7.7 - Viewscapes and Cultural Sites .....	77
7.8 - Wetlands.....	77
<b>Appendix B - Implementation Tools .....</b>	<b>81</b>
8.1 - Official Plan Designations and Policies .....	81
8.2 - Lake Capacity .....	82
8.3 - Future Residential and Commercial Development.....	83
8.4 - Septic Re-Inspection .....	84
8.5 - Environmental Advisory Committees .....	86
8.6 - By-Law Enforcement.....	87
8.7 - Stewardship .....	88
8.8 - Boathouses .....	89
8.9 - Building on Footprints.....	90
8.10 - Minor Variances .....	91
<b>Appendix C: Interview Questions .....</b>	<b>92</b>
<b>Appendix D: CD of OPs and Relevant Documentation.....</b>	<b>94</b>



References ..... 95

## Chapter 1 - Introduction

### 1.1 – The Issue

Planning for lakes and their respective natural heritage features sometimes leads policy makers, planners, academics and local citizens to work together in an attempt to conserve our natural environment (Ramy, 2010). Unfortunately, Ontario lakes are not immune from development pressures and changes to water quality (Hall and Smol 1996; Hendry and Leggatt 1982). Proper lake planning at the local level has the ability to mitigate and protect Ontario's water resources into the future (FOCA 2009).

Stakeholders involved with the planning and management of Clear, Stony and White Lakes are interested in exploring **best lake plan and management practices** from across Ontario for application in their watershed.

### 1.2 - The Planning Problem to be Addressed:

There have been different approaches to lake planning and natural heritage systems (NHS) planning throughout Ontario. This is evident when examining different lake plans and official plans (OPs) produced by planning authorities, within the southern Ontario context. Examples close to home include the Clear, Stony and White Lake Plan and the County of Peterborough OP. With that said, many different factors are at play for every plan, including: hydrology, lake depth, lake size, sedimentation, lake recreation and seasonal and full time residential development. Understanding why certain initiatives and policies elsewhere in the Province were put in place will be imperative in an attempt to inform planning for Clear, Stony and White Lake as the County of Peterborough moves towards its OP Review. **Specifically, this report aims to recommend to The Environmental Council for Clear, Stony and White Lakes and the County of Peterborough Planning Department a comprehensive list of best**

**practices from selected case studies regarding the implementation of successful lake planning and NHS planning techniques.** The project was funded through the Social Sciences and Humanities Research Council and is supported by The Environmental Council for Clear, Stony and White Lakes, working in partnership with the County of Peterborough Planning Department.

### 1.3 - The Scope of Work:

This study focuses on offering lake planning best practices and policy recommendations for increased environmental protection of Clear, Stony and White Lakes. The study area is located North-East of the City of Peterborough in South-Central Ontario (Figure Y). The research project took eleven months to complete (September 2011- July 2012), with the final product being submitted to The Environmental Council for Clear, Stony and White Lakes in early July.

Information was collected using multiple sources. First, a significant amount of the material collected was from grey literature. This included lake plans, OPs and other government guidance documents produced by stakeholders within each of the case study locations. Policy documents were also analyzed with respect to planning implications for the Clear, Stony and White Lakes area. Second, a literature review was completed based on mainly peer-reviewed academic sources - for the purpose of creating a set of criteria to judge the environmental protection policies within each case. Lastly, information was also collected from interviews with planners from each case study and the OMNR.

The case studies that were examined included: i. District of Muskoka and the lower tier municipalities of Gravenhurst and Bracebridge, ii. City of Kawartha Lakes, iii. Rideau Canal/Parks Canada and the two local municipalities of Rideau Lakes and the North Grenville,

iv. Region of Waterloo and the local municipality of Cambridge, and v. the Oak Ridge's Moraine Conservation Plan.

#### 1.4 - Precedents

Below is a list of important sources regarding lake planning, environmental protection measures and NHS planning. This section of the report focuses on key academic sources and past SURP work on the subject. Where possible, the sources have been provided on a CD (Appendix D).

It is first imperative to mention relevant government documents and general guidance documents. The *Lakeshore Capacity Assessment Handbook* (2007) was produced to protect water quality of Ontario's Precambrian Shield lakes. This document describes how much development can take place on the shorelines of a Precambrian Shield lake without there being an impact on water quality. This document was used to assess the areas of Stony Lake that are deemed part of the Precambrian Shield, both Clear and White Lakes lie south of the Shield (CSW Lakes Plan, 2008). MNR's Natural Heritage Reference Manual (2010) provides guidance regarding the development and use of Ontario's natural heritage in recognition of the Provincial Policy Statement. This document has heavily influenced the recommendations that have been put forth in this report. The Federation of Ontario Cottagers Associations, *Lake Planning Handbook for Community Groups* (2009) provides overall guidance in respect to putting together a proper lake plan. The value in this document came when examining the grey literature obtained from the selected case studies during the document analysis part of the project.

Academic sources and professional reports from the sciences were used to develop criteria for evaluating case study documentation and informing recommendations. For example, Hendry and Leggatt (1982) and Hall and Smol (1996) discuss the impacts of cottage shoreline

development on water quality. Both studies use lakes from south and south-central Ontario and these studies were used to help guide interview questions. The issue of natural shorelines and shorelands is important as it relates to wildlife and fish habitat. The *Shoreland Classification Survey Manual* (2003) addresses why shoreland restoration is desired. The *Fill Quality Guide and Good Management Practices For Shore Infilling in Ontario* (2011), looks at best management practices of shoreline alteration for the purpose of creating structures and enhancing or creating aquatic habitat. This information is also closely tied to water quality literature, pertinent to this research. In reference to protection of important habitat, Fahrig (2003) and Bennett (2003) offer compelling evidence that planning must address habitat connectivity. Fahrig (2003) writes on the importance of biodiversity noting that there are 40 different measures of habitat fragmentation. Bennett (2003) also writes on the importance of linkages and his evaluation criteria to judge linkage quality was an important resource. The information discussed above is a good sample of some of the important literature on work that addresses relevant subject matter.

Notable Queen's School of Urban and Regional planning reports include Hendren (2009), Spang (2009) and Ramey (2010). Hendren (2009) addressed landscape character assessment (LCA) toward improving lake planning. Interestingly, Hendren uses Clear, Stony and White Lakes as his case study. Hendren reviewed academic literature and grey literature to assess the value of LCA to lake planning initiatives. Although the model Hendren used was not directly applicable to my research, the academic and grey literature used helped direct my literature review and informed my evaluation criteria. Spang (2009) wrote on community-based lake planning in the cottage regions of Ontario. Her work largely focused on providing recommendations for lake planning organizations as they look to improve plans in the future.

Spang used William C. Baer's (1997) plan evaluation method, which is not directly applicable to my study. Spang raised many good points in the recommendations section of her report, which was consulted when developing my own recommendations. Lastly, Ramey (2010) looks at the intersection of science and conservation planning in her Master's thesis. Ramey's document acts as the greatest precedent to my work, largely because of content and research methods. Ramey employed a triangulation approach to collecting information, with the components being a literature review, document analysis and semi-structured interviews. It is largely Ramey's approach to understanding the production of stewardship science that was of interest.

## **Chapter 2 – Methodology**

Four methods were implemented during the course of this research project. This approach was comprised of an extensive literature review of existing material, long interviews, document analysis and two information dissemination feedback sessions.

First an extensive literature review was completed. As mentioned above, the majority of information collected was academic sources, OPs and guidance documents. The academic sources were used to better understand the theory associated with this research project, while the guidance documents such as the products authored by MOE and OMNR were used as reference tools for evaluating case studies. Finally, the OPs were evaluated as a part of case study document analysis.

The long interview technique was used to guide the interviews. This research method takes part between a single respondent and the investigator and is designed to give the investigator an efficient and stream-lined instrument of inquiry (McCrackin, 1988). Much like a semi-structured interview, the long-interview calls for a special kind of structure and preparation so the investigator can maximize time spent with the respondent. An open-ended questionnaire for example is a good tool (McCrackin, 1988). Furthermore, McCrackin (1988) writes of the advantages to using general and nondirective questions and that it is in the investigators interest to look for prompts during the interview in order to get more information out of the respondent.

McCrackin's four-step method of inquiry guided the interviews. The first step was to conduct an exhaustive literature review, which is its own method type in this report, as described above. The second step was to familiarize and defamiliarize oneself with the topic. This allows the investigator to listen acutely and to establish distance from embedded assumptions. The third step was to draft carefully constructed questions and to listen to things such as assumptions and

impressions while interviewing. Lastly, and with the help of an audio recording device, a summary of each interview was created and used to help develop best practice recommendations. Also, Merriam (2009) provides a method of “open coding,” where applicable themes are highlighted and recorded from interviews. To summarize patterns, themes were sorted into analytical codes (Merriam 2009). It should be noted that all participants were informed of the research project to the fullest extent (via informed consent) and that they had the option to withdraw from the interview and study at any time. Interviews with planners from the Township of Gravenhurst, Township of Bracebridge, Township of Rideau Lakes, Township of North Grenville, City of Waterloo, City of Cambridge, District of Muskoka and two with MNR staff were held. Interviews with planners from the City of Kawartha Lakes, Parks Canada and the Region of Waterloo were not possible due to resource constraints.

Document analysis was the final research method used. Analyzing case study OPs and reports collected was the focus of this research method. Yin’s (2009) three principles of data collection are most important. First, using multiple sources of evidence to critique each case study was imperative. This includes collecting and reviewing all applicable documentation and comparing it to other reports and information from the literature review. This comparison was carried out by creating two sets of criteria, one set focused on environmental protection and the other on implementation tools. The criteria were extracted from existing planning documentation (See Appendix A and B). Second, creating a case study database proved to be important as a significant amount of material was examined. Lastly, maintaining a chain of evidence with regards to case study literature and interview transcripts increased the reliability of information. A chain of evidence involves creating large spreadsheets in matrix form that summarized information gathered. This certainly helped in quick examination of material.



Data from OPs and phone interviews was evaluated and sorted by creating electronic spreadsheets in the form of a matrix. Noble (2010) argues that matrices are a useful way to gather information and provide a quick visual aid in the form of information summaries (Noble, 2010). The matrix design used in this report was developed based on the environmental protection policies and implementation tools that were developed through interview and document analysis carried out at the beginning of the project. Information gathered that satisfied both a specific environmental protection policy and an implementation tool would go into the column of the matrix where the policy and tool meet. This method of data collection allows for simple collection of information and also shows where there are gaps in knowledge. Please refer to Appendix D to see the Best Practices spreadsheet and the Role of Science spreadsheet. Appendix D is a CD that contains many important references.

Two information sharing sessions were held to discuss case study findings and to review best practices. Information was collected from the sessions pertaining to opinions and expertise from participants. The sessions were used as forums to vet information and seek advice on further areas of research.

Information from academic sources and some grey literature was collected from online databases and publicly accessible websites, an example being the *Kawarthas, Naturally Connected* website. Municipal and provincial websites provided some documentation also, including the websites of the City of Cambridge and County of Peterborough among others. Additional documentation not available on websites was requested from municipal departments by phone. For interviewing purposes, planners were contacted from the case study locations via phone or e-mail.

### **Chapter 3 - Literature Review**

Planning departments can use OPs, zoning by-laws and site plan control as ways to influence future development and to protect the unique character of a municipality. A brief discussion of each is presented below.

An OP is created by a municipality and is used to guide future land use decision making. The City of Oshawa defines an OP as “an Official Plan is a statutory document which sets out the land use policy directions for long-term growth and development in a municipality” (City of Oshawa, 2012). It is important to note that this definition mentions that an OP sets out policy, not law. The purpose of an OP is to set out the broad policy goals and objectives that the municipality would like to work towards for the next 10, 15 or 20 years. An OP sees its strength largely in guiding the creation of a zoning by-law.

Zoning by-laws are most commonly developed in conjunction with OPs. The City of London defines zoning by-laws as they relate to OPs.

“Zoning by-laws establish and regulate the use of land by implementing the policies of a city's Official Plan. They provide cities with a way to co-ordinate land uses, protect areas by preventing incompatible uses, and establish appropriate standards for development (City of London).”

Furthermore, Hodge and Gordon (2010) argue that zoning essentially deals with three things:

- 1) The use of a land parcel
- 2) The parcel coverage by structures
- 3) Building height

Zoning in this sense guides the vision of the municipal planning department and strongly influences all new land use. Zoning by-laws are enforced by a by-law enforcement officer.

Site plan control is another tool used by municipalities in properly maintaining the integrity and character of their community. Site plan control is often used as a way to affect the look and shape of development beyond what the zoning by-law calls for. Site plan control and approval is enabled under the Planning Act and is a development review process which seeks to mitigate the impacts of development. The Township of Lanark Highlands notes the difference between site plan control by-laws and zoning by-laws. Site plan control will be applied “over and above those set out in the zoning by-laws” (Township of Lanark Highlands, 2012). For example, maintaining developments as council intended, ensuring new developments meet certain standards of appearance and quality and, ensuring adequate landscaping, parking and drainage, are just some of the ways site plan control influences built form (Township of Lanark Highlands, 2012).

### 3.1 - Land Use Planning Theory & Practice

Land use planning practice should is largely influenced by planning theory. The following is a brief discussion of rational, advocacy and collaborative planning theory and its relevance to lake planning.

Rational planning or “rational comprehensive planning” (RCP) was widely used in the 1950s and 60s and is still applied today. RCP has its roots in the policy analysis and social reform traditions of planning (Friedmann, 1987). Faludi (1982) saw planning as a way to apply rationality or reason to human affairs. As such, RCP can be seen as a procedure. For example, this procedure involves surveys to gather data, followed by analysis, and a preparation of a master plan as the final product. Issues and problems are examined, solutions identified and the best alternative is selected. Forester (1987) criticizes RCP though because of the assumption that there needs to be full information on the subject environment, alternatives, and values of citizens.

RCP is relevant today as municipal land use planning demonstrates many of the characteristics of RCP theory. The municipal level of government plays the most direct role with regards to implementing planning goals in Ontario. Through the creation of OPs, that are consistent with the Planning Act, the Provincial Policy Statement and other relevant policies and guidance documentation, municipalities are able to guide sustainable and environmentally sensitive development within their jurisdictions. Zoning by-laws then act as an extension of the OP and inform planners about proper land use development. Secondary plans and municipal programs help to further push the local planning agenda within a municipality. All of these tools are critical to proper lake planning and management.

Lachapelle (2003) speaks to the increasingly messy world in which we live and critiques the RCP because it can function poorly leading to public dissatisfaction. Planning has evolved to become a much more complicated process in the last 50 years, and other planning theories have garnered attention and greater influence in practice. As a response to RCP, advocacy planning emerged in the 1960s. Advocacy planning has its roots in the social mobilization tradition of planning. An instrumental thinker in the field is Davidoff. Davidoff (1965) called for planners to be advocates and to engage the political process in the interest of both individuals and governmental organizations that are concerned with proposing policies for future development. Hudson (1979) refers to advocacy planning as a way to defend the weak from the strong (Hudson, 1979). Essentially, making sure the planning process is undertaken in a fair and inclusive way is the aim of advocacy planning. Lake planning is expressed through both formal processes involving municipal land use planning, preparation of OPs and approval of development permits. This type of planning reflects RCP. Lake planning also takes the form of

local lake associations preparing lake plans (Buck Lake Association, 2011, Greater Bobs and Crow, 2007).

Collaborative planning is informal and reflects the ideas put forward through advocacy planning theory. Collaborative planning is the key component of land use and resource management processes and has its roots in the social learning tradition (Tewdwy-Jones and Allmendinger, 1988). Tewdwy-Jones and Allmendinger (1998) speak to the importance of language in Habermas' theory of communicative action and argue it is central to consensus and action. It is at this point when power and self interest can be neutralized. Moreover, communicative action requires at least two participants to engage in interpersonal dialogue to reach a common understanding on future action. Healey is another important thinker who has written on collaborative planning. Healey (2003) notes that wider economic, social and environmental forces shape the planning process. These forces do not necessarily determine the qualities of place, rather collaborative processes can emerge based on human agency and contribute to the qualities of place. In addition, Margerum (2002) notes that collaborative planning is a partnership between government, major sectors of the community, interest groups, and the public. These stakeholders work toward consensus on planning issues. Finally, McGuirk (2001) insists that a planner is a facilitator or critical friend that must deal with misinformation. It is to this end that collaborative planners must assess all information and stakeholders during the course of his/her research in an attempt to develop the most equitable and far-reaching plan possible. In many cases, lake associations work through collaborative planning processes to influence formal municipal land use planning processes to have their values and policies implemented.

### 3.2 - Environmentally Sensitive Areas (ESA) Planning

With the RCP process in the early 1980s, ESA planning emerged as a way to plan and manage environmentally sensitive areas on private lands. ESA planning preceded NHS planning. Jennings and Reganold (1991) write that ESAs are landscape elements or places that are vital for the long-term vitality of an areas biodiversity, water, soil or other natural resources that are found both on the site and in a regional context. ESAs include wildlife habitat, riparian areas, prime agricultural areas and wetlands (Ndubisi et al., 1995). Inclusion of ESAs in OPs is an exclusionary process. Areas such as groundwater recharge areas and areas of highly erodible soils are among the areas a municipality can designate (Ahern, 1991).

An instrumental thinker as it relates to ESA planning is Paul Eagles. In his 1984 work, *The Planning and Management of Environmentally Sensitive Areas*, Eagles argues that there are two basic reasons to protect ESAs. The first has to do with utilitarian reasons, whereby ESAs contain products and processes that are useful to mankind both in the present and in the future. This is also known as the “resource bank” argument. The second motive to protect environmentally significant lands argued by Eagles relates to altruistic and moralistic reasons. This is the idea that nature has a right to live on this Earth, or “deserves to survive because it is (Eagles 1984, p.3).”

The planning focus moved from areas of special concern, to also include planning for corridors and linked networks of land during the 1990s. Ndubisi et al. (1995) indicated: “when ESAs are interconnected, they could serve as greenway corridors consisting of networks of linked landscape elements that provide ecological, recreational and cultural benefits to a community.” Furthermore, Ndubisi et al. go on to argue that the processes which municipalities

use to protect ESAs can serve as a tool for managing and locating greenways. Specifically, Eagle's (1984) "resource bank" argument correlates nicely with NHS planning ideas. The development and implementation of the concepts around ESAs provided the foundation for NHS planning practiced today in Southern Ontario.

### 3.3 - Main Components of Natural Heritage Planning

There has been a growing number of scholars writing on topics associated with NHS planning in the past 20 years (Fahrig, 2003; Forman and Godron, 1986). Important contributions have been made by Lenore Fahrig. Fahrig's work often focused on the harmful effects of habitat fragmentation on species biodiversity. She writes that:

The fragmentation literature provides strong evidence that habitat loss has large, consistently negative effects on biodiversity. This implies that the most important question for biodiversity conservation is probably "How much habitat is enough?" Different species use different kinds of habitat, and different species require different amounts of habitat for persistence (Fahrig, 2003, p. 509).

Cores and corridors play an important role in NHS planning and a fundamental understanding of the two is vital, especially as it relates to habitat fragmentation. A core area (or ecological node) provides habitat to a wide range of wildlife and plant species. They should be large enough to provide wildlife species with the 'essentials' of life, including food, shelter and water. Core habitats will vary in size and characteristics; and should reflect the diversity of habitats that are native to an area (Ontario Nature). Moreover, Corridors connect separate core natural areas (Ontario Nature). In other words, they serve as a "linear linkage" between large habitat blocks (Forman and Godron, 1986). The two work together to form NHSs as we know them today.

Similar to Fahrig's work, Chetkiewicz et al (2006) provide more important research related to NHS planning, specifically corridors and conservation. They first discuss the idea that

just because a corridor is created, does not mean it will be used by species in the area. Animals must avoid predators, forage and sleep, meaning they continuously assess habitat for suitability. Habitat provided to animals must be suitable to them if they are to utilize it. The other misconception relates to the classical way in which NHS are viewed. That is, there are core areas that are connected by corridors, and there is a sea of inhabitable matrix everywhere else (Chetkiewicz et al., 2006). We now know that organisms use the “inhabitable matrix” for moving around for example, and do not reside only in core areas.

The writers above and others have impacted the evolution of NHS planning. The main components of NHS planning used in Ontario today are outlined in OMNR’s *Natural Heritage Systems Reference Manual*. These include:

I) *Representation/Distribution*: Protecting both rare and common features is encouraged, as a fundamental step in a NHS plan is to consider the full range of natural features in an area (OMNR, 2010). This would include matrix.

II) *Patch Attributes*: When core areas are absent, groupings of habitat should be planned for. This may include a cluster of natural areas that span over a range of habitats. Size is important as it relates patches. This is because large patches are able to contribute to biodiversity better than smaller, similar habitat patches. Noss and Cooperrider (1994) argue that large populations are better supported by large areas and are more resilient to human-induced disturbances than smaller areas. The shape of the natural heritage area is also important to planners, as to is connectedness. For example, block-shaped or round patches contain less “edge” per unit area than that of narrow and long patches. This is important because edges refer to where different areas meet (OMNR, 2010). The connectedness of patches is also important because



blocks of habitat that are closer together are superior to those further apart. Functional linkages between patches and wildlife movement are the reasons for this (OMNR, 2010).

III) *Linkage and Corridor Attributes*: The NHRM (2010) argues that many attributes must be considered when designing natural heritage systems. For instance, the habitat needs of species that will be frequenting the patches should be taken in to account. So should the shape, length and width of all corridors (OMNR, 2010). Tiebout and Anderson (1997) discuss that the dispersal patterns of species using the corridors should be an important consideration also. The habitat diversity and complexity, species diversity, species rarity, naturalness and disturbance, and finally hydrological values should all be considered when planning for NHS (OMNR, 2010). NHS planning is a vital component of lake planning as water features on the landscape are critical to ecosystem integrity and function and the life cycle of wildlife including critical habitat.

#### 3.4 - Lake Planning and How it is Implemented

Lake planning is essential if future generations are to enjoy lake resources and cottage living. Aquatic ecosystems are currently being impacted in numerous ways (Lytras, 2006). For example, lakes are susceptible to pollutants that tend to accumulate over time (Lytras, 2006). Therefore, there is a need for lake management due to the inability of some stressed lake ecosystems to operate in self-sustaining ways because of damages that exceed their capacity for self-repair (Lytras, 2006). It is for this reason that lake management is often approached in a biophysical perspective. A biophysical perspective refers to the ecological functions of lake, and how these functions will be sustained (Klessig, 2001). This makes sense as most lake planning traditionally has been concerned with factors that impact water quality (Centre for Sustainable Watersheds, 2006). Monitoring water quality and lake planning more generally must be a collaborative effort. Born and Rummery (1989) stress that through a set of institutional

arrangements, such as municipal land use planning, stewardship, land acquisition etc, planning and implementation of lake management programs can be carried out. “Institutions” in this sense refers to public and private organizations that serve to carry out societal activities with the intention of achieving social goals. This captures the notion of community involvement tied in with local decision making bodies such as municipalities.

French Planning Services argue that “the lake plan is an action-oriented plan developed by the community to reflect and preserve the special character of the lake.” Lake planning also engages community members to better identify and protect unique characteristics of shoreline communities and to recommend land use policies to municipal authorities. Furthermore, lake planning should recommend stewardship approaches to ensure protection, maintenance, sustainability and restoration in the long-term of natural, social and physical features (Buck Lake Association, 2011). A well developed lake plan communicates what the desired future vision of the lake is and sets out goals and objectives to be used as measures of success (French Planning Services, 2012). It is for this reason that an all encompassing lake plan can contribute to the proper management of lake resources now and into the future. Many of Ontario’s lakes have benefitted over the years from having lake plans developed in this manner. It should be noted that a lake plan is *not* a legal document. It is a guidance document only, and has no legal standing such as provincial legislation, and municipal OPs. A lake plan is a community developed document and reflects community consensus (Buck Lake Association, 2011).

Lake planning goes hand-in-hand with land-use planning and thus, NHS planning. In theory, planners should be able to implement their land-use training and knowledge to design lake plans that take into account lake specific characteristics and translate this information for use in municipal planning. There is no set method or list of criteria to take into account when

preparing a lake plan, although numerous documents set out criteria (Spang, 2009 & FOCA, 2010) Proper land-use planning has the potential to protect sensitive and important lake features. FOCA (2010) provides a summary of land-use items that should be included and discussed in any lake plan. These are:

- Percentages of Crown or privately owned shoreline.
- Location and nature of Crown Land (Provincial Parks, Conservations Reserves, etc).
- Past lake development.
- The number of shoreline residential properties currently found on the lake.
- The number of tourist commercial uses.
- The number of vacant lots and their respective development status.
- The maximum amount of lots that can be created according to regulations.
- How development will be impacted if lake is deemed to be “at capacity.”
- Creation of an ‘existing land-use map’ identifying development in the watershed.

Also, based on examination of numerous lake plans, Spang (2009) provided a list of eight evaluation criteria to take into account when organizations involved in lake planning create, review and update existing plans. These are:

- The plan should explain context and setting.
- The plan should display basic planning considerations based on theory and its underlying criteria.
- The plan should explain the how and who of the plan-making process.
- The plan should address all key issues and demonstrate how it is connected to the larger world.
- The plan should highlight which agencies/persons are responsible for implementing the plan.
- The plan should explain where the data came from as to provide the technical bases of the plan.
- The plan should be written in a clear fashion.
- The plan should be user-friendly and transparent.

It is through inclusion of this type of information in lake plans that make these documents useful for municipal planners and community members.

### 3.5 - Lakeshore Capacity Planning

An important component of lake planning for lakes on the Canadian Shield is “lakeshore capacity planning.” This model was developed by Dillon and Rigler (1975) and brings science together with a model to inform decision making. Dillon and Rigler’s model quantified linkages between natural sources of phosphorus, water balance, human inputs via shoreline development, lake morphometry and ice-free Total Phosphorus (TP) concentration of a lake. This became known as Ontario’s Lakeshore Capacity Model (LCM). The LCM model was calibrated on Canadian Shield lakes in central Ontario and has formed lake management decisions in both the public and private sector. Since the 1970s, coefficients and input parameters of the LCM have been modified with the availability of new information (Paterson et al. 2006). Although TP can come from a host of anthropogenic sources, domestic sewage represents the most likely source to most recreational lakes on the Canadian Shield (Dillon et al. 1986, Dillon et al. 1993). Lakeshore capacity studies have been developed and used to measure the amount of TP entering Ontario lakes ever since its conception.

An important tool of lakeshore capacity monitoring is the lakeshore capacity assessment (LCA) development by OMOE to help predict the impacts of shoreline development on water quality. To determine the state of a lakes water quality, the LCM approach is used. This model establishes the maximum development that should be permitted in order for a lake to avoid negative effects to the local water quality (FOCA). The Lakeshore Capacity Handbook was developed to help with lakeshore capacity issues and is used by many municipal planning authorities. The document is seen as a guide and resource to help inform planning decisions (MOE, 2010).

### 3.6 - Relevant Legislation and Policies

Numerous other pieces of legislation and policy are relevant to and impact lake planning. A number of these are discussed below.

#### **Federal:**

**i)** Federally, the *Fisheries Act* plays an important role with respect to fish and fish habitat. The Federal Department of Fisheries and Oceans (DFO) protect all fish and fish habitat through fish habitat provisions found in the *Fisheries Act*. Lake planning must ensure all aspects of the Fisheries Act (Fisheries Act, R.S., 1985, c. F-14) are upheld. Note: recent changes to the Fisheries Act will reduce the amount of protection afforded to lakes through Fisheries Act enforcement. These changes are expected shortly.

**ii)** Parks Canada is another important player at the national level. In the context of this research, the Trent Severn Waterway and Rideau Canal both contribute to Canadian society today and are historically and environmentally significant heritage resources (Parks Canada, 2007). Parks Canada has the mandate to regulate the Trent-Severn Waterway, which Clear, Stony and White Lakes are parts of. In total, Park Canada manages and protects nine historic canals.

**iii)** The *Navigable Waters Protection Act* (NWPA) minimizes interference of navigation in navigable waters in Canada, and allows for the construction of bridges, dams and docks on navigable waters. The NWPA regulates lake construction on navigable waters, regulates the removal of wrecks and prohibits the depositing of material into navigable waters (Transport Canada).

**Provincial:** Provincially, many different pieces of legislation are used to guide planning practice, both at the urban and regional level. Below are a number of important documents released by the Ontario government that directly impact lake planning in Ontario.

**i)** The *Planning Act* (1990) sets out the guidelines for land use planning in Ontario. It describes how land uses can be controlled and by whom. Through the *Planning Act*, land uses can be regulated through zoning by-laws and minor variances. Furthermore, the *Planning Act* provides the basis for considering Ontario's interests, such as managing and protecting natural resources (The *Planning Act*). The Ministry of Municipal Affairs and Housing (MMAH) and Conservation Authorities (CAs) also play an important role with regards to lake and land use planning in Ontario. It is the mandate of MMAH to identify and protect Ontario's land use interests.

Promoting sound environmental planning and safe communities falls within the responsibility of MMAH (Land Use Planning).

**ii)** The *Provincial Policy Statement, 2005* (PPS) was created to share the planning interest of the Province with stakeholders with the intention that all planning decisions at the local and regional level "shall be consistent" with provincial policy. The PPS can thus be seen as an extension of the *Planning Act*, or more specifically, as a quasi-regulation of the *Planning Act* to assist in its broad implementation goals. Under section 3 of the *Planning Act*, the PPS is given its legislative authority. All applications, matters and procedures that commenced on or after March 1, 2005 must be consistent with the PPS.

**iii)** *The Natural Heritage Reference Manual, Second Edition* (NHRM) produced by OMNR in 2010 also influences lake planning. First, it is important to note that this document is neither law or policy. It is a reference manual and is intended to be read in that manner. It is intended that the NHRM provide technical guidance in support of the PPS and its respective natural heritage policies. Thus, the document offers "recommended technical criteria and approaches" in being consistent with the PPS in the protection of natural heritage systems (OMNR, 2010, pp.1).

Recommendations made in the NHRM are triggered only when there is a requirement to be consistent with the PPS.

v) *The Endangered Species Act, 2007 (ESA)* was developed to protect all species at risk in Ontario. Through development restrictions and permitting, the ESA limits damage to SAR habitat. Further discussion of the ESA is provided in the Species at Risk section.

iv) CAs also play an important role with respect to planning in Ontario. CAs provide an integrated watershed approach to planning and are thus organized on a watershed basis. Services CAs provide include flood forecasting, watershed monitoring and, management of conservation lands (Conservation Authorities Act, R.S.O 1990, chapter C.27). CAs must balance environmental, economic and human needs (Natural Champions).

### 3.7 - Stewardship

Stewardship is an important part of lake management and planning in Ontario. Stewardship is able to “fill the gap” between what is required by legislation and what is desired, and is able to recognize the unique connection lake residents have with their environment (Spang, 2009). This is important because legislation is often very conceptual and high level, and in many cases, unable to be enforced. For examples, Stewardship Canada – which was formed in 2001 - brings together information, knowledge, contacts and stewardship resources (Stewardship Canada). Canada’s Stewardship Agenda vision reads “a nation where Canadians are actively working together to sustain our natural life-support systems” (Federal-Provincial et al, 2012).

There are four goals of Stewardship Canada to support this vision. These are:

- 1) Invest in stewardship
- 2) Strengthen the application of knowledge
- 3) Strengthen policy and legislative support for stewards
- 4) Connect Stewardship programs

(Federal-Provincial et al, 2012)

It is interesting to note that stewardship is a national focus in this example and there are clearly defined goals of the government. Provincially, Ontario Stewardship guides stewardship activities. Supported my OMNR, “Ontario Stewardship's purpose is to inform landowners about the value of an ecologically friendly approach.” Ontario Stewardship is particularly interested in development pressure on lakes, wetlands, and productive farmland (Ontario Stewardship, 2011). At the regional level, CAs are very active stewards of the land. For example, Toronto and Region Conservation discuss stewardship and its intersection with education. “Environmental stewards care for the land and water resources through their positive environmental actions with the help of fun and educational programs for all ages,” This includes hands-on demonstrations, private landowner workshops and even nature walks (Stewardship, 2012). Private land owners should not be forgotten as stewards of the land either. Many groups have been formed in Ontario with the aim of helping private landowners become responsible stewards of their land. The Township of Uxbridge acknowledges this, stressing that the local environment is enhanced by protecting it through private landowner stewardship. By being a steward of your own land, you create a healthier place for you and your family to live, improve water quality and increase the variety of wildlife and habitat in the area (The Township of Uxbridge, 2012). Effective stewardship relies on co-ordinated governance and integrated decision making. Environmental, economic, and social interests must be considered during the integrated decision making process (Langley Environmental et al, 2003). If this can be accomplished, stewardship is a viable lake management option that can provide a host of environmental benefits to a lake region.



## **Chapter 4 - Analysis**

The analysis section of the report examines how each environmental protection policy and implementation tool is being used, or not used, in each case study location. Please consult Appendices A and B if further information is desired.

### **4.1 - Environmental Protection Policies: Water Quality**

Findings suggests that there are various ways a municipality can approach protecting water quality. Although provincial ministries do provide some support, each municipality is expected to develop its own strategic approach with regards to how water quality should be protected in a lake planning context.

First, the work done by the District of Muskoka must be acknowledged. A document known as the “Muskoka Water Strategy,” describes how the water and watersheds of Muskoka are to be protected. This document is implemented across all six lower tier municipalities as well, including Bracebridge and Gravenhurst. A four prong approach is implemented. This includes.

1. Lake System Health
2. Muskoka Watershed Council
3. Communication
4. Broader water initiatives

This report focuses on the Lake System Health component of the Muskoka Water Strategy in detail as this is arguably the most comprehensive approach to protecting lake water quality among all case study locations. With that said, other municipalities do examine components of Lake System Health to various degrees. A Lake System Health approach to protecting water quality as described in the Muskoka Water Strategy, includes biological monitoring. In collaboration with OMOE’s Dorset Environmental Science Centre, secchi depths, phosphorous

concentrations, pH, alkalinity, conductivity, calcium, nitrogen, dissolved oxygen and temperature profiles are collected from 193 sites, on 164 lakes. This method of data collection has proven to be the most comprehensive with regards to measurements. The District of Muskoka has also made it their priority to train lake associations and concerned groups on volunteer monitoring programs. This includes forest health and benthic analysis monitoring. The end goal is to have many monitoring programs active in order to collect the most data possible. Lastly, as part of the Lake System Health Program, the District of Muskoka supports special studies for lakes that show significant water quality issues. This is a positive end result based on the biological monitoring completed initially. This is also an example of adaptive environmental management as the information is used in decision making.

With regards to drinking water, the Region of Waterloo appears to be a leader. First, the Region of Waterloo OP makes reference to Source Water Protection Areas. These areas describe two and ten year time of travel capture zones for groundwater. This indicates how long it will take groundwater in each zone to reach a municipal drinking well. Wellhead protection areas are also provided in the Region of Waterloo OP. The purpose of these is to show the total area of land that contributes water to a single municipal well. Next, Wellhead Protection Sensitivity Areas are detailed from 1-8. Designations of 1 are the most sensitive, and 8 would be the least sensitive lands. This allows for the management of underlying groundwater with regards to vulnerability. The North Grenville OP has a similar policy. Section 6.2.7 of the North Grenville OP states that development will be discouraged within 100M of groundwater recharge and discharge areas. Coincidentally, sensitivity ratings of 1 in the Region of Waterloo represent the area within a drinking water well. Lastly, Surface Water Intake Protection Zones are also

designated in the Region of Waterloo OP to protect surface water sources. These are all unique ways to addressing drinking water quality management.

With regards to stormwater management, The Oak Ridges Conservation Plan offers very restrictive development guidelines. For example, all major development applications must have an accompanying stormwater management plan. As far as water quality is concerned, it is required that 80 percent of suspended solids be removed from stormwater runoff as a long term average. All other municipalities examined have respectable water quality policies in place, but nothing unique in terms of being highlighted in this report.

The above water quality initiatives should be considered by the County of Peterborough. Currently Kawartha Lake Stewards takes it upon itself to measure phosphorus levels, E.Coli Bacteria, and secchi depths and provides this information to the County.

**Recommendation:** The County of Peterborough Should Consider developing a Water Strategy guidance document similar to that of Muskoka that examines much more water quality indicators. These may include pH, conductivity, calcium, alkalinity and nitrogen.

#### 4.2 - Natural Shorelines:

Results from the case studies compiled regarding maintaining natural shorelines may be the most robust in the entire report. Many interesting policies have been gathered. First, the District of Muskoka's shoreline development policy is a progressive way to protect erosion, siltation and nutrient migration in a recreational cottage region. At a minimum, a target of 75% of linear shoreline frontage of a lot will be maintained in a natural state at a depth of 15m from the shoreline. If the targets are unable to be met, a net improvement over the existing situation is

required by the District, especially for already developed lots that are looking to further develop and redevelop. The Town of Gravenhurst takes this further in section D2.2 of its Zoning by-law. It states that lot coverage will be limited within 20m of the shoreline, the shoreline area and the first 20m from the shoreline be at least 75% in a natural state, the height of buildings within the first 20m of shoreline will be limited to mirror the natural tree line, the size of marine related structures relative to shoreline frontage will be limited, the size of boathouse relative to lot area with 20m of the shoreline will be limited and they will be only one storey. Preventing the development of land considered a significant landscape feature, including steep slopes in excess of 40%, barren rock and narrow channels is also mentioned. This policy is for building on vacant lots, and for cottage rebuilds on the same lot that have a significant amount of natural vegetation. Although this policy may be similar to some others in different municipalities, it is undoubtedly the most complete approach to protecting natural shorelines among all case study locations. A similar policy to this one is the Town of Gravenhurst “sliding scale policy” that is found in the “building in footprints” discussion further in the analysis chapter. This policy is very much related to maintaining the natural characters of the shoreline. Also, the District of Muskoka, as part of the Lake System Health Program, surveys 3 to 4 lakes every year documenting all man-made structures. The condition of the shoreline and the land-use adjacent to the lake is recorded and all information is passed on to lake associations and area municipalities.

Similar to the above policy, The Township of Rideau Lakes Zoning By-Law (section 3.22) states that for a lot abutting a water body which is being used for a non-marina purpose, the lesser of a maximum 15m or 20% of shoreline shall be occupied by decks, pump houses, patios etc. This by-law is similar to the policy being imposed by the District of Muskoka, because it is a quantifiably measured approach to shoreline protection. The City of Kawartha Lakes places

exact measurements also on building setback and size (Section 18.6.2). Shoreline activity areas (docks, boathouses, pump houses etc) shall be the lesser of 25% of shoreline frontage or up to 23m for a residential lot and the lesser of 25% of shoreline frontage or up to 30m of open space for residential development. 33% of shoreline frontage for tourist and resort commercial lots and 50% shoreline can be removed for marinas.

Lastly, the Township of North Grenville calls for the retention and establishment of mature tree cover, native shrubs and vegetative cover on lands within 15m of the high water mark. This is to protect the riparian and littoral zone. A water access area of a maximum of 9m is allowed, provided the natural state of the shoreline is disturbed as little as possible.

Other case study locations speak to some degree about protecting natural shorelines, except for the Oak Ridges Moraine Conservation Plan. These shoreline protection policies (including the sliding scale policy) have the potential to be very effective if the County of Peterborough adopted them. The County of Peterborough could approach implementing these goals by including them into site plan control guidelines, in addition to developing stricter OP and zoning by-law amendments.

Currently, the County of Peterborough provides setback standards for various OP designations similar to other municipalities. For example, Seasonal Residential and Lakeshore Residential structures must be at least 30m back from the shoreline. Also, Section 5.1.3.3 of the County Plan requires local plans to include policies that look to enhance and protect natural shorelines. These policies are a good first step.

**Recommendation:** The County of Peterborough may wish to consider developing a shoreline protection policy that states that the first 20m of land from the high water mark act as a natural buffer. The buffer should be no less than 75% natural.

#### 4.3 - Lake Capacity:

Lake Capacity issues appear to be dependent on the current state of the lakes in each municipality. Most municipalities have classified which lakes are already at capacity, and ones that are approaching capacity. The Township of Rideau Lakes (Section 2.2.3) has a very interesting policy with regards to protecting its lakes water quality on non-capacity reached lakes. For development proposals that would result in the creation of three or more lots with access to water, a lake impact study is required to assess the effect of nutrient loading on lake water quality. Also, any significant non-residential development within 300m of a lake requires a lake impact study as well. The approval authority looks for no negative impacts when examining the findings.

The District of Muskoka uses a “limits to growth” approach when examining lake capacity issues. This approach analyzes physical and policy constraints to growth and identifies available developable area (Muskoka Water Strategy, 2004). If water quality issues are identified from biological monitoring anywhere in the District as part of the Lake System Health Program, policy and physical constraints to development are analyzed for the lake in question. This allows for specific policy development for at-risk lakes. Common constraints include: limited shoreline and increased frontage needs for fish and wetlands. Furthermore, the District of Muskoka has moved beyond a “lake capacity model,” and is using a more site specific and lake specific

approach. This approach is more localized and allows for flexibility and specific studies. Limits to growth assessments provide background information for local municipal planning decisions.

The Town of Gravenhurst OP has some unique policies with regards to over-threshold lakes and at-capacity lakes. First, the Town of Gravenhurst encourages site plan control for all shoreline and non-shoreline, commercial, industrial and institutional development. This is used to ensure that storm water management and construction mitigation techniques are used. Also, for low sensitivity water bodies and moderate, high, and over threshold water bodies, site plan control is required to protect recreational water quality. Finally, the Town of Gravenhurst has another restrictive and proactive lake capacity policy. For all cold water lakes (and the County of Peterborough could consider this for all lakes), any development within 300m of a water body will assume to cause harm to the water body until proven otherwise (Section D.3), likely through a lake impact study. Remaining case study locations either do not address lake capacity policies at all, or do not offer any differing policies from the ones noted above. See Appendix A and B for further details.

The County of Peterborough has attempted to identify some of the at capacity lakes within its political boundary. Identified water bodies that may not be able to sustain future development include Julian Lake and Lasswade Lake according to Section 6.2 of the County OP. It is also mentioned that site specific impact assessments may be required by the Ontario Ministry of Environment.

**Recommendation:** The County of Peterborough should incorporate water capacity modelling within the new Water Strategy document that was recommended. This document would indicate which lakes should be measured and watched closely, working with local municipalities.

#### 4.4 - Provincially Regulated Environmental Protection Policies

Ontario municipalities are given their power from the Province, and as such, are often referred to as creatures of the province. Depending on the issue, a municipality will have either a significant amount of influence and power, or not as much influence and power as desired. The following four environmental protection policies are all largely guided by Provincial legislation that local municipalities are meant to follow. With that said, there are still ways municipalities can work around or go beyond Provincial requirements. The ways in which municipalities are attempting to deal with *wetlands, fish and wildlife habitat, SAR habitat* and *resource extraction* analyzed below.

##### 4.4.1 - Wetlands

The PPS describes how provincially and locally significant wetlands are classified and dealt with. This strongly restricts how much control a local planning authority has. The Conservation Authorities Act states that there shall be no development in or within 120m of a provincially significant wetland, or in or within 30m of a locally significant wetland. An EIS by a proponent can allow development though if it can be proven that there will be no negative effects. All case study locations are required to follow these parameters.

Municipalities across all study areas are approaching planning for wetlands in the same general way, especially for provincially significant wetlands which require a 120m setback. Not all municipalities speak to locally significant wetlands. Only the Township of Gravenhurst, City of Kawartha Lakes, Township of North Grenville and Township of Rideau Lakes mention locally significant wetlands in their OPs. A minor variance can be approved if an EIS can prove there will not be significant destruction to important ecological features.



The County of Peterborough does not mention the existence of locally significant wetlands (LSW) in its OP. Only provincially significant wetlands are referenced, which are protected by the PPS, including adjacent lands.

**Recommendation:** The County of Peterborough should indicate that all wetlands known to local planning authorities that are not already identified as PSWs be given locally significant status.

#### 4.4.2 - Fish and Wildlife Habitat

Fish and wildlife habitat is regulated by the Federal Government and the Province of Ontario. First, fish habitat is protected under the Fisheries Act federally and the PPS provincially. Wildlife habitat is protected in Ontario by the PPS much like fish habitat. For both fish and wildlife habitat, development is not allowed to take place in or adjacent to fish and wildlife habitat without meeting provincial and federal requirements. This is noted in all municipal OP's examined. All participants interviewed mentioned that they are following requirements set out to them with regards to the Fisheries Act and the PPS. None of the case study municipalities go beyond the requirements of federal or provincial requirements.

Deer wintering areas are noted in the District of Muskoka OP and protection policies are provided.

**Recommendation:** It is in the County's best interest to keep working with MNR in protecting and identifying old and new significant fish and wildlife habitat as special protection may be required.

#### 4.4.3 - SAR Habitat

The ESA (OMNR, 2007) outlines how SAR habitat is protected in Ontario. Destruction or damage to SAR habitat is prohibited for all species that are listed as endangered or threatened unless a permit is obtained from the province. Although the ESA is a new Act, it is having a noteworthy impact on how development is taking place in Ontario.

Although case study locations are following what the ESA describes to the best of their ability with respect to indicating to landowners where there is known occurrences of species at risk, some are finding that the science and support provided by MNR is lacking. Mapping is often dated, and on-the-ground research is largely non-existent. It appears that SAR habitat protection is one of the most important environmental protection issues that needs to be addressed moving forward.

The County of Peterborough is fulfilling its obligation under the ESA. It is working the MNR to restrict development in the habitat of species at risk

**Recommendation:** To work with MNR to produce up to date mapping and information regarding the location of known species at risk. Funds may wish to be made available for increased GIS mapping and in field research documenting where species at risk are found.

#### 4.4.4 - Resource Extraction

The Ontario Mining Act and the Aggregate Resources Act dictate what is and what is not permissible in Ontario's Crown and private land with regards to resource extraction. Municipal planners that were interviewed spoke of the Aggregate Resources Act when asked how resource extraction is approached close to water resources. The general consensus was that local planning authorities have little to no influence when it comes to resource extraction anywhere in their planning area. Resource extraction appeared to be viewed negatively by some interviewees, stating that it was often viewed as more important than proactive environmental protection. The revenues generated from pit and quarry operations are likely the main motivation behind having the Province provide operational development and rehabilitation support. Municipalities are to have OP designations and Zoning by-laws in conformity with provincial legislation. Ironically, one interviewee mentioned that the developer of a pit or quarry does not even need to be in conformity of the OP and zoning by-law.

Municipalities are still able to influence where resource extraction is able to take place. For example, one interviewee mentioned that zoning by-laws should require at least 200m setbacks from waterbodies for all extraction sites. Also, an Aggregate Advisory Committee is used in the City of Kawartha Lakes as a way to engage concerned citizens with MNR and the local CA.

The District of Muskoka has a policy in its OP (Section E.12) that addresses how aggregates resources have the potential to harm significant landscape features as they are related to the tourism industry. Area municipalities are encouraged to not allow extraction activities that will negatively affect selected topography and vegetation for scenic enjoyment reasons.

The County of Peterborough mentions many of the same resource extraction requirements that other municipalities do as well. This includes distances from resource extraction sites must be from other land uses (Section 2.6.3.1). Section 4.1.3.3 of the OP says that rehabilitation must take into account approved land use designations. Proactive policies such as these are encouraged to be expanded upon in the OP review in 2013.

**Recommend:** The County of Peterborough may wish to consider restricting resource extraction within at least 200m of the high water mark of water bodies.

#### 4.5 - Viewscapes and Cultural Sites:

There are some very interesting ways that both viewscapes and cultural sites appear to be protected in the case study locations researched.

First, the District of Muskoka attempts to designate in its OP (Section F.96) all significant heritage features, and works with local conservation groups to identify features not yet inventoried. Heritage features that the OP looks to identify include: important historical sites, geological sites, scenic features, archeological sites, and sites of significant biological interest. There are special components to each of these items to help in their protection. For example, an application for development shall have regard to or improve the viewing potential of scenic vistas for the general public, and when undertaking road improvements, the authority that has jurisdiction shall attempt to enhance or retain scenic qualities of the road. The Town of Bracebridge, which is an area municipality of the District of Muskoka, is working on a policy that will identify all scenic roads and highways, which will allow them to work with MTO to restrict signage and billboards. Building off this idea of protecting cultural and scenic features,

the Town of Bracebridge is currently working on a way to set out policies to restrict development on Rainbow Ridge, which is an important cultural and natural feature in the area that citizens would like to have protected. The Region of Waterloo has similar policy of protecting regional roads during times of development, but also attempts to protect “significant valleys.” These include Grand River, Conestogo River, Nith River and Speed River; all of which are nationally recognized as a Canadian Heritage River.

The Region of Waterloo is also developing a Regional Implementation Guideline for Cultural Heritage Landscape Conservation (Section 3.G.5 OP). This implementation guideline is designed to be updated with new heritage features and is to provide a framework and direction for identifying features of regional interest. Each feature will be identified through a Cultural Heritage Conservation Landscape Plan. This will include a list of cultural heritage resources being conserved within the Cultural Heritage Landscape through planning tools set out in the Heritage Act. This will essentially act as a living inventory of heritage features in the region.

The Region of Waterloo also has identified four environmentally sensitive landscapes (ESLs). The Region of Waterloo claims that the ESLs framework is the first of its kind on Ontario (Region of Waterloo, 2012). Essentially, land uses and activities in the area are planned as to not damage the environmental integrity of the ESL. The type and amount of development is limited in the area. One of the features in the north-west corner of the City of Waterloo is part of the ESL. This is a great example of planning authorities incorporating regional environmental features into City and Regional OPs.

The City of Cambridge has completed a dedicated Heritage Master Plan. This plan guides the City to find, conserve, assess and celebrate heritage resources in the area. This plan, prepared by private consultants, encourages development that respects the heritage character of

Cambridge and most importantly, recommends policies for OP updates. This plan will allow the City of Cambridge to focus heritage conservation efforts much more easily.

The Townships of Rideau Lakes and North Grenville are currently working with Parks Canada and federal and provincial agencies in developing the Rideau Corridor Landscape Strategy (Parks Canada, 2012). Development pressures along the Rideau Canal are creating challenges for Municipalities, especially as they grapple with local economic development. The Rideau Corridor Landscape Strategy will address how future development will take place, while still encouraging the protection and enhancement of cultural heritage features. Public consultation is currently taking place. It will be interesting to see how municipalities incorporate their ideas into the Strategy, as the Township of Rideau Lakes already encourages the identification, protection, maintenance, restoration and enhancement of cultural heritage landscapes (Township of Rideau Lakes, 2010).

Finally, the City of Cambridge identifies heritage character areas in its OP (Section 4.9). These geographical areas have been modified by human activity and are valued by the community. They include clusters of heritage resources and are considered for conservation and enhancement because they represent important historical patterns of development. Policies regarding these areas are developed on consultation with the Municipal Heritage Advisory Committee according to the City OP.

Neither the City of Kawartha Lakes, nor the Oak Ridges Moraine Conservation Plan offer any original viewscape or cultural heritage policies. The Town of Bracebridge OP sums up viewscape and heritage conservation efforts nicely. This is the idea that the “enhancement and preservation of the natural and man-made environments shall be incorporated within any development or redevelopment proposal (Section 16.10).”

The County of Peterborough does not have much in its OP regarding the protection of viewscales and cultural sites, and will have many potential options. With that said, the County of Peterborough policy of identifying scenic roads is something to build from, especially as the Trent Severn Waterway is within the planning area.

**Recommendation:** The County of Peterborough should consider funding a Cultural Heritage Study and County of Peterborough Significant Landscape Heritage Study to better protect its unique cultural assets.

#### 4.6 - Implementation Tools: Natural heritage

This project has been looking generally at how different environmental protection policies are being used to impact the ways NHS planning and lake planning takes place. Furthermore, there are specific ways to protect for NHS beyond protection for natural shorelines, wildlife habitat etc. For example, there is a desire in the Region of Waterloo to create a comprehensive natural heritage inventory. This would identify provincially significant wetlands, ANSI's, significant wildlife habitat etc. with associated buffers. This would reduce the frequency of site walks needed by staff and paid consultants, and would identify the geographical extent of features in the area. Also, the inventory would help to inform the review for assessing development applications and would be a non-legal part of the OP, which would be attached as an index to help inform policy. The Region of Waterloo also pushes for 30% forest cover across the entire region. It aims to increase forest cover in appropriate regions to achieve this goal.

Natural Linkage Areas are protected in the Oak Ridges Moraine Conservation Plan. Section 35.2 of the plan sets out what must be approved for there to be aggregate operations in a

Natural Linkage Area. The applicant must demonstrate that there will not be extraction within 1.5m of the water table, extraction will be done as quickly as possible, the site will be rehabilitated in stages as quickly as possible, and that the entire site must be rehabilitated. The quantity and quality of the groundwater must be maintained, restoring self-sustaining vegetation and restoring land to agricultural use is also required.

The County of Peterborough provides many general natural heritage policies in its OP, much like many of the case study locations that have been analyzed during this project. Section 4.1.3.4 does well to explain building on or adjacent to natural heritage features and the role of the environmental impact assessment process. With that said, a natural heritage inventory would enhance natural heritage protection in the area. The *Kawarthas, Naturally Connected* project now being completed looks to complete such an inventory across the County of Peterborough and the City of Kawarthas Lake. The County is an important stakeholder in this project.

**Recommendation:** The County of Peterborough should consider implanting the findings of the *Kawarthas, Naturally Connected* project and use the data to inform parts of the OP review in 2013.

#### 4.7- Official Plan Designations and Zoning By-Laws

OP designations and zoning by-laws have been used by case study locations to help implement policies that are locally important. All case study locations are using their OPs and zoning by-laws to regulate development and harmful alteration to the environment. For example, the City of Cambridge prepared some of its GIS mapping alongside the development of its OP and zoning by-law. This coordinated approach appears to be a best management practice that



bridges policy and science. Also, from studying the relationship between the District of Muskoka and the Region of Waterloo with their area municipalities, an interesting trend has been noticed. In both cases, the Upper Tier municipalities have created broad environmental policies, which Lower Tier municipalities have adopted and made more restrictive in their OPs and zoning by-laws. One limitation to this practice was noted by an interviewee. This person noted that the policies laid out in the Upper Tier OP are sometimes hard to implement on the ground because of a lack of accurate data and mapping. OP and zoning by-law creation among all case study locations are dependent on scientific information available to them, and too many case study location interviewees mentioned that there was not enough data for them to make proper decisions.

One interviewee saw zoning by-laws strictly as a way to curb development. In this sense, although the document is to be developed as transparently as possible, zoning is used to implement OP designation policy in a way that development is sufficiently controlled. But if development is to ever be controlled in such a manner that it fits in with the existing character of the area, only site plan control can do that. Site plan control appears to be the most important tool and lesson learned from the interview section of this report. Each municipality is using site plan control as a way to control development. For example, in order to maintain the natural state of the shoreline in the Town of Gravenhurst, site plan approval is required for all new-builds and rebuilds. This ensures the shoreline is protected, in conjunction with the strong shoreline protection by-law already being enforced. Using site plan control with a strong zoning by-law can provide strong environmental protection.

The County of Peterborough does not offer any unique findings with regards to OP designations and zoning by-laws. Seasonal Residential and Lakeshore Residential are important

designations that provide unique waterfront policies. Also, like all other upper tier municipalities in Ontario, the County of Peterborough sets out general policies that lower tier municipalities conform to. Minor variances are the responsibility of lower tier municipalities within the County of Peterborough.

**Recommendation:** The County should take pride in its OP designations. Improvements can always be made though, and it is encouraged that the County remain a strong partner in policy development at the local level.

#### 4.8 - Septic Re-Inspection:

Septic re-inspection programs are popular among case study locations. Most municipalities have a summer program which involves summer student visits to dwellings to make sure the septic systems are up to code. The Township of Bracebridge runs a four month program during the summer months through its Building Division. The program that has been running for 15 years and has now completed four rounds of inspection. The inspector is given the status of By-Law Enforcement Officer and is thus allowed to enter private property. In the Township of Gravenhurst, they are creating a database of information from their lake inspections which are all inspected by a student. The lakes are chosen based on problems identified through the Lake System Health Program. Interestingly, they are thinking about purchasing a metal detector to help locate and determine what types of systems are being used by lake residents. Finally, the Township of Rideau Lakes has a volunteer septic re-inspection program set up with the Mississippi Rideau Septic Group. The program is now in year five of five and has been a relative success. Property Owners are informed of the program and respond if they are willing to participate. An inspector will then visit the property and note any deficiencies or if the system

has failed, and will inform the Township if so. The updates to the Building Code now provide municipalities with the option of creating mandatory inspection programs, and this is something the Township of Rideau Lakes will consider at summer's end, as most municipalities likely will do. The City of Kawartha Lakes also runs a septic re-inspection program through the Haliburton, Kawartha, Pine Ridge Health Unit. No other lower tier municipality is currently operating a septic re-inspection program among case study locations examined.

There are no tax funded programs operating among municipalities researched. These would fund a mandatory program through property taxes. With that said, the Township of Huron-Kinloss, which is not one of the case study locations, is implementing a program that the County of Peterborough may find interesting. The Huron-Kinloss Community Septic Inspections began in the spring of 2007. Through mandatory inspections, every property in the Township with a septic system will be inspected on a rotating basis every 6-8 years. The inspections are all carried out by a qualified Ontario Building Code Part I Sewage Systems inspector. The program is funded by a \$55 annual tax bill of properties with a septic system. Property owners are mailed inspection reports once an inspection has been completed. The reports include an aerial photograph of the property with an outline of the septic system location. Lastly, the inspection takes roughly 30-45 minutes and between 300-400 properties are inspected every year (Township of Huron-Kinloss, 2012(a)). In a dedicated blog for citizens of Huron-Kinloss to gather information and post comments, it reads that the Township is a leader in Ontario in its initiative to preserve the natural environment and improve water quality through this program (Township of Huron-Kinloss, 2012(b)).

The County of Peterborough is currently not operating any septic re-inspection programs as described above.

**Recommendation:** The County of Peterborough may consider developing a septic re-inspection program that is funded through annual property taxes.

#### 4.9 - Redevelopment and Building on Footprints:

The issue of building on existing footprints and the ability to extend the building envelope is a legitimate concern for people living on Clear, Stony and White Lakes. Some interesting information has been gathered from case study locations with regards to this issue. First, the General Amendment to by-law no. 2010-04 in the Town of Gravenhurst addresses the reconstruction, enlargement and extension of legal non-complying dwellings. This by-law amendment addresses *both* building on footprints, and residential redevelopment. The amendment, which is related to the District of Muskoka shoreline development policy discussed earlier, outlines how building size is related to distance from the shoreline. The provision states that where an existing legal dwelling (including legal non-complying) encroaches into the setback for the Optimal Summer Water level, the dwelling is able to be replaced, enlarged or extended if:

1. The non-compliance setback is not increased.
2. The height of the dwelling does not exceed the current height within 10m of the Optimal Summer Water Level.
3. The dwelling unit is no wider than 5m + 0.75m for each metre the dwelling is from the Optimal Summer Water Level. Each metre back from the water, another 0.75m width can be added to the size of the dwelling. This is known as the “sliding scale policy.” Please see Appendix A for an example.

The Town of Bracebridge outlines nicely in their zoning by-law that the property owner is not in full control of providing drawings and surveys to the Town when reconstructing. Section 4.8 vii of the Town of Bracebridge zoning by-law states that a building location survey that has been prepared by an Ontario Land Surveyor for both the original and new dwelling must

be provided to the Township. A Site Plan Agreement is established with the Town after this step. Other municipalities have indicated that they sometimes struggle with not having enough information when people demolish their existing structure, often because they have not informed the municipality beforehand. Having an Ontario Land Surveyor active as part of the process may help in ensuring that legal con-complying structures remain the same before and after renovations.

The Township of Rideau Lakes is following the decision of *Ottawa (City) v. TDL Group Corp* with regards to how a rebuild of a legal non-complying structure should be addressed. When the Region of Ottawa-Carleton was amalgamated to form the City of Ottawa, a new zoning by-law was written that restricted the rights of property owners to alter their legal non-complying structures. This by-law essentially read that the only way a property owner could rebuild on the same footprint was if his/her building was destroyed or damaged involuntarily. This was ruled a violation of the *Planning Act*, Section 34.9.A by the OMB. A property owner is allowed to renovate and even completely rebuild a legal non-complying structure according to the OMB decision. One interviewee said it best, “in the case of rebuilding non-complying structures, it is an apple for apple, and not an apple for orange.” Furthermore, only small changes can be made to structures in the Township of Rideau Lakes if requirements are being met to fulfill obligations of the Ontario Building Code.

The County of Peterborough should address this issue the same way that the Township of Rideau Lakes is. Any change in the height, volume and non-compliance of a structure needs to be approved through a variance, but if the structure is destroyed through an “act of god” or if the property owner would like to rebuild the structure to the same dimensions for whatever reason,

this is allowed under section 34.9.A. of the *Planning Act* . A planning authority must ensure that their updated OP and zoning by-law conforms to the law.

The County of Peterborough does well in listing when an EIS is required for building close to significant natural heritage features, and this includes redevelopments. Section 4 of the County OP looks at some of these requirements. Lake capacity impact studies are also mentioned under 4.4.3 of the OP with regards to how future development may impact area lakes. The study must prove that the lake in question can support an additional structure and septic system.

**Recommendation:** The County of Peterborough should develop a sliding scale development policy that requires buildings further from the waterfront to be larger than structures proposing to build closer to the water's edge. The County should follow the Township of Gravenhurst's lead.

#### 4.10 - Environmental Advisory Committees and Stewardship

Many programs are operated by the Muskoka Heritage Foundation, such as Muskoka Stewardship Program and the Natural Heritage Program. The Muskoka Stewardship Program identifies ecologically significant properties and works with landowners to protect natural values of their property via volunteer stewardship agreements (Muskoka Stewardship Program). The Natural Heritage Program promotes environmental awareness and is involved with shoreline restoration projects. There is a Built Heritage Program among many other programs. The Muskoka Heritage Foundation works alongside the Muskoka Heritage Trust. This volunteer land trust group acquires property of significant ecological value or holds a conservation easement on private property which has the ability to restrict development (Muskoka Heritage Trust). The

Muskoka Watershed Council which is not part of the government structure is an advisory body that aims to enhance the air, water and terrestrial ecosystems of watersheds of Muskoka. The group is comprised with local concerned citizens and elected officials. Members provide an advisory role to local and regional decision makers. They provide educational materials and produce watershed report cards every four years, which includes the grading of sub-watersheds. This group has a lot of input at the public consultation phase and is described as partner with the municipality. An interesting result of the Council is the creation of the Watershed Inventory, created with the help from MNR and the District Municipality of Muskoka. This inventory identifies significant natural areas and important degraded areas in the watershed (Watershed Inventory Project). This project was funded by the Ontario Trillium Foundation. The District of Muskoka has also created the Muskoka Water Web (Muskoka Water Web). This resource provides shoreline land use maps and biological monitoring maps among other education material. The work the District of Muskoka has done with its area municipalities and its desire to create and support all of these environmental groups is the most impressive of all case study locations.

There was not a lot of information collected from interviews or research regarding EACs. However, it can be determined that EACs and whether they exist or do not exist depends on local interest and issues. For example, there is an Aggregate Advisory Committee in the City of Kawartha Lakes. This is not the case for all area municipalities. The Township of Rideau Lakes seeks the advice of the Local Architectural Conservation Advisory Committee to advise Council on cultural heritage issues. In addition, there are the more general EACs, such as the Gravenhurst Environmental Advisory Committee that finds itself a subcommittee of council. Two councillors sit on the council with concerned members of the public. The Township runs environmental

policies through this group. The Gravenhurst Environmental Advisory Council's role is to review development applicants and to advise council on environmental issues. In the City of Cambridge, the Cambridge EAC advises council much like in Gravenhurst. They also provide guidance and input for OP reviews and deal with specific initiatives. For example, they have participated in the creation of a tree cutting and tree watering bylaw. Programs were created to help developers know what trees to plant, and how. In this example, programs were created from expertise. What appears to be most important with regards to EACs, is that there needs to be a clear mandate for an advisory group to be successful. If a group does not have a clear focus as to what its role is, it runs the potential of becoming less effective.

What is now the Region of Waterloo had the first ever EAC, and the work now being done by the Region of Waterloo Ecological and Environmental Advisory Committee (RWEEA) continues the tradition of progressive environmental stewardship (Environmental Advisory Committees of Ontario, 2012). In 2012, the RWEEA is looking at a lot of plan of subdivision proposals. This includes discussion on re-zoning in one example (Regional Municipality of Waterloo, 2012). An upper-tier EAC in the County of Peterborough would be able to provide County planners technical expertise regarding proper subdivision development such as RWEEA. The 2012-2016 Regional Forest Management Plan is another focus of RWEEA. This particular plan covers the management of 16 woodlands. These woodlands are owned by the Region of Waterloo and comprise 11 regional forests (Regional Municipality of Waterloo, 2012). The work RWEEA is doing is similar to the work of other EACs in Ontario, and should be considered and examined as a possible model for a potential County of Peterborough EAC.

The County of Peterborough does not have its own EAC. This does not stop lower tier municipalities from having their own though. A great example is the Township of Galway-



Gavendish & Harvey EAC which is active in environmental activities in the community. As far as stewardship in the County of Peterborough, there are multiple organizations working to improve the natural environment. The importance of local groups such as the Environmental Council for Clear, Stony and White Lakes and Kawartha Watershed Citizens Council does not go unnoticed. There could be some improvement with regards to coordination across groups moving forward.

**Recommendation:** A cross organizational website could be funded or facilitated in partnership with the County to direct users to all organizations involved with stewardship activities across area municipalities.

#### 4.11 - Boathouses:

There were a few interesting best management practice policies found with regards to boathouses and their role in contributing to a safe lake environment. Section D4.3.5 of the Town of Gravenhurst OP states that a boathouse can be constructed if there is a minimum lot frontage of 90m and that the structure is only one story with no attic. The structure can be a maximum height of 3.9m with a sloped roof. In most designations in the OP, the policy reads "One boathouse per lot having a maximum height of one storey and used only for storage of marine equipment shall be permitted as an accessory use." Zoning by-law 4.4.3 from the Town of Bracebridge could compliment the above policy. It states that the total portion of a shoreline occupied by a boathouse shall not exceed the lesser of 25% of lot frontage or 22m. Together this would ensure the character of the shoreline remains intact.

Section 3.9.3 of the City of Kawartha Lakes OP states that a natural buffer may be reduced to 8m for 25% of a lot's water frontage, to a maximum of 9m to allow for an in-water

boathouse. For commercial uses in City of Kawartha Lakes, boathouses should minimize the impact from adjacent uses by being 4m from the side lot line.

Lastly, The Township of Rideau Lakes approaches boathouses in a similar manor to above. Section 2.6.1 of their OP calls for the maintenance of a minimum 15m strip of undisturbed and natural vegetation abutting the shoreline of waterfront properties, with limited allowance for water-related structures such as a boathouse.

Other municipalities do not offer the County of Peterborough any other important policies regarding boathouses, although they may have policies that are ideal for their local context.

The only mention of boat houses in the County of Peterborough is with reference to encroachment into the 30m buffer required between structures and the high water mark. This is allowed under the current Peterborough OP if it can be proven to the local municipality that the waterfront is not impacted by the boathouse. There is no mention of boathouse height in the OP.

**Recommendation:** The County of Peterborough may wish to consider a restriction on boat house height to one story. The County should also consider encouraging the townships to pass by-laws that restrict boathouse use to storage only, and thus one that does not allow for human habitation.

#### 4.12 - By-Law Enforcement and Minor Variances

This area of research yielded the least in respect to applicable results. First, by-law enforcement appears to be approached in the same general way across municipalities. That is, by-law enforcement officers respond to complaints when brought to the municipality's attention.

Also, building inspectors have a role to play in ensuring structures are built to code. One interviewee mentioned that the best way to discover if anything is wrong is through a complaint driven system, where property owners feel comfortable approaching the municipality. In another municipality, an interviewee was passionate about the role of building permits. He/she believed that it was imperative that front line staff are appropriately trained to inspect properties and that commitment comes from the top down.

With respect to zoning by-laws, one interviewee indicated that his/her municipality is able to enforce zoning through site plan control by-laws. A property standards officer ensures that everything is followed and is given the authority to lay charges. Lastly, another interviewee mentioned that strength is found in legislation. Specifically, this person noted the importance of the Building Code Act, and that all development can be stopped if parts of a structure are not built properly. An important tool can be enforcing legally binding site plan control agreements for all redevelopments.

If someone would like a minor variance on a legal land-use or structure that is not in conformity with local by-laws, they must go through the appropriate channels. The Township of Rideau Lakes and the Township of Muskoka Lakes provide a detailed document outlining what a minor variance is and how ones application will be dealt with. For example, the Township of Rideau Lakes provides information on what exactly will be considered during the four tests of a minor variance (The Township of Rideau Lakes). At the back of the document, the minor variance (and site plan) application form is attached. This easy to use document is very user friendly. The Township of Muskoka Lakes provides a similar document to its residents. The items to be considered by the Township of Muskoka Lakes as they relate to a minor variance application are (The Township of Muskoka Lakes, 2011):

- 1) compatibility with neighbouring development
- 2) visual impact
- 3) environmental concerns (but not to the same extent as OP Amendments or Zoning By-law Amendments)
- 4) impact on neighbouring properties
- 5) consistency in decisions
- 6) intent of OP and zoning by-law

The City of Kawartha Lakes provides a separate document to the application form, titled *A Guide to the Minor Variance Process* (2010). This document speaks to what a minor variance exactly is, where one goes to get a minor variance, the minor variance process, and even how to appeal a decision to the OMB.

Little was gathered as ways to approach the minor variances process outside of what is dictated in the Planning Act. One interesting idea was presented by an interviewee with a lot of experience. The interviewee was adamant that there should not be minor variances on vacant lots, especially large vacant lots. People should develop in compliance with the existing zoning by-law, especially with regards to greenfield development.

The minor variance process is dealt with in the same manor in the County of Peterborough as it is in all case study locations. That is, a landowner must apply to the local municipality to receive a minor variance. Minor variances in shoreland and waterfront areas can be awarded to build within the mandatory 30m waterfront setback though. For example, section 6.2.6.3 (c) of the County of Peterborough OP states that a minor variance is allowed if it ensures health and safety. By-law enforcement is handled via a complaint driven system also. This appears to be the norm across case study locations.

**Recommendation:** The County of Peterborough should encourage lower-tier municipalities to not allow minor variances on vacant lots.

## **Chapter 5 - Role of Science**

Science plays an important role in preparing OPs, zoning by-laws, guidance documents, lake plans, and stewardship websites, among others. Science can inform policy and the way Ontario's lake regions develop, especially as it affects natural heritage systems. Western science can be defined as "knowledge or a system of knowledge covering general truths or the operation of general laws especially as obtained and tested through the scientific method and concerned with the physical world and its phenomena" (Mariam-Webster, 2012). Understanding the physical world and its phenomena is applicable to the County of Peterborough OP review. The abundance of natural heritage features present across the area municipalities calls for proactive environmental protection, and science in all forms can provide the data and knowledge for developing policy.

An understanding of western science, local ecological knowledge, and embedded knowledge is important moving forward. These different types of science have directly or indirectly informed policy or action in case study locations. This has been determined from literature reviews, document analysis and interviews. A description of the three types of science examined in this report will now be provided.

First, for the purpose of this report, western science will be very much associated with the definition provided by Mariam and Webster, and will be thought of as "hard science." Mazzocchi (2006) describes western science as favoring analytical and reductionist methods. It can also be thought of as objective and quantitative, and rooted in academic transmission. In essence, western science attempts to isolate its objects of study by placing them into simplified controlled experiments (Mazzochi, 2006). In this sense, western science can be viewed as isolationist and prescribed.

Second, local ecological knowledge is important to this report. Ramy (2010) describes this form of science as “locally collected information.” Local ecological knowledge comes from the people who live in the area. First Nation people describe their knowledge as traditional ecological knowledge. Fazey et al. (2006) note that an expert understanding of an ecological system is constructed through years of observation and reflection. Trying to uncover how systems can change over time in a holistic way is enhanced with local ecological knowledge.

Third, embedded knowledge is an important component to this research. Embedded knowledge speaks generally to broad concepts and is often regarded as truth. Ramey’s (2010) research suggested that embedded knowledge stemmed from principles that are largely accepted by the scientific community (western science). This form of scientific knowledge was closely linked to conservation biology and landscape ecology. For the purpose of this report, embedded knowledge will represent fact or truth with regards to generally accepted scientific principles.

## 5.1 - Findings

The purpose of this report was largely to research and understand best management practices from various case study locations to inform the County of Peterborough of options when updating their OP. Another important part of this research is to determine what types of science are being used. This includes understanding when different forms of science are being used.

First, the literature review section of this research made clear that much of landscape/aquatic ecology and its associated principles are based on the western science tradition. For example, the literature review section of this report discussed the concept of lakeshore capacity modeling and different ways in which water quality is analyzed. Measuring

safety for human beings is the underlying theme here, even though these techniques are used to determine if aquatic species will be healthy also.

Document analysis, which included examining OPs and relevant legislation and guidance documentation, spoke to the importance of western science. Depending on the issue, background studies for development are commonly cited across legislation, and are adhered to in all OPs. This means that if development is to take place, it must be proven at a scientific level that there will not be a certain level of harm. A good example is that an environmental impact study shall be required for all development proposed within 120m of a provincially significant wetland or within 30m of a locally significant wetland. This type of requirement can be found in the PPS and in OPs across Ontario. Interviews with planners and members of MNR were also very supportive of western science, but also critical indicating that new science was required to inform better decision-making.

A very common theme from interviewees was that there is not enough scientific information coming from MNR and MOE. Wetland, ANSI and species at risk mapping was highlighted as being limited. In some instances, case study locations indicated that the mapping they were using was over 25 years old (e.g. wetland mapping). Another concern highlighted by interviewees was that there were not enough biologists and employees of the Province in the field doing research. This research – which would inform future mapping and quantitative models – is needed to support new legislation such as the ESA (2007). Furthermore, the ESA was indicated as being extremely unenforceable because of a lack of support at the Provincial level and lack of knowledge at the local level with regards to species at risk and where they are located. Non-profit organizations such as Ducks Unlimited were noted as filling the void with

regards to mapping for many municipalities. The role of CAs has become more important also, even with budget restrictions.

The general finding with regards to western science is this: the Province is unable to provide case study locations with enough information for them to fulfill their roles as responsible stewards of the land. Organizations, even including lake associations and stewardships groups, are now being relied on to provide data and labor power where they never did before. To conduct a proper environmental systems analysis is expensive and municipalities are often unable to undertake their own research. The province and municipalities are often in a dialogue over who should be doing the research, while the environment continues to degrade. As one interviewee put it, “so who loses in the end is the bobolink and the painter turtle.” The importance of western science is critical moving forward, and there currently remains a large schism between the local and Provincial decision makers.

Local ecological knowledge and embedded knowledge was lacking with regards to what was found in the literature review. No sources stood out as speaking to local ecological knowledge based on the information gathered to inform the interview portion of this report. This makes sense based on how western science appears to be relied on much more than other forms at the provincial and municipal level. With that said, embedded knowledge did appear in the literature to some degree. General statements known to be the truth are used in a descriptive sense in a lot of academic writing. The writing is delivered in such a way that the writing on topics such as the importance of cores and corridors present their case as what they are saying is general knowledge. For example, a quote from an extension note from the Land Owner Resource Centre on preserving natural shorelines reads “natural vegetation along the shoreline of lakes and rivers plays a crucial role in protecting water quality, preventing soil erosion and preserving the



ecological balance of aquatic environments (Land Owner Resource Centre, 2000). It is just believed that this type of information is fact, and this has heavily influenced how the research was conducted for this report. The reason for this is simple. Information based on western science was not needed to back up every statement or policy mentioned in the report. It was believed from embedded knowledge that large connected pieces of natural features are ideal.

In the document analysis section of this research, local ecological knowledge was non-existent. There was little to no mention of anything related to local ecological knowledge. Embedded knowledge did play an important role though. Embedded knowledge was found everywhere in case study OPs. Almost all environmental protection policies in OPs speak to embedded knowledge when outlining why certain policies are in place, assuming it is not prescribed in provincial legislation already. For example, Section 2.1.3 of the City of Kawartha Lakes OP reads “the surface and groundwater within the City is an important resource. Measures will be taken to protect the water quality and quantity of the surface and groundwater resource.” In the Oak Ridges Moraine Conservation Plan, it reads “The Moraine has a unique concentration of environmental, geological and hydrological features that make its ecosystem vital to south-central Ontario (ORMCP, 20052, pp.2).” Statements like this one are plentiful across OPs. In this instance, it is just known that water quality is an important thing. It is just known that water quality and quantity should be protected. Statements such as this one and others that speak more directly to western science as a measurement to development are commonly found across OPs.

During the interviews, the importance of local ecological knowledge was indicated as being important. As mentioned earlier, stewardship groups and lake associations are now being relied on to provide information and support initiatives dealing with environmental issues. Interviewees were quick to note how important the information gathered from non-governmental

organizations is, as most communities have active lake associations. These groups appear to be the backbone of much of the stewardship activity that takes place. Stewardship activity works to produce and use all of the three identified types of science, but the importance of local ecological knowledge is magnified here. Since lake associations are comprised of people generally involved with helping plan for a healthy lake environment, they bring with them knowledge of the area. For example, the Clear, Stony and White Lakes Plan is partially a product from local ecological knowledge, as there were multiple resident workshops held during the document's creation. "The purpose of the resident workshops was to provide information about the lake planning process and promote discussion among the residents to identify important values and special features that support the current high quality of life in the watershed community, and the issues that impact these values" (CSW Plan, 2008, pg. 9). The identification of important values and special features is a role stewardship groups appear to focus upon throughout case study locations.

Below is an examination of the most important documents used in the production of this report. An analysis of the types of science used to produce each of these documents will now be examined.

The NHRM (2010) provided much of the background information used in this report. It offers the reader a thorough understanding of how provincial legislation is connected with natural heritage protection. The overall purpose of the document is to guide planning authorities through the process of applying the proper policies and management practices to natural heritage features. The document is largely based on western science, and provides a long list of academic references to be used for further research. Western science is what the entire document focuses upon, but embedded knowledge supplements this in a descriptive nature. Embedded knowledge is used to describe process in the NHRM, using sentences such as "large patches tend to

contribute more to biodiversity than smaller patches of similar habitat” (2010, pp. 146). With that said, scientific information is cited often in the document, giving it a very technical feel. Smaller organizations have contributed to this document also. A study from the Upper Thames River CA (2003) is cited arguing that there is a negative correlation between native plant species richness and distance between ANSIs and natural features. Localized western science certainly had a role to play in the creation of NHRM.

Case study OPs were dissected for their environmental policies, but also for their use of science. Western Science and embedded knowledge was very common in all OPs. First, western science is often required in studies when property owners would like the build. Section 3.3.3.9 of the Township of Rideau Lakes OP requires one to prove that there will not be adverse impacts to hydrology and surface water quality and quantity, and must note the predicted changes and sensitivity to changes. This is required if the OP is to allow for a change in designation of lands for mineral resources from another designation. Also, noise and compatibility studies may also be required. For example, section 9.3 of the Bracebridge OP requires a noise and compatibility study for all new residential development within 400m of existing extractive industrial operations. The science in this sense would need to prove that residential development would not be an inappropriate land use in this area. Upper and lower tier municipal plans, the Oak Ridge Moraine Conservation Plan and the Rideau Canal National Historic Site Management Plan all call for western science in one form or another. Although embedded knowledge does come through in broad general statements, western science drives most OP policy.

*The Kawarthas, Naturally Connected* project now being completed, seeks information from a broad range of organizations and stakeholders. This will undoubtedly result in local ecological knowledge being passed on, in conjunction with embedded knowledge and western

science. The current list of stakeholders is 24, including the Alderville First Nation, Kawartha Heritage Conservancy, Ducks Unlimited, County of Peterborough, Victoria Stewardship Council and the Environmental Council for Clear, Stony, White Lakes. It is interesting to note that this project is being completed by interested partners, and is not funded through a provincial program, although MNR has become very active. Interviewees noted that the final product will be various layers of mapping software that planning authorities will be able to use to guide land use decision making. They also mentioned that a scenario planning team has been put together, which includes concerned citizens and councillors among other stakeholders. It is here, when discussing recommendations that local ecological knowledge may influence the process. The map layers will be a product of many meetings and much collaboration.

As mentioned earlier, the work of various stewardship groups does not go unnoticed. These groups offer scientific information not otherwise attainable by planning authorities for resource and financial reasons. Stewardship groups do a lot of water quality monitoring-type work and can provide a lot of data that is useful in developing future policy. Beyond this though, stewardship groups create products that can be used by its citizens. The Muskoka Watershed Council for example has created “stewardship guides” that give basic information on a large range of topics. The *Species at Risk in Parry Sound-Muskoka* guide gives detailed information on the different classifications of SAR, and also gives a list of SAR that may be found in the area. More than just environmentally specific work, the Muskoka Heritage Foundation facilitates a Built Heritage Program. Through this program, property owners are encouraged to protect the heritage features of their properties. The Muskoka Heritage Foundation works with community groups interested in protecting cultural heritage (Muskoka Heritage Foundation, 2012). In another example, the city is much more active in creating science with stewardship groups.

Cambridge Waters, which is a subcommittee of the Cambridge Environmental Advisory Committee, looks to engage the public through its many projects. The goal is educate people on local water resources and the interconnection between water use and conservation (City of Cambridge, 2012). Local ecological knowledge may have a role to play here although western scientific protocols are used by volunteers. Overall, stewardship groups are an important way to engage concerned citizens about environmental protection. Stewardship groups use a lot of western science in the production of their materials, but appear to use other local forms of knowledge in outreach with the public.

Overall, western science was the commonly found form of science identified in this project. Embedded knowledge was also quite noticeable, especially when policy was based on known truths. Lastly, local ecological knowledge was hard to find, even in the stewardship group work. There is likely more local ecological knowledge being shared between parties than what makes it onto professional documents. It is recommended that a future study look at the role of local ecological knowledge in producing policy.

## **Chapter 6 - Conclusions and Recommendations**

Below is a list of recommendations that the County of Peterborough should consider in their upcoming OP review. Possible initiatives have been broken down into short term recommendations, long term recommendations, and two supporting recommendations. Long term recommendations are more time and resource intensive and are often more expensive, while short term items are easier to implement, often more cost effective and do not require much maintenance. Supporting recommendations are items that may not be addressed in an OP review but are important at the County level nonetheless. Below are six short term recommendations, four long term recommendations and two supporting recommendations that the County of Peterborough might wish to consider moving forward in the OP review process.

### **6.1 - Short Term**

The impact of residential cottage development and boathouse use is extremely evident on County lakes, such as Clear and Stony. Boathouses (and all marine structures) take away from the scenic views of the shoreline, but also affect the ecological function of a lakes shoreline.

- ***Recommendation #1:*** In both heavily developed and non-heavily developed lakes, the County of Peterborough may wish to implement a policy that allows for boathouses to be a maximum of one storey high and do not allow for human habitation.

The closer a structure is to a water body, the more it influences the character and function of the natural shoreline. The size of a structure should be conditional on distance from the nearest lake or water body.

- ***Recommendation #2:*** The County of Peterborough should consider implementing a “sliding scale” development policy on all new developments on area lakes. The closer a

property owner would like to build to a water body, the smaller the structure can be. The County could develop its own system, or could follow the lead of the Township of Gravenhurst.

The Aggregate Resources Act (ARA) governs the way aggregate operations function in Ontario. Municipalities still have the right to zone for aggregate resources, thus deciding where this type of operation can and cannot take place. Many municipalities have mentioned this is the direction they are going in their review updates.

- **Recommendation #3:** A mandatory setback from lakes and all water bodies would ensure that resource extraction does not take place where it should not. A setback of 200M from all water bodies should be considered in the County of Peterborough OP review process.

Retaining the natural shoreline as much as possible is an imperative way to ensure habitat is protected in the long term. This also protects the soil and helps keep the shoreline strong. A buffer between the high water mark and where removal of trees can take place is a delicate balance.

- **Recommendation #4:** The County of Peterborough should consider developing a shoreline protection policy that states that the first 20M of land from the high water mark act as a natural buffer. This buffer should be at least 75% natural. A program that encourages re-naturalization to the 75% level should also be considered, working with local vendors to supply native vegetation.

Through the Conservation Authorities Act, all provincially significant wetlands are protected from destructive and incompatible development. Many wetlands do not make it on the list for a host of reasons, including some in the County of Peterborough.

- **Recommendation #5:** The County of Peterborough should protect *all* wetlands from development by working with conservation authority staff and other government ministries to identify their location. All wetlands known to the County should be given locally significant status, which protects them under provincial legislation.

Septic re-inspection programs can ensure that nutrient loading is limited and that property owners become educated on septic system issues. The County of Peterborough would be able guide such a program from the County level if need be.

- **Recommendation #6:** A septic re-inspection program should be created in each County of Peterborough area municipality. Public consultation with property owners would inform the public of how the program will benefit the lakes everyone enjoys. An annual property tax charge could fund the program and the databases that would be created.

## **6.2 - Long Term**

In an increasingly developing society, viewsapes and cultural sites must be maintained or they run the risk of being permanently destroyed. A long term plan or vision for protecting the cultural heritage of the County of Peterborough would inform OP policy and could foster of culture of preservation in the area.



- **Recommendation #7:** Create a County of Peterborough Cultural Heritage Study and County of Peterborough Significant Landscape Heritage Study. These documents would outline what is protected, and where development can occur around areas of interest.

Site plan control areas go beyond the impact of a restrictive zoning by-law and add one more layer of protection against incompatible development. Site plan control areas along shoreline areas can restrict development that is not the desire of the current OP.

- **Recommendation #8:** All waterfront sites should be site plan control areas. Although this may be quite resource exhaustive, it would ensure that all development follows a vision that the public and local government feel strongly about, especially as it relates to retaining the integrity of the shoreline. A policy of not allowing minor variances on vacant lots would work in tandem with this policy.

A natural heritage systems inventory could provide information and data on every environmental feature within the County's jurisdiction. An inventory of this magnitude would make it much easier to develop policies for certain areas.

- **Recommendation #9:** Continue to work with partners in creating a mapped system of connected natural areas known as *The Kawarthas, Naturally Connected*. Implement the findings by updating the County OP and zoning by-law.

### **6.3 Supporting Recommendations**

Preparing a well developed guidance document such as the Muskoka Water Strategy has helped inform decision making across the District of Muskoka. Key components of the strategy

are: 1) Lake System Health, 2) Muskoka Watershed Council, 3) Communication and 4) Broader Water Initiatives. 1 and 2 have been discussed in this report. Communication refers to reaching out to the community, using resources such as the Muskoka Water Web described earlier. Broader Water Initiatives includes sharing information and integrating programs between stakeholders interested in watershed issues.

- **Recommendation #10:** Develop a County of Peterborough Water Strategy. Present and summarize the main goals of the initiative, and work with area municipalities to implement the broad goals of the plan in their OPs and zoning by-laws.

EACs have proven to be important stakeholders with regards to protecting the natural environment at the local level. EACs also can provide an important stewardship role that municipalities do not have the resources or time to commit too.

- **Recommendation #11:** An EAC should be considered at the County level, which would work with local EACs in lower-tier municipalities. The County of Peterborough EAC would be able to work with the County and could review and check proposed and current projects.

## **Appendix A - Evaluation Criteria Used to Guide the Research**

This section sets out the evaluation criteria used to guide the research for this project. The evaluation criteria were selected based on variables that were discussed in the literature as important to natural heritage planning and lake planning. Evaluation criteria were separated into two categories – those variables that should be addressed through in lake planning and associated implementation tools. Variables to be addressed include: water quality, natural shorelines, wetlands, fish and wildlife habitat, species at risk (SAR) habitat, resource extraction, viewscales and, cultural sites. Implementation tools include: natural heritage policies, OP designations, zoning, future development and redevelopment, septic re-inspection, environmental advisory committees, enforcement, stewardship, boathouses, minor variances and building on footprints.

### *Environmental Protection Polices*

#### 7.1 - Water Quality

**Brief description:** water quality impacts both human beings and the physical environment.

Depending on where water quality is being monitored in Ontario (I.E. Shield lakes, non-shield lakes, shallow lakes, Great Lakes), different inputs will affect how healthy a water body is.

Clear, Stony and White Lakes all depend on good water quality to support human and aquatic life.

**Justification:** Water quality is an integral component to a healthy lake. Moreover, cottage living and human activities have the ability to impact water quality. Ways in which water quality is monitored differs across space. The Clean Water Act and Ontario Water Resources Act are the pieces of provincial legislation that aim to protect water quality for all Ontarians.

The work of the Kawartha Lake Stewards Association (KLSA) is encouraging. *The Clear, Ston(e)y, and White Lake Plan* notes that they only measure easily measured criteria, such as Phosphorous, E. Coli and Secchi measurements.

**Background Information:** Below is a list of pollutants and indicators that should be considered when assessing Clear, Stony and Whites Lakes, keeping in mind that only Phosphorous, E. Coli and Secchi measurements are currently being measured. Phosphorus, Nitrogen, Secchi depth, E. Coli and Dissolved Oxygen standards are provided because they appear to be the most commonly cited measures of water quality based on the literature. Acceptable concentration levels are established by MOE's *Water Management: Policies, Guidelines, Provincial Water Quality Objects* (1994).

**Phosphorus:** As mentioned in *The Clear, Ston(e)y, and White Lake Plan*, phosphorus is a pollutant and is derived from both human and natural sources. To avoid nuisance concentrations of algae in lakes, phosphorus concentrations of 20 micrograms per litre or 20 parts per billion (ppb) should not be exceeded for ice-free periods (MOE, 1994). High level protection against aesthetic deterioration calls for concentration levels below 10 ppb. Concentrations below 30 ppb will eliminate excessive plant growth in rivers and streams (MOE, 1994). Safe drinking water levels for phosphorus is 50 mg/L (Safe Drinking Water Act, 2002).

**Nitrogen:** Many agencies have specified maximum acceptable concentrations for nitrogen in drinking water. There is a general consensus that concentration levels of 10 mg/L for Nitrate and 1 mg/L for Nitrite are safe for drinking water. The maximum concentrations for fresh water aquatic life is 200 mg/L for Nitrate and 0.06 mg/L for Nitrite (Water Quality Criteria, 2011)

**Secchi Depth:** Secchi disk measurements are a common way to measure water clarity in an area. A secchi depth greater than 5m indicates an oligotrophic lake, a measurement of 3-5m is

characteristic of a mesotrophic lake, and less than 3m signifies an eutrophic lake (Otter Lake Landowners Association Inc, 2007). According to *The Clear, Ston(e)y, and White Lake Plan*, it appears that all of the lakes are mesotrophic in nature, as Stony, Clear and White Lakes are generally less than 4m, and Upper Stony being over 4m. This is indicative of a moderately nutrient rich lake (Greater Bobs and Crow, 2007).

**Dissolved Oxygen and Temperature:** The following is a summary of acceptable dissolved oxygen concentration levels

Dissolved Oxygen Concentration				
Temperature	Cold Water Biota		Warm Water Biota	
°C	% Saturation	mg/L	% Saturation	mg/L
0	54	8	47	7
5	54	7	47	6
10	54	6	47	5
15	54	6	47	5
20	57	5	47	4
25	63	5	48	4

(MOE, 1994)

Figure 1: Acceptable Dissolved Oxygen Concentrations Provided by MOE

**Escherichia coli (E. coli):** *The Clear, Ston(e)y, and White Lake Plan* also discusses the potential negative impact of high E. Coli levels. The plan notes that levels about 100 E. coli per 100 mL of water is considered to be unsafe by public health officials. This number is supported by MOE’s Water Management (1994) report. If E. coli counts exceed 100 per 100 mL, a site is no longer safe for swimming or bathing. E. coli is a specific indicator of fecal contamination (MOE, 1994).

Different municipalities will monitor different aspects of water quality depending on the local context. There are proactive steps that can be taken to limit negative impacts on water quality and quantity. The list below provided by the Landowner Resource Centre appears to be quite all encompassing and is supported by the Ontario government. This report touches on many of these talking points also. These are (Landowner Resource Centre, 1999):

- 1) Use less water
- 2) Manage waste water properly
- 3) Take small steps at home (non-toxic cleaners, eliminate use of fertilizers etc.)
- 4) Control erosion and sediment
- 5) Protect wetlands
- 6) Conserve groundwater
- 7) Manage storm water
- 8) Prevent spills (oils, pesticides/herbicides, fertilizers and other chemicals.)
- 9) Boat responsibly

If policy (in this case OP review) can be tailored to address these methods of protecting water quality, measurements in the future will hopefully support these good initiatives.

## 7.2 - Natural Shorelines

**Brief Description:** Natural shorelines represent a natural defense against anthropogenic cottage and shoreline development. The Land Owner Resource Centre (2000) believes that a natural shoreline 1) provides food and shelter for wildlife, 2) provides spawning beds for fish, 3) improves water quality, 4) catches runoff and excess nutrients, 5) cools and provides shade for water and, 6) limits growth of algae and aquatic plants. It is for these reasons that protecting natural shorelines is imperative.

**Justification:** Natural vegetation along the shoreline of lakes is an essential part of protecting water quality, minimizing soil erosion, and preserving an aquatic environments ecological balance. Unfortunately in many Ontario lakes, natural vegetation has been removed and is now dominated by non-native species (Land Owner Resource Centre, 2000).

There are common ways in which a natural shoreline is negatively impacted by development. First, retaining walls – which are often installed to prevent shoreline erosion from waves – are almost useless to most fish and plants (MAPLE Inc, 2003). The shoreline is often dead around this area. Docks and boathouses also pose threats to fish and plant life as they can alter natural processes. For example, docks can destroy bottom vegetation and cement

foundations of boat houses often impact local ecology. Lastly, infilling and excavations for the purpose of extending the shoreline can contribute much sediment to a lake (MAPLE Inc, 2003). Avoiding these alterations to the natural shoreline is now the focus of CAs, Parks Canada and MNR.

**Background Information:** The first step in shoreline restoration is to identify what state the shoreline is in. Natural (N) shorelines are those that show no significant human disruption (MAPLE Inc, 2003). Here, development is not visible and there is well established native vegetation. Regenerative (R) shorelines are those that have been developed with the local environment in mind. There has been an avoidance of significant alteration to the shoreline and there is evidence of active planting. Less than 20-25% of the shoreline has been disturbed for waterfront access, docking etc. Ornamental (O) shorelines are those with turf grass lawns or other non-native vegetation at the expense of the native vegetation. Ornamental shorelines are often characterized with artificial structures that occupy a notable percentage of the property frontage. Finally, degraded (D) shorelines are those which may impact lake ecology and where natural vegetation is no longer present. Soil erosion is often a reality as are failing retaining walls etc. Immediate remedial work is needed to stabilize the shoreline (MAPLE, 2003).

In the case of natural shoreline restoration, there are four main strategies suggested by Land Owner Resource Centre (2000). The first is preservation. This is retaining shorelines and access to shorelines that are not significantly and presently altered. Second is naturalization. This is allowing degraded shorelines to return to their natural state without any interference. The next option is enhancement, which is the planting of native species while removing non-native species. This is a good option to get the process initiated. Lastly, restoration is completely clearing shoreline areas and planting native species in the now open shore.

### 7.3 - Species At Risk

**Brief Description:** *The Endangered Species Act, 2007 (ESA)* was designed with the intention of providing leading protection and recovery of Ontario's at risk species. The ESA builds off of the original Endangered Species Act written in 1971. Major differences between the two documents are highlighted in the most recent version. Specifically, the ESA (2007) places priority on the use of scientific-based review of species. The Committee on the Status of Species at Risk in Ontario (COSSARO) is mandated through the ESA to list species at risk in Ontario by using the best available science and Traditional Aboriginal Knowledge.

**Justification:** The ESA has strong implications as it relates to natural heritage systems planning. *Sections 9 and 10 of the ESA are significant tools for the government in fulfilling its mandate to protect species at risk in Ontario.* Section 9 calls for the protection and recovery of species at risk. It is a violation of section 9 if a species is killed, harmed or harassed at any time or if it is transported or sold. Section 10 puts a prohibition on damaging or destroying habitat of species listed on the Ontario List of species at risk. Further, sections 16 and 17 outline the implementation and interpretation of permits and agreements issued by MNR. Through sections 16 and 17, the ESA is able to restrict and monitor development in areas otherwise prohibited by sections 9 and 10.

**Background Information:** There is both "regulated" and "general" habitat provided by the ESA (2007). When a species is named to the Species at Risk in Ontario (SARO) list, its habitat is protected. General habitat in this sense are the areas that the species depends on. This protection shall remain in place until a species-specific habit regulation is created by MNR (OMNR, 2011).

Once a species is named to the SARO list, identifying species specific habitat is initiated (OMBR, 2011). This provides the province with greater knowledge of what is meant by a species



habitat. Moreover, the legal description of a species habitat is a species specific regulation. The general habitat protection described above is removed once a specific habitat regulation is created. The province has two years to identify regulated habitat for endangered species, and 3 years for threatened species (OMNR, 2011).

#### 7.4 - Fish Habitat

**Brief Description:** Fish habitat is the responsibility of both the federal and provincial government. First, Fisheries and Oceans Canada (DFO) protects fish and fish habitat through the federal Fisheries Act (NHRM, 2010). This is the principle statute for the protection of fish habitat and fisheries in Canada. Under the Fisheries Act, work that may result in harmful alteration, disruption or destruction of fish habitat is not allowed, unless DFO has granted such development.

The legislative authority in Ontario to protect fish habitat is found within the PPS (2005). PPS policies direct Ontario planning authorities to address fish habitat during planning approvals. MNR provides technical guidance to planning authorities to promote sound planning and to ensure fish habitat is protected through planning.

**Justification:** Fish habitat is protected because aquatic species depend on undisturbed vegetation to survive. Planning is used as the tool to accomplish this.

**Background Information:** The PPS (2005) explicitly refers to fish habitat in section 2.1.5. It reads “Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.” Section 2.1.6 speaks to development restrictions on adjacent lands to fish habitat, and states that development is only allowed if there is no negative impacts to fish habitat or their ecological functions.

Fish habitat, as defined in the Fisheries Act, c. F-14, is "...spawning grounds and nursery, rearing, food supply, and migrations areas on which fish depend directly or indirectly in order to carry out their life processes."

Lastly, the Habitat Referral Protocol for Ontario (2009) produced by the multi-agency Aquatic Resources Management Advisory Committee discusses the approval and permitting role of agencies that have a responsibility to review development proposals around water, and where there may be impact to fish and fish habitat (Aquatic Resources Management, 2009). Federal, provincial and municipal agencies in Ontario must collaborate in the review of these proposed projects. These include DFO, Parks Canada, Transport Canada, Environment Canada, MNR, MTO, MOE, Ontario Ministry of Agriculture, Food and Rural Affairs, and CAs.

At the most basic level, CAs and county/municipal planning authorities are to support the Fisheries Act and PPS in planning for fish and fish habitat, and must direct development proposals to the appropriate authorities if permitting is required.

### 7.5 - Wildlife Habitat

**Brief Description:** Wildlife habitat is also protected by the Ontario government. Much like fish habitat, wildlife habitat is protected through the PPS (2005). Section 2.1.4 of the PPS reads "development and site alteration shall not be permitted in: significant wildlife habitat; unless it has been demonstrated that there will be no negative impacts on the natural features of their ecological functions." Section 2.1.6. speaks to there being no development allowed on adjacent land to significant wildlife habitat unless there will be no negative impacts to the natural features or their ecological functions.

**Justification:** Much like fish habitat, wildlife need maintained natural features to survive. It is common knowledge that biodiversity is impacted if cores and corridors, among other natural habitat, is destroyed.

**Background Information:** The Significant Wildlife Habitat Technical Guide produced by OMNR (2000) was created to help in the identification, description and prioritization of significant wildlife habitat (OMNR, 2010). The four categories that have been created to facilitate identifying and evaluating significant wildlife habitat are:

- 1) Habitats of seasonal concentration of animals
- 2) Rare vegetation communities or specialized habitat for wildlife
- 3) Habitat of species of conservation concern
- 4) Animal movement corridors

If wildlife habitat is determined to be significant based on the evaluation system provided in the Technical Guide, it warrants protection under the *Planning Act* (OMNR, 2000). The updated NHRM (Figure 9-1) provides an updated and recommended process for identifying the occurrence of significant wildlife habitat.

The updated NHRM calls for planning authorities to identify all significant wildlife habitats on a comprehensive basis. This may include carrying out site assessments before site-specific planning approvals are granted. It is suggested that evaluation and identification of significant wildlife features be undertaken after other natural heritage features have been identified. A great example of a comprehensive approach to identifying significant wildlife habitat is the Peel-Caledon Significant Wildlife Habitat Study that has now been completed (OMNR, 2010).

\*For information regarding how habitat of species at risk is protected, please refer to the species at risk portion of the literature review.

## 7.6 - Resource Extraction

**Brief Description:** Resource extraction in Ontario is subject to the Mining Act of Ontario (amended in 2009) and all mineral rights are owned by the Crown (FOCA, 2011). By virtue of the Crown controlling all mineral rights, certain rules or policies have been set in place to protect Ontario's precious resources. Non-metallic aggregate resources that are extracted above ground are subject to the Aggregate Resources Act (1990).

**Justification:** Unfortunately, and even with the new restrictions on resource extraction, municipalities are left with little to no power as mining exploration can occur up to the property line of private land owners, as municipal OPs do not apply to Crown Land (FOCA, 2011). This is why it is important to understand how other municipalities are addressing resource extraction and its relationship with water bodies. Groups such as FOCA believe that in Southern Ontario, all crown land should become subject to the rules of the Planning Act so municipalities are able to zone for future mining exploration.

**Background Information:** In 2009, the Ministry of Northern Development and Mines introduced new legislation in an attempt to modernize Ontario's Mining Act. Although there are many complaints of omissions, the Mining Act has made it clear what is and what is not acceptable with regards to resource extraction in Ontario. The four key elements discussed below come from Michael Bourassa's presentation: *Ontario Mining Act Amendments (2009)*

- 1) Right of Prospector to Enter Lands: Prospector's are permitted on Crown lands as long as a license is held. Individuals must pass a prospector's awareness program to obtain a license.
- 2) Right to Stake a Claim: In southern Ontario (applicable to Clear, Stony and White Lakes), mining rights below private surface lands are withdrawn from prospecting. Different rules apply in Northern Ontario.
- 3) Exclusive Right to Conduct Exploration: Sections 78.2 and 78.3 speak to the process of obtaining the right to mine. They are:

**78.2** (1) No person shall carry out an activity pre-scribed for the purposes of this section on a mining claim, mining lease or license of occupation for mining purposes unless the person has submitted an exploration plan, in accordance with any prescribed requirements, including any Aboriginal consultation that may be prescribed. (Mining Act, 2009)

**78.3** (1) No person shall carry out an activity pre-scribed for the purposes of this section on a mining claim, mining lease or license of occupation for mining purposes unless the person has applied for and been issued an exploration permit. (Mining Act, 2009).

These new sections are different from the previous Mining Act (which was in use during the production of the *The Clear, Ston(e)y, and White Lake Plan*) because now an exploration plan must be developed by the claim holder and the same individual must obtain appropriate permits.

- 4) Right to Secure a Lease: If an Exploration Plan and Permits are obtained, the mining claim is leased for one year.

There are also rules regarding the operation of a Pit or Quarry in Ontario, which are provided in the Aggregate Resources Act. Aggregate is defined as gravel, sand, clay, earth, shale, stone, limestone, dolostone, sandstone, marble, granite, and rock and these materials are often extracted in Southern Ontario (Rules & Regulations). Aggregate operations are strictly controlled and regulated by the Act. All of the standard criteria for a license, aggregate permit and wayside permit application is provided in the Act and are controlled by OMNR. This leaves local governments with little control over the fate of their aggregate resources.

A municipality has the role of designating the location of future aggregate operations. For example, it is important that the allocation of residential land does not sterilize important aggregate resources as a result of bad land use planning. Municipalities are to map out where resource extraction can and cannot take place in schedules provided in municipal OPs.

## 7.7 - Viewscapes and Cultural Sites

**Brief Description:** If viewscapes and cultural sites are deemed to be important parts of Ontario's heritage, there are protection policies at the provincial level that may be of interest according to the Ontario Ministry of Tourism, Culture and Sport (OMTCS, 2005). A framework for the protection of Ontario's heritage properties can be found in the Ontario Heritage Act. Provincial and municipal roles are defined in this document.

**Justification:** Protecting viewscapes and cultural sites in Ontario is largely the role of local planning authorities and is not subject to any strict environmental protection policies.

OPs and zoning are tools that planning authorities have readily available to them to protect features deemed to contain heritage value.

**Background Information:** The Ontario Heritage Act allows for the creation of Municipal Heritage Committees. These committees' advise Council on heritage issues and assist in exercising its power under the Ontario Heritage Act (2005). Some of the activities the Municipal Heritage Committee may perform are: creation of heritage resources inventory and advise Council on designation and alteration to heritage resources (OMTCS, 2005).

Lastly, Council is given the power under the Ontario Heritage Act (2005) to designate properties of cultural value or interest (OMTCS, 2005). The Municipal Heritage Committee usually recommends the designations, but anyone in the community can request that a property be designated. Parks, buildings, archeology sites and other cultural sites can be designated.

## 7.8 - Wetlands

**Brief Description:** *The Clear, Ston(e)y, and White Lake Plan* (pp. 21) describes wetlands as "... open water, marsh, swamp, fen or bog and are a vulnerable and critical part of our natural

heritage.” The plan goes on to say that wetlands are nature’s filters, and that they purify water sources. High rates of biological activity in wetlands result in specific plant and animal species not found anywhere else.

**Justification:** Wetlands are important in the NHS context because they are often found in discrete patches within a matrix of habitat (Gibbs, 1993). This makes them potentially vulnerable to development.

**Background:** In 1993, the Ontario Wetland Evaluation System was created by MNR. Although based on scientific criteria, the evaluation system was developed to serve the needs of Ontario’s planning process. The system provides a method to rate wetlands relative to each other. Wetland values are grouped into four components. These principle components are *Biological, Social, Hydrological, and Special Features*. Each component is then evaluated individually, as it is subdivided into subcomponents etc. Based on the scoring, a wetland becomes classified as provincially significant or locally significant (OMNR, 1993). The difference between the two classifications is that with a higher score, a wetland is classified as provincially significant. The PPS (2005) protects all provincially significant wetlands, and planning authorities are to adhere to this. Section 2.1.3(b) of the PPS reads “Development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E and 7E.” Clear, Stony and White Lakes falls with these Ecoregions.

Section 2.1.6. of the Provincial Policy Statement states that development shall not be permitted in adjacent lands to natural heritage features as policies that have been identified in policies 2.1.3., unless ecological function of these lands has been evaluated and it has been demonstrated that there will be no negative impacts.

As for incentive programs for restoring wetlands, the Conservation Land Tax Incentive Program (CLTIP) (2010) aims to recognize, encourage and support the responsible stewardship of Ontario's significant lands (OMNR, 2010). The program works by exempting landowners who agree to protect heritage values of their private property. Activities that will degrade, damage or result in loss of features are not undertaken by the landowner via an agreement with the Province. MNR is the lead Ministry for the CLTIP, but other stakeholders and agencies are involved with this program also, providing different functions.

Biodiversity is found across the Ontario landscape. In 2005, MNR developed *Ontario's Biodiversity Strategy*. "*Biological diversity or biodiversity refers to the variety of life, as expressed through genes, species and ecosystems, that is shaped by ecological and evolutionary processes* (OMNR, 2005, pp.1). This strategy was produced with the intention of providing guidance and support to all Ontarians, communities, and sectors of society. The intent is Ontario's biodiversity will be conserved in light of an expected four million more people in Ontario by 2030 (OMNR, 2005). Living sustainability and respecting nature is the overall aim of the document.

Interestingly, *Ontario's Biodiversity Strategy* (2005) provides six "strategic directions" that are meant to mitigate threats to Ontario's biodiversity. These include:

- 1) Engage Ontarians: What is the community doing to educate and increase awareness of biodiversity related issues?
- 2) Promote Stewardship: How are private landowners being engaged and what incentive programs (if any) have been created?
- 3) Work Together: How well is the case study location working with others? I.E. Aboriginal communities, urban and rural communities, academic institutions, etc.
- 4) Integrate Biodiversity Conservation in Land Use Planning: How has the community incorporated biodiversity into its land use plans?
- 5) Prevention: What biodiversity related policies have been created and are now used to prevent development on sensitive lands?



- 6) Improve Understanding: How is new scientific knowledge and traditional knowledge from Aboriginal cultures and rural communities being incorporated into biodiversity best management practices?

## **Appendix B - Implementation Tools**

### **8.1 - Official Plan Designations and Policies**

**Brief Description:** OP designations are important because they outline what activities and types of development are allowed in areas under the control of the local planning authority. Without OP designations, there would be no control over where development can take place and at what scale. OP designations help implement the land use policies the municipality has deemed as important.

**Justification:** One way to plan for natural heritage is to designate land use accordingly. The NHRM (2010) stresses the importance of developing regulatory tools and OPs aimed at protecting natural heritage resources.

Some of the more important OP approaches that the NHRM (OMNR, 2010) stresses as it relates to NHS planning are:

- 1) Prepare policies and land use designations for nature heritage systems
- 2) Prepare policies and land use designations for nature heritage features and areas
- 3) Incorporate natural heritage features and areas within a broader, less restrictive designation
- 4) Prepare policies for adjacent lands of natural heritage features and areas
- 5) Prepare site plan control policies

It is through the Planning Act (para. 34(1) 3.2) that local municipalities are empowered to pass zoning by-laws that prohibit the use of land or the locating, erecting or using of structures and buildings within natural features and areas (OMNR, 2010, 113).

**Background Information:** Planning authorities should zone with the following in mind (NHRM, 2010, 114):

- 1) Consistency with the PPS
- 2) The policies of the official plan and the extent to which they provide the ability to achieve consistency with the PPS
- 3) The quality and accuracy of data available

If planning for natural heritage systems and environmentally sensitive areas is consistent with the requirements set out in the Planning Act and Provincial Policy Statement, there are different approaches planning authorities can take. For example, natural heritage features can be zoned to prohibit development and site alterations. Permitted uses may include open space and environmental protection (OMNR, 2010). This would be most appropriate for significant wetlands in the Stony, Clear and White Lakes region. Planning authorities should also consider establishing setbacks, zoning and evaluation requirements for adjacent lands. Lastly, provisions for minimum distances and lot line setbacks can be used to achieve appropriate locations for structures and buildings. This could be used to contribute for buffering significant natural features (NHRM, 2010). Lastly, site plan controls should also be considered by planning authorities as another way to protect significant environmental features.

## 8.2 - Lake Capacity

**Brief Description:** Lake Capacity Assessments (LCA) are used to predict the impacts of shoreline development on water quality of inland lakes. A Lakeshore Capacity Model (LCM) is used to determine the maximum allowable shoreline development that can occur without impairing water quality (Federation of Ontario Cottagers).

**Justification:** A LCM tells us the carrying capacity of a lake in terms of maximum allowable total phosphorus (TP) concentration (MOE, 2010). This is important because it provides data on the current water quality situation in a lake and allows us to estimate how many future development a shoreline can handle. Excessive phosphorus can lead to increased algae growth which not only reduces water clarity, but lessens a lakes aesthetic appeal. When algae die, they settle at the bottom of the lake, which leads to increased bacterial levels to decompose the algae.

Finally, more oxygen from the water column is used resulting in a loss of cold, well-oxygenated habitat that is needed for many cold water species (MOE, 2010).

**Background Information:** A LCM may indicate that a lake is at its development capacity. FOCA suggests that this be incorporated into future planning decisions and OPs. Zoning by-laws could state that there is no more development allowed in certain lakes where a LCM has determined that TP concentrations are already high.

It should be noted that LCM's were developed on and tested on Canadian Shield lakes. This is an important issue because Clear and White Lakes lie south of the Canadian Shield, Clear being a boundary lake. The LCM has been successfully used to assess boundary lakes (lakes partly off the Canadian Shield). Caution should be used when employing this water quality testing technique (Federation of Ontario Cottagers). It is in my opinion that MOE be contacted if LCAs are to be used on Stony, Clear and White Lakes.

### 8.3 - Future Residential and Commercial Redevelopment

**Brief Description:** Residential and commercial redevelopment refers to the construction of new building on the same site or parcel as a structure had previously stood. This allows for the adaptive reuse of an already developed property and can limit sprawl-like expansion. A typical reason for redevelopment has to do with inadequate or incompatible development in fringe areas of communities, despite zoning regulations (Hodge & Gordon, 2008). The PPS (2005) speaks of redevelopment in reference to healthy, livable and safe communities.

**Justification:** Redevelopment in the lake planning context is concerned with building on existing footprints. This is important because people are allowed to redevelop a non-complying structure. Can it be made bigger if it does not follow the zoning-bylaw? Redevelopment in the

PPS (pp.35) is defined as: "... the creation of new units, uses or lots on previously developed land in existing communities..." This definition could lead to some open ended interpretations because it is difficult to determine if one can build on larger structure on the same footprint.

**Background Information:** At the provincial level, redevelopment is often viewed with intensification through a proactive lens, where at the lake level, redevelopment may be viewed in a negative or restrictive light. I.e., redevelopment may mean big and environmentally destructive developments that do not fit into the existing character of the lake.

General redevelopment policies and zoning is up to the planning authority (as long these are consistent with provincial legislation), so one should expect some variation in approach. All of the information discussed above such as water quality, wetlands, lake capacity etc. feeds into how redevelopment is utilized or restricted.

#### 8.4 - Septic Re-Inspection

**Brief Description:** Septic re-inspection programs are funded and created by area municipalities in the context of planning for lakes. These programs often see by-law officers enter private properties to inspect the entire septic system, including tile fields. Often, different lakes are examined each year on a rotating cycle.

**Justification:** In Ontario, the Building Code Act (BCA) (1992) regulates the construction, operation and maintenance of on-site septic systems. Municipalities, health units and CAs are provided with the administrative structure through the BCA to establish their own re-inspection programs if they wish to do so (Septic Systems Re-Inspection). Enforcement agencies are given regulatory powers through the BCA. Thus, septic re-inspection programs are justified because it is in the public's health interest to have such programs, and it also protects water bodies for nutrient loading.

**Background Information:** The Ministry of Municipal Affairs and Housing’s (MMAH) *Septic System Re-Inspection* guidance document provides information on inspection criteria. To conduct inspections of potentially unsafe sewage systems, enforcement agencies are able to refer to BCA S.15(1) which speaks to right of entry. Right of entry onto land is provided to inspectors “to determine whether a building is unsafe.” S.15(1) is largely the reason there has been many re-inspection programs established, especially over the past 15 years. Furthermore, sewage systems are deemed unsafe according to BCA S.15(2.1) if they are not properly maintained or operated in accordance with the OBC (2006) and BCA (1992). S.16 provides information on power of entry.

Re-inspection programs depend on three areas of documentation. These are:

- 1) Inspection Reports: For both the property owner and inspector. This report contains information recorded during the visual inspection.
- 2) Letter to Homeowner: Details the results of the visual inspection. Informs the property owner of needed remedial work or if there is no evidence of the system being unsafe. Obligations to the property owner should be outlined here if system is deemed unsafe.
- 3) Documentation of Safe Inspection: If there is no evidence of an unsafe system, this provides the property owner documentation that there was a visual inspection and nothing alarming was found. (Septic Systems Re-Inspection).

In Part 8 of the Ontario Building Code (OBC), the different types of wastewater treatment systems are listed. It is common for septic re-inspection programs to use this information, such as the Township of Archipelago, to inform the inspection program process. Below is an example of the Township of the Archipelago checklist for deficiencies for sewage system classes. (Septic Systems Re-Inspection).

**Class 1 (Privy)**

- Absence of fill around the base of the privy
- Inadequate soil depth

**Class 2 (Greywater)**

- No evidence of a grey-water pit; pipe on surface of the ground
- Absence of fill around the base of an existing pit

- Inadequate cover

**Class 4 (Septic System)**

- No existing system; pipes on surface of the ground, or slightly buried
- Old tanks in need of replacement
- No indication of leaching bed; outlet pipe from ground extending into/onto ground
- Leaching bed completely overgrown, in need of replacement
- System completely buried; requires information

**Class 5 (Holding Tank)**

- Corroded access cover
- Holes in holding tank
- Access openings not properly sealed

**General**

- Extra plant growth over the leaching bed area
- Foul odours outside
- Effluent breaking out to the ground surface
- Significant algae growth in or around nearby lakes or water bodies.

The Township of Gravenhurst has also provided MMAH with a sample list of items to watch for

Different types of re-inspection programs have been created and there is no set way to create and maintain such a system. Visual inspections appear to be the norm, as more intensive inspections cost significantly more. One is encouraged to look at the *On-Site Sewage System Maintenance Inspection* (2010) document produced by The Ministry of Municipal Affairs and Housing. This document outlines what septic system inspectors should be looking for, much like the examples given above.

### 8.5 - Environmental Advisory Committees

**Brief Description:** Many environmental advisory committees (EACs) provide advice on natural heritage protection. Depending on the context – and based on a review of many EACs in Ontario – they are usually comprised of 7-15 members. In most cases, there are two councillors and the rest are made up of local citizens and city staff, but there are no set rules for composition. For Clear, Stony and White Lakes, the issues that an EAC would examine and be given the mandate to watch over would be unique to the landscape.

**Justification and Background:** EACs are becoming increasingly popular as environmental concerns amplify across Ontario and Canada. Many counties and municipalities now have EACs to provide knowledge and recommendations to Council on many issues.

The EACs of Ontario website writes:

The mandate of EACs varies from municipality to municipality. Some EACs focus on the environmental aspects of land-use planning. Others deal with a broader range of environmental issues. These can include waste management, tree protection, water quality, wetlands, environmental education, trails and bikeways, as well as environmental policies and plans.

In the City of Waterloo for example, the local EAC works with planning staff to help guide efforts to be more effective. Collaboration is a tool the EAC groups uses to gain legitimacy in planning issues and to become more informed on environmental issues overall.

#### 8.6 - By-Law Enforcement:

**Brief Description:** By-law enforcement is the act of having a by-law enforcement officer (in most cases) charging residents for breaking rules set out in the city by-laws, likely zoning by-laws. For example, if someone removes all native vegetation on a shoreline and this is deemed a deviation from what is allowed in the zoning by-law, enforcement will come into effect.

**Justification:** Since each municipality or county has its own by-laws, enforcement will differ. Resources also dictate enforcement efforts, as available capital is dependent upon an entire host of variables. With that said, there appears to be some common ground among rural communities in enforcing their respective by-laws.

**Background Information:** In respect to the County of Peterborough context, a County Council document discussed the different approaches to enforcing the county's many by-laws in the future. The options discussed were (The County of Peterborough, 2008):

- 1) Police Enforcement



- 2) Private Enforcement
- 3) Transfer Authority for Enforcement to Townships
- 4) Enforcement by Public Works Staff

Many municipalities across Ontario choose to provide a by-law enforcement officer.

With that said, enforcing by-laws in lake regions may be more resource exhaustive depending on access.

### 8.7 - Stewardship

**Brief Description:** Stewardship takes many forms. From organized groups to local citizens, active stewardship is a valuable way to protect our natural environment. Canada Stewardship defines stewardship as “... a shared responsibility between organizations, communities and individuals to manage and protect our environment and ecosystems. It is both an action and an ethic by which Canadians care for land, water and air today, and for generations to come.”

Furthermore, stewardship is about working together to protect our natural environment.

**Justification:** To facilitate stewardship across the province, Ontario Stewardship was created. Ontario Stewardship is a program run through MNR that focuses on protecting and restoring Ontario’s natural resources. This is achieved through support and engagement (Ontario Stewardship).

Ontario Stewardship supports Stewardship Council’s across Ontario. There are currently 46 Stewardship Councils that are designed to address the needs of landowners and local issues that concern forestry, water, wetlands, agriculture, wildlife etc. It is believed that through education, public perception is influenced which can shift attitudes related to development and land use practices (Ontario Stewardship).

**Background Information:** Peterborough County Stewardship Council is a local organization.

Peterborough Council Stewardship Council's website proudly communicates their vision. It is:

Landowners and organizations working together to promote, encourage, support and demonstrate the value of using our soil, water, wetlands, woodlands, wildlife and other natural resources wisely, to maximize economic, ecological and social (recreational) opportunities and benefits for current and future generations (Program Overview).

Peterborough Council Stewardship Council provides funding to landowners who wish to carry out land stewardship projects. Technical assistance to landowners is provided in addition to funding.

There are other forms of stewardship at the provincial level. For example, the Species at Risk Stewardship Program is central to the ESA (2007). The pillars of the program include (Ontario's Species at Risk Stewardship Program):

- 1) Education and outreach
- 2) Incentive programs to support private landowners, and
- 3) Funding for stewardship activities

As a part of the program, the Ontario Species at Risk Stewardship Fund has been created to encourage greater public involvement in the protection and recovery of at risk species and their habitats (Ontario's Species at Risk Stewardship Program).

## 8.8 - Boathouses

**Brief Description:** Boathouses are unnatural structures placed on the shorelines of many of Ontario's lakes. They allow for the storage of pleasure craft and marine equipment. Some boathouses have separate rooms for sleeping and storage other than the main area.

**Justification:** There can be significant impact when a boathouse is constructed. For example, a newly constructed boathouse can cover spawning habitat for fish, disturb logs and rocks that

provide shelter for aquatic species, cause sedimentation and erosion from bank disturbances, introduce toxic material via improper building materials and disrupt the sensitive life stages of fish (Fisheries and Oceans Canada, 2011).

**Background Information:** Since Clear, Stony and White Lakes are a part of the Trent-Severn Waterway (TSW), the construction of boathouses falls under federal control (if the structure is to be placed in water). The document, *Rideau Canal and Trent-Severn Waterway: Policies for In-Water and Shoreline Works and Related Activities* (2007) provides detailed instructions for someone wishing to build a new in water boathouse.

The local CA and municipality should be contacted if a boathouse is to be constructed on land (The Lakeland Alliance, nd). There may be a partnership with DFO also. For example, Cataraqui Region Conservation Authority and DFO work together with respect to fisheries reviews on all on shore and in water projects (Charleston Lake Association, 2011).

### 8.9 - Building Footprints

**Brief Description:** A building footprint is the total area surrounded by the external walls of a structure. Everything inside the exterior walls is considered part of the footprint.

**Justification:** Building footprints are important as they relate to this project because people commonly demolish and redevelop cottages for residential use. In most municipalities (including the County of Peterborough) one is not allowed to demolish a structure and build a larger structure outside of the existing building footprint; unless approval has been obtained from the local planning department.

**Background Information:** Information was collected on building permits, and if new buildings require permits if they are under a certain size. OPs will call for building permits depending on

the structure. One must obtain a building permit in the province of Ontario if they wish to construct a structure over 10 square meters (OMMAH, 2010). This is meant to ensure safety.

There may be other reasons a building permit is required though, and where the County of Peterborough will have a significant degree of control. A building permit may be required by the County to comply with local zoning by-laws and other planning controls on buildings. This is important because although a building may be under the 10 square metres minimum, by-laws may still be able to control development on Clear, Stony and White Lakes.

### 8.10 - Minor Variances

**Brief Description:** A minor variance is a small change or variation from the local zoning by-law. In order for a minor variance approval to be accepted, section 45(1) of the Planning Act (1990) must be satisfied.

**Justification:** Minor variances in cottage country are approached in the same manner as in urban Ontario, as the Planning Act is an all encompassing document. With that said, zoning by-laws are certainly different in rural communities.

**Background Information:** Section 45(1) speaks to the four tests that a minor variance must meet. They are:

- 1) Is the application minor?
- 2) Is the variance desirable for the appropriate development or use of the property?
- 3) Is the general intent and purpose of the by-law maintained?
- 4) Is the general intent and purpose of the Official Plan maintained?

If a proposed project receives a “yes” to each of these questions, the project can continue. Minor variances on vacant lots are a common issue planners must deal with in rural Ontario. It is important the if a minor variance is granted on a vacant lot, that the intent of the OP is still maintained.

## **Appendix C - Interview Questions**

### **General Questions**

1. If you don't mind answering, how long have you been working at your job, and what exactly are your responsibilities? This would be helpful for context.
2. How involved is your department with the lake planning and/or environmental planning? Can you highlight some unique or important policies?
3. How has OP policy changed over time with respect to environmental issues and lake planning? How did environmental policy and lake planning policies come to be?

### **Environmental Protection Policies**

4. What policies have you developed that address water quality?
5. How has lake capacity informed lake planning? How are you using lake capacity modeling?
6. Do you have any (re)natural shoreline related policies?
7. How are you addressing provincial and locally significant wetlands? (same as everywhere else?)
8. How are you addressing fish and wildlife habitat? (same as everywhere else?)
9. How is SAR habitat being protected? (enforced by MNR?)
10. How does the municipality deal with resource extraction close to lakes?
11. Has your municipality implemented any policy that addressed the protection of viewscapes or cultural sites?

### **Implementation Approaches**

12. How do the above environmental protection policies (natural shorelines) inform or contribute to and promote natural heritage protection/systems and policies?
13. How are OP designations and zoning by-laws used with regard to your OP's environmental protection policies?

14. How is your municipality approaching residential and commercial (re)development that may impact NHP and lake planning?

15. How is septic re-inspection handled? Is there a property tax program?

16. Are there any Environmental Advisory Committees in the area? What is their role with respect to environmental policies, natural heritage protection and lake planning?

17. How are environmental protection policies enforced? By-law enforcement officer mainly?

18. Are there monitoring and stewardship programs operating in the area? How does the municipality work with these groups?

19. Are there any unique boathouse restriction policies in your municipalities?

20. Are minor variances dealt with the standard way? (four tests?)

21. How does your municipality deal with building on footprints? Are there any unique strategies?

### **Role of Science**

22. What type of science were the OP policies based on? I.E. wetland mapping, ANSI?

23. Has the municipality undertaken its own environmental work? Has the province completed most of this science?

24. Have you gotten any scientific information from NGO's in the preparation of policies?

## **Appendix D – CD of OPs and Relevant Documentation**

Contents include:

- All municipal OPs, including the County of Peterborough
- Muskoka Water Strategy
- Township of Gravenhurst “sliding scale” development policy
- Provincial Policy Statement
- Endangered Species Act
- Copy of this report
- Data Collection Table and Role of Science Table

## References

- “About Stewardship Canada.” Stewardship Canada. Retrieved March 11, 2012 from <[http://www.stewardshipcanada.ca/index.php/about\\_stewardship\\_canada](http://www.stewardshipcanada.ca/index.php/about_stewardship_canada)>
- Ahern, J. “Planning for An Extensive Open Space System.” *Linking landscape structure and function*. Landscape and Urban Planning 21(1991): 131-145.
- Aggregate Resources Act. R.S.O. 1990.
- Aquatic Resources Management Advisory Committee. *Fish Habitat Referral Protocol For Ontario*. Ottawa: Queen’s Printer, 2009.
- Baer, W.C. “General Plan Evaluation Criteria: An Approach to Making Better Plans.” *Journal of the American Planning Association*. Vol. 63, Iss. 3 (1997), pp. 329-344.
- Bennett, Andrew F. *Linkages in the Landscape: The Role of Corridors and Connectivity in Wildlife Conservation*. Gland Switzerland and Cambridge, UK: IUCN, 2003.
- Born, Stephen M. And Carolyn Rumery. “Institutional Aspects of Lake Management.” *Environmental Management* 13 (1989): 1-13.
- Bourassa, Michael. “Ontario Mining Act Amendments: Introduction and General Comments.” *Fasken Martineau* (2009).
- Buck Lake Association. *Buck Lake Plan: Planning for a Sustainable Future*. 2011.
- “Built Heritage Program.” Muskoka Heritage Foundation. Retrieved May 18, 2012 from <<http://www.muskokaheritage.org/programs/built-heritage-program/>>
- “Bylaw Enforcement.” Township of Rideau Lakes. Retrieved Dec 20, 2011 from <<http://www.twprideaulakes.on.ca/development/bylaw-enforcement.html>>
- Cambridge Heritage Master Plan. Prepared by BRAY Heritage. 2008.
- “Cambridge Waters.” City of Cambridge. Retrieved May 18, 2012 from <[http://www.cambridge.ca/planning\\_services/policy\\_planning/cambridge\\_waters](http://www.cambridge.ca/planning_services/policy_planning/cambridge_waters)>
- Centre for Sustainable Watersheds. *Shoreline Stewardship in Ontario 2006: Recommendations Towards a Framework for Improved Cooperation in Shoreline Stewardship Program Development and Delivery*. 2006.
- “Community Septic Inspection Program.” Township of Huron-Kinloss Township. Retrieved April 26, 2012(a). <http://www.huronkinloss.com/septic-systems.cfm>
- Conservation Authorities Act. R.S.O. 1990.



- Davidoff, P. "Advocacy and Pluralism in Planning." *American Institute of Planners* 31 (1965): 331-336.
- "Definition of Science." M-w.com. Retrieved May 18, 2012 from <<http://www.merriam-webster.com/medical/science>>
- Dillon, P.J. and F.H. Rigler. 1975. "A simple method for predicting the capacity of a lake for development based on lake trophic status." *J. Fish. Res. Board Can.* 32 (1975):1519-31.
- Dillon P.J. and H.E. Evans. 1993. "A comparison of phosphorus retention in lakes determined from mass balance and sediment core calculations." *Water Res.* 27 (1993):657-68.
- Dillon, P.J., K.H. Nicholls, W.A. Scheider, N.D. Yan and D.S. Jeffries. 1986. "Lakeshore Capacity Study–Trophic Status." *Ont. Min. Municip. Affairs Tech. Report.* 89 pp.
- "Dock and Boathouse Construction." Fisheries and Oceans Canada. Retrieved Dec 20, 2011 from <<http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/provinces-territoires/territoires/on/os-eo08-eng.htm>>
- "Environmentally sensitive landscapes." Region of Waterloo. Retrieved April 26, 2012 from <<http://www.regionofwaterloo.ca/en/abouttheenvironment/environmentallysensitivelandscapes/lands.asp>>
- Faludi, A. "Toward a Combined Paradigm of Planning Theory?" A Rejoinder, *In Critical Readings in Planning Theory*. Ed. C, Paris. Oxford: Pergamin, 1982. 13-25.
- Fahrig, Lenore. "Effects of Habitat Fragmentation on Biodiversity." *Annual Review of Ecology, Evolution, and Systematics*. Vol. 34, Iss. 1 (2003), pp. 487-515.
- Fazey, J., A. Fazey, A. Salisbury, D. Lindenmayer, and S. Dovers. 2006. "The nature and role of experiential knowledge for environmental conservation." *Environmental Conservation* 33(1): 1-10.
- Federal-Provincial-Territorial Stewardship Working Group. *Canada's Stewardship Agenda: Naturally Connecting Canadians*. Ottawa: Queen's Printer, 2002.
- Federation of Ontario Cottagers' Association. *Lakeshore Capacity Assessment: The Facts*.
- FOCA and French Planning Services, *Lake Planning Handbook for Community Groups*. Peterborough, 2009.
- Forester, J. "Planning in the Face of Conflict." *American Planning Association* 53 (1987).
- Forman, R. T. T., and M. Godron. *Landscape Ecology*. New York: Wiley, 1986.

- “Frequently Asked Questions About Zoning By-Laws.” City of London. Retrieved April 26, 2012 from  
<[http://www.london.ca/d.aspx?s=/Planning\\_and\\_Development/zonebylaw.htm](http://www.london.ca/d.aspx?s=/Planning_and_Development/zonebylaw.htm)>
- “Frequently Asked Questions,” Transport Canada. Retrieved Jan 25, 2012 from  
<<http://www.tc.gc.ca/eng/marinesafety/oep-nwpp-faqs-202.htm#a3>>
- Friedmann, J. *Planning in the Public Domain: From Knowledge to Action*, Princeton: University Press.
- Fisheries and Oceans Canada. *Fisheries Act*. Ottawa: Queen’s Printer, 1985.
- “Fishing and Dock Laws/Bylaws.” *Charleston Lake Association*. Retrieved 20 Dec. 2011 from  
<<http://www2.ucdsb.on.ca/athens/CharlestonLakeAssoc/Fishingdocks.html>>
- Gibbs, James P. “Importance of Small Wetlands for the Persistence of Local Populations of Wetland-Associated Animals.” *Wetlands* 13 (1993): 25-31.
- Greater Bobs and Crow Lake Association. *A Stewardship Plan for Bobs and Crow Lakes*. 2007.
- “Habitat Protection and Species at Risk.” *Species at Risk*. Ontario Ministry of Natural Resources. Retrieved 20 Nov. 2011 from  
<<http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/244438.html>>
- Hall, Rolland I. and Smol, John P. “Paleolimnological assessment of long-term water-quality changes in south-central Ontario lakes affected by cottage development and acidification.” *Canadian Journal of Fisheries and Aquatic Sciences*. Vol. 53, Iss. 1 (1996), pp.1-17.
- Healey, P. “Collaborative Planning in Perspective.” *Planning Theory* 2 (2003): 101-23.
- Hendren, Mike. *Assessing the Potential Value of Landscape Character Assessment in Improving the Lake Planning Process*. Master’s Report, School of Urban and Regional Planning: Queen’s University, 2009.
- Hendry, G.S and Leggatt, E.A. “Some Effects of Shoreline Cottage Development on Lake Bacteriological Water Quality.” *Water Research*. Vol. 16, Iss. 7 (1982), pp. 1217-1222.
- Hodge, G., & Gordon, D. *Planning Canadian Communities*. Fifth Edition. Canada: Thomson Nelson, 2008.
- Hudson, B.M. “Comparison of Current Planning Theories: Counterparts and Contradictions.” *American Planning Association* 25 (1979): 387-397.
- “*Huron-Kinloss Community Septic Inspections*.” Township of Huron-Kinloss. Retrieved April 26, 2012(b). <http://hkcsi.blogspot.ca/>

- Jennings, M.D. and Reganold, J.P. "Hierarchy and subsidy-stress as a theoretical bases for managing environmentally sensitive areas." *Landscape Urban Planning* 21 (1991): 31-45.
- Klessig, Lowell L. "Lakes and society: The contribution of lakes to sustainable societies." *Lakes & Reservoirs: Research and Management* 6 (2001): 95-101.
- Lachapelle, P.R., McCool, S.F. and M.E. Patterson. "Barriers to Effective Natural Resource Planning in a "Mess", World." *Society and Natural Resources* 16 (2003): 473-490.
- "Lake Data." Muskoka WaterWeb. Retrieved April 27, 2012 from <<http://www.muskokawaterweb.ca/lake-data>>
- Landowner Resource Centre & Ontario Ministry of Natural Resources. *Preserving Water Quality*. Queen's Printer for Ontario, 1999.
- Land Owner Resource Centre. *Preserving and Restoring Natural Shorelines*. Queen's Printer for Ontario, 2000.
- "Land Use Planning," Ontario Ministry of Municipal Affairs and Housing. Retrieved Jan 26, 2012 from <<http://www.mah.gov.on.ca/Page186.aspx>>
- Langley Environmental Partners Society, Land Stewardship Centre of Canada, Conservation Ontario, Comité ZIP Baie des Chaleurs, Clean Annapolis River Project. *National Watershed Stewardship Report: Policy recommendations and suggested actions to expand and strengthen watershed*. Langley, British Columbia: Langley Environmental Partners Society.
- Lytras, E. "Developing Models for Lake Management." *Desalination* 213 (2007): 129-34.
- MAPLE Inc. and Rideau Valley Conservation Authority. *Shoreland Classification Survey Manual*. 2002.
- Margerum, R.D. "Collaborative Planning: Building Consensus and Building a Distinct Model for Practice." *Planning Education and Research* 21 (2002): 237-53.
- Mazzocchi, Fulvio. "Western Science and Traditional Knowledge." *European Molecular Biology Organization* 7 (2006): 463-466.
- McCracken, Grant. *The Long Interview*. Newbury Park, California: Sage Inc, 1988.
- McGuirk, P.M. "Situating Communicative Planning Theory: Context, Power and Knowledge." *Environment and Planning A* 33 (2001): 195-217.
- Merriam, S. B. *Qualitative Research: A Guide to Design and Implementation*. USA: Jossey-Bass (Wiley), 2009.

Media Release. "Regional Municipality of Waterloo Ecological and Environmental Advisory Committee Agenda." April 24, 2012.

"Mining Issues." Federation of Ontario Cottagers' Association. Retrieved Nov 15, 2011 from <<http://www.foca.on.ca/mining-issues>>

"Municipal Law Enforcement." City of Kawartha Lakes. Retrieved Dec 20, 2011 from <<http://www.city.kawarthalakes.on.ca/residents/municipal-law-enforcement>>

"Muskoka Stewardship Program." Muskoka Heritage Foundation. Retrieved May 17, 2012 from <<http://www.muskokaheritage.org/programs/muskoka-stewardship-program/>>

Muskoka Water Strategy, 2004.

Mutual Association for the Protection of Lake Environments Inc. *Shoreland Classification Survey Manual*. 2003.

"Natural Champions," Conservation Ontario. Retrieved Jan 25, 2012 from <<http://www.conservation-ontario.on.ca/>>

Ndubisi F, DeMeo T, Ditto ND. "Environmentally sensitive areas: a template for developing greenway corridors." *Landscape and Urban Planning* 33 (1995): 159-77.

Noble, B.F. *Introduction to environmental impact assessment: A guide to principles and practice*. Don Mills: Oxford University Press, 2010.

Noss, R.F., and A.Y. Cooperrider. *Saving Nature's Legacy: Protecting and Restoring Biodiversity*. Washington, D.C.: Island Press, 1994.

"Official Plan." City of Oshawa. Retrieved April 26, 2012 from <[http://www.oshawa.ca/mun\\_res/dev\\_appr/off\\_plan1.asp](http://www.oshawa.ca/mun_res/dev_appr/off_plan1.asp)>

OMB decision. *Ottawa (City) v. TDL Group*.

Ontario Ministry of Municipal Affairs and Housing. *Building Code Act*. Queen's Printer for Ontario, 1992.

Ontario Ministry of Municipal Affairs and Housing. *Citizen's Guide: Building Permits*. Queen's Printer for Ontario, 2010.

Ontario Ministry of Municipal Affairs and Housing. Oak Ridges Moraine Conservation Plan. 2002.

Ontario Ministry of Municipal Affairs and Housing. *Ontario Building Code*. Queen's Printer for Ontario, 2006.

- Ontario Ministry of Municipal Affairs and Housing. *On-Site Sewage System Maintenance Inspection*. Queen's Printer for Ontario, 2010.
- Ontario Ministry of Municipal Affairs and Housing. *Septic Systems Re-Inspection*. Queen's Printer for Ontario.
- Ontario Ministry of Municipal Affairs and Housing. *The Planning Act*. Queen's printer for Ontario, 1990.
- Ontario Ministry of Natural Resources. *Significant Wildlife Habitat Technical Guide*. Queen's Printer for Ontario, 2000.
- Ontario Ministry of Natural Resources. *Conservation Land Tax Incentive Program*. Queen's Printer for Ontario, 2010.
- Ontario Ministry of Natural Resources. *Endangered Species Act, 2007*. Queen's Printer for Ontario, 2007.
- Ontario Ministry of Natural Resources. *Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005*. 2nd ed. Queen's Printer for Ontario, 2010.
- Ontario Ministry of Natural Resources. *Ontario's Biodiversity Strategy*. Queen's Printer for Ontario, 2005.
- Ontario Ministry of Natural Resources. *Ontario Wetland Evaluation System: Southern Manual*. Queen's Printer for Ontario, 1993.
- Ontario Ministry of Natural Resources. *Significant Wildlife Habitat Technical Guide*. Queen's Printer for Ontario, 2000.
- Ontario Ministry of Northern Development and Mines. *Ontario's Mining Act*. Queen's Printer for Ontario, 1990.
- Ontario Ministry of the Environment. *Fill Quality Guide and Good Management Practices For Shore Infilling in Ontario*. Queen's Printer for Ontario, 2010.
- Ontario Ministry of the Environment, Ministry of Natural Resources, and Ministry of Municipal Affairs and Housing. *Lakeshore Capacity Assessment Handbook: Protecting Water Quality in Inland Lakes on Ontario's Precambrian Shield*. Queen's Printer for Ontario, 2010.
- Ontario Ministry of the Environment, Ontario Ministry of Natural Resources and Ontario Ministry of Municipal Affairs and Housing. *Lakeshore Capacity Assessment Handbook:*

- Protecting Water Quality in Inland Lakes on Ontario's Precambrian Shield.* Queen's Printer for Ontario, 2010.
- Ontario Ministry of the Environment. *Safe Drinking Water Act: Ontario Regulation 169/03.* Queen's Printer for Ontario, 2002.
- Ontario Ministry of the Environment and Energy. *Water Management: Policies, Guidelines, Provincial Water Quality Objectives.* Queen's Printer for Ontario, 1994.
- Ontario Ministry of Tourism, Culture and Sport. *Ontario Heritage Act.* Queen's Printer for Ontario, 2005.
- Ontario Ministry of Tourism, Culture and Sport. *Strengthening Ontario's Heritage.* Queen's Printer for Ontario, 2005.
- Ontario Nature. *Cores and Corridors – The Importance of a Green System in Southern Ontario.* Don Mills, Toronto. 2002.
- Ontario Provincial Policy Statement.* Queen's Printer for Ontario, 2005.
- “Ontario's Species at Risk Stewardship Program.” *Species at Risk.* Ontario Ministry of Natural Resources. Retrieved Nov 17 from  
<[http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/STEL01\\_131229.html](http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/STEL01_131229.html)>
- Otter Lake Landowners Association Inc. *Otter Lake Water Quality Monitoring Report.* Centre for Sustainable Watersheds, 2002.
- Parks Canada. *Rideau Canal and Trent-Severn Waterway: Policies for In-Water and Shoreline Works and Related Activities.* Ottawa: Queen's Printer, 2007.
- Parks Canada. *Trent Severn Watersheds Shoreline Policy and Regulation: Review and Recommendations.* Ottawa: Queen's Printer, 2011.
- Paterson, A.M., Dillon, P.J., Hutchinson, N.J, Futter, M.N., Clark, B.J., Mills, R.B., Reid, R.A. & W.A. Scheider. “A Review of the Components, Coefficients and Technical Assumptions of Ontario's Lakeshore Capacity Model, Lake and Reservoir Management, 22 (2006): 7-18.
- “Private Land Stewardship.” *The Township of Uxbridge.* Retrieved Feb 13, 2012 from  
<[http://www.town.uxbridge.on.ca/private\\_land\\_stewardship](http://www.town.uxbridge.on.ca/private_land_stewardship)>
- “Program Overview.” Peterborough County Stewardship. Retrieved Nov 17, 2011 from  
<[http://www.ontariostewardship.org/councils/peterborough/index.php/program\\_overview](http://www.ontariostewardship.org/councils/peterborough/index.php/program_overview)>

- Ramey, Sarah Ellen. *The Influence of Science on Conservation Planning in the Long Point Region: How Characterizations of Science Affect Conservation Applications*. Master's Thesis. School of Urban and Regional Planning: Queen's University, 2010.
- Rapley, Tim. *Doing Conversation, Discourse and Document Analysis*. Thousand Oaks, California: Sage Inc, 2007.
- "Rideau Corridor Landscape Strategy." Parks Canada. Retrieved April 26, 2012 from <<http://www.pc.gc.ca/lhn-nhs/on/rideau/plan/sacr-rcls.aspx>>
- "Rideau advisory committee." Parks Canada. Retrieved April 26, 2012 from <[http://www.pc.gc.ca/docs/r/on/rideau/pd-mp/page\\_12.aspx](http://www.pc.gc.ca/docs/r/on/rideau/pd-mp/page_12.aspx)>
- "Rules & Regulations." Ontario Ministry of Natural Resources. Retrieved May 8, 2012 from <[http://www.mnr.gov.on.ca/en/Business/Aggregates/2ColumnSubPage/STEL02\\_167074.html](http://www.mnr.gov.on.ca/en/Business/Aggregates/2ColumnSubPage/STEL02_167074.html)>
- "Site Plan Control." The Corporation of the Township of Lanark Highlands. Retrieved April 26, 2012 from <<http://www.lanarkhighlands.ca/Planning/SitePlan.php>>
- Spang, Elizabeth. *Community-Based Lake Planning in Ontario's Cottage Regions: Developing a Comprehensive Tool for Making Better Plans*. Master's Report, School of Urban and Regional Planning: Queen's University, 2009.
- "Species at Risk in Parry Sound-Muskoka." Stewards' Guide Series, Muskoka Heritage Foundation.
- "Stewardship." Toronto and Region Conservation. Retrieved Feb 13, 2012 from <<http://trca.on.ca/get-involved/stewardship/>>
- Tewdwr-Jones, M and P. Allmendinger. "Deconstructing Communicative Rationality: A Critique of Habermasian Collaborative Planning." *Environment and Planning A* 30 (1998): 1975-89.
- Tiebout, H.M. III, and R.A. Anderson. "A comparison of corridors and intrinsic connectivity to promote dispersal in transient successional landscapes." *Conservation Biology* 11 (1997): 620-27.
- The City of Cambridge. *Draft Official Plan*. 2011.
- The City of Kawartha Lakes. *Official Plan*. 2010.
- The City of Kawartha Lakes. *A Guide to the Minor Variance Process*. 2010.
- The Clear, Ston(e)y and White Lake Plan, 2008.
- The County of Peterborough. *County of Peterborough Official Plan*. 2010.

The County of Peterborough. *Municipal By-Law Enforcement*. 2008.

The District of Muskoka. *Office Consolidation of the Official Plan of the Muskoka Planning Area*. 2010.

The Lakeland Alliance. *Best 1<sup>st</sup> Call*.

“The Planning Act.” Ontario Ministry of Municipal Affairs and Housing. Retrieved March 11, 2012 from <<http://www.mah.gov.on.ca/Page1760.aspx>>

]

The Region of Waterloo. *Regional Official Plan*. 2011.

The Township of Bracebridge. *Official Plan of the Town of Bracebridge*. 2005. The Township of Muskoka Lakes. *Application for Minor Variance or for Permission*. 2011.

The Township of Rideau Lakes. *Combined Minor Variance & Site Plan Application Package*.

The Township of Rideau Lakes. *Official Plan*. 2010.

The Town of Gravenhurst. *Official Plan*. 2008.

The Municipality of North Grenville. *Official Plan*. 2010.

“Upper Thames River Conservation Authority (UTRCA).” The Middlesex Natural Heritage Study: a natural heritage study to identify significant woodland patches in Middlesex County. Retrieved Nov 14, 2012 from <<http://www.thamesriver.on.ca/MNHS/MNHS.htm>>

“Watershed Inventory Project.” Muskoka Watershed Council. Retrieved April 27, 2012 from <<http://www.muskokaheritage.org/mwc/programs/watershed-inventory-project/>>

“Water Quality Criteria for Nitrogen (Nitrate, Nitrite, and Ammonia).” *Environmental Protection Division*. B.C. Ministry of Environment. Nov 15, 2011 from <<http://www.env.gov.bc.ca/wat/wq/BCguidelines/nitrogen/nitrogen.html>>.

“Welcome.” Environmental Advisory Committees of Ontario. Retrieved Nov 14, 2011 from <<http://www.eacs.ca/>>

“What is a Lake Plan?” French Planning Service. Retrieved Jan 25, 2012 from <[http://lakeplan.com/index.php?option=com\\_content&view=section&layout=blog&id=8&Itemid=105](http://lakeplan.com/index.php?option=com_content&view=section&layout=blog&id=8&Itemid=105)>

“What is Stewardship.” Stewardship Canada. Retrieved April 24, 2012 from <[http://www.stewardshipcanada.ca/index.php/what\\_is\\_stewardship](http://www.stewardshipcanada.ca/index.php/what_is_stewardship)>



“What We Do.” Muskoka Heritage Trust. Retrieved April 27, 2012 from <http://www.muskokaheritage.org/mht/about-us/what-we-do-2/>

“Welcome.” Environmental Advisory Committees of Ontario. Retrieved June 28, 2012 from <http://www.eacs.ca/>

Whitelaw, Graham. “The Role of Environmental Movement Organizations in Land Use Planning: Case Studies of the Niagara Escarpment and Oak Ridges Moraine Process.” PhD Dissertation, University of Waterloo. 2005.

“Who We Are.” Ontario Stewardship. Retrieved 17 Nov, 2011 from [http://www.ontariostewardship.org/index.php/about\\_us](http://www.ontariostewardship.org/index.php/about_us)

Yin, Robert K. *Case Study Research: Design and Methods*. 4<sup>th</sup> ed. Thousand Oaks, California: Sage Inc, 2009.