Planning and Management in Eastern Ontario’s Protected Spaces: How do science and public participation guide policy?

By

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Abstract

Providing opportunities for outdoor recreation and maintaining ecological integrity are primary management objectives for protected spaces in the public domain, but as visitation and visitor expectations change, a balance must be maintained between environmental and visitor use that is consistent with management goals.

There is an increasing dependence on public participation in protected area management to compensate for an increasing budgetary gap between desired and actual management states. The Investigator explores how science, public perception, and collaborative relationships with stakeholders influence management planning and what the effect has been on management action. How has that balance between visitor use and environmental preservation objectives been affected?

Three case study sites were selected in eastern Ontario: a national park, a provincial park, and a municipal forest. For each site, semi-structured interviews with staff and stakeholders were conducted, guiding legislation and supporting documents were analysed, and site observational evidence was collected. The data was analyzed using methodological triangulation and McCracken’s (1988) four-part method of inquiry.

The results identified each site’s management goals and the management planning and action utilized to achieve those goals. The integration of environmental science and the role of public perception and participation are described as well as the nature of the management response. The discussion identifies management trends across the three governmental levels, characterising how ecological integrity and visitor use are managed, the impact of funding on management action, and the role and influence stakeholders have achieved at each site.

Findings revealed trends from federal to municipal governance, principally: i) operational funding decreases; ii) the influence and dependence on public participation and stakeholder collaboration increases; iii) the importance of environmental preservation objectives decrease while ‘use’ associated objectives increase. Critically however, it was observed that when funding levels are below the threshold required to comply with stated management goals,
protected area management becomes more reactive and tends to favour 'use' related objectives over environmental preservation objectives despite land managers' best intentions. I hope this document serves to accurately characterise the pressures land managers experience in managing our protected spaces and to identify where they have been most successful.
Acknowledgements

Thank you to all who have supported and encouraged me through my research and the writing of my thesis. It has been no small task to return to academia after leaving a career in industry. Thanks to all the staff and volunteers associated with Limerick Forest, Frontenac Provincial Park, and St. Lawrence Islands National Park who contributed to my research. Your energy and dedication as caretakers of our protected spaces was evident during every interaction. The optimism and passion you share every day despite the significant challenges we see today in managing our natural heritage gives me great hope.

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Finally, thanks to my wife Diane. You have been supportive right from the start and helped me see the light at the end when I could not. Your feedback, patience, and editing skills got me through many challenges. Don’t worry; it won’t be long before we’ll be able to travel the world again.
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<tr>
<td>ANSI (-LS)</td>
<td>Area of Natural Scientific Interest (Life Sciences)</td>
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<td>ATV</td>
<td>All-Terrain Vehicle</td>
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<td>BMA</td>
<td>Bytown Motorcycle Association</td>
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<tr>
<td>CASIOPA</td>
<td>Centre for Applied Science in Ontario Protected Areas</td>
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<tr>
<td>DFO</td>
<td>Department of Fisheries and Oceans</td>
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<td>DUA</td>
<td>Designated Use Area</td>
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<td>EA</td>
<td>Environmental Assessment</td>
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<td>EI</td>
<td>Ecological Integrity</td>
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<td>ELC</td>
<td>Ecological Land Classification</td>
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<td>EQ</td>
<td>Explorer Quotient</td>
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<td>ESA</td>
<td>Environmentally Sensitive Area</td>
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<td>FAP</td>
<td>Frontenac Paddling Association</td>
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<td>FABR</td>
<td>Frontenac Arch Biosphere Reserve</td>
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<td>FN</td>
<td>First Nations</td>
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<td>GLSC</td>
<td>Grenville Land Stewardship Council</td>
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<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
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<tr>
<td>LAC</td>
<td>Limits of Acceptable Change</td>
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<td>LEK</td>
<td>Local Ecological Knowledge</td>
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<td>LFAC</td>
<td>Limerick Forest Advisory Committee</td>
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<tr>
<td>MPP</td>
<td>Member of Provincial Parliament</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>NPS</td>
<td>National Parks Service</td>
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<td>NRVIS</td>
<td>Natural Resources Values Info System</td>
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<td>OMNR</td>
<td>Ontario Ministry of Natural Resources</td>
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<td>ORV</td>
<td>Off-Road Vehicle</td>
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<td>PCA</td>
<td>Parks Canada Agency</td>
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<td>PPCRA</td>
<td>Provincial Park and Conservation Reserves Act</td>
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<td>PSW</td>
<td>Provincially Significant Wetland</td>
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<td>ROS</td>
<td>Resource Opportunity Spectrum</td>
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<td>SAR</td>
<td>Species At Risk</td>
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<tr>
<td>SLINP</td>
<td>St. Lawrence Islands National Park</td>
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<td>SPIN</td>
<td>Summer Profundal Index Netting</td>
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<td>TEK</td>
<td>Traditional Ecological Knowledge</td>
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<tr>
<td>UCLG</td>
<td>United Counties of Leeds and Grenville</td>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>VAMP</td>
<td>Visitor Activity Management Process</td>
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<td>VERP</td>
<td>Visitor Experience and Resource Protection Framework</td>
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<td>VIM</td>
<td>Visitor Impact Management</td>
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<td>VIP</td>
<td>Visitor Information Program</td>
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Chapter 1 - Introduction

History

The growth of an environmental consciousness and transition to a more leisure oriented society in North America over the past 30 years has contributed to a large growth in outdoor sports and activity enthusiasts and a greater understanding of their resulting impacts on the landscape (Manning, 1999; Pigram & Jenkins, 1999). In the United States, between 1982 and 2000, growth in hiking-related activities nearly tripled, snowmobiling grew by 125%, and camping as well as non-motorized water sports increased by between 25 and 50% (Cordell, 2008). Though growth slowed between 2000-2007, total participation days still increased 25% over those seven years (Cordell, 2008). In the period between 2000-2007, the types of activities engaged in have also changed, with the most growth seen in physically less challenging activities (e.g., nature viewing and photography, motorised off-road sports) and a decrease in physically challenging activities (Cordell, 2008).

While the growth in outdoor recreational activities cannot be controlled by land managers, access to certain areas, such as environmentally sensitive areas, can be managed. A pervasive objective of land management agencies today involves the protection of environmental and cultural aspects of protected land (Gertsch & Jager, 2006; Graham, Nilsen, & Payne, 1988; Leung & Marion, 2000; Monz, Cole, Leung, & Marion, 2010). Legislation governing parks, planning, wildlife, and water, among others are the driving force behind such protection, but ultimately management plans must be produced and implemented in order to guide land managers towards a state where management goals and objectives are met and the desired
vision for the area is attained (Gertsch & Jager, 2006; Haider, 2006). Some common examples of actions within a management plan for outdoor recreation might include permit systems for camping, banning of motorized vehicles, or trail routing to avoid sensitive areas. Land managers can use these tools to balance their environmental protection objectives with appropriate public access (Payne & Nilsen, 2002). The right of public access is often an objective of publicly-owned protected spaces (Gertsch & Jager, 2006; Graham et al., 1988; Haider, 2006) and may also facilitate the creation of a revenue stream, either directly, as a component of a funding formula, through citizen advocacy in government, or private support. A visitor management plan can be an effective method to achieve both environmental and visitor access objectives (Haider, 2006; Leung & Marion, 2000; Monz et al., 2010).

As the number of outdoor recreation participants increase and the types of activities change over time, conflicts can arise due to real or perceived negative impacts attributed to specific recreational activities. This may result in activities being subject to further land use restrictions. In a case of competing goals, recreational land access to publicly owned protected space often has an objective to familiarize the public with the land resource being protected (Gertsch & Jager, 2006). The balance then, is determining what types of recreational activities are permissible and at what intensity level before both the recreational experience is degraded and the environmental objectives for site protection are compromised.

**Objectives**

In the field of Recreation Ecology, there is a lack of research linking recreation impact studies with policy direction (Haider, 2006). Furthermore, for the region I am interested in, eastern
Ontario, there is a poverty of peer reviewed literature dealing with recreation management or associated monitoring. I will describe, through three case studies of recreational areas in eastern Ontario, how recreation policy direction is influenced, specifically examining the role of biodiversity science, public participation and perception, and collaborative relationships between land managers and stakeholders.

Biodiversity science and its influence on management planning warrants investigation as each of the case study sites share a similar management objective promoting environmental preservation (Department of Justice Canada, 1998; Government of Ontario, 2006; United Counties of Leeds & Grenville, 2003). The relative importance of biodiversity science in protected area management and its impact on planning and management were explored through the following research questions: i) How is planning and management influenced by biodiversity science? ii) Have land managers at the case study sites, integrated science into their visitor component of their management plan? iii) As an input parameter into a management plan, does biodiversity science adequately influence recreational planning policy and management response in protected land in Eastern Ontario?

Public participation is also prominent in visitor planning and management. Sites that are in the public domain often have as one of their objectives, a mandate to provide public access. There are provisions in some Provinces to create ecological reserves which can legally restrict public access for the benefit of environmental preservation and scientific study (Taschereau, 1985). The following research questions were developed to explore the role of public participation in outdoor recreational planning and management. i) How does public perception of the impacts
of recreational use modify the direction of recreational planning and management and were those decisions supported by science? ii) How do management organizations utilize feedback from visitors to determine policy direction? iii) How is science used to refute or support the views and associated policy direction advocated by public input?

Finally, there is evidence that stakeholders have increasingly entered into collaborative relationships with land managers (McCool, 2009; Wondolleck & Yaffee, 2000). This growing trend, fuelled by decreased government funding and recognition that volunteerism can fill that gap, may also be influencing policy direction which was explored by examining the role of collaborative relationships (McCool & Patterson, 2000).

**Methods**

In order to answer the research questions, a comparative case study approach was chosen to characterize the state of visitor management plans in Eastern Ontario protected space across a range of management objectives and goals. This method has allowed insight into common and diverging issues experienced by land management agencies on a regional level (Berg, 2009).

The sites were selected in eastern Ontario (the region of Ontario including the County of Lennox and Addington, Renfrew County, and all points east). Also contained entirely within this area is the Frontenac Arch Biosphere Reserve (FABR), a UNESCO Biosphere Reserve. The case study sites include St. Lawrence Islands National Park (SLINP), Frontenac Provincial Park, and Limerick Forest, owned and managed by the United Counties of Leeds and Grenville (UCLG) (Figure 1). The site selection process was geared to address a primary question in the thesis; how does management planning and action differ for different levels of government? Though
the eastern Ontario region was selected due to its proximity to Queen’s University in Kingston, Ontario, the region does host St. Lawrence Islands National Park, one of only three terrestrial National Parks in greater southern Ontario region. Each of the individual sites were selected to represent federal, provincial, or municipal governance yet were required to be located in relatively close proximity to each other. This facilitated similarities between the sites in representative ecosystems under protection and both the population and potential markets being served. Each of the sites were also required a predominately natural environment recreation experience and share similarities in permitted recreational activities. The site selection rationale was predicted to highlight unique aspects of planning and management related to the level of governance while minimizing differences attributed to other factors.

![Map of protected areas in eastern Ontario](Figure 1: Location of protected areas case study sites in eastern Ontario (Google, 2012))

The case studies are explanatory and utilize semi-structured interviews, document analysis, and site observations as data sources used in data triangulation (Yin, 2009). Triangulation refers to the use of multiple data sources supporting each other, to establish facts of the case study (Yin,
While each is described individually, strengths and weaknesses in the development and execution of each site’s visitor management plan are directly compared.

**Structure**

Following the Introduction, the body of this thesis comprises five main chapters; Literature Review, Methods, Results, Discussion, and Conclusions. Chapter 2, the Literature Review sets the stage for this report. It features a short history of outdoor recreation in protected spaces including the evolution of the field of Recreation Ecology, essentially the study of the human impact of leisure activities on natural systems and how best to manage or mitigate the impacts. Also included are contemporary references to outdoor recreation and management, sustainable recreational development, impacts and conflicts resulting from outdoor recreation, the influence of public participation on outdoor recreation, and the use of collaborative planning in outdoor recreation. In Chapter 3, I present the methods used in the case study. The criteria for site selection and the description and significance of each selected site is also presented. The data collection methods are explained in detail as well as potential limitations in the data collection. Presentation of data, data analysis (triangulation & four-step method of Inquiry) and presentation of the results is contained within the Results chapter. The Discussion chapter compares and further explores study’s findings between the sites and discusses their implications. Finally, Chapter 6 presents the study’s conclusions and areas where future study may be warranted.
Chapter 2 – Literature Review

Recent History of Outdoor Recreation

The growth of an environmental consciousness and transition to a more leisure oriented society in North America over the past 30 years has contributed to a large growth in outdoor sports and activity enthusiasts and their resulting impacts on the landscape (Manning, 1999; Pigram & Jenkins, 1999). In the United States, between 1982 and 2000, based on the National Recreation Survey, growth in hiking related activities nearly tripled, snowmobiling grew by 125%, and camping as well as non-motorized watersports increased by between 25 and 50% (Cordell, 2008). Though growth in outdoor recreation slowed between 2000-2007, total participation days have still increased 25% over the same time period (Cordell, 2008). In the period between 2000-2007 the types of activities engaged in have also changed, with the most growth seen in less physically challenging activities (day-hiking, nature viewing and photography, motorised off-road sports) and slowing or decrease in growth of more physically challenging activities (backpacking, canoeing, mountain biking, climbing) (Cordell, 2008; Pergams & Zaradic, 2008). During roughly the same period (2000-2009), both Parks Canada Agency (PCA) and the National Parks Service (NPS) have seen stagnant or declining visitor numbers to their parks (Shultis & More, 2011). A similar decline has been noted in U.S. state parks and U.S. national forests over the same time period (Pergams & Zaradic, 2008). This decline may be partly in response to changing outdoor recreation preferences more towards activities not widely permitted in many of the protected spaces surveyed (Pergams & Zaradic, 2008). Nonetheless, stagnant or declining visitation is viewed by management agencies as a threat to continued public, political, and financial support at each agency (Campbell & Walker, 2008; Pergams & Zaradic, 2008;
Though Shultis and More (2011) argue that declining visitation is a favourable development and will result in decreasing visitor impacts and an opportunity to re-emphasize preservation values in the parks system, they agree that the “contemporary neoliberal political environment” would need to change before the “use value” response to declining visitation could change (Shultis & More, 2011 p. 110). A more productive outlook accepts the current paradigm of visitation leading to public support that management agencies currently face. Agencies then need to focus on how they can adapt to changing trends, including flat visitation numbers and mitigation of visitor impacts (Campbell & Walker, 2008; Gertsch & Jager, 2006; Pergams & Zaradic, 2008; Sheedy, 2006). In the case of PCA, the mandate to provide recreational opportunities to the public in conjunction with stagnant visitation has created an environment where increasing visitation is a priority (Shultis & More, 2011). PCA is working to achieve that goal by evaluating “new or changing activities” against environmental and cultural preservation objectives (Gertsch & Jager, 2006 p. 163) to attempt to increase the appeal of our protected spaces to a changing Canadian society (Campbell & Walker, 2008).

Recreation Ecology

The field of recreation ecology in North America emerged to study the impact that outdoor recreation has had on natural environments (Leung & Marion, 2000; Monz et al., 2010). It has developed in the last 50 years to examine and understand relationships between the number of visitors, the specific activities they participate in, and the subsequent ecological and social impacts the protected area experienced (Leung & Marion, 2000). The current body of published research originates from a rather small group of ‘full-time’ recreation ecologists and
a second, larger group of practitioners who do not identify themselves specifically as recreation ecologists but rather, view the field as an ‘add-on’ to their main field of study (Campbell & Walker, 2008; Marion, 2006). Currently, the most prolific of those full-time recreation ecologists in the North America are David Cole, Yu-Fai Leung, Christopher Monz, and Jeffery Marion (Marion, 2006).

**Outdoor Recreation & Management**

The development of a protected area management plan is useful for balancing multiple management objectives that often conflict with each other, in a format that provides consistent, relevant, and cohesive policy direction for the duration of the planning window identified in the management plan (Clarke, 2000; McCool & Patterson, 2000). The most prevalent objectives as related to protected spaces are; environmental preservation, cultural heritage preservation, resource management, and opportunities for outdoor recreation and education. Objectives are prioritized by legislation and policy applied to the management agency and in the case of both PCA and Ontario Parks, the number one objective is environmental and cultural heritage protection (Ontario Ministry of Natural Resources, 2009; Parks Canada, 2008). In the presence of outdoor recreational opportunities and mandate, a visitor management component to the environmental management plan should be included when it is expected that visitor induced impacts may have an impact on the other stated objectives of the protected area or impact visitor satisfaction (Haider, 2006; McCool, 2005; Stankey, McCool, Clark, & Brown, 1999). While park systems such as Parks Canada and Ontario Parks cite environmental preservation as the primary objective, with the provision of recreational and educational opportunities as a secondary objective, other public land
management agencies have stated natural resource management as the defining management objective (Stankey et al., 1999). The increasing integration of recreational opportunities and conservation values into natural resource management is a result of growing public political mobilization and social demand (McCool, 2005). It introduces a much higher level of complexity to a natural resource based management plan in order to meet management objectives and the public’s expectations, yet there continues to be an under appreciation and lack of planning towards recreation and conservation objectives in natural resource based management (Stankey et al., 1999). Integrating visitor management into an environmental or natural resource based management plan should use both natural and social sciences to identify and implement recreational and educational opportunities for visitors while identifying and executing visitor management strategies that balance the visitor experience with other management objectives (Nilsen & Tayler, 1997; Payne & Nilsen, 2002). The “traditional functional structure of may natural resource management organizations” (Stankey et al., 1999 p. 435), financial constraints, and a low public demand for recreational opportunities can result in a lack of or insufficient visitor management on land managed for natural resources (Stankey et al., 1999).

To manage the often complex issues arising from the impact of outdoor recreation from both the environmental preservation and visitor experience objectives, procedural decision making processes are used in many cases to rationalise conflicting objectives because they allow management agencies to address unconsidered and unanticipated outcomes of their decision making (Haider, 2006). Procedural decision making process should integrate performance indicators derived from ecosystem monitoring, visitor surveys, and public consultation in an
iterative fashion to draw out those potentially positive and negative outcomes resulting from management decisions, by identifying interactions and impacts that may not have been recognized by land managers (Haider, 2006). In the contemporary environment, the complexity of these conflicting issues can be extreme and include aspects of evolving user trends, public participation, political interference, limited resources, inter-user conflicts, and changing demographics and social values. Combined with changing social expectations and greater environmental and preservation requirements, the maintenance and use of a comprehensive general and site specific body of knowledge in decision making to resolve visitor management issues is critical (McCool, 2005).

The early model for managing visitor use and impacts was carrying capacity and it is still a fundamental basis for the more complex visitor management frameworks used today (Payne & Nilsen, 2002). Both ecological and social carrying capacity models set out to determine acceptable visitor impact thresholds and follow-up management actions (Stankey & McCool, 1989). A fundamental weakness in carrying capacity though, was the establishment of discrete thresholds; an impact was either acceptable or not (Stankey & McCool, 1989). That limit though, was not reflected in practice as the ecological carrying capacity model does not reflect the multiple biological capacities within an ecosystem and the social carrying capacity model does not reflect the varied expectations of different user groups (Payne & Nilsen, 2002; Stankey & McCool, 1989). Early framework models were developed from the realisation that using a recreational carrying capacity model without an appropriate methodology resulted in a linear management ideal that lacked the complexity to deal with conflicting issues that are inherently interrelated as opposed to independent of each other (Stankey & McCool, 1989). More recent
visitor management frameworks have attempted to facilitate a more appropriate response to the increasingly complex decision-making required of management agencies through policy implementation and legislation governing land management agencies (McCool, 2005).

Visitor management frameworks can “be defined as a process involving a sequence of steps that lead managers and planners to explicate the particular issue” (McCool, 2005 p. 5). They are fundamentally designed to facilitate solutions to complex management issues by breaking down specific issues into a subset of problems, each of which can be thoroughly described, alternative solutions weighed, and a path forward set (Haider, 2006; McCool, 2005). Once implemented, a visitor management plan based on a visitor management framework should be the road map for managing outdoor recreation on a protected site. It should document the social and ecological standards that were established in the planning stage, define the type and frequency of indicators that are monitored, and provide a basis on where and how visitor management strategies are applied (Nilsen & Tayler, 1997). Integral to visitor management frameworks is stakeholder participation during the planning phase and recognition that both the planning process and ongoing visitor management is iterative (Haider, 2006).

The earliest planning frameworks developed for visitor planning were the Recreation Opportunity Spectrum (ROS) and the Limits of Acceptable Change (LAC). The ROS was developed as a systematic tool for identifying a broad inventory of potential recreational opportunities. It considered the reciprocal impacts with other land uses and integrated consumer demands for desired recreational opportunities. ROS, however, is not a good framework for integrating ecological preservation into visitor management as it acts as a
recreation centric planning tool, matching the supply to demand (Stankey et al., 1999). The ROS framework was intended to plan for a diverse range of recreational opportunities and experiences for visitors that a) met visitor expectations of activity style and quality and, b) would continue to meet visitor expectations in response to management activities that are incompatible with recreational use (forestry activities, exclusion from environmentally sensitive areas). Adaptations to ROS resulted in the LAC framework which has greater applicability to protected spaces with environmental preservation objectives. Measurable impact indicators are identified that characterise the values and goals that led to the creation of a protected area. The limit of acceptable change is the maximum amount of change, “defined explicitly by means of quantitative standards”, that is tolerated for an identified impact indicator (Stankey, Cole, Luca, Petersen, & Frissell, 1985 p. 1). Indicators may reflect a range impacts on ecological integrity or visitor experience, dependant on management objectives. Management action is prescribed to maintain impacts below the identified thresholds. The framework is adaptive and flexible, using ongoing impact monitoring and the evaluation of decisions to improve management actions. Land management agencies have continued to adapt visitor management frameworks to meet organizational needs (Stankey et al., 1999). More recent examples are the Visitor Impact Management (VIM) framework used by the U.S. Park Service, the Visitor Experience and Resource Protection (VERP) framework used by the U.S. Department of the Interior, and the Visitor Activity Management Process (VAMP) framework used by Parks Canada (Haider, 2006). All use LAC as the basic structure in their development and integrate public participation, environmental protection, and economic development in degrees appropriate to the organization’s ideology and management objectives (Haider, 2006).
The contemporary visitor management frameworks commonly used in North America are all based on synoptic planning theory (Nilsen & Tayler, 1997). Synoptic planning theory takes a systems view and evaluates the management objectives (ends) against the available resources and management constraints (means) (Hudson, Galloway, & Kaufman, 1979). Goals and objectives are defined, policy options are identified and evaluated against the available resources, and policy is then implemented (Hudson et al., 1979). Each step in the process allows for consultation and feedback to improve management outcomes and is powerful in both its simplicity and its broad range of applicability. A weakness though, in synoptic planning theory and application of visitor management frameworks is the institutional centred approach of determining what is best on behalf of the public and difficulty in recognizing pluralistic views or alternative policy approaches (Hudson et al., 1979; Selin & Chavez, 1995). This may not be an undesirable shortcoming when planning for outdoor recreation in protected spaces, especially when environmental preservation is the primary goal and human use is the greatest threat (Wright & Rollins, 2002) but the potential for improved planning outcomes is well documented when using a collaborative planning approach (Selin & Chavez, 1995; Wondolleck & Yaffee, 2000). The collaborative approach has been used successfully with the LAC framework by making value judgements and goals the focus of discussion rather than indicators and standards (Lachapelle & McCool, 2003; Nilsen & Tayler, 1997).

**Conflicts in Outdoor Recreation**

**Conflict – knowledge versus practice**

The likelihood of conflict undoubtedly will arise when people meet. In the context of protected spaces and outdoor recreation, conflict should also be expected. Many researchers have
defined conflict as “goal interference attributed to another’s behaviour” (Ewert, Dieser, & Voight, 1999; Jacob & Schreyer, 1980 p. 369; Manning, 1999; Rollins & Robinson, 2002; Schneider, 2000). Goal interference is characterized as an inability of an individual or group to achieve their desired recreational goals, whether they are physical or experiential. It is not the failure to reach a physical recreation goal or competition for resources that define the ‘interference’ but the attributing of blame on the outcome towards another individual or group regardless if it is real or perceived (Jacob & Schreyer, 1980). Working in conjunction with goal interference, social carrying capacity also plays a significant role in recreation conflict. Social carrying capacity can be explained as the ‘volume’ component of goal interference or the point at which the frequency of negative interactions exceeds the ability of a user group to cope with goal interference (Payne & Nilsen, 2002). Conflict has the potential to degrade one’s visitor experience or in some cases, dissuade visitation all together (Manning, 1999). Resolution to conflict should then be based on a clear understanding of the acceptable impact to the recreation area’s environmental and recreation objectives as set out in the management plan. A critical step in conflict management is the integration of an established knowledge base into an area management plan. This could be accomplished by selecting an appropriate management framework that could guide land managers in resolving visitor use issues in a way consistent with the objectives set out by the management plan. Unfortunately, management plans do not always integrate an appropriate framework to guide the resolution of conflict arising from visitor use. The lack of a conflict management strategy in a management plan does not necessarily mean that conflict is not being dealt with effectively by a land manager (Schneider, 2000). The difficulty arises from the expectation that the land manager must be
able to assess complex issues and implement resolutions that minimize the magnitude of the conflict (Schneider, 2000; Spiers & Plummer, 2005). Spiers & Plummer (2005 p. 349) propose “that perhaps park managers are not as prepared or educated about conflict nor its management as previously thought”. The literature suggests that categorizing a conflict or potential for conflict offers a better potential for resolving recreation conflict (Manning, 1999; Schneider, 2000). Jacob and Schreyer (1980) summarized recreation conflict as originating from four major factors: 1) activity style (behaviours and personal meanings), 2) resource specificity (personal value attributed to a place), 3) mode of experience (the extent to which external stimuli determines the quality of the experience), and 4) lifestyle tolerance (tolerance between user and social groups). Jacob and Schreyer (1980) further postulated that the four major factors of recreational conflict would lead to the ten propositions of conflict presented in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Statements describing the basic sources of inter-user conflict. Adapted from (Jacob &amp; Schreyer, 1980)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The more serious and committed participants are in an activity, the greater the chance of conflict when encountering participants who engage in the activity in a less serious and more casual fashion</td>
</tr>
<tr>
<td>2. Participants in an activity seeking external affirmation and social status recognition encountering participants that desire a more personal experience and internally derived satisfaction may result in intra-activity conflict</td>
</tr>
<tr>
<td>3. Intra-activity conflict occurs when participants who have attained a higher status level within an activity are forced to interact with participants at a lower status level</td>
</tr>
<tr>
<td>4. Participants with differing definitions of what constitutes status level within an activity will result in conflict between each other</td>
</tr>
<tr>
<td>5. If a participant has specific expectations to achieve a satisfactory experience, they are more likely to experience conflict than a participant with more general expectations</td>
</tr>
<tr>
<td>6. If the attributes of a place are important to a visitor, they are likely to experience conflict with those who place less value on that location</td>
</tr>
</tbody>
</table>
7. Participants who have developed a sense of ownership towards a recreational resource will experience conflict with those engaging in behaviour or activities that differs from the traditional uses.

8. When the barriers to achieving a high status or special experience within an activity become less restrictive for low status participants, conflict occurs due to the loss of exclusivity.

9. A participant who has a very focused criteria for what external stimuli results in a satisfactory experience will experience conflict with a participant who has a more relaxed or unfocused criteria of what constitutes desirable stimuli.

10. Conflict results when different groups view each other as having undesirable traits or pose a threat to any desired recreation goal.

Jacob & Schreyer’s (1980) model for recreation conflict becomes further developed as seen in Manning’s (1999) model for expanded recreation conflict (Figure 2). Conflict models have become increasingly more descriptive in the literature, all with a goal to understand the underlying issues that incite conflict (Manning, 1999; Spiers & Plummer, 2005). When evaluating the applied effectiveness of VAMP in managing recreational conflict, no literature

![Figure 2: Expanded conflict model demonstrating external stimuli, internal evaluation, and realized behaviours of a recreational user.](Manning, 1999 p. 202)
could be found. At the municipal and conservation area management level, there also appears to be a lack of published literature however, Warfield’s (1997) thesis stands as a comprehensive case study of recreation conflict and impact in the Ganaraska Forest, Ontario.

Though unpublished, her recommendations were adopted by the Ganaraska Conservation Authority and consisted in principle, of zoning and education for conflict and impact mitigation. Unfortunately, there does not appear to be a follow up study to evaluate the effectiveness of Warfield’s recommendations. Regionally, municipalities and conservation authorities appear to span a wide spectrum in how visitor management and conflict mitigations implemented. This is likely dependant on varied management objectives, priorities, resources, and pre-existing visitor issues. If the body of knowledge available in recreational conflict management is not appropriately drawn upon, does effective and appropriate action occur to minimize the magnitude of conflict? When drawn upon correctly, the array of techniques available to manage user conflicts offer an effective means to mitigate the magnitude of conflict. Many of these tools are also effective in mitigating the environmental impacts of use (Table 2). Visitor management may employ a suite of indirect and direct management techniques in order to meet stated goals. Indirect management aims to influence visitor behaviour through education, and the quality or type of service offerings while direct management aims to regulate behaviour through enforcement, zoning, rationing, and restrictions (Payne & Nilsen, 2002). Examples of direct and indirect management techniques are summarized in Table 2.
Table 2: Management Techniques and examples of management actions used in visitor management. Adapted from (Hammitt & Cole, 1998; Kachi & Walker, 1999; Payne & Nilsen, 2002)

### Indirect Management

<table>
<thead>
<tr>
<th>Categories of Management Techniques</th>
<th>Examples of Resulting Management Actions</th>
</tr>
</thead>
</table>
| Physical Alterations               | Improve or neglect access (e.g. vehicular access or parking, trail improvements, improved dock or ramp for water access)  
                                          Improve or neglect campsites (e.g. regular campsite maintenance & value-added service offering at designated campsites, hike-in or drive-in camping sites)  
                                          Service offering targeting specific activity or activity styles (e.g. trail construction designed for preference of specific user types) |
| Education & Communication          | Advertising (or not) recreational opportunities (e.g. participation events such as the Frontenac Challenge)  
                                          Education (e.g. outdoor recreation training sessions, interpretive centre, kiosks) |
| User Fees                          | Entrance fee (e.g. setting a visitor fee as a visitor density control rather than revenue)  
                                          Fee scale (e.g. implement a fee system that modifies densities of specific use types or seasonal changes in fees) |

### Direct Management

<table>
<thead>
<tr>
<th>Categories of Management Techniques</th>
<th>Examples of Management Actions</th>
</tr>
</thead>
</table>
| Enforcement                        | Use of fines or penalties (e.g. penalties for infractions)  
                                          Policing of regulations (e.g. increase compliance through the threat of being caught) |
| Zoning                             | Separate incompatible uses (e.g. motorized from non-motorized, sensitive ecosystems from high use or intensity)  
                                          Temporal zoning (e.g. non-hunting use restricted during hunting season, motorized use restricted during spring thaw)  
                                          Concentration of use (e.g. restrict high use or intensity activities to designated locations) |
| Rationing                          | Rotate use or dispersal of use (e.g. distribute site access by limiting permits available at access points; require visit to central location for permitting)  
                                          Reservations (e.g. require reservations for campsites instead of first come, first serve; reservations for trail or park access)  
                                          Group size (e.g. restrict maximum group size to reduce impact; require minimum group size for bear threat mitigation)  
                                          Limit length of stay |
| Restriction                        | Restrict type of use (e.g. mountain bike or equestrian use in Frontenac Provincial Park)  
                                          Restrict aspects of permitted use (e.g. use of camping stoves instead of open campfires)  
                                          Restrict collecting (e.g. firewood collection at campsites) |
Ultimately, determining the appropriate management action should be guided by a visitor use framework integrated into management policy and plans (Manning, 1999; Payne & Nilsen, 2002; Wright & Rollins, 2002).

**Conflict – compatibility of permitted uses**

Protected areas used for recreation all have the potential for various permitted uses, each dependant on the availability of a suitable resource and on the organization managing the site. The potential for conflict between users has previously been established through theoretical conflict models (Hammit & Schneider, 2000; Manning, 1999). In conflict research, establishing the magnitude of conflict between specific outdoor recreation activities is an important step in visitor planning required if outdoor recreation conflict is to be managed and reduced. Empirical studies have provided much of the learning into specific use conflicts, often linking the evidence back to theoretical models (Manning, 1999). A recurring theme in empirical research is the asymmetrical nature of outdoor recreation conflict, with one activity’s participants suffering a degraded experience while the other experiences very little impact. McCay and Moeller (1976) developed a compatibility index for recreational users based on hiking, equestrian, cycling, and motorbike use of Ohio trails. While dated, three important findings were reported: recreational users enjoy meeting their own kind, the greatest dissatisfaction is expressed towards the more mechanized activities, and the opinions expressed by any one group are not homogeneous (e.g. not every interaction between groups will result in a negative experience) (McCay & Moeller, 1976). As with most generalizations, the idea of use compatibility does not address all the underlying issues and may require more specific investigation to understand the conflict (Manning, 1999). Applied studies and literature on conflict between outdoor recreationalists is
widely available, partly because research has been driven by the specific needs of individual management agencies (Campbell & Walker, 2008). Caution should be used when utilizing specific use conflict studies as the temporal and geographic context of a study may reflect a unique set of variables. Manning (1999 p. 195) provides a range of examples of studies that analyse inter-use recreational conflicts, the most relevant for the selected case study sites are outlined in Table 3.

Table 3: Examples in literature of sources of recreational conflict categorized into restricted use and multi-use visitor management models. Modified from (Manning, 1999 p. 195)

<table>
<thead>
<tr>
<th>Visitor Management Model</th>
<th>Potential Recreation Conflict (targeted to management model)</th>
</tr>
</thead>
</table>
| Passive recreation model guided by environmental preservation and excludes mechanized recreation | Motorized & non-Motorized watercraft (Adelman, Heberlein, & Bonnickson, 1982; Ivy, Stewart, & Lue, 1992)  
Activity styles in hiking (Kyle, Graefe, Manning, & Bacon, 2004)  
Activity styles in camping (Clark, Hendee, & Campbell, 2009)  
Recreation with & without dogs (Page, Nielsen, & Goodenough, 1994; Pröbstl, Wirth, Elands, & Bell, 2010) |
| Multi-use recreation model guided by natural resource management and includes mechanized recreation and hunting | Motorized & non-Motorized recreation (4 season) (Jackson & Wong, 1982; McCay & Moeller, 1976; Noe, Hull, & Wellman, 1982; Noe, Wellman, & Buhyoff, 1981)  
Hikers & Mountain Bikers (Carothers, Vaske, & Donnelly, 2001; Jacobi, Manning, Valliere, & Negra, 1996; Ramthun, 1995; Watson, Roggenbuck, & Williams, 1991; Watson, Williams, & Daigle, 1991)  
Hunters & non-Hunters (Vaske, Donnelly, Wittmann, & Laidlaw, 1995)  
Hikers & Horses (Blahna, Smith, & Anderson, 1995; Watson & Niccolucci, 1992)  
Recreation with & without dogs (Page et al., 1994; Pröbstl et al., 2010) |

**Outdoor Recreation - Environmental Impacts**

Outdoor recreation in protected areas always has the potential for environmental impact.

Managing the potential for impact and determining an acceptable impact is the crux of the field
of recreation ecology and a major component in visitor management. Organizations must
decide what acceptable recreational uses are and how they fit into the management objectives
of both the organization and the site. A good starting point is the idea of ecological carrying
capacity. Ecological carrying capacity can be assessed by answering three questions (Payne &
Nilsen, 2002):

1) How have humans impacted a particular ecosystem?
2) Has the impact changed the character of that ecosystem?
3) If there is an impact, is the impact acceptable?

The potential for environmental impact of an outdoor recreation activity is one of the
determining factors in the approval of an outdoor activity at a site. That potential for
environmental impact opens up a decision tree in regard to the management of the activity in
question: 1) Does the potential for environmental impact exceed the impact threshold set out
by management objectives? 2) Can use be effectively managed to remain below a site’s impact
threshold (Payne & Nilsen, 2002)?

For any protected site, an organization must determine the nature of the visitor induced
impact. Impacts may be obvious and direct, such as soil and shoreline erosion, vegetation
damage, transport of exotic species, and the presence of garbage (Leung & Marion, 2000) or
less apparent such as changes to wildlife behaviour (Rogala et al., 2011), water quality, or
microbial soil activity (Leung & Marion, 2000). Changing trends in outdoor recreation may also
result in impacts to new areas that had not previously been suitable for traditional recreation
opportunities; canyoning (aquatic activity requiring a wetsuit and difficult to access water
courses) (Hardiman & Burgin, 2011) and geocaching (Blouin, 2008) are two such activities.

Much of the current impact research is commissioned in response to specific site requirements
(Campbell & Walker, 2008) and has been “restricted in spatial, temporal and ecological scales” (Leung & Marion, 2000 p. 26) though there are increasing examples of research addressing wider ranging impacts such as the Rogala et al. (2011) study investigating large mammal redistribution in response to human activity in Canada’s mountain parks. Land managers must then evaluate both the magnitude and significance that impacts have on both ecological and social carrying capacity within the site. Prioritizing impacts dedicates limited funding to areas where impacts are greatest such as impacts with a large spatial component or impact intensity (Campbell & Walker, 2008; Leung & Marion, 2000). Unfortunately, with limited resources to carry out monitoring, management, and maintenance strategies, land managers may have difficulty answering questions 2 and 3 when evaluating ecological carrying capacity through monitoring programs, even reverting back to visual impact and visitor perceptions as a measure of impact which is more appropriately a social indicator rather than an ecological indicator (Manning, 1999; Payne & Nilsen, 2002). Another factor when measuring or predicting impacts of different outdoor recreation activities is the frequency of use component. Virtually every recreation activity follows a curvilinear relationship (Figure 3) between impact and frequency of use. When frequency of use is low, each occurrence of use has a relatively severe impact regardless of the activity. Subsequent uses will cumulatively have less impact. In a generic management regime, only the lowest impact uses with low visitor numbers would benefit from a dispersal of use strategy that allows the resource to recover from the impact. In practice however, concentration of use is a more common strategy because: 1) use frequency and type often reaches the flatter part of the curve quickly, 2) ecological carrying capacity and the acceptable threshold of damage in most management regimes that integrate outdoor
recreation with conservation also occurs on the flatter part of the curve. Though literature reviewing the impacts of outdoor recreation activities lacking resource availability was not consulted, a cursory search of the literature yields studies on the direct impact of virtually every practiced outdoor recreation activity. Walking related activities are generally confined to trails though activities such as geocaching and orienteering have a trampling component but recovery rates are generally rapid on eastern North American sites (Cole & Marion, 1988). When considering the impact of walking related activities when confined to established trails, activity specific impacts include changes in vegetation, erosion, changes in abiotic and biotic soil structures, exotic species transport, and effects of people (including dogs) on wildlife (Pickering, Hill, Newsome, & Leung, 2009b; Rogala et al., 2011; Sime, 1999; Weaver & Dale, 1978).
Table 4: Common recreational activities occurring on linear corridors and their potential environmental impacts. (Castley, Hill, Pickering, Hadwen, & Worboys, 2008; Pickering, Hill, Newsome, & Leung, 2009a)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Potential Trail Impact</th>
</tr>
</thead>
</table>
| Pedestrian activities (hiking, jogging, dog walking) | - Trail widening around wet areas  
- Increased soil nutrification (dog feces)  
- Trail degradation on sandy soils |
| Mountain biking                  | - Spontaneous establishment of new trails  
- Unregulated trail construction do not always meet ‘best practice’ guidelines  
- Poor rider education and skidding results in rut formation and soil detachment  
- Can be resistant to using artificially hardened trails |
| Equestrian                       | - Greater soil compaction  
- Trail degradation is more pronounced, especially during wet periods  
- Increased soil nutrification |
| Hunting                          | - Similar to walking activities  
- Off trail trampling is more prevalent  
- Motorized transportation may be used to access favourable sites.  
- Seasons are in spring and fall when soil and vegetation is most vulnerable to damage |
| ATV                              | - Larger footprint causing trail vegetation damage  
- Generally limited to logging access roads  
- Promotes erosion through soil detachment  
- Able to cover large distances in short time periods |
| Motocross/Dirt Bikes             | - Access to virtually all trails  
- Cutting through soil layers and soil detachment  
- Spontaneous creation of new trails  
- Able to cover large distances in short time periods |

Trail impact studies have also reviewed the negative effects of increased use, effectiveness of trail routing, trail maintenance, and trail construction in mitigating impacts associated with trails and their use (Leung & Marion, 1999a; Leung & Marion, 2000).

Unlike trail impacts, camping impacts tend to be greater in magnitude because of concentrated activity over a longer duration than would be experienced on a trail (Leung & Marion, 2000).

Much like trail studies, camping studies examine vegetation, soil, and wildlife impacts but as the
activity style changes from transient (travel from point A to B) to residential (activity centred around an attraction), the mechanism and outcome of impacts also differ. Even one night of camping can result in significant vegetation loss (Cole, 1995), limiting the spatial extent of campsite impacts on vegetation and soil through management strategies is a favourable outcome (Cole, 1992). It follows then, that the literature focuses on evaluating the effectiveness of management strategies employed at campsites. Siting (Leung & Marion, 1999b; Marion & Leung, 1997; Williams & Marion, 1995), design and construction (Farrell & Marion, 1997; Williams & Marion, 1997), and camping policies (Cilimburg, Monz, & Kehoe, 2000; Clavering, 2005) are the most common topics in camping impact studies. As in trail impacts, campsites also have wildlife impact though more through displacement from favourable sites or attraction due to availability of food (Hammitt & Cole, 1998). The availability of food at campsites can lead to boom and bust cycles of small animal populations in proximity to campsites or dangerous human-bear interactions, both examples ultimately have a negative effect on the subject animals (Hammitt & Cole, 1998).

Comparative studies of off-road vehicles (ORV), horse riding, mountain bike, and hiker impacts quantify and confirm the greater magnitude of impact at similar user densities of ORV and horse over mountain biking and hiking (Hammitt & Cole, 1998; Pickering et al., 2009b; Sack & da Luz, 2003; Weaver & Dale, 1978; Wilson & Seney, 1994). Two studies of note, both with a southern Ontario context are Warfield’s (1997) case study of Ganaraska Forest and Thurston & Reader’s (2001) experimentally applied impacts of mountain biking. Warfield assessed trail impacts of ORV, horses, and hikers in her study with four relevant conclusions: 1) while ORV use did have the highest impact and degradation effect on trails, those effects tended to be
spatially restricted to the trail; 2) horses had a demonstrably higher impact on trails than hikers but less than ORV use; 3) off-trail ORV activity occurs in areas meeting ORV user preferences and very quickly degrades those areas; 4) Regardless of activity, use of wet trails (e.g. spring thaw) has a much greater impact than use of dry trails (Warfield, 1997). Thurston & Reader’s study of experimentally applied impacts of mountain bikes investigated impacts in a southern Ontario context. Their conclusion, that mountain biking does not have a significantly greater impact on trails than hikers (Thurston & Reader, 2001) is a position supported in the literature (Quinn & Chernoff, 2010). They did note however that trail preferences differed between the two groups and if trails are not provided that meet mountain bike user preferences, mountain bikers may seek out preferred features independently (Symmonds, Hammitt, & Quisenberry, 2000; Thurston & Reader, 2001).

Opportunities for paddling and motorized boating activities present negative impacts as well. Assumptions have been made that paddling activities are low impact and motorized boating yield higher impacts, however this may not always be the case. The impact of motorized boats on aquatic environments include the release of exhaust, fuel, and oil, wake induced shoreline erosion, noise generation, wildlife disturbance, and providing an invasive species vector (Bulté, Carrière, & Blouin-Demers, 2010; Hammitt & Cole, 1998). In contrast, paddling activities are generally quiet and generate little wake (Hammitt & Cole, 1998) but the impacts of paddling on wetland and shoreline wildlife can be greater due to ability to come in close proximity to shore and ability to access wetland habitats not accessible by larger watercraft (Borgmann, 2011).

Paddling tends to have greater impacts on shoreline erosion contributing to aquatic
nutrification and turbidity due in part, to the ability to ‘pull out’ of the water at virtually any favourable location (Hammitt & Cole, 1998).

**Natural Science – Role in Management Planning**

**Integration into Visitor Management Planning**

Our interpretation of environmental management has evolved over the time. Historically in parks systems, environmental management had focused on managing for aesthetics, a natural ideal, and recreation opportunities, all focused on benefiting tourism (Eagles, 2002; McNamee, 2002). A period of minimalist management followed, driven by the idea that nature did not require management, it could simply manage itself (Woodley, 2002). Today’s model in both Parks Canada and Ontario Parks is ecosystem management, incorporating the “representation of native ecosystem types, maintenance of viable populations, maintenance of ecological and evolutionary processes, and continuance of ecosystem resilience in the face of human pressures” (Theberge & Theberge, 2002 p. 72). Minimal management is still a desired ideal in parks management though the need for active management is recognized (Eagles, 2002; Parks Canada, 1994; Woodley, 2002).

In a very simple sense, successful management and planning for the preservation of ecological integrity begins by establishing baseline conditions and employing strategies to move towards a desired management condition. The Canada National Parks Act defines ecological integrity as “park, a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes” (Department of Justice Canada, 2000 p. 1). In practice this management process is proceduralised, utilizing steps to: 1)
Identify the environmental goals, 2) Determine the appropriate indicators of ecological integrity and implement monitoring protocols, 3) Using those indicators, establish the baseline condition and define the desired condition consistent with environmental goals, 4) Implement appropriate management strategies for achieving the desired condition, 5) Utilize monitoring protocols to evaluate management outcomes (Nilsen & Tayler, 1997; Payne & Nilsen, 2002).

This reflects one cycle through an iterative process of environmental management and does not account for changing conditions. Ecological systems are complex as are the anthropogenic influences we subject them to, which necessitates a flexible management process that adapts to unanticipated outcomes (Woodley, 2002). Utilizing an adaptive management process that integrates iterative decision making with the ongoing evaluation of outcomes to facilitate environmental management is a good example of flexible management and is much more than just an improved monitoring and management process (Walters, 1997). Adaptive management should involve a multi-disciplinary approach by engaging science, management, and stakeholders in creating predictive models for management issues. This management model integrates problem analysis, screen potential management strategies, and allows for feedback of data and outcomes to further improve the model. Adaptive management allows for continuous improvement in the management of complex ecosystems (Walters, 1986; Woodley, 2002).

Central to environmental management are the management goals or objectives defined by the managing organization. These objectives are influenced by “values, laws, policies, and plans.” (Eagles, 2002 p. 265) and may prioritize environmental preservation, resource management, or social and recreation opportunities. An environmental management regime developed using
only natural science and existing solely for preservation of ecological integrity on a subject site, wholly unencumbered by other influences, anthropogenic or otherwise, could be considered purely theoretical. It is uncommon for protected sites to maintain stable or unchanging ecotypes, due either to geographic and temporal anthropogenic influences or the natural successive nature of many ecotypes (Campbell & Walker, 2008; Meffe & Carroll, 1997). It follows then, that goals of ecological integrity for a given site must be clearly defined and much more descriptive than historic management policies which were minimalist and simply allowed nature to take its course (Theberge & Theberge, 2002; Woodley, 2002). Establishing the site ecological integrity goals should occur in parallel with natural science research designed to characterise and develop a baseline for each feature defined in the preservation goals. Studies need to be conducted that determine the quantity of each feature, its location within a protected site, temporal changes to the feature, its relationship to other environmental features, what sort of data is required to monitor its condition, how much data is required to improve a feature’s condition (Eagles, 2002). This scientifically acquired baseline assessment and an adaptive management strategy are the key to identifying appropriate management practices designed to move the condition of identified environmental features towards the desired state defined in site environmental goals (Eagles, 2002).

In reality, environmental objectives are influenced by political, social, and cultural factors, all impacting the state of ecological integrity and management actions are not solely driven by natural science outcomes (Eagles, 2002). An objective of publically owned protected spaces often permits the inclusion of visitors into protected spaces and presents additional internal anthropogenic impacts that are thought to present the greatest impact to ecological integrity
Integration of natural science is critical for maintaining ecological integrity in response to visitor use. Initial baseline assessments of the ecosystem condition are used to establish zoning categorized for its sensitivity in response to visitor use, recreational opportunities are assigned to zones based on their predicted level of impact, assessment protocols are defined that measure appropriate indicators against standards, and finally, management strategies are implemented to mitigate impacts (Nilsen & Tayler, 1997). On-going monitoring of indicators and the evaluation against standards is crucial to identifying and resolving impact issues (Hammit & Cole, 1998) and is a major driver of recreation ecology research, specifically in response to individual site issues (Campbell & Walker, 2008; Leung & Marion, 2000; Monz et al., 2010). The outcome is a selection of established and standardized monitoring protocols (Hammit & Cole, 1998) that aid in the selection of appropriate indicators and acquisition of reliable data required to implement successful management strategies.

While experience and local knowledge are important factors that should influence the selection of impact indicators, the acquisition of reliable and comparable data is required for justification of management resource allocation (Hammit & Cole, 1998). Monitoring protocols used by site managers are typically designed to assess immediate site impacts (Hammit & Cole, 1998) and have spatial limitations that may not reflect impacts in a larger system (Campbell & Walker, 2008). The spatial limitation factor is generally viewed as resulting from minimal funding available and specific demands management agencies have for ecological integrity monitoring development, site assessments, or to meet legislative demands (Monz et al., 2010). As such, many agencies have been resistant to fund recreation ecology studies that extend beyond a site specific environmental scope or implement experimental design and theoretical development.
(Campbell & Walker, 2008; Marion, 2006; Monz et al., 2010). Additionally, more research is required to evaluate the effectiveness of visitor management frameworks implemented at the site level in preserving ecological integrity (Leung & Marion, 2000; Nilsen & Tayler, 1997).

Environmental Protection – Classifications and Assessments

The management objectives and policies developed by land management organizations in protected area management are varied in the global diaspora of land management organizations and even within a single organization’s land holdings. The use of internationally recognized guidelines for classifying protected areas into categories is an important tool for understanding the relative level of protection afforded an area both domestically and internationally (Dudley, 2008). Environmental protection is broadly defined as the implementation of policies and procedures designed to control the degradation of the natural environment and its processes (Gamas, 2010). The degree to which environmental protection policies are implemented is dependent on the goals and objectives of the protected area. The International Union for Conservation of Nature (IUCN) has provided that tool in the Protected Area Management Categories system, a six category classification structured around management objectives (Dudley, 2008). Protected areas to be classified under the IUCN system are identified by their defining characteristics (Table 5) and the stated management objectives that are intended to retain those characteristics (Dudley, 2008). There is concern though, that management objectives do not define or ensure appropriate management actions and that classifying protected areas by their conservation outcomes would provide a more accurate IUCN category assignment (Boitani et al., 2008). The six categories are also not necessarily
hierarchical in their importance but rather apply the most appropriate management objectives
to the natural resource requiring protection (Dudley, 2008).

Table 5: International Union for Conservation of Nature Protected Area Management Categories and
tables of the major defining characteristics.  
(Dudley, 2008; Dudley, Parrish, Redford, & Stolton, 2010)

<table>
<thead>
<tr>
<th>Category</th>
<th>Major Defining Characteristics</th>
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<tbody>
<tr>
<td>Ia (strict nature reserve)</td>
<td>- undisturbed locale of intact ecosystems of regional, national, or global significance</td>
</tr>
<tr>
<td></td>
<td>- minimal anthropogenic influence (historic and contemporary)</td>
</tr>
<tr>
<td></td>
<td>- requires minimal active management to maintain desired preservation goals</td>
</tr>
<tr>
<td></td>
<td>- offers scientific opportunities</td>
</tr>
<tr>
<td>Ib (wilderness area)</td>
<td>- free of human development within the boundaries</td>
</tr>
<tr>
<td></td>
<td>- nearly intact ecosystems and of appropriate size to maintain stable ecological processes</td>
</tr>
<tr>
<td></td>
<td>- offers scientific and low density passive recreational opportunities</td>
</tr>
<tr>
<td>II (national Park)</td>
<td>- large area supporting outstanding representative features of a major natural region</td>
</tr>
<tr>
<td></td>
<td>- retains a mostly ‘natural’ state and has not host exotic native species</td>
</tr>
<tr>
<td></td>
<td>- requires minimal active management to maintain desired preservation goals but are good candidates for restoration projects</td>
</tr>
<tr>
<td></td>
<td>- offers cultural, scientific, social, and passive recreational opportunities</td>
</tr>
<tr>
<td>III (natural monument or feature)</td>
<td>- protection of an outstanding natural or culturally significant natural feature</td>
</tr>
<tr>
<td></td>
<td>- similar to Category II but protecting a feature rather than ecosystem</td>
</tr>
<tr>
<td></td>
<td>- offers cultural, scientific, and social opportunities</td>
</tr>
<tr>
<td>IV (habitat/species management area)</td>
<td>- protection of ecosystem fragments</td>
</tr>
<tr>
<td></td>
<td>- able to provide refuge and/or corridors for native flora and fauna</td>
</tr>
<tr>
<td></td>
<td>- requires active environmental management to maintain ecological process</td>
</tr>
<tr>
<td></td>
<td>- offers recreational, educational, and social opportunities to local communities</td>
</tr>
<tr>
<td>V (protected landscape)</td>
<td>- an area with desirable aesthetic and natural features that integrates human activity with natural process in an enduring fashion</td>
</tr>
<tr>
<td></td>
<td>- can provide a buffer zone around higher level categories</td>
</tr>
<tr>
<td></td>
<td>- offers cultural, recreational, and social opportunities to local communities</td>
</tr>
<tr>
<td>VI (protected area with sustainable use of natural resources)</td>
<td>- integrates sustainable use of natural resources into conservation goals</td>
</tr>
<tr>
<td></td>
<td>- offers cultural, economic, recreational, and social opportunities to local communities</td>
</tr>
</tbody>
</table>
The criteria for designation under the IUCN Protected Area Management category system is not only dependant on the identification of appropriate natural asset and management objectives, but the management plan must be legally binding to safeguard management objectives and prevent arbitrary amendments and there must be an organizational will to pursue category assignment (Dudley, 2008).

The Ontario Parks utilizes a system of six different park classifications that define park management goals and policies. The four primary management objectives for Ontario Parks include: environmental protection, cultural heritage, recreation, and tourism, each contribute to the six park classifications in different way through management policies (Table 6). The Ontario Parks classification system also utilizes zoning within each site to enable protected area management plans to apply appropriate management policies to reflect any natural and cultural heritage features or identify zones that provide services to visitors and staff (Ontario Ministry of Natural Resources, 1992). The six zoning classifications are:

i) Natural Environment Zone – supports passive outdoor recreation and the preservation of aesthetic, cultural, and natural heritage features.

ii) Development Zone – Typically associated with the Park office and visitor services including facilities catering to day-use and serviced campsites.

iii) Wilderness Zone – Zone of minimal development, sufficient size to support a wilderness experience for visitors, and protect natural and cultural heritage.

iv) Nature Reserve Zone – Minimal development and visitor access for natural heritage features requiring additional protection and buffering from adjacent uses.

v) Historical Zone – Preservation of historical and cultural heritage with the minimum development required to facilitate visitor appreciation.

vi) Access Zone – Similar to the Development Zone but utilized at sites offering minimal visitor facilities. (Ontario Ministry of Natural Resources, 1992)
Table 6: Integrating and prioritizing Ontario Parks management objectives into the Ontario Parks classification system.
Adapted from Table 1, Ontario Provincial Parks: Planning and Management Policies 1992 Update (Ontario Ministry of Natural Resources, 1992 p. 26)

<table>
<thead>
<tr>
<th></th>
<th>Wilderness Parks</th>
<th>Nature Reserves</th>
<th>Historical Parks</th>
<th>Natural Environment Parks</th>
<th>Waterway Parks</th>
<th>Recreation Parks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>&lt; 50,000 Ha</td>
<td>Ecologically self-contained</td>
<td>Dependant on resource</td>
<td>&lt; 2,000 Ha</td>
<td>Linear corridor</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Environmental Protection</strong></td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Cultural and Natural Heritage Appreciation</strong></td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Recreation (Wilderness oriented)</strong></td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Recreation (Day-use oriented)</strong></td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td><strong>Tourism opportunities</strong></td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
</tbody>
</table>

In addition to the classification and zoning system, Ontario Parks also integrates the IUCN Protected Area Management category system into Park classification. Wilkinson and Eagles (2001) note that this results in virtually every Provincial Park retaining an IUCN Class II status (National Parks) (Dudley, 2008). They suggest that IUCN Protected Area Management category system is being incorrectly applied by Ontario Parks, giving the impression that every site has a primary objective of ‘protection’ which is not the case (Wilkinson & Eagles, 2001).

Another system used in classifying and zoning protected areas is the OMNR Area of Natural Scientific Interest (ANSI). The designation system is applied to sites that are either privately or publically owned, including Ontario Parks and affords protection under applicable Government
of Ontario legislation (Ontario Ministry of Natural Resources, 2011). The ANSI system is used to identify sites that have:

1. Representation – *of geological themes or landform-vegetation features of an ecodistrict.*
2. Condition – *an assessment of the degree of human-induced disturbances.*
3. Diversity – *the number of high quality, representative features that exist within a site are assessed.*
4. Other ecological considerations – *ecological and hydrological functions, connectivity, size, shape, proximity to other important areas, etc.*
5. Special features – *such as populations of species at risk, special habitats, unusual geological or life science features and educational or scientific value.*

(Ontario Ministry of Natural Resources, 2011 p. 2)

Identified sites are assigned hierarchical classifications of “*Provincially Significant*”, “*Regionally Significant*”, and “*Locally Significant*” ranging from sites meeting all the criteria and are of exceptional quality to those that meet most of the classification criteria and have qualities better represented at other sites (Ontario Ministry of Natural Resources, 2011 p. 3).

Parks Canada also integrates zoning into park management planning to apply specific management policies to appropriate areas within the park. Unlike the Ontario Parks system, Parks Canada does not link the IUCN Protected Area Management category system to park zoning or classification or use a park classification system for national parks (Parks Canada, 2008). The zoning system consists of five zones;

1) Special Preservation – Finest examples of natural or cultural heritage requiring special protection and preservation. Usually site specific and may be unique, threatened, or endangered.
2) Wilderness – Broad areas of natural environment in a wilderness state. Minimal intervention is required to maintain healthy ecosystems and natural heritage features.
3) Natural Environment – Opportunities for a broad range of visitors to experience natural and cultural heritage features with minimal park facilities.
4) Outdoor Recreation – Limited areas that allow more intensive recreational use yet continue to offer opportunities for visitors to experience heritage features.

5) Park Services – Communities and facilities required to service the park. (Parks Canada, 2008)

**Nature of Information – Empirical science versus local and traditional ecological knowledge**

The use of various forms of ecological knowledge as support for empirical science is becoming increasingly common in wildlife population studies and in resource management decisions (Gilchrist, Mallory, & Merkel, 2005). Local ecological knowledge is often called traditional ecological knowledge (TEK) which implies a multi-generational aboriginal origin though it can have non-aboriginal origins (Gilchrist et al., 2005). TEK does have a consistent characterisation of practices, beliefs and knowledge passed down and acquired from each subsequent generation (Gilchrist et al., 2005). When gathering information through interviews however, ecological knowledge acquired often has a more contemporary origin based on the knowledge and experience of the interview participant and is better described as local ecological knowledge (LEK) (Gilchrist et al., 2005). The usefulness of data acquired can vary widely as LEK is developed under a cultural, political, and spiritual bias. Some believe the methods used to identify “local knowledge experts” are often insufficient, lacking in both reporting of the methods utilized and adoption of “systematic approaches” (Brook & McLachlan, 2008; Davis & Wagner, 2003 p. 463). Evaluating the validity of LEK also has challenges as the comparative empirical data used to corroborate LEK is often acquired from different areas and times, which results in significant limitations of any comparison (Gilchrist et al., 2005). Ironically, the
rigorous evaluation of LEK against empirical data required for validation is also seen as devaluing the communities from which the LEK was acquired (Brook & McLachlan, 2005). Citizen science is also employed in wildlife and ecological study work but, unlike LEK, utilizes defensible and repeatable scientific methods. By engaging a volunteer (or citizen) component to scientific studies, a larger resource is mobilized for data acquisition and it also promotes public participation which can result in stronger links between science, the community, and any resultant policy and management decisions (Cuthill & Fien, 2005; Schonbeck, 2003).

**Collaborative Recreation Planning & Stakeholder Participation**

Historically, land management agencies have been top-down, unilaterally delivering management policy on behalf of the public interest (Pimbert & Pretty, 1997; Selin & Chavez, 1995; Wondolleck & Yaffee, 2000). This approach was increasingly difficult to implement in the face of growing social and political mobilization and interest. Adversarial relationships developed with impacted stakeholder groups who utilized legal and political means to block, stall, or reverse decisions (Selin & Chavez, 1995). The outcome would often result in disjointed management strategies and a lack of cohesion in the planning designed to meet the agency’s management objectives. Faced with impasse, mistrust, and apathy in implementing management policy coupled with an evolving understanding that successful management often exceeds legal boundaries, engaging the public was seen as the only way to get things done (Wondolleck & Yaffee, 2000).

Engaging stakeholders in the decision making process does not always imply a collaborative relationship. Collaboration is often defined as:
1) The pooling of appreciations and/or tangible resources (e.g. information, money, labour, etc.),
2) by two or more stakeholders,
3) to solve a set of problems which neither can solve individually. (Gray, 1985 p. 912)

Collaboration occurs in situations where involved groups or individuals do not have inherent control or power over others in the process. Participation in collaborative processes are voluntary but ultimately should create an interdependence between individual groups in the pursuit of desired objectives (Wondolleck & Yaffee, 2000) and a shared responsibility in the potential outcomes (Selin & Chavez, 1995). Not every participatory relationship between management agencies and stakeholders can be defined as collaborative, yet engagement of stakeholders through public consultation or the recruitment of volunteers for park management assistance are examples that implement aspects of collaboration. Though such relationships may not achieve true consensus outcome, they are still invaluable because they indicate a continuing trend towards collaborative decision making (Selin & Chavez, 1995). It is also critical to note that collaboration is not a rigid process but one that can “evolve dynamically in response to a host of internal and external factors” (Selin & Chavez, 1995 p. 190).

The requirement for public consultation in protected area planning is an often legislated requirement of management agencies (Krumpe & McCool, 1997; Selin & Chavez, 1995), though Wondolleck and Yaffee (2000) contend it is a poor reason for justifying the use of collaborative processes. Their support for integrating collaborative processes into management planning contends that:

Collaboration can lead to better decisions that are more likely to be implemented and, at the same time, better prepare agencies and communities for future challenges.
Building bridges between agencies, organizations, and individuals in environmental management is not an end in itself. Rather, it is a means to several ends: building understanding, building support, and building capacity. By developing interpersonal and inter-organizational linkages, managers can be better informed and make choices about future direction that are more likely to solve the problems at hand. (Wondolleck & Yaffee, 2000 p. 23).

In the current paradigm, where many agencies have dual mandates of both preservation and use, it makes sense then, to engage stakeholders in recreation planning so the problems that arise in meeting multiple mandates can be resolved through consensus building (Krumpe & McCool, 1997). In visitor management planning, effective collaboration can also be used as a means to:

1) Provide outdoor recreation and education opportunities that are relevant to the changing trends in recreation and demographics of the populace (Krumpe & McCool, 1997; Makopondo, 2003).

2) Develop a shared sense of ownership and responsibilities for recreational resources between management agencies and stakeholders and public support of management agency decisions in highly politicized democracies (Krumpe & McCool, 1997; Wondolleck & Yaffee, 2000).

3) Benefit from pooling or sharing of resources in the implementation of recreational opportunities to accomplish more in a time of constrained budgets and market based management models (Wondolleck & Yaffee, 2000).

4) Avoid delayed and disjointed management decisions that are destined to fail the interests of one or more impacted stakeholders and subsequent development of mistrust arising from conflict (Wondolleck & Yaffee, 2000).

Unfortunately, collaborative processes can be poorly applied, especially in agencies that possess remnants of the former top-down institutional culture. Public involvement may then be driven by the legislative requirements and not by a genuine understanding of the processes
in collaborative planning (Selin & Chavez, 1995; Wondolleck & Yaffee, 2000). This shortcoming may not be evident in “tame” problems (King, 1993), where there is only one possible outcome of consensus (Krumpe & McCool, 1997) but “wicked” problems (Allen & Gould, Jr., 1986) require more public participation, often requiring significant negotiation in addition to data collection in order to create a consensus. Agencies must also develop a cultural understanding rather than just a procedural understanding of public participation to successfully deal with wicked problems before they become “messes” (Ackoff, 1974; Krumpe & McCool, 1997).

Mistrust between agencies and stakeholders’ is another potential obstacle to successful collaboration. A history of unilateral decisions, ideological divides, and broken promises can create a hostile environment where collaboration is unlikely to be successful without significant intervention (Wondolleck & Yaffee, 2000). Three additional barriers to successful implementation noted in the literature are power imbalances that exist or develop among stakeholders, a lack of resources (funding and time) available to conduct the process and implement the findings, and difficulty in engaging the public (Wondolleck & Yaffee, 2000).

Collaboration tends to be ephemeral but the results should be tangible for a longer period of time. Collaborative relationships are not built on organizations but on individuals meeting face to face to resolve issues but, as participants change, solutions are implemented, and stakeholder focus evolves, the value of the relationship may diminish yet legacies live on in its solutions. For that reason, using collaboration for a finite time to develop enduring policies and management plans is often done by design (Wondolleck & Yaffee, 2000).
If collaborative relationship dynamics tend to suffer in longevity, how can agencies continue to engage positive public participation in an enduring fashion? The benefits of on-going public participation in recreation management are clear by providing: continuing feedback to management, volunteer labour force for work projects, public sense of ownership and responsibility, and a greater institutional memory, all valuable aspects in an environment of constrained management budgets and resources (Wondolleck & Yaffee, 2000).

Table 7 outlines the different typologies of public participation in visitor management planning and implementation. For management agencies, maintaining active long term public participation is desirable as it engages a volunteer labour force and additionally, can facilitate ongoing public involvement/support in management decisions (Pimbert & Pretty, 1997). Achieving long term public participation however and positive outcomes, requires management agencies to value the knowledge and ideas of participatory groups as well as concede at least some decision making autonomy to them (types 4-6, Table 7) (Pimbert & Pretty, 1997). In contrast, excessive public participation can undermine the efforts of agencies to effectively manage other stated objectives because of excessive autonomy despite conflicting goals or the utilization of external initiatives to exact change (types 6-7, Table 7) (Pimbert & Pretty, 1997).

The mobilization of public participants in protected area management must be managed flexibly, especially when long-term partnerships are desired. They are vulnerable to the same obstacles that collaborative relationships are, specifically, collaboration tends to generate ephemeral partnerships or insufficient integration of participants knowledge and ideas leading participants to become disengaged or driven to self-mobilization.
Table 7: Typology of participation – classes of participatory engagement and their defining characteristics. 
Adapted from (Pimbert & Pretty, 1997; Pretty, 1994)

<table>
<thead>
<tr>
<th>Typology</th>
<th>Characteristics of each type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Passive Participation</td>
<td>• Management direction is communicated to the public</td>
</tr>
<tr>
<td></td>
<td>• Unilateral decision making process without public feedback</td>
</tr>
<tr>
<td></td>
<td>• Data, analysis, and methods remain the sole property of the management agency</td>
</tr>
<tr>
<td>2. Participation in Information Giving</td>
<td>• Participation through surveys, questionnaires, interviews, etc.</td>
</tr>
<tr>
<td></td>
<td>• Recruited groups may utilize visitors, local communities, tourists, residents, other stakeholders, etc.</td>
</tr>
<tr>
<td></td>
<td>• Proceedings occur without stakeholder participation</td>
</tr>
<tr>
<td></td>
<td>• Data, analysis, and methods remain the sole property of the management agency.</td>
</tr>
<tr>
<td>3. Participation by Consultation</td>
<td>• Participation through consultation such as public meetings and may engage external agents (consultants)</td>
</tr>
<tr>
<td></td>
<td>• Problems and solutions are defined and may be modified in response to public consultation &amp; feedback.</td>
</tr>
<tr>
<td></td>
<td>• Management agency has no obligation to share the decision making process or implement feedback from public consultation.</td>
</tr>
<tr>
<td>4. Participation for Incentives</td>
<td>• Participation by contributing through giving programs or labour</td>
</tr>
<tr>
<td></td>
<td>• Motivating incentives may include; sense of place, social belonging, contribution to a shared goal, sense of ownership, personal satisfaction, financial.</td>
</tr>
<tr>
<td></td>
<td>• People have no stake in prolonging activities should the incentives cease. In a change of management dynamic change, the requested contributions may no longer match personal expectations and devalue personal incentives</td>
</tr>
<tr>
<td>5. Functional Participation</td>
<td>• Participation through creation of groups meeting predetermined objectives related to management</td>
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<tr>
<td></td>
<td>• Occurs subsequent to the development of policy objectives and is used to help implement and maintain management objectives.</td>
</tr>
<tr>
<td></td>
<td>• Dependent on external initiators and facilitators (such as protected area managers), but may become self-dependent.</td>
</tr>
<tr>
<td>6. Interactive Participation</td>
<td>• Participation through collaborative processes including planning.</td>
</tr>
<tr>
<td></td>
<td>• Development of action plans and the mobilization of stakeholder interests</td>
</tr>
<tr>
<td></td>
<td>• Work to create consensus in response to multi party conflicting interests</td>
</tr>
<tr>
<td></td>
<td>• Integrates learning process and understanding of different</td>
</tr>
</tbody>
</table>
In application, Pretty’s Typology of Participation is framed from the perspective of land managers and describes how participation is integrated into management (Cornwall, 2008). At higher government levels, there is often a reluctance demonstrated by land management agencies in granting stakeholders power, control, and resources (Cornwall, 2008; Wondolleck & Yaffee, 2000). This is most evident where management goals serve national or provincial interests and there is a greater risk that the management of shared natural resources will become disproportionally influenced by local stakeholders (Wondolleck & Yaffee, 2000). Those same agencies often bare the accountability in decision making and are also funded to be self-sufficient which can discourage collaboration in areas where land managers have direct control.

Increasing levels of collaboration are utilized when management agencies lack unilateral control over management decisions and require social and political capital to proceed with management action (Wondolleck & Yaffee, 2000).

Conversely, land managers at lower government levels benefit from and utilize higher levels of participation because the management goals reflect community goals and a shared resource. The power and resource imbalance is also comparatively small and land managers depend on more interactive relationships to achieve shared accountability through both shared ownership and responsibility and for the efficiencies derived from shared resources (Wondolleck & Yaffee, 2000).
Chapter 3 – Methods

Approach

In order to characterize the state of visitor management plans in Eastern Ontario protected space, a multiple case study approach was chosen. Three sites with a range of management objectives and goals were evaluated. The case study approach is descriptive and has some explanatory elements for frequently recurring issues. The methods utilized included semi-structured interviews, document analysis, and site observations, all used as data sources for methodological triangulation (Yin, 2009). These are described in detail below.

In order to minimize research bias, the Investigator reflected on his pre-conceived notions of ‘appropriate’ permitted recreational uses and their management. Coming from both a mountain biking and hiking background, the Investigator understands both sides of the potential for trail impacts from multiple uses and the resulting user conflict. Having experienced both sides, a particular bias towards a user group can be approached more pragmatically; by evaluating the content of, and compliance to, the management plan rather than forwarding a pre-conceived notion. A second, but related bias is the idea of sustainable recreational use. A biased view might define sustainable recreational use as a pattern and intensity of use that does not degrade the recreational experience for a visitor to the area. The bias may be introduced because the broad definition does not set a specific threshold that defines unsustainable use from an ecological integrity perspective, but rather guided by the user’s expectations as influenced by their recreational activity preference.
Site Selection

Three sites in Eastern Ontario were selected for the case study. Each site was selected to ensure representation at each level of government management in the region; federal, provincial, and municipal. The site selection also considered that the contiguous area must include a range of ecotypes and be large enough to potentially support a range of recreational activities in a natural setting. The sites’ relative proximity was also considered. By maintaining a regional aspect to site selection, variability introduced by proximity to major population centres was minimized. Each site also had to include an objective stipulating recreational access, permitted various recreational uses, and potentially have user profiles and attendance that might result in degraded recreational and environmental parameters in the absence of direct or in-direct visitor management strategies.

Sites that met the criteria and that were selected were St. Lawrence Islands National Park (SLINP), Frontenac Provincial Park, and Limerick Forest.

St. Lawrence Islands National Park was established in 1904 by the Federal Government. The modern operating entity, Parks Canada, manages 24.4 km\(^2\) consisting of 21 islands and 3 mainland properties, headquartered on the St. Lawrence River at Mallorytown Landing. The park is located within the Thousand Island ecosystem zone and lies on the Frontenac Axis, a southerly extension of the Canadian Shield, and is characterized by granite outcroppings, shallow soils, and numerous wetlands. The Park is known for its island holdings located on the St. Lawrence River and accessible only by boat. Unique aspects of the park include one of the highest levels of biodiversity in the Canadian National Park system, fire-adapted ecology, and a
refuge for several Canadian species at risk including Deerberry (*Vaccinium stamineum*), and the
Gray Ratsnake (*Pantherophis spiloides*) (Francis & Leggo, 2004). The Park also has the highest
visitor densities of a Canadian National Park and multiple access points (Francis & Leggo, 2004). Mechanized recreational use is prohibited on terrestrial sites however motorized water access
to park sites is not regulated. Popular permitted recreational activities in the park include boat-
in camping, hiking, and recreational boating. Ecological preservation and recreational access
are both objectives of the National Park system mandate (Department of Justice Canada, 1998).
SLINP exists as part of a national system of parks established to protect outstanding examples
of Canadian natural heritage and environmental preservation is the primary objective in the
Parks Canada Agency Act (Department of Justice Canada, 1998). The Parks Canada Agency Act,
the Species at Risk Act, and the Canada National Parks Act are the backbone of the legal
framework under which SLINP operates and defines the management objectives, enforcement
powers, penalties, and permitted uses (Department of Justice Canada, 1998; Department of
Justice Canada, 2000; Department of Justice Canada, 2002). Though the legal framework does
state that environmental preservation must be a prerequisite for management, flexibility does
exist at SLINP for implementing policy within the hard limits set by the legislation (Parks
Canada, 1994; Parks Canada, 2008). The Park is also located within the UNESCO Frontenac Arch
Biosphere Reserve. The most recent management plan was issued in 2010 (Parks Canada, 2010).

Frontenac Provincial Park was established by the Ontario Provincial Government in 1974,
encompassing 5,214 Ha of semi-wilderness on the Canadian Shield approximately 40 km north
of Kingston, Ontario. The location of the Park on the Canadian Shield results in an undulating
topography, with many granite hills with shallow soils as well as numerous lakes and wetlands. The forest cover is second growth mixed coniferous/deciduous Great Lakes forest. Popular permitted uses in the park include paddling, hiking, and hike or paddle-in camping. Equestrian, motorized watercraft, and mechanized terrestrial activities are prohibited. Motorized watercraft are permitted in the Park only on lakes with water access outside Park boundaries. The Provincial Park and Conservation Reserves Act (PPCRA) provides the primary legal framework under which Frontenac Provincial Park must operate. The PPCRA and Ontario’s Endangered Species Act state the primary management objectives for Frontenac Provincial Park as well as enforcement powers, penalties, and permitted uses including specific recreational activities. The Ontario Parks Protected Areas Planning Manual and Provincial Park Bluebook provide Park staff with guiding management policy though the legislative framework appears relatively restrictive at the site level (Ontario Ministry of Natural Resources, 1992; Ontario Ministry of Natural Resources, 2009). The Park is located in a region easily accessible to large population centres yet offers a large contiguous area for wilderness oriented recreation activities and environmental preservation (Bonta, 2005).

Limerick Forest is owned and managed by the United Counties of Leeds and Grenville (UCLG) as a working forest with recreational access, consisting three major contiguous tracts totaling 5,782 Ha. The forest is situated on the Smiths Falls limestone plane, a large area in Eastern Ontario of very shallow soils over limestone bedrock. The area now consists of a mix of Great Lakes forest type, working coniferous plantations, and wetlands. The origins of the forest date back to farms that were abandoned in the 1930’s. The County took ownership of the abandoned land and planted Pinus sp. and Picea sp. to stabilize soils and reforest land. The
management framework established for Limerick Forest was developed in a collaborative planning process facilitated by UCLG when management responsibility was returned to the County from the Ontario Ministry of Natural Resources (Willis, 2006a). The product of that process was the Limerick Forest Long Range Management Plan which was passed as a County by-law. It defines the primary management objectives for Limerick Forest and describes its role a providing economic, social, and environmental benefits to County residences in a sustainable fashion (United Counties of Leeds & Grenville, 2003). UCLG is required to manage the Forest in compliance with the Ontario Endangered Species Act and the Ontario Planning Act (Byford, 2007; United Counties of Leeds & Grenville, 2003). The County did not establish a legal framework for enforcement powers or penalties in the Limerick Forest Long Range Management Plan (Byford, 2007; United Counties of Leeds & Grenville, 2003). While considered a working forest, forestry operations tend to be limited to the productive pine and spruce plantations. Recreational use in Limerick Forest is the most permissive of the three case study sites. Hunting, motorized recreation, mountain biking, equestrian, and hiking are all permitted within the forest. Visitor counts are increasing, especially in the motorized recreation sector due to an increasing regional population and newly implemented exclusions of motorized vehicles in other areas.

**Semi-structured Interviews**

The study focused on each site by interviewing land managers and other ‘feet on the ground’ members of each organization who influence policy and direction at the local level. There was also recruitment of recreational stakeholders who have collaborative relationships with the respective sites. For each site, interviewees always included: the land manager or park
superintendent, individuals professionally familiar with site ecology, representatives of
volunteer groups with collaborative relationships with the respective sites, and representatives
of recreational user groups which may include commercial tourism operators.

Semi-structured were conducted with each interviewee. Participant selection was purposive
(Berg, 2009; Merriam, 2009) and so participants at each site were selected by evaluating their
organizational position, influence on site policy direction, and scientific/research capacity.
Individuals ranking highly in all three categories are the most desirable participants. Snowball
sampling recruitment was also employed as a recruitment strategy. Purposive selection was
also employed during snowball sampling to ensure potential candidates met the criteria
required for the study. After familiarizing interview participants with the goals of the study and
at the conclusion of the interview, participants were asked to recommend potential interview
subjects. This allowed the Investigator to recruit participants whom he might not have been
aware of during the initial recruitment phase. Five interviews were conducted for both
Frontenac Provincial Park and Limerick Forest however only three were conducted for SLINP.
The lower number of interviews conducted at SLINP was due to two factors: i) difficulty in
identifying and recruiting non-Parks Canada candidates involved with in-Park initiatives; ii) the
Parks Canada staff recruited were leaders in their staff positions and repetition was anticipated
with other participants in lower staff positions. While the self-sufficient nature of SLINP’s
planning and management resulted in lower participant recruitment, SLINP, researchers, and
Parks Canada generated a correspondingly higher number of reports and other documents than
the other two sites which was felt to compensate for any perceived gaps in the interview data.
Questions were formulated through analysis of literature (see Chapter 2) and categorized into three central themes:

i) Influence of science and environmental monitoring on visitor management policy direction

ii) Influence of public perception on visitor management policy direction

iii) Influence of collaborative relationships between land management and recreational user groups on visitor management policy direction.

The questions were modified to be appropriate to the role the interviewee played at each site but designed to extract knowledge of the above identified themes from the interviewee perspectives. The interviewees were encouraged to provide answers that included applicable examples so the Investigator could: i) better understand context of the answer through a working example; ii) allow the interview subject to utilize situational explanation rather than theoretical explanation; iii) extract other situational examples embedded within the original example; and iv) use the provided examples to form more specific questions for the interview subject and future interview subjects.

The interviews were recorded with an audio recorder and then professionally transcribed in semi-verbatim format (excludes redundant words, false sentence starts, and stutters). The transcripts were then coded by theme/category, using computer assisted qualitative data analysis software, specifically NVivo 9 which was also used for analysis of data.

Interview questions remained on theme, but were tailored to the role of the subject in the organization. This was done in order to avoid asking questions that may be unrelated to the person’s role or the use of vocabulary and phrasing that was inappropriate for the audience. A limitation may have involved the Investigator, in the process of developing relevant questions,
having made assumptions regarding the role of the participant in the organization that may have resulted in inadvertently failing to acquire relevant data from the participants.

There was also concern regarding participant’s candour. Participants may have contributed the ‘official’ position of the affiliated organization regarding potentially controversial topics rather than sharing their personal views. It was predicted that this effect would be most prevalent for subjects with a high professional or business stake. None of the participants opted for anonymity but may have measured their responses as a result. Anonymity was maintained regardless of participants response to the request, the Investigator evaluated the risk to the participant and determined that: a) the professional risk to the participant was likely greater than the benefit, b) none of the interview responses increased in value if attributed to an individual, and c) the small number of interviewees and the unique nature of the responses may identify individuals to their colleagues and peers however the responses will likely to remain anonymous outside of those intimately familiar with the operational details at each site.

Table 8: Interview participants identified by case study location and role played at each site.

<table>
<thead>
<tr>
<th>Role of the interview participant</th>
<th>Limerick Forest</th>
<th>Frontenac Provincial Park</th>
<th>St. Lawrence Islands National Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees of case study sites</td>
<td>LF1</td>
<td>F1, F2, F3</td>
<td>SL1, SL2, SL3</td>
</tr>
<tr>
<td>Volunteers and members of affiliated and collaborating organizations</td>
<td>LF2, LF3, LF4</td>
<td>F4</td>
<td></td>
</tr>
<tr>
<td>Independent commercial or commercial participants</td>
<td>LF5</td>
<td>F5</td>
<td></td>
</tr>
</tbody>
</table>

The referencing method utilized in Chapter 4 for interview participant responses identifies interviewees by an alphanumerical code linking the participant with the applicable case study
site. Table 8 further identifies participants through their relationship with each site thus giving context to the nature of the participant’s observations.

**Document Analysis**

Public documents regarding each specific site and managing organization were collected and analyzed. These documents included guiding legislation, management plans, visitor management plans, and both commissioned reports and EI monitoring results studying visitor impacts. Documents were acquired both online and as hard copies from each of the three sites. The results of the document analysis were used to assist in the formulation of site and subject specific interview questions and corroborate or contradict results derived from the interview analysis (Yin, 2009). The initial interviews and document collection guided further document acquisition through participant assistance, document trails, and new findings (Merriam, 2009). All documents were evaluated for authenticity and accuracy using Guba & Lincoln’s questions from *Effective Evaluation* (Guba & Lincoln, 1981):

1. Is the document’s history known?
2. Where did I get the document?
3. Is the document actually what it is purported to be? With what level of confidence?
4. Is the document original (or a copy of the original) and is it complete?
5. Is there a record or any evidence of editing or tampering?
6. Once the document is determined to be genuine, under what context or circumstances was the document produced?
7. Who authored the document?
8. For what purpose was the document created and who was the intended audience?
9. What sources of information did the author use to create the document? How reliable are those sources of information?
10. Is any bias evident in the document? Does the author have any bias?
11. What level of honesty should be expected in the document based the previous ten questions?
12. Are there corroborating or background documents available that may support a document’s authenticity?

A potential limitation in the document analysis lies in the document acquisition method. Acquisition was facilitated by online availability as well as by the assistance of the participants in acquiring related documents and may not be comprehensive. For example, at one particular site, the latest documentation was still in development and not available to the Investigator. I suspect that organizational culture precedes an approved management plan so this might be of a particular disadvantage to the Investigator in triangulating observations because the organization’s culture might tend to operate more closely to the plan in development rather than the current documentation.

Site Observations

Direct and participant observations of the subject sites were conducted. Evidence corroborating or contradicting both interview and document analysis results were noted, including the observed effectiveness of site visitor management plans, evidence of policy implementation, and organizational prioritization, and visitor compliance. Participant observations were primarily of other recreational users and were conducted in a manner to minimize the influence of the observer (Merriam, 2009). There may be some bias with the participant observations as participants may revert to complying with regulations rather than common practice (Yin, 2009). It was hoped that by being a fellow recreational user, the observed did not deviate from their common practice. The direct observations assisted in corroborating the participant observations (Yin, 2009). Direct observations were also
conducted from the viewpoint of a participant in one of the predominant recreational activities for each site:

i. Limerick Forest – mountain biking in the south forest block. Observations on trail maintenance (single & double track) and visitor impacts (trail widening/trampling, remediation, closing, and bridging over wet areas, etc.).

ii. SLINP – kayaking to one or two of the islands (Parks Canada zone 1 & 2 islands) to observe visitor impacts (compliance with regulations, trampling, trails, etc.) A hike on SLINP’s Jones Creek tract will also be conducted.

iii. Frontenac Provincial Park – trail hike in the park. Observe visitor impacts (trail damage, campsite impacts, shoreline damage at campsites or boat launches, evidence of remediation activities).

Data was gathered as photographic evidence during the field visits targeting evidence of visitor impacts as well as observed visitor impact mitigation work at each site. Digital photos were taken from on-trail vantage points only. Any visitor impacts or mitigation projects that had occurred and were not visible from the trail were not captured as evidence. It was assumed during field visits, that impacts occurring beyond the view from the trail, would have originated at the trail and be observable at that point (i.e. trampling or informal trails). All photos were downloaded from the digital camera at the conclusion of the field visit and were assigned a time stamp and geo-tag for the photo location. Photos were also captioned with details and notes regarding the observable evidence in the photo as well as any other details not captured in the photo that may have motivated its creation. Photos were processed as described above within 24 hours of the site visit to preserve memory detail. A potential limitation of the data acquired during site visits was also identified. The awareness and the resulting photographic evidence are not driven by a particular expertise in ecology, trail design, or other field. The data was gathered using the Investigator’s interpretation of what was intended versus what exists and was driven by the Investigator’s perspective as a recreational user.
Data Analysis

The data analysis used a four-part method of inquiry as described in *The Long Interview* (McCracken, 1988). The four steps are structured to encourage the Investigator to utilize the literature to form a foundation for the research but allow for the utilization of both the related experiences of the Investigator and interview subjects to guide the research path (Figure 4).

The analytical data acquired from the literature and the cultural data collected from one’s own experiences and that of the interview subjects, were integrated and developed resulting in this thesis, a compilation of new analytical conclusions that will hopefully contribute to theoretical

![Figure 4: Four-Part Method of Inquiry](image)

(McCracken, 1988, p. 30)
development and practical application to be integrated back into the body of literature.

Step 1 begins with the literature review, an exhaustive search of relevant literature in order to set the stage for the further research. The Investigator used this process to define the themes and questions to be used as the basis for the research and interview design.

The second step utilized the experience of the Investigator to identify cultural themes which, in conjunction with Step 1, was used in the interview design. The background of the Investigator provides “an extraordinarily intimate acquaintance with the object of study” (McCracken, 1988 p. 32) allowing the Investigator to explore themes that may not be recognized by researchers less familiar with the object of study. The personal background and experience is also used during the data analysis to find commonalities in the data that may not be apparent to the Investigator who is not aware of the subtler issues. Those same experiences can also be used to identify any positions on issues that may vary from an expected or familiar result.

Step 3, the discovery of cultural categories, is the interview process itself. The completed interview design is exercised on the interview subjects.

The final step builds on the previous three steps and is the step in the inquiry where data analysis, discussion, and conclusions are developed and recorded. McCracken describes the Stages of Analysis (Figure 5) as beginning with a microscope followed by grouping details together, eventually concluding in stage 5 having derived conclusions that no longer refer to the individuals in this research, but to visitor management as a whole. It is the final conversion of the cultural learnings to analytical learnings.
Stage 1 is the most focused of the five stages and examines each utterance in the interview, relevant points in the documents, and each field observation as a point of data in itself. Each observation is then considered independently of the rest of the text. It is coded using categories identified in both the literature review and personal experience and thus becomes an observation. The observations are then sorted, filtering the critical from non-critical.

Stage 2 is expanded observation; the observations are further developed by expanding on each observation so that “its implications and possibilities are more fully played out” (McCracken, 1988 p. 45). The observation is also related back to the data source to identify its context.
within the data source and then relating each observation to the other observations identified in each individual data source.

The third stage steps back further by viewing the observations in each transcript, photo, or document that were identified in the previous step to those observations from other data sources at that particular site. Patterns at each site should be identifiable when viewing the observations in this manner. More general issues should now be observed for each site.

Stage 4 develops the observations into specific themes by reviewing the details and comments generated subsequently of the initial observations and during the previous stages. As specific themes are determined, further review of the themes identified the consistencies and contradictions at each site and in the Eastern Ontario context. Themes were classified and ranked hierarchically resulting in parent themes, subthemes, and independent or uncategorized themes.

The last stage is the review of the results of Stage 4 and the development of discussion and conclusions from the themes. It is at this point where the Investigator transitions the themes and observations that are linked to locations or people into analytical categories that are not possessed by place or person but by fact and conclusion.
Chapter 4 - Results

Introduction

In structuring and identifying the themes to be explored for this research venture, both the original hypothesis and the research and review of the existing literature indicated that, at each of the case study sites, visitor planning and management would initially be guided by government legislation or in the case of Limerick Forest, a municipal vision integrated into official planning at UCLG. The integration of science, public participation, and any subsequent management action are adaptive management responses used manage protected areas in a fashion consistent with their respective management objectives. That approach also allows for temporal adjustments to management objectives and policy to reflect changing social, political, and environmental conditions. The research focus then, for data collection and analysis, individually categorized the role of science, public participation, and collaborative relationships in influencing policy at each site. In the study, the Investigator broadly defined policy as consisting of management objectives, planning ("what we said we need to do"), and management action ("what we did to meet our planning objectives"). The Results chapter follows this framework of inputs (public participation, collaboration, science, objectives) and outputs (management action, policy modification) when presenting the findings at each of the case study sites.

Frontenac Provincial Park

Introduction

Frontenac Provincial Park was initially established as a park reserve in the 1960’s before being designated a provincial park in 1974. Located 40 km north of Kingston Ontario (Figure 6), it is a
contiguous tract of more than 5200 Ha in size and covers a region of small lakes, shallow soils, and rocky hills common to the Frontenac Arch, a southerly extension of the Canadian Shield. Much of the park has a history of human impacts including resource extraction (forestry and mining), hunting, and agriculture. As intensive human use declined within the future park boundaries, natural communities have re-established themselves. The vegetation coverage now consists of mature second growth forest with species mix and coverage density reflecting that of the Great Lakes-St. Lawrence forest region, previous human use, topography, and soil depth. The diversity of both terrestrial and aquatic animal species is considered healthy for the
region with 356 identified species of which nine bird species, six reptile species, and two insect species are designated as Species at Risk in Ontario. A 2003 plant species survey identified 630 plant species of which eighteen are considered rare in Ontario, one is designated as Special Concern, and four are nationally endangered (Bonta, 2005).

Frontenac Provincial Park is classified as a Natural Environment Class Park under the Provincial Park and Conservation Reserves Act (PPCRA) with the majority of the park assigned Wilderness zoning (Bonta, 2005). Frontenac Park is also designated IUCN II Protected Area Management status (Bonta, 2005). The PPCRA explicitly states the management objectives of the natural environment class park;

“The objectives of natural environment class parks are to protect outstanding recreational landscapes, representative ecosystems and provincially significant elements of Ontario’s natural and cultural heritage and to provide high quality recreational and educational experiences.” (PPCRA, 2006, c. 12, s. 8 (5))

The PPCRA also establishes the legislative framework and regulation for operation of the Ontario Parks system. All parks in the system including Frontenac Provincial Park must adhere to the four primary objectives set forth by the PPCRA:

1. To permanently protect representative ecosystems, biodiversity and provincially significant elements of Ontario’s natural and cultural heritage and to manage these areas to ensure that ecological integrity is maintained.

2. To provide opportunities for ecologically sustainable outdoor recreation opportunities and encourage associated economic benefits.

3. To provide opportunities for residents of Ontario and visitors to increase their knowledge and appreciation of Ontario’s natural and cultural heritage.

4. To facilitate scientific research and to provide points of reference to support monitoring of ecological change on the broader landscape. (PPCRA, 2006)
The park is managed directly by an on-site Park Superintendent with assistance from the Ontario Parks Southeast zone office located in Kingston. Overall management is conducted from Ontario Parks’ main office in Peterborough, Ontario as a division of the OMNR and from the direction of the MPP appointed the Minister of Natural Resources.

Recreation within the park is characterized as wilderness orientated and activities permitted are passive such as hiking, backcountry camping, paddling, and fishing attracting a demographic desiring a wilderness style experience (Bonta, 2005). Mechanized activities are not permitted in the park (Government of Ontario, 2006). Visitors numbers have plateaued since 1995 and an average of 29,500 each year have visited for the period of 1995 to 2003. Since 1997, 38% of visitors were campers with the balance being day users. Additionally, in 2000, 98.5% of parks users visited between July and October (Bonta, 2005; Mulrooney & Clarke, 2002).

**Science in the Park**

Interview participants were asked how science is used at Frontenac Provincial Park. The responses tended to focus on natural sciences and specifically the study of natural systems and their components, such as endangered species, hyper-abundant species and wildlife populations and were independent of visitor management and impacts, ecological integrity monitoring work, utilizing both professional and citizen science were mentioned in interviews and found during document reviews. Prominent examples were the Frontenac Interior Camping Study (Clavering, 2005), Tetsmine Lake Brook Trout Assessment (McCauley, 2011), Summer Profundal Index Netting for Lake Trout (F2), Monitoring Avian Productivity & Survivorship program conducted by the Migration Research Foundation (Derbyshire, 2011), and
ongoing endangered species population health monitoring as part of Frontenac Provincial
Park’s core mandate (F1). Though natural science study results were often used to guide visitor
management decisions, the use of science to measure visitor impacts was only explicitly
mentioned in the Frontenac Interior Camping Study, though a demonstrated link between
recreational use and study outcomes should be anticipated in fish population health related
assessments. Only the Frontenac Interior Park User Survey (Mulrooney & Clarke, 2002) utilized
any social science methods and its primary purpose was to quantify visitor demographics,
recreational preferences, and user satisfaction for the purpose of visitor planning and
management.

**Using Science to evaluate Visitor Impacts**

Though the interviewer had intended the “how is science used” question to reflect on the use
of science to measure visitor impacts and guide visitor management, the participant responses
tended to focus on one study in particular. The question was not explicitly structured to favour
natural sciences from social sciences in order to gauge from the responses, what relative
importance each participant granted the two fields and their use in measuring visitor impacts
and guiding visitor management. Each of the participants was asked to relate and describe
examples of study and monitoring work conducted as a direct response to visitor induced
pressures. The only example at Frontenac Provincial Park that participants stated was designed
to measure visitor impacts was the Frontenac Interior Campsite Impact Study (Clavering, 2005)
(F1; F3).

The recommendations presented in the Frontenac Interior Campsite Impact Study featured
regular monitoring, establishing standardized protocols, expanding monitoring to other
campsites, and evaluating the impact of downed wood usage on aquatic environments (Clavering, 2005). Interview participant F1 stated that acting on the recommendations was an issue; “At Frontenac, the only one we have done is the interior campsite downed wood debris study.......and then we didn’t even change anything based on the doing that project”. Interview analysis did reveal several issues around campsite firewood collection including: visitor attitudes and expectations (removal of standing dead and live wood, expectation that wilderness camping experience includes firewood collection), environmental impacts of firewood collection at campsites, potential for invasive species introduction through visitor supplied firewood, and lack of practical options for accessing Park supplied firewood (F1; F2).

Participant F2 indicated that Summer Profundal Index Netting (SPIN) for Lake Trout assessment would occur in the park during 2011. While participant F2 did not explicitly link the anticipated work to visitor impacts, the relationship is present due to sport fishing permitted within the park. Monitoring the Lake Trout populations in Park lakes had been conducted historically through SPIN assessments, but had not occurred in the park since 1995, when the Rideau Lakes Fisheries Assessment Unit was closed (Bonta, 2005). Sport fishing on interior lakes continues to be a permitted recreational activity and at least three lakes were actively stocked with Brook Trout to in order to maintain them as a recreation resource (Bonta, 2005). It is unknown whether stocking has continued past 2008, which was the most recent information found in reviewed documents (McCauley, 2011). Lake Trout stocking had ceased in 1985 and Lake Trout populations are intended to be maintained through naturally reproducing populations only. Conducting the SPIN assessments is expected to reflect the health of the population including the impacts of the sport fishery on Lake Trout populations. In association with the Frontenac
Stewardship Council, assessments of Brook Trout were also planned in the park in 2011 and are expected to demonstrate population health in response to natural reproduction and sport fishing. If the assessment demonstrates a declining population, Brook Trout stocking is expected to resume in the subject lakes (McCauley, 2011).

**Using Social Science methods**

The only example of work using social science methods was the Frontenac Interior Visitor Survey, last conducted in 2000 (Mulrooney & Clarke, 2002). It is a tool used by Frontenac Provincial Park to indirectly monitor visitor impacts collecting feedback on user demographics, preferences, and satisfaction. Specific issues from the statistical summary of the survey, published in 2002, have been integrated in to the Frontenac Background Information report (Bonta, 2005), produced as a scoping document for the development of a revised management plan. The Frontenac Provincial Park user survey summary (Mulrooney & Clarke, 2002) document indicates that Frontenac Provincial Park had opted to conduct this particular formal and comprehensive visitor survey on a six year cycle however no further surveys have been conducted since 2000. On an on-going basis, feedback is solicited from park users and stakeholders and integrated into planning and policy but this collection method however, tends to be informal conversation, feedback forms voluntarily submitted on departure, or through public meetings (F2; F3; F4). The impact and utilization of user and stakeholder feedback will be discussed further later in the results.

**Monitoring ecological integrity independently of visitor impacts**

The natural science work carried out at Frontenac Provincial Park is coordinated through the Southeast Zone office, located in Kingston, Ontario. The professional expertise and resources
are shared among the parks managed under the zone office and the areas requiring study and study priorities are also determined at the zone office (F1). Interview analysis revealed two drivers for identifying natural science study in Provincial parks: a) identifying and monitoring endangered species populations, and b) monitoring ecosystem health. Both guide visitor planning and management by providing scientific data to identify ANSI zones, determine appropriate recreational use within each zone, and assist in the environmental assessment process for recreational development (F1; F2). Interviews and document analysis indicate that the current management capacity at Ontario Parks generally favours passive environmental management strategies in Natural Environment parks and the examples mentioned by participants F1 and F3 appear to agree with that approach. A notable exception to this passive environmental management strategy was mentioned in the recommendations resulting from monitoring work on hyper-abundant species. Three examples mentioned in the interviews and documents were beaver and deer in Frontenac Provincial Park as well as Cormorants in Presqu'ile Provincial Park (F1). Though the Cormorant study work in Presqu'ile Provincial Park is not directly related to Frontenac Provincial Park, the resources required are shared with Frontenac Provincial Park through the Southeast zone office. The degree of justification required to facilitate culling the Cormorant population resulted in a disproportionate use of natural science resources in the Southeast Zone Office, estimated by the participant F1 to be 70% of the time available for all Southeast Zone parks, including Frontenac Provincial Park. The same participant also indicated that despite the measurable negative impact hyper-abundant deer populations are having on Frontenac Provincial Park flora, the negative perception that
Frontenac Provincial Park stakeholders have expressed regarding population control as a management recommendation, presents too great a hurdle to pursue further.

**Engaging Citizen Science**

The use of citizen science as a supplementary data acquisition method is used by Ontario Parks for monitoring animal populations, especially the Grey Ratsnake. Park users are encouraged to report wildlife sightings to the park office and details of the observation are recorded. The Park Info Guide for 2012 (Ministry of Natural Resources, 2012) does have one article regarding participation in citizen science. The article, targeted to park visitors, requests the reporting of all turtle and Gray Ratsnake sightings to the park office. The publication is primarily geared towards recreational opportunities and visitor compliance education and does not contain any further articles on ecological research or monitoring. It was noted by participant F1 that while citizen science is useful, it requires significant coordination of resources that may have better use elsewhere. Participant F4 indicated that the Friends of Frontenac organization has also participated in citizen science opportunities such as SAR population identification and assessment, though more so historically, as the organization’s culture has become more maintenance and customer service oriented. It may also be presumptive to equate monitoring work by the Friends of Frontenac to the citizen science programs directed towards visitors as membership includes current and emeritus academics from Queen’s University with a more formal background in research methods (F1; F3; F4). Both academic and NGO researchers are encouraged to conduct natural science research within Frontenac Provincial Park but generally must be predominately self-funded (F1). Three examples that were noted in the data included the ongoing work by Migration Research Foundation (Derbyshire, 2011), turtle research
originating from Carleton University (Bulté et al., 2010), and Brook Trout assessments in Tatshine Lake by the Frontenac Stewardship Council (McCauley, 2011). For graduate research opportunities within the park, execution may not be as dependent on the availability of Ontario Parks funding however interview participant F1 noted that conclusions and recommendations are often not presented in a summarized or relevant format and consequently of little benefit to time constrained staff. Perceptions regarding the use of consultants for natural science study work within Frontenac Provincial Park was also negative (F1). The reasons cited were: a) significant time is required by Ontario Parks’ staff to orient contractors, b) the high cost per unit time conducting research, and c) the desired focus of the report did not often address the expectations of Ontario Parks biologists (F1).

Management

Public perception

Ontario Parks has a mandate to provide recreational and educational opportunities to the residents of Ontario. This is entrenched as objectives 2 and 3 in the PPCRA, 2006 (Government of Ontario, 2006). Ontario Parks stresses the expectation of quality customer service through their organizational values and code of ethics as well as a dedicated section in the Ontario Parks Employee Orientation manual on “Customer Service and Phone Use” (Ontario Parks, n.d.). Websites targeting park users also support a customer service oriented culture with quotes such as “Ontario Parks is committed to providing world-class recreational opportunities for our visitors through excellent customer service.” (Government of Ontario, 2011). The positive customer service attitude was reflected in the interview analysis with repeated references to engaging visitors and soliciting feedback, especially with frontline staff and the Friends of
Frontenac volunteers providing frontline services (F2; F3; F4). The customer service expectation was highlighted by participant F2 “So if we don’t take our customers seriously, we can’t keep going”. Participants described techniques that helped them achieve customer satisfaction with both park visitors and neighbouring stakeholders. Key themes from those techniques were identified as: communication, diplomacy, consistency, enforcement, engagement, and accommodation (F2). The PPCRA was mentioned as the regulatory means for achieving customer satisfaction and through measured enforcement and moderate accommodation of park visitors and stakeholders, the ideology and behaviour of park visitors remains consistent with that of the PPCRA, Frontenac Provincial Park Management Plan, and park staff (Figure 7) (F2). It should be noted that strict enforcement of regulation was portrayed as uncommon, with the application of soft regulatory enforcement such as warnings being a more regular occurrence (F2) (Government of Ontario, 2006). Interviews

Figure 7: Frontenac Provincial Park regulatory signage
also reveal a relaxed interpretation of PPCRA regulation to accommodate historical use, wilderness experience expectations, and stakeholders neighbouring the park (F2). It was mentioned by participants F1, F2 and F3 that a major concern in the delivery of quality service and visitor satisfaction was receiving a “Minister’s letter”. The Minister’s letter was described by participants as a directive issued by the Ontario Minister of Natural Resources to provide satisfactory resolution to complaints or inquiries directed by members of the public directly to elected officials (F2). The receipt of a Minister’s letter was characterized as an indication of park’s staff failure to address negative customer experience in a satisfactory manner and reflected poorly on Frontenac Provincial Park staff (F2). Though participants noted that Frontenac Provincial Park had not received a Minister’s letter, there is a high level of awareness regarding the potential. As participant F1 stated, “I don’t think the public is aware if they wrote to the minister rather than Ontario Parks, they would get a much more solid pushback” and “It’s frightening the power that happens when people write to the minister”. It was also noted that the generation of a Minister’s letter is possible even when adhering to Ontario Park’s policy (F1). Participant F3 noted that Ontario Parks is a political organization and a Minister’s letter tends to drive the decision making process towards an outcome that may not address critical factors. For this reason, participant F3 noted a preference to engage grassroots involvement in park activities. This principle appears to be upheld through informal engagement of visitors and volunteers in citizen science and recreation infrastructure maintenance work (F1; F3; F4). Despite a high level of concern and awareness regarding the receipt of a Minister’s letter, participant F3 indicated that it did not drive a relaxed style of park regulations enforcement, but certainly “you must be as reasonable and justified is two terms that always come to mind in
There was some inconsistency between participants F1, F2, and F3, regarding how policy and regulation are applied, with F1 and F2 preferring an ideological position most consistent with the Ontario Parks position of environment and ecology first, visitors second, and participant F3, taking a more diplomatic approach that balances the immediate interests of local stakeholders and visitors with Ontario Parks four principle objectives. The outcome was characterized as meeting the intent of Ontario Parks management objectives without creating adversarial relationships with visitors and local stakeholders.

The Frontenac Provincial Park 2012 Information Guide (Ministry of Natural Resources, 2012), published for visitors to the park, contains articles highlighting recreational opportunities within the park as well as a listing of educational recreation workshops. The publication also contains multiple articles outlining desired visitor behaviour, park regulations, and enforcement powers of Ontario Parks yet only contains one article on threats to the Park’s ecological integrity (Emerald Ash Borer) and none on active management strategies (Ministry of Natural Resources, 2012).

Management Planning

Frontenac Provincial Park continues to operate under the management plan released at the time of park establishment in 1974 (Bonta, 2005; Hough,Stansbury and Associates Ltd., 1974). Since that time, there have been two management plan reviews in 1981 and 1997 (Hough Woodland Naylor Dance Limited, 1997; Ministry of Natural Resources, 1981). Both reviews integrate minor revisions into the original management plan to reflect changes in legislation, park boundaries, natural science knowledge, changing priorities, and increasing visitor
pressures. While the management plan reviews have integrated new information and evaluated the implementation of recommendations, the framework for the 1974 management plan has remained virtually unchanged. This issue was highlighted by the author of the 1997 review;


That need is further reinforced by this statement;

“Since there is no commitment from Ontario Parks, at this stage, for conducting a full management planning study for the park, the consultants have been requested to limit their tasks to identification of issues for future study and planning. No field assessment or public consultation process was included in the scope of services; the consultant’s work is based on existing background review, limited agency contact, and discussions with staff and the Friends of Frontenac.” (Hough Woodland Naylor Dance Limited, 1997 p. 4).

Since that time, documents show that a background information document was completed in 2005 in preparation for the development of a fully revised management plan (Bonta, 2005). The document integrated the results from the Frontenac Interior Park User Survey (Mulrooney & Clarke, 2002), existing background reviews, existing scientific study data, and public consultation for scoping of management options. Participant F2 supported this timeline and indicated that the process had stalled due to other resource commitments however park stakeholders continue to demonstrate a desire to move forward with the process, albeit with fresh public consultation (F2; F3). Interviews also revealed that management options were not only guided by ongoing informal consultation with the park visitors and stakeholders (F2; F3) but that “most of the feedback has come from the planning process when we put out the
“invitation to participate” (F2). Park planning resourcing is managed under the Ontario Parks Southeast zone office and is shared by multiple sites, including Frontenac Provincial Park (F1; F2; F3). Planning tasks directly related to Frontenac Provincial Park are frequently conducted to review and implement individual planning options. Several types of planning tasks were mentioned, such as the development of recreation infrastructure to meet visitor expectations, environmental assessment work (and public consultation) for recreation infrastructure projects, meeting of new legislation requirements (including the revised Endangered Species Act (Government of Ontario, 2007)), and addressing recent ‘Duty to consult’ requirements with First Nations (F1; F2; F3). Participants indicated that the management structure and resource availability appears to favour current ‘hot topic’ issues with little time remaining to develop long-term comprehensive management plans or directions (F1; F2).

Collaborative Relationships

Beyond public participation, interview participants were asked about the existence of collaborative relationships between organized citizen groups and Frontenac Provincial Park. The Friends of Frontenac organization was the most frequently mentioned example of an enduring relationship though several examples of issue or project based relationships were also identified (F1; F2; F3; F4; F5). The elevation of participation from passive to active appeared to be motivated by various combinations of sense of place, desire to give back, and quality of life (F3; F4). For groups such as the Friends of Frontenac and individual Frontenac Provincial Park volunteers, identification with the park’s ideologies of recreation and preservation were indicated as motivators (F4). For others, such as Frontenac Outfitters or the Clear Lake
landowners, mobilizing to preserve personal interests from external influences is a more prominent motivator (F3; F5).

The group identified as having the most prominent relationship with Frontenac Provincial Park was the Friends of Frontenac group (F1; F2; F3; F4). Consisting of volunteers, the Friends of Frontenac is described as a volunteer wing of Frontenac Provincial Park dedicated to providing a labour pool for the maintenance of recreation infrastructure, customer service, and fundraising support (F3; F4). Participant F4 described the group’s charter as “there to support the park and we’re there to help make it accessible to visitors and so on. But we’re not there to make decisions about the park.” Regardless of the Friends of Frontenac charter to provide support to park management, member volunteers, who are among the most active users of the park are free to take an advocacy role as individuals (F3; F4). Active volunteers were also portrayed by one interview participant as having a vested interest in keeping Frontenac Provincial Park as a “best kept secret” (F4). There was no direct evidence of this claim seen in the document analysis or in other interviews, though a desire to exclude car camping as a management option was expressed by several participants (F1, F2). The Friends of Frontenac organization also provides an internet presence for the Park with a regularly updated website with maps, calendar of events, and other news (The Friends of Frontenac Park, 2012). The information contained in the website is geared towards visitor use and the Park’s human history with no references to the condition of the natural heritage in the Park or environmental management strategies (The Friends of Frontenac Park, 2012). The organization also generates the Frontenac News, a publication released three times a year with similar content to the Friends of Frontenac website though there has been a recent inclusion of a column describing
unique characteristics of the area’s geological history (F4) (The Friends of Frontenac Park, 2012).

Other organized groups, such as the Frontenac Arch Biosphere Reserve (FABR), Frontenac Paddling Association (FAP), and the Frontenac Stewardship Council have relationships with Frontenac Provincial Park that are much more collaborative with power shared more equally between stakeholders (F3; F4). Both FABR and FAP engage Frontenac Provincial Park in greater regional planning goals while the Frontenac Stewardship Council has partnered with the park on at least one occasion to study park fisheries (F3; F4; F5) (McCauley, 2011). These relationships are characterized in the interviews as a relatively small working commitment in comparison with the primary objectives of the organizations involved (F3; F4).

There were several organized groups that the Investigator expected to have a greater collaborative role with Frontenac Provincial Park but analysis indicated they did not. The Kingston Field Naturalists, Rideau Trail Association, Cataraqui Canoe Club, and the Cataraqui Trail Association all have interests that overlap with Frontenac Provincial Park interests yet the Investigator found no evidence that any were pursuing an active relationship or targeted goals with the park (F3; F4; F5). A potential explanation may be because of the large number of organization members who are also volunteers with Friends of Frontenac or simply unassociated park volunteers.

Of the remaining two groups mentioned, the Clear Lake landowners appear to be united by a single and rather focused issue of eliminating traffic by park visitors and staff along Clear Lake Road, an alternate and unauthorized park access point (F3). Their participation is more active,
bordering on self-mobilization but there is little evidence of collaboration (F3). Alternatively, Frontenac Outfitters, a large retailer and renter of paddling and outdoor equipment located close to the park’s main access road and adjacent to the park’s borders, depends on park visitors as a significant portion of its customers (F5). A positive relationship with park management, recreation development, and park policies benefiting Frontenac Outfitters business plans were all issues mentioned in participant interviews as having positive outcomes for Frontenac Outfitters (F3; F5). Participant F3 supported a characterization of a “supportive relationship” between Frontenac Outfitters and the park. Though management staff were careful not to promote one commercial operator over others, Frontenac Outfitters is more integrated into the park’s recreational infrastructure than its competitors through proximity, equipment, and skills courses offered (F5) (Ministry of Natural Resources, 2012). At the management planning and policies level however, the relationship offers fewer immediate benefits to either Frontenac Provincial Park or Frontenac Outfitters due to the substantial effort and long time frames generally required to initiate policy change (F4; F5). Some of the barriers identified in the interviews to productive input on management planning were: a lack of resources (both parties) available to investigate alternative management options, frustration with public sector bureaucracy, and somewhat differing ideology on the future of recreation development within the park (F1; F3; F5). Participant F5 indicated that being involved in the public consultation required for comprehensive management planning represents the best opportunity to initiate management options that could benefit commercial operators.
**Limerick Forest**

**Introduction**

Owned and operated by the municipality of the United Counties of Leeds and Grenville (UCLG), Limerick Forest consists of 5,782 Ha of land split among seven different tracts (Byford, 2007). Each tract is composed of agglomerated land parcels with the majority of the parcels acquired as municipal seizure due to non-payment of land taxes. Much of the area was cleared for agriculture in the mid-19th century by Irish immigrants but shallow, nutrient deficient, and often slow draining soils and topography resulted in insufficient agriculture productivity and eventual abandonment (United Counties of Leeds & Grenville, 2003). The conditions that facilitated the land acquisitions resulted in holdings of seven somewhat contiguous tracts. The municipality’s land acquisitions began in 1939 and coincide with UCLG entering into an agreement with the Ontario Department of Lands and Forests in 1940 under the Reforestation Act of 1921. The Department of Lands and Forests and its successor, the Ontario Ministry of Natural Resources (OMNR), reforested and managed Limerick Forest on behalf of the UCLG as forest plantations until 2001, when management responsibilities were returned to the UCLG (United Counties of Leeds & Grenville, 2003). The UCLG retains ownership of Limerick Forest and land use in the Limerick is regulated by applicable Official Plans, zoning and zoning by-laws, and provincial environmental protection legislation (Byford, 2007). The management direction for Limerick Forest is centred on the Limerick Forest Long Range Management Plan which was enacted by county by-law in 2003 and requiring municipal council approval for revisions (United Counties of Leeds & Grenville, 2003). Management action is facilitated by a Forest Manager under the direction of UCLG and the objectives set out in the management plan (LF1)(Byford, 2007).
The study predominately examined Limerick Forest South which consists of 1,470 Ha of wetlands and forest on acidic nutrient poor sandy soils overlaying a shallow water table, typical of the Edwardsburg Sand Plain. Located approximately 20 km north of Prescott or 20 km south of Kemptville (Figure 8), the south tract consists of a mixed forest cover with approximately equal thirds of natural forest, coniferous plantation, and wetlands (Byford, 2007).

Figure 8: The location and approximate boundaries of Limerick Forest South. (Google Maps, 2012)

The natural forest component is a mix of remnant farmstead deciduous woodlots and naturally regenerated coniferous and deciduous species usually occurring on wetter sites unsuitable for plantation use. The plantation forest occurs on degraded agricultural land abandoned in the
early 20th century. It was replanted with Jack Pine (*Pinus banksiana*), Red Pine (*Pinus resinosa*), White Pine (*Pinus strobus*), and White Spruce (*Picea glauca*) of which only Red Pine is actively managed as a forest resource. The remaining third of Limerick Forest South are predominately wetlands of which the provincially significant Limerick Wetland falls under the Groverton Bog ANSI (United Counties of Leeds & Grenville, 2003). As of the publication of the Limerick 20 Year Forest Management Plan, accurate wildlife inventories have not been established in Limerick Forest though habitat evaluation has identified that Limerick Forest may host several species at risk and endangered species (Byford, 2007).

Limerick Forest is considered a “working forest” with a multi-use ideology that includes resource extraction, a wide variety of recreational opportunities, and environmental conservation (LF1)(Byford, 2007). Identified as a community forest, the 20 year management plan reveals the broad mandate to which the forest is managed;

“To enhance the economic and social welfare of the residents of the United Counties of Leeds and Grenville through the improvement, sustainable use, development and protection of Limerick Forest’s wildlife, timber, non-timber and ecological resources” (Byford, 2007 p. 1)

The vision statement from the Limerick Forest Long Range Management Plan echoes that of the 20 year management plan (Byford, 2007; United Counties of Leeds & Grenville, 2003). It emphasises community participation in management of the forest and brings together the ideal of economic, social, and environmental sustainability in a stable, long term co-existence;

“A century from now Limerick Forest will be an outstanding example of community cooperation in the sustainable management of its natural resources. Limerick Forest will be providing a wide variety of community goods and services including jobs and revenue, varied recreational opportunities, the protection of areas of significant
biodiversity, the protection of soil and water resources, and the provision of structured educational opportunities.” (United Counties of Leeds & Grenville, 2003)

Recreational use is a major component of the multi-use ideology and is valued by the community (LF1). The 20 year management plan states six recreation management objectives as applied to recreational opportunities and resources within Limerick Forest.

“1. To maintain a diversity of forest cover types and stand structures to provide for a diversity of recreational uses.

2. To ensure that timber management activities (e.g. harvest, renewal, and maintenance) are undertaken in a manner, which eliminates or minimizes conflicts with other users of the forest.

3. To ensure that recreational uses do not degrade or adversely affect the forest, its access roads and trails or other values.

4. To promote the use of Limerick Forest as a public resource for forestry and natural environment education.

5. To provide a safe environment for the public use of Limerick Forest.

6. To solicit external financial and human resources support for the development and/or improvement of recreation opportunities in Limerick Forest.

7. To collect data and information on the outdoor recreational use of Limerick Forest for incorporation into the forest management and land-use planning process and to support future UCLG tourism development initiatives.” (Byford, 2007 p. 57)

Promotion and development of tourism is a major component of the seven recreation management objectives, highlighted by the need to provide a diversity of opportunities, preserving the quality of those opportunities, and promoting those opportunities as part of tourism initiatives (Byford, 2007). The forest has a long tenure of unrestricted use for a wide range of recreational activities originating when Limerick Forest was managed by the OMNR and continuing under UCLG management to today and includes passive non-mechanized
activities, hunting, and both mechanized and motorized activities but does exclude overnight
camping and the use of campfires or camp stoves (LF1; LF4).

“Limerick Forest attracts many people in pursuit of recreational opportunities. Current
recreational activities in Limerick Forest include picnicking, hiking, hunting, bird
watching, cross country skiing, horseback riding and trail riding on bikes, motorbikes,
all terrain vehicles (ATVs) and snowmobiles.” (United Counties of Leeds & Grenville,
2003 p. 27)

The municipality does not implement user fees for use of the area and access to the area is de-
centralized and unrestricted making it difficult to collect accurate visitor data (LF1). Informal
visitor data was collected in Limerick Forest south for both winter and summer use activities in
2003 and used to estimate visitor numbers at 10,190 visits (Willis, 2006b). The highest density
of use was estimated to be 50% greater for winter versus non-winter use of which
snowmobiling was the predominant activity. Motorbikes, ATV, and mountain bikes accounted
for the majority of three season users (Willis, 2006b).

Role of Science

The use of science in Limerick Forest South was not often mentioned in interviews. When
asked to describe examples, especially studies that were related to visitor impacts, the results
were negative. Participant LF1 stated that it is felt that the need for visitor impact study work is
not a current priority for two reasons: a) most of the recreational activity is concentrated in
Limerick Forest South, 1,470 Ha of the forest’s total 5,782 Ha, and b) despite intensive weekend
use of Limerick Forest South, the weekly average user densities are perceived as low. That
viewpoint was shared by participant LF4, who indicated that recreational single track trail
corridors of approximately 1.25 m in width have comparatively less impact than other activities
occurring in the forest such as timber harvests. In addition, participant LF4 indicated that the impact mitigation efforts implemented by volunteers of the largest user group, the Bytown Motorcycle Association and compliance with UCLG regulations provide a level of protection consistent with the quality of the resource being protected. Participant LF4 described the Forest as “possibly fulfilling an opportunity or a need that does not exist in some of those other environments” and understanding that there are other protected sites that have higher quality natural heritage values and that “it would be crazy to put a lot of resources into pursuing that”, referring to environmental conservation in Limerick Forest.

During interviews, there were mentions of some ecological monitoring work that had occurred recently in the forest but not necessarily specific to Limerick Forest South (LF3). Participant LF1 mentioned that both the UCLG Forest Manager and Forestry Technician informally document visible visitor impacts that are believed to require remediation or mitigation. Participants LF2 and LF4 also noted that they have also conducted observational work on recreation impacts and reported any observations back to the UCLG staff. Only one interview participant was noted as having biology training and an active interest in natural science study work within Limerick Forest (LF3). Participant LF3 noted that observing recreation impacts was an incidental aspect of research work which focused on “mostly wildlife observing, recording, and reporting”, including rare flora and fauna, species at risk, and invasive species. Participant LF3 also implied that any work conducted in Limerick Forest was in outlying blocks, not in Limerick Forest South, and that most of the work conducted was actually on the participant’s own property (LF3).
The document analysis of both the Limerick Forest Long Range Management Plan (United Counties of Leeds & Grenville, 2003) and Limerick Forest Twenty Year Forest Management Plan (Byford, 2007) stated that there was a significant lack of both scientific data and First Nations values from forest resource, ecological integrity, and cultural perspectives. Much of the data used to develop the current management plan originated from the OMNR Natural Resources Values Info System (NRVIS) and is of 1980’s vintage (Byford, 2007). For the provincially significant wetlands and ANSI-LS areas, there are mentions of provincial wetland evaluations yet a lack of references and no mention of work conducted after UCLG resumed management (Byford, 2007).

The Limerick Forest 20 Year Forest Management Plan recommended filing gaps in the data to update forest resource status and implement the provincial Ecological Land Classification (ELC) for Limerick Forest when sufficient ELC inventory work has been completed (Byford, 2007). The forest age and site class distribution and the working group and stocking distribution data were mentioned as being particularly important in planning forest resource management activities and forecasting yields, both important aspects of a revenue generating ‘working’ forest (LF5).

Participant LF3 and LF5 indicated that the identification of ‘Proposed Old Growth Forest’ zones in Limerick Forest utilized localized ELC work and was required to justify ecological protection under the management plan. The Limerick Forest 20 Year Forest Management Plan also states that Limerick Forest South has six permanent sample plots that utilize Ecological Monitoring and Assessment Protocols to monitor forest health from both forest health and forest resource productivity perspectives (Byford, 2007).

Environmental Management and Local Ecological Knowledge (LEK)
While the collection and use of natural science data is not used extensively within Limerick Forest, interview participants described the extensive use of observational data and recreation impact mitigation strategies in environmental management (LF1; LF2; LF4). Direct observational data of recreation activity impacts are collected by both area management and volunteers (LF1; LF2; LF4). Types of recreation impact observations reported as requiring further action were characterized as trail related impacts, especially rutting and trail widening associated with trails through low-lying areas (Figure 9). Other often reported impacts, though not directly related to recreational activities, were the dumping of garbage on either the main access road or on forest fire roads and vandalism to the forest infrastructure (i.e. damage to signs). Interview participant LF1 reported that remedial and mitigation actions were initiated as the availability of labour and financial resources allowed. Dealing with Impacts that had a greater perceived impact on the recreational enjoyment of the area or consumed fewer budgetary and volunteer resources appeared to be granted a more expedient resolution (LF1). Noted examples were the removal of downed trees across trails and clean-up of dumped garbage on roadsides and fire

Figure 9: Trail widening and rutting on multi-use trails in Limerick Forest South
roads (LF1; LF4). Interview participant LF1 noted that the remediation and mitigation of trail damage occurring in wetter areas was very important but required more labour and financial resources to resolve. The strategies employed, as described by participant LF1 were: a) construction of wooden bridging over wet areas, b) use of trail consolidation materials, c) re-routing of trails away from problem areas, and d) the closing of trails. Participant LF1 noted that the efficacy of trail maintenance strategies was not formally evaluated but rather informally evaluated through observation of durability, longevity, and effectiveness against the initial outlay of financial and labour resources. The same participant (LF1) also utilized literature and observations from other jurisdictions to some degree for determining trail maintenance strategies however, the large volume of literature coupled with limited time to review it was a factor against its regular use. Participant LF2 did note that Bytown Motorcycle Association does employ ‘best practice’ documents for trail development and maintenance to reduce erosion but implied that the relatively flat topography of Limerick Forest South did not require the use of specialized strategies. Participant LF4 stated that it was his belief that in a linear corridor, localized rutting and trail widening on flat low-lying topography was likely not as great as an environmental impact as it is perceived. The same participant did state though, that gullying and other erosional effects were impacts requiring attention due to their potential impact beyond the linear trail corridor.
The use of zoning and exclusion to mitigate the environmental impacts of recreational activities is not widely used within the forest but is applied in at least two notable examples at Limerick Forest South (LF1; LF4)(Byford, 2007). The first is the seasonal closure of the forest to motorized vehicles during the period of spring thaw (LF1; LF4) and the second, the exclusion of motorized vehicles from hiking only trails in the forest block around the Limerick Forest centre building (Figure 10). No evidence was found in either documents or interviews that indicated an explicit ban of recreational activities in ANSI or PSW areas though the observed ideology of all interview participants suggested that trail use and development in wet areas and wetlands is discouraged (LF1; LF2; LF4)(Byford, 2007).

Only passive terrestrial (Figure 11) and aquatic based recreation (waterfowl hunting, fishing) activities were mentioned as occurring in wetland areas (LF1).

An adaptation of environmental assessment (EA) has been used in Limerick Forest for recreational development (LF1)(Byford, 2007). It was implemented by the Limerick Forest Advisory Committee (LFAC) and consisted of queries to establish if the development...
was consistent with the objectives of Limerick Forest Management Plan, what the potential impacts were on the environment, other stakeholders, and existing infrastructure, and what mitigation strategies were planned to minimize impacts (Byford, 2007). Participant LF4 noted that it was a “positive thing” to involve a participant with an environmental focus because it allowed him to “look at it from a different perspective and say well, okay, all right, I didn’t realize that”. Since the dissolution of LFAC and the creation of the Friends of Limerick group, it appears that the EA process is no longer actively conducted with participant LF1 voicing the opinion that visitor numbers are low enough that a reactive approach is more productive than the proactive approach.

Responses by interview participants were used to attempt to gauge what threshold a recreation impact must reach before it is viewed as detrimental and to what extent local ecological knowledge played in response. Participant LF2 best described both the dominant attitude of recreational users and their interpretation of environmental resilience through this statement:

Figure 11: Boardwalk for nature viewing on single use hiking trails in Limerick Forest South.
“We don’t mind a little mud, but we don’t want to create big mud pits and holes and all. So there is a little bit of a problem there, but the actual damage, for lack of a better term, the environmental impact is actually I would say, very small because if we stop riding the trail for two years, it will basically rehabilitate itself.”

The same participant was also cognisant of greater impact potential in sensitive areas, mentioning a hypothetical example of a trail running through habitat with a confirmed population of Blanding’s turtle (LF2). Participant LF2 noted that as a group, recreational users were willing to abide by a trail closure “As long as nobody was jerking our chain and could prove to us reasonably that this is happening”. Another participant from the same user group stated that the recreation impacts were all relative and in a working forest, even highly degraded trails were completely obliterated by a thinning operation (LF4). The example of relative damage was described by participant LF4 using this example; the summer construction of snowmobile trails versus motorbike single track trails. Snowmobile trail development often employs heavy equipment and must be sufficient width to accommodate grooming machines and the impact should be perceived as much greater than the 1.25 m width of a single track trail (LF4). In practice however, a rutted muddy section of single track carries a greater negative perception than a snowmobile trail where grading has occurred and has been cleared to a 3 m width (LF4).

**Management**

**Public Perception**

In both the interviews and the documents reviewed, a long tenure of relatively unregulated multi-use outdoor recreation has been permitted in Limerick Forest, starting from the initial
land acquisitions, through OMNR management, and continuing today under UCLG management (United Counties of Leeds & Grenville, 2003). Participant LF1 stated;

“Anybody can come out and do whatever they want as long as they’re not breaking any laws and that they respect the fact that there’s other users out there.”

Participant LF1 also noted three principal regulations on outdoor recreation that have been implemented: a) no overnight camping, b) no fire, and c) seasonal trail closures due to wet conditions. It was also stated that the unofficial policy adopted in Limerick Forest to date, is of multi-use recreational and though the management plan indicates that designated use area (DUA) zoning is a tool available to manage for single use recreation, DUA maps show that it has not been utilized (Byford, 2007). Participant LF1 also stated that management staff do not have enforcement powers for general regulations in Limerick Forest. Local law enforcement exercise enforcement powers within Limerick Forest but only with respect to provincial and municipal laws, not Forest regulations.

Participants involved in outdoor recreation noted in their interviews that the multi-use recreational policy has created an environment where tolerance and respect has developed between user groups and is built on the education of users in regard to; a) the impact of their behaviour on others, and b) the behaviour of other users impacting themselves (LF2; LF4). This was echoed in an informal conversation with equestrian user (Appendix B) and with participant LF1 who noted that no intra-use conflict complaints had been received, though he did concede that there was an “absolute disconnect there” in reference to passive nature oriented recreation such as nature viewing, towards motorized recreation. Participant LF4 noted how critical education and communication are because safety issues can arise in addition to
situations that result in goal-interference. He also noted that a cultural divide between rural and urban residents can make education more challenging. Both of the participants who are involved in motorized recreation mentioned their concern regarding the potential for the exclusion of their activity by land managers in order to manage inter-user and environmental impacts (LF2; LF4). As an organization, they stated that education among their members, respect for other users, contribution of volunteer hours, and confronting irresponsible users were priorities for ensuring continued access to Limerick Forest (LF2; LF4).

The mechanized (motorized vehicles and bicycles) and equestrian users in Limerick Forest South have benefited from the Limerick Forest multi-use policy and the management plan objective to use Limerick Forest as a tool to promote tourism (LF1; LF2; LF4). Participants indicated that motorized recreation users from Montreal and Ottawa frequently visit the area (LF1; LF2; LF4). Equestrian users (Appendix B) also indicated that events have been hosted in Limerick Forest that have drawn participants from outside the region and the mountain bike community hosted the 2012 Eastern Ontario High School Mountain Bike Championships (Meier & Meier, 2012; Willis, 2006b). Participant LF1 noted that hosting events for recreational user groups would be supported by Limerick Forest and would continue in the future.

Anecdotal observations by interview participants and data from limited user surveys indicate that hiking and nature viewing accounts for relatively few visitors in Limerick Forest South (LF2; LF4) (Willis, 2006b). Interview participants noted infrequent encounters with hikers and dog walkers and that often, the only indicator of hikers in the forest are the presence of their vehicles at trailheads (LF1; LF2; LF4). Participant LF4 suggested that regionally, there are more
and better quality recreation resources elsewhere that draw hikers to other locations. Single use hiking trails have been established directly to the north of the Limerick Forest Centre (Figure 10) which travel through plantation forest and also include an extensive boardwalk system (Figure 11) to segregate passive recreation from motorized users. A search for data reflecting visitor counts on the single use hiking trails or any reports on costs versus benefits to justify such infrastructure development were unsuccessful.

A recurring issue voiced by interview participants involved access by irresponsible users (LF1; LF2; LF4). Irresponsible was characterized as participating in illegal activities, disregarding any use or zoning restrictions in Limerick Forest, and not respecting the right of other users to enjoy their recreation experience (LF1; LF2; LF4). The irresponsible users were described as local residents with a ‘sense of entitlement’ and an attitude, voiced by participant LF1 as “Take a hike. We’re paying our taxes; we can do what we want out here.” Participant LF1 believes that a long tenure of unrestricted use, unenforced regulations, and multiple access points are all contributing factors to poor behaviour. Participants also believe that increasing use and maintenance by UCLG management, responsible recreation users, and the presence of volunteers is reducing the overall incidence of irresponsible behaviour though the associated publicity may be creating a perception of a worsening issue (LF1; LF2; LF4).

Another major issue that impacts the public’s perception of Limerick Forest is its status as a working forest (LF1). Participants have noted that forestry activities have a negative visual impact and can be very destructive on the trail systems though UCLG management noted only one complaint as a result of harvesting (LF1; LF2; LF4; LF5). Participant LF5 mentioned that
many forest users, especially in Limerick Forest South, have had opportunity to experience forestry operations previously which tends to moderate their response. He went on to say that Limerick Forest North users have not experienced a forestry operation and a negative response should be expected to forestry operations.

Management Action

The UCLG manage Limerick Forest with two full time employees, the Forest Manager and a Forest Technician (LF1). Participant LF4 stated that the Forest Manager had a forestry background rather than a tourism background which he thought introduced a bias towards resource management. Documents do support the primary objective of Limerick Forest as a working forest and in the interviews, forestry revenues were mentioned as helpful towards managing both the resource management and recreation objectives (LF1) (Byford, 2007; United Counties of Leeds & Grenville, 2003). In addition to full-time staff, summer students are hired but their role was not fully described in the interviews though they did contribute towards recreation infrastructure maintenance (LF1). Participant LF1 and LF5 noted that the Forest Technician and the summer students were more the ‘feet on the ground’ personnel while the Forest Manager did not have opportunity to visit the Forest frequently. The lean management structure for Limerick Forest indicated a high reliance on outside labour resources to meet management objectives (LF1; LF2; LF4). This observation was supported in the interviews with participant LF5 who developed the 20 year management plan (Byford, 2007). He mentioned that forest resource contractors were required to perform major forest operations, participant LF4 mentioned that he had been contracted for natural science work for the UCLG, and all
participants stated that volunteers contribute most of the labour resource towards recreation infrastructure maintenance and development (LF1; LF2; LF3; LF4; LF5).

The document analysis on the 20 year management plan developed for Limerick Forest reveals a plan that is geared heavily towards forest management (Byford, 2007). Participant LF5 noted that one of the goals of Limerick Forest were certifications under the Eastern Ontario Model Forest umbrella and the Forest Stewardship Council (Figure 12) which both have numerous surveillance and management requirements that are audited. The recreation component of the 20 year management plan is not as prescriptive as the forestry component but does reflect the Forest’s role to provide a wide range of recreational opportunities for residents, tourism opportunities for visitors, and to maintain the quality of the recreational experience in a sustainable fashion (Byford, 2007). Both interviews and documents fail to indicate any significant data collection that has occurred in order to evaluate the effectiveness of programs.

Figure 12: Limerick Forest South Forest Stewardship Council Canada certification
or projects implemented to meet environmental or recreational objectives stated in the management plan. Participant LF5 indicated that the lack of relevant data for forestry, the environment, and recreation was also an impediment in the development of the 20 year management plan.

Details regarding annual operating budgets were not included in the 20 year management plan and participants did not provide specifics (Byford, 2007). Participant LF1 noted that forestry revenues did contribute towards forest management. It was not clear if Limerick Forest was expected to run a cost recovery operation though participant LF1 indicated that the working budget allows for some recreation infrastructure maintenance and recreation development such as trail signage. There is no user fee for recreational users and interview participants indicated that implementation of such a fee would be difficult due to lack of enforcement, multiple access points, and public resistance (LF1; LF4). Major recreation development projects rely on fundraising or external funding efforts by volunteers (LF1). One example was the construction of the Limerick Forest Centre which was funded through a grant submitted in collaboration with the Bytown Motorcycle Association (LF1).

**Collaboration with Stakeholder Groups**

Collaborative relationships and partnerships appear to be a crucial component in the management of Limerick Forest. Interview participants noted that without collaboration between UCLG and recreational user groups, there would insufficient resources to maintain or develop recreation infrastructure (LF1; LF2; LF3). Collaboration with other organizations for environmental or forest resource projects was not specifically explored during participant
interviews. One example of collaboration with Ducks Unlimited was observed during one site visit; an active wetland project begun in 1998 (Figure 13). The 20 year management plan specifically includes collaboration with other stakeholders as a management strategy for both recreation and the natural environment but it is notably absent for forest resource management (Byford, 2007).

![Ducks Unlimited wetland project in Limerick Forest South](image)

Figure 13: Ducks Unlimited wetland project in Limerick Forest South

The instance of collaboration most frequently observed in the interviews and was crucial to the development of Limerick Forest’s management goals and objectives subsequent to resumption of UCLG management was that of the Limerick Forest Advisory Committee (LFAC) (LF1; LF2; LF3; LF4; LF5)(Willis, 2006a). Initiated by the Grenville Land Stewardship Council (GLSC), the UCLG provided a commitment to support LFAC in a continuing partnership with the GLSC (Willis, 2006a). LFAC was composed of stakeholders who were organized into five sub-committees
dealing with administration, forest resources, recreation, ecology, and education (Willis, 2006a). As well as playing a key role in setting a management direction, creating management goals and objectives, and providing stakeholder input into the long range management and 20 year management plans, LFAC stakeholders mobilized the resources of the groups they were representing at the LFAC table (LF2; LF4; LF5). Noted examples were recreation infrastructure maintenance and development, establishment of environmental monitoring plots, trail mapping services, and development of administrative procedures for hiring forest resource contractors (Willis, 2006a). Interview participant LF4 noted that the cohesiveness of each committee varied. His opinion was that the recreation sub-committee was the most productive and acted as a buffer between other committees with differing objectives. Participant LF3 was a member of the Ecology committee and stated that “It wasn’t always easy, but I think it was productive, and I think my input was very useful and valuable and produced a better plan”, while another participant (LF4) indicated LFAC eventually “became largely dysfunctional at the end”. The same participant noted that LFAC was dissolved because it deviated from its mandate as an advisory group and began acting as a management group in conflict with UCLG Limerick Forest Management.

In response to the dissolution of LFAC, the Friends of Limerick were created as the volunteer labour arm of UCLG’s forest management. Participants stated that recreational user groups such as the Bytown Motorcycle Association (BMA) continue to maintain a collaborative relationship with Limerick Forest management and several are also members of Friends of Limerick (LF1; LF2; LF4). Interview participants repeatedly noted that BMA plays a very active role in Limerick Forest, supplying volunteer labour for recreation infrastructure development
and maintenance (Figure 14), applying for and receiving a grant to construct the new Limerick Forest Center building, developing the trail signage system (Figure 15), and pro-actively communicating insurance and liability information as four major examples (LF2; LF4). Other recreational user groups were mentioned as absent or playing a minor role as stakeholders (LF4). Participant LF4 noted that may be because the BMA comprises the largest user group in Limerick Forest and is motivated to maintain a working relationship with UCLG due to issues arising between land managers and motorbikes in other jurisdictions. In comparison, participants indicated that other user groups were either not well organized, did not believe their continued access was threatened, or simply did not have a sufficient number of participants to organize (LF2; LF4). Participants were clear that the collaborative relationship with the BMA was not to encourage management decisions favourable to the BMA, however they do concede that recreation infrastructure maintenance and
development is done with motorbikes in mind as the BMA is the primary volunteer labour force in the Forest (LF2; LF4). As participant LF2 stated in regard to motorized recreation in Limerick Forest;

“We realize there has to be a balance. I think all users realize there has to be a balance between recreational usage, motorized or non-motorized, and environmental issues. And we don’t have a problem with that. That’s where we’ve got to work together and have the compromises.”

Participant LF4 also echoed the conciliatory message of participant LF2 with this statement;

“I don’t want any sport to climb forward on the back of another sport by putting one down to achieve your own personal goals.”

Both quotes characterize the collaborative role the BMA has with Limerick Forest management and was supported in the by participants LF1, LF3, and with equestrian users in Limerick Forest (Appendix B).

**St. Lawrence Islands National Park**

**Introduction**

The smallest of the three case study sites, St. Lawrence Islands National Park protects roughly 2,400 Ha of land within the Thousand Island ecosystem. Highly fragmented, the Park’s land holdings are scattered along the St. Lawrence River between Kingston and Brockville consisting of a combination of mainland, island, and islet properties. The Park’s core properties consist of Grenedier and Hill Islands, Jones Creek, Langdon Bay, and Mallorytown Landing where the administrative office is located (Figure 16). Two outlying properties managed by SLINP but not developed for recreational use are located at the eastern end of Lake Ontario (Main Duck Island) and on Lower Beverly Lake south of Delta, Ontario (Skoryna Nature Reserve).
Established in 1904, SLINP is the oldest National Park east of the Rocky Mountains and was the smallest until 900 hectares of new land acquisitions were added in 2007.

The majority of the Park’s holdings protect a mixture of forest and wetlands on shallow soils and rock ridges that are typical of the Canadian Shield in eastern Ontario. In this area, the Frontenac Arch extends south across the St. Lawrence River, joining the Canadian Shield with the Adirondack Mountains and is included in the Frontenac Arch Biosphere Reserve. The flora of the region is typical of the St. Lawrence forest type though the Park also hosts fire adapted
ecosystems consisting of species at the northern extent of their natural range. The region hosts a high level of biodiversity, over thirty SAR, and provides a refuge to local and migrating wildlife due in part to topography unfavourable to intensive human development (Parks Canada, 2010).

Parks Canada’s management of SLINP is guided by federal legislation that includes the Parks Canada Agency Act (Department of Justice Canada, 1998), the Canada National Parks Act (Department of Justice Canada, 2000), and the Species at Risk Act (Department of Justice Canada, 2002). The mission statement of Parks Canada highlights the guiding principles to which the agency operates;

“On behalf of the people of Canada, we protect and present nationally significant examples of Canada’s natural and cultural heritage, and foster public understanding, appreciation and enjoyment in ways that ensure the ecological and commemorative integrity of these places for present and future generations.” (Parks Canada, 2008 p. 1)

The principles integrate three primary elements into management and planning: a) the protection of our natural and cultural heritage, b) to provide opportunities for visitors to experience our preserved heritage, and c) to educate Canadians, while remaining both relevant to changing demographics and preventing degradation of the resources afforded protection.

Parks Canada uses natural science research and monitoring, adaptive management strategies, public consultation, and the integration of traditional knowledge to facilitate park management and has enforcement powers granted by the Canada National Parks Act to ensure compliance (Parks Canada, 2008).

The overall level of protection granted SLINP is consistent with IUCN II however Parks Canada uses its own five part zoning classification system for National Parks. The majority of SLINP is classified as Parks Canada zone 2 (wilderness) with exceptional and highly sensitive natural
heritage areas classified as zone 1 (special preservation) where visitor use is highly restricted or excluded. Zones 3 to 5 (natural environment, outdoor recreation, park service) allow for increasingly intensive human uses and are sparsely represented in the park. The park hosts 20 sites designated as environmentally or culturally sensitive, including ANSI wetlands, rare flora communities, and historic First Nations sites (Parks Canada, 2008; Parks Canada, 2010).

The location of SLINP along the Highway 401 corridor between Toronto and Montreal, its proximity to large American cities, and accessibility by recreational watercraft results in an estimated 70,000 visitors each year and high visitor densities of 7,283 visitors/km$^2$ on the island properties (Parks Canada, 2010). The park’s recreational offerings are primarily focused on day use activities such as paddling, walking related activities, and recreational boating. Camping is also permitted on some of the island properties and while not considered car accessible camping, the easy accessibility to campsites is inconsistent with a ‘backcountry’ camping experience. Visitors are subject to user fees and wardens are granted enforcement powers however fragmented land holdings contribute to uncontrolled access (Parks Canada, 2010). Participant SL2 noted that visitor surveys have identified that 85% of park visitors are repeat visitors and the majority of visitors were classified as “gentle explorers” who desire the “same experience time in and time out replicated”.

**Role of Science**

Ecological research, monitoring, and active management strategies are used extensively in the Park with multiple examples noted during document analysis of The Pitch Pine Post, an annual publication generated by SLINP for the public (St.Lawrence Islands National Park, 2011).
Articles in the publication often relate easily observed impacts to natural ecological or active environmental management processes in order to educate the public towards a greater appreciation of the unique natural heritage found in the region (St.Lawrence Islands National Park, 2011). The Park Management Plan outlines the key desired strategies and the management actions that are to be utilized for ecological research and monitoring in the Park (Parks Canada, 2010). The first strategy, “Strength through Regional Connection: working together to maintain natural and cultural authenticity” (Parks Canada, 2010 p. 10) is geared primarily to role of preserving and restoring ecological integrity in both the park and regionally.

Key points in the plan include:

- Collaborative relationships geared towards acquisition of land with high quality natural heritage features;
- Work towards understanding the principle threats to the Park’s ecological integrity;
- Collaborative relationships with other regional conservation oriented organizations;
- On-going ecological monitoring work and continuing work on monitoring and recovery programs for Species at Risk;
- The implementation of the Integrated Vegetation Management Plan for the Thousand Islands Ecosystem and St. Lawrence Islands National Park (McPherson, 2006);
- Use of prescribed burns to restore and maintain fire adapted ecosystems in the Park;
- Promote the use of citizen science in ecological monitoring programs;
- Monitor the impacts of both invasive and hyper-abundant species and implement management strategies.

Interview participant SL3 stated that there is only one ecosystem scientist currently with SLINP with technicians conducting data collection in the field to meet the core mandate objectives.

The core mandate at SLINP includes long-term ecosystem monitoring and SAR monitoring, protection, and preservation/restoration of critical habitat (SL3). The data collected for core mandate activities is used to evaluate the condition of the Park and the results published in the State of the Park report, generated every 4-5 years (Francis & Leggo, 2004). Participant SL3
noted the areas of focus to meet the core mandate included research in fire science, environmental assessment work for new development, evaluating research permit applications, and ecosystem monitoring of wetlands, streams, and forests. The interview analysis also highlighted ecosystem monitoring and research conducted outside the core mandate of Parks Canada but supporting key management strategy one (engaging regional partners to maintain natural heritage) in the SLINP management plan (SL3). Key examples that were noted included monitoring of Emerald Ash Borer population expansion (Bowman & Smith, 2012) and the use of citizen science both within the Park and as part of the Park’s Greater Park Ecosystem strategy (SL3).

**Using Science to monitor Visitor Impacts**

Interview participants were asked how “*science is used to monitor visitor impacts*” at SLINP with the intent to evaluate how the Park monitors visitor use and their impacts on the ecosystem. Interview participants SL1 and SL2 responses indicated that their focus was on the social sciences with respect to visitors in the Park. The interview analysis identified the Visitor Information Survey, conducted every five years as part of the Visitor Information Program (VIP) as a “*keystone*” social science monitoring program (SL2). The VIP is part of SLINP’s mandate and is used to evaluate visitor satisfaction, activities, and destinations within the Park against the desired targets and reported to the Treasury Board (SL2). Participants noted that the VIP program at SLINP is not as well funded as those at other Parks Canada sites and lacks sufficient data to perform an “*in-depth analysis*” with longitudinal changes in visitor behaviour or the concept of social carrying capacity as a function of limits of acceptable change (SL2). The participants also noted that engaging the social science group at the Ontario Service Centre was
often not possible due to insufficient resources and a large regional backlog of work requests (SL1; SL2). Both participant SL1 and SL2 shared their positive feelings on the growing importance of social science research in SLINP and its growing recognition in the Park as an important field of research despite historically having been only occasionally utilized by researchers, and mentioned Lori Bradford’s research on signage and the effect on visitor compliance (Bradford & McIntyre, 2005) as a prominent example.

When considering the use of ecological science in monitoring visitor impacts, participant SL3 provided several examples of monitoring work that ranged from directly monitoring visitor impacts to indirect observations as a consequence of the proximity of visitor use to monitoring locations. Participants mentioned in-depth trampling evaluation studies (Bradford & Leggo, 2003), monitoring of Emerald Ash Borer spread and human vectors (Bowman & Smith, 2012), mandated long-term ecosystem condition monitoring in close proximity to campsites, proposals for rapid assessment protocol work to monitor garlic mustard spread along trail corridors, and informal observational data collection of visitor impacts in sensitive areas (SL1; SL3). A literature search prompted by a recollection of old media reports resulted in two additional visitor impact publications, one documenting the impact of road mortality on the Park’s turtle population (Bradford, 2003) and the other on the impact of recreational boating on the Northern Map Turtle (Bulté et al., 2010). The use of observational visitor impact assessment was noted by participant SL3 as being used as a data collection tool for comparing actual visitor impact versus the expected impact determined by the EA process for trail corridor impacts. Projects requiring greater resource investment, having a significant impact on visitor
satisfaction, or having the potential for substantial environmental impacts were noted to have a more rigorous and defensible evaluation (SL3).

Interview participants were asked what role citizen science played in the Park; either to act as a nucleus for public engagement or as a significant addition to ecosystem monitoring data collection. Participant SL3 described a notable off-site implementation of citizen science that contributes to the Parks greater ecosystem management strategy called the Citizen Science Initiative. Local landowners have been engaged to monitor ecosystem health on their private land using the same protocols as SLINP to assist the Park in evaluating greater ecosystem health and contributing volunteer acquired data in response to declining organizational budgets (SL3). Seven private landowners are contributing to the program; four monitoring forests, two monitoring wetlands, and one conducting stream monitoring. Participant SL3 noted that increasing budget restrictions may require SLINP to focus resources to internal monitoring only and it may not be possible to pursue off-site initiatives so any pre-existing citizen science initiatives will provide valuable insight to external ecosystem health. Interview analysis suggested that the engagement of citizen science within Park boundaries was not widely used or promoted. Participants SL1 and SL2 did not cite examples of volunteers working within the Park in any capacity. Participant SL3 did note that citizen science was engaged for a Grenadier Island Bird count and for the annual Bird Studies Canada Christmas Bird Count, both utilizing volunteers with ornithological knowledge. No examples were cited that utilized Park visitors for observational work such as SAR sightings. Participant SL3 did mention that organizational politics did influence the use of citizen science and volunteers within the Park for work that is included in Parks Canada’s core mandate. This was characterized as a perception that core
mandate work conducted by non-employees could negatively impact the job security of Parks Canada employees. This restriction was also noted as an impediment to hiring summer students for monitoring work even though participant SL3 stated “I could probably have an army of students here”.

Management

The analysis of Parks Canada documents indicates a federal government agency firmly grounded in procedure, policy, and regulation. The policy based culture apparent in the documents (Parks Canada, 2008; Parks Canada, 2010) was also reflected in the participant interviews with references to “core mandate”, named initiatives and programs, species at risk legislation, application of the EA process, and the Parks Canada library of ‘best practices’ documents (SL1; SL2; SL3). A prominent representation of that accountability at the site level in SLINP is the use of key indicators to measure performance against desired goals. The ‘State of the Park’ report, required by all Parks Canada sites as a pre-requisite step in management planning process, outlines the measured performance indicators, their condition, and any temporal trends with the last ‘State of the Park’ report for SLINP completed 2004 (Francis & Leggo, 2004; Parks Canada, 2008). Document analysis also revealed references to the legislation that require park management plans be reviewed every five years and amended or revised if “changed circumstances affect major plan objectives both directly and significantly” (Parks Canada, 2008 p. 28). The most recent SLINP park management plan was completed in 2010 integrating findings of the 2004 State of the Park report (Francis & Leggo, 2004; Parks
Participant SL3 noted that a new State of the Park report is planned for 2012 and indicated that reporting will commence shortly.

Interview participants were asked for their opinion regarding their ability to continue to meet all the management objectives set out for SLINP. Every participant indicated that financial constraints were a complicating factor in meeting growing demands with participant SL2 summarizing the situation as “expectations are increasing and the funding isn’t there to match that”. Participant SL1 did note that there have been one time increases in funding to meet the increased role of law enforcement and a greater ecological integrity mandate but incremental changes in management requirements have not resulted in increased funding. Concern was also noted by all interview participants over the current financial climate and how existing SLINP programs may be impacted. Participant SL3 noted that regional partnerships and off-site initiatives may be reduced in order to maintain an on-site focus. Despite the recognition of financial and resource constraints, interview analysis did not identify any on-going engagement of volunteers or partnerships with NGO for on-site park initiatives in either visitor experience or environmental preservation roles. As noted earlier, participant SL3 noted that the organizational culture was resistant to the utilizing non-employees for work internal to the Park. He noted that organizational culture prioritized employment implications over environmental objectives though he did not agree with the situation. It was also noted that the availability of funding also impacted the ability to hire summer students for natural science positions in the Park despite a backlog of work (SL3).

Integrated Management
The park’s management plan uses the terms ‘integrated’ and ‘holistic’ in reference to desired management strategies and objectives (Parks Canada, 2010). The integrated approach is noted in the management plan as the desired strategy for achieving environmental preservation, visitor experience and satisfaction, and public appreciation objectives instituted by Parks Canada (Parks Canada, 2010). The management plan describes integration as requiring “that solutions for all aspects of the mandate are carried out concurrently, and results in improvements to each aspect in a mutually supportive manner” (Parks Canada, 2010 p. 2). The holistic aspect is described in the management plan represents a further integration of competing objectives by requiring planning for one objective to also include planning for the other two (Parks Canada, 2010). Participant SL3 noted that this integration of objectives is part of his workplace environment by virtue of the placement of the ecosystem scientist’s workspace among the workspace of the visitor experience department. Participant SL3 noted that both informal “water cooler chats” and professional conversations were aided by the proximity of ecology and visitor experience staff and were of great benefit to the integration of ecology and visitor experience at an early stage in planning. It was also mentioned that this level of early integration between ecology and visitor experience departments was “fairly good” compared to other Parks Canada sites (SL3). The early, informal collaboration was noted as being more productive when done in advance of the Environmental Assessment (EA) process as opposed to instances where the only significant collaboration between ecology and visitor experience has occurred during the formal EA (SL3).

**Visitor Management**
The integration of visitor experience and environmental preservation objectives was evident in the interview analysis. There were many examples of active management cited in the interviews that were primarily targeting ecosystem health and either utilized visitor management directly to help achieve a desired outcome or, in cases where poor public perception rather than a direct physical impact might impair a desired outcome, actions such as education and communication were employed (SL1; SL2; SL3).

Document analysis revealed that with high visitor density, fragmented land holdings, moderate regional population density, a large number of SAR, and the presence of many transitional and successional ecosystems, the negative pressures on long-term ecosystem health exceeds the natural capacity to sustain it (Francis & Leggo, 2004; Parks Canada, 2010). Sustaining and improving long-term ecosystem health and preserving SAR habitat are two core environmental preservation mandates at SLINP noted in the Park Management plan (Parks Canada, 2010).

Examples of direct visitor management utilized for environmental preservation noted during interviews with participants (SL1; SL2; SL3) utilized geographic exclusion, activity restrictions, and service rationing as methods to change visitor behaviour. Participant SL1 described the closure and removal of facilities on Endymion Island as a prominent example of visitor exclusion as an environmental management strategy. Endymion Island is a Parks Canada zone 1 island and supports Deerberry habitat (SAR) however Park commissioned studies (Bradford & Leggo, 2003; Reichl, 1995) indicated continuing visitor induced degradation despite the implementation of mitigation strategies. As a result, SLINP elected to close portions of the island and install alternative visitor infrastructure on a neighbouring island (SL1). The closure was significant due to the long history of established recreational use of the island, a negative
public reaction, and the requirement of defensible natural science data to support management action (SL1). The use of exclusion as a management strategy in outlying properties lacking a tradition of recreational use (Main Duck Island and Skyorna Nature Reserve) does not appear to require the same level of justification to implement (SL1)(Parks Canada, 2010). The level of justification required for other management strategies such as trail closures, generator use at zone 2 island moorings also appear to be tied to established history of use (SL1; SL2). Participant SL3 shared and expectation that the use of observational data for impacts caused by a recently opened trail through sensitive habitat would be sufficient to justify any subsequent adaptive management strategies. In contrast, participants SL1 and SL2 noted a very high level of resistance and the use of self-mobilisation by visitors in order to overturn a ban on the use of generators by recreational boats moored at zone 2 islands where a long tenure of use had already been established.

The Park has also utilized indirect visitor management strategies such as communication and education, two methods participants noted were commonly used (SL1; SL2). The Park also has enforcement powers for non-compliance of park regulations granted by guiding legislation (Department of Justice Canada, 2000), however none of the interview participants mentioned the use of enforcement a visitor management strategy. All the examples mentioned employed communication and education when behaviour modification was required. The use of signage on the Thousand Island Parkway warning of turtles crossing, use of signage indicated trail closures, and communication on the purpose and timing of prescribed burns or hyper-abundant species culls were either observed or noted by participants (SL1; SL2; SL3).
In addition to the use of visitor management as an aid to environmental preservation, it is employed by the visitor experience group at SLINP to improve visitor experiences. Participant SL2 described the use of the VIP program to aid the Park in developing infrastructure and allocating resources to meet visitor expectations and achieve management the objectives of increasing visitation and meeting the visitor satisfaction threshold. Examples found in both interviews and documents include:

- Trail maintenance activities (Figure 17)
- Trail infrastructure development to meet the demand of island visitors and engage mainland visitors, all subject to the EA process (SL3; Figure 18; Figure 19).
- Integration of geocaching into permitted park activities official Parks Canada caches (SL2)
- Annual publication of the Pitch Pine Post to communicate changes in the park to visitors and provide an educational perspective on active management strategies used in the Park (St. Lawrence Islands National Park, 2011).
- Interpretive signage around within the Park (SL1; SL2)

Participant SL2 noted that visitor management strategies continue to be adaptive and mentioned the national campsite reservation system as an example. Though SLINP has not yet been integrated into the national campsite reservation system, a need was identified to reduce the instances of recreational paddlers arriving at islands when all the ‘first come, first serve’ campsites have already been occupied by recreational boaters, leaving little daylight remaining to safely check other islands for an empty campsite (SL2).

**Public Perception**
Interview participants were not directly queried regarding the public’s perceptions of the Park and its management actions but participants were encouraged to share examples of any challenges they had encountered as a result of management actions. All participants are employees of Parks Canada which may have biased the responses.

Participant SL2 noted that the analysis of visitor surveys conducted as part of the VIP revealed the majority of Park users accessed the park via water access and that 85% of SLINP users are repeat visitors. The VIP also noted that the majority of users were classified using the Explorer Quotient (EQ) (Bouchard, 2009) as “Gentle Explorers”; reluctant travellers who seek to recreate previous recreational experiences that are consistent with their cultural background (SL2). Participant SL2 also highlighted that mainland visitors recorded an average visit of 15 minutes, likely due to the Park’s proximity to the Highway 401 corridor. The Investigator’s observations tended to support the short duration of visit. During a 120 minute hike at the mainland Jones Creek property on a July weekend, only two other visitor groups were seen, a middle-aged mixed gender group who did not appear to be wearing hiking appropriate clothing were encountered approximately 1km from the trailhead and a younger
couple briefly stopped in the parking lot seeking a bathing spot for their dog. No other vehicles besides those belonging to the two encountered groups were seen in the trailhead parking lot.

Examples of visitor non-compliance with Park regulations and lack of respect for the preservation ideology practiced by Parks Canada was also noted in participant interviews, personal communications, and from online blogs. Interview participants noted the creation of social trails (unofficial trails often representing the shortest distance between two points) and un-authorized fire pits have required mitigation action however communication strategies were the only actions mentioned as being utilized despite the law enforcement powers of Parks Canada Wardens (SL1; SL2).

Additionally, statistics related to enforcement activities were not found in during document analysis. Examples of non-compliance were noted in a personal communication with a
mountain biker (Figure 20) and from an online source (Drummond, 2009). In both cases local residents were identified as the non-compliant party. The first involved a local cottager dumping household garbage bags on an island site and in the second, a local resident who went mountain biking on the Jones Creek trails (Figure 20).

Drummond (2009) noted that continued non-compliance appeared to be tied to an apparent lack of enforcement by Parks Canada. She continues by hypothesizing that the use of facility closures and the use of exclusion as mitigation actions impacts compliant users only but does nothing to prevent
non-compliant use which she considers the original and continuing cause of anthropogenic induced degradation (Drummond, 2009).

Additionally, she perceives the reduction of human footprint on the islands to negatively impact the cultural heritage of the region and that hyper-abundant species are having a far greater negative impact on the park ecosystem than compliant users (Drummond, 2009).

The long tenure of human use in the Thousand Island region was also noted as a challenge experienced by SLINP when proposing changes to Park services or policy that have an impact on visitor behaviour (SL1; SL2). The ‘Gentle Explorer’ EQ of park visitors indicates a resistance to change yet interview participants noted that SLINP is mandated to preserve ecological integrity and experiences challenges in service delivery due to budgetary constraints (SL1; SL2). While non-compliance was a more commonly described behaviour exhibited by visitors, one example of self-mobilisation, described during interviews, was initiated by a policy change at SLINP to ban electrical generator use by visitors when moored at zone 2 islands (SL1; SL2). This change was implemented to bring recreational use in zone 2 areas at SLINP into agreement with Parks Canada’s ideology of permitted zone 2 uses yet resulted in an organized group of recreational boaters approaching the Minister responsible for Parks Canada to voice complaints (SL1; SL2).

Beyond the use of exclusion, zoning, and restricted use, other actions used in active environmental management may impact visitors indirectly. Document analysis noted the use of prescribed burning for the restoration of fire adapted ecosystems and the use of culling for reducing the impact of hyper-abundant species such as White tailed deer (SL3)(Parks Canada, 2010; St.Lawrence Islands National Park, 2010; St.Lawrence Islands National Park, 2011;
St. Lawrence Islands National Park, 2012). Environmental management actions that have a visual impact on park visitors and neighbours or those that involve population management can result in a negative public perception (SL3). Participant SL3 was queried in the steps taken by SLINP to facilitate the management action and reduce the likelihood of public self-mobilisation. He explained that the correct communication and messaging are key. SLINP staff use a combination of strategies prior to conducting management action with negative implications that include:

- Parks Canada directive requiring the creation of a hyper-abundant wildlife management plan and monitoring data clearly demonstrating that populations are above normal and having a negative environmental impact (SL3).
- Engagement of a neutral party to evaluate the environmental condition and provide an additional expert opinion (SL3).
- Engagement of the SLINP visitor experience group to provide targeted education and messaging programs for park visitors and neighbours to communicate the existing environmental condition and the expected outcome. For White tailed deer management, this included information about hyper-abundant species impacts in interpretive programs and the Pitch Pine Post publication. Targeting the messaging to the audience most likely to provide resistance is critical (SL3).
- Engaging stakeholders in a consultative or collaborative as required. The Akwesasne Mohawk nation were engaged for both White tailed deer management and prescribed burns. For White tailed deer management, First Nations members conducted the cull (SL3)(Parks Canada, 2010).
- Commence education and messaging programs well in advance of management action. For the impact of White tailed deer on Park ecosystems, communication commenced three years before population control was conducted (SL3).
- Door to door visits by SLINP staff to communicate the purpose of management action and provide interpretive observational expertise to landholders (SL3).

Participant SL3 noted that elements of each strategy are applied prior to the implementation of management action in anticipation of the degree of negative public perception. The banning of electrical generator use at zone 2 Park islands was an example noted by participants SL1 and
SL2 where the degree of public resistance was unanticipated and the communication strategy implemented by SLINP was insufficient to prevent self-mobilisation by an organized stakeholder group.

**Collaboration in management**

All interview participants noted that the use of collaborative relationships for onsite Park initiatives was uncommon (SL1; SL2; SL3). Participants SL1 and SL2 did not provide any examples of onsite collaboration however they did indicate some interest in conceiving a ‘Friends of’ volunteer group to assist with management of Main Duck Island in Lake Ontario. Formation of such a group would provide assistance to SLINP in management activities because the Park does not intend to dedicate sufficient resources for frequent visits to the island by Parks Canada staff (SL1). At the time of the interview, the relationship was in the early stages of development with the volunteer group requesting recreational access to the island in return for volunteer commitments (SL1). Participant SL1 implied that preferential use by a volunteer organization was not a desired outcome. Participant SL3 noted several collaborative efforts that included:

- **Muskie Canada** – The identification, protection, and restoration of Muskie nursery habitat. The project included collaboration with the Department of Fisheries and Oceans (DFO) and the Ontario Ministry of Natural Resources (OMNR).
- **Intergovernmental collaboration** – Examples include the sharing of SLINP’s Integrated Vegetation Management Plan with Ontario Parks and consultation with OMNR regarding regulated water levels in the St. Lawrence River.
- **Frontenac Arch Biosphere Reserve (FABR)** – Coordinated regional land planning and conservation initiatives engaging landholders, municipal, provincial, and federal governments, land trusts, passive recreation groups, and academia.
• Eastern Ontario Model Forest – collaboration through GeoConnections (administered by Natural Resources Canada) for land use planning workshops, engaging municipal planners, landowner groups, OMNR, Ontario Nature, and FABR.
• Neighbouring landowners – engagement in long-term ecosystem monitoring on neighbouring properties.
• Akwesasne Mohawk First Nation – consultation and collaboration with First Nations regarding the sharing of Traditional Ecological Knowledge (TEK), collaboration for active management strategies, and consultation regarding areas of cultural significance in SLINP.

Of the collaborative examples noted, only the partnership with the Akwesasne Mohawk First Nation involved action within Park boundaries (SL3). All other relationships were conducted as part of greater park ecosystem planning or in ecosystems directly bordering the Park (SL3). This finding appears to be consistent with results presented earlier that indicate a lack of onsite engagement of volunteers or organizations to conduct collaborative recreational or environmental partnerships. The engagement of First Nations, stakeholders, and local communities in SLINP’s management planning is noted in Parks Canada’s Guide to Management Planning (Parks Canada, 2008) and SLINP’s management plan (Parks Canada, 2010) as a legal requirement of Parks Canada management planning. At SLINP however, First Nations participation can be characterized as ‘Functional Participation’ while other stakeholder groups are engaged in a more hierarchical, ‘Participation by Consultation’ (Table 7).

Participants were questioned regarding the role of commercial tourism operators operating in the Thousand Islands area. Document and interview analysis did not reveal a requirement on the park of Parks Canada or commercial operators to engage in a formal relationship. Instead participatory relationships appeared to fall under Parks Canada’s duty to consult stakeholder groups (Parks Canada, 2008). Interview participants described the existing relationship with
two paddling outfitters who were noted as serving customers visiting SLINP; 1000 Island Kayaking and Misty Isles Lodge. Each offers boat rentals and tour packages that specifically utilize recreational opportunities within the Park. Participant SL2 noted that both have been engaged by the Park to identify ways to match Park services to both tourism opportunities and customer demands. After the initial consultation process, participant SL2 noted that Misty Isles Lodge tended to take a less active role and relying on SLINP to initiate communication. In contrast, 1000 Island Kayaking has maintained an active dialogue with SLINP and was noted as having a “green ethic” and “a sense of impacts” and tends initiate communication with SLINP (SL1; SL2)
Chapter 5 - Discussion

Introduction

Each of the case study site’s implementation of protected area planning and management was unique but reflective of their visions and goals, management objectives, and organizational ideology. There are however, enough similarities across the different sites to examine why management strategies differ even when the management objectives appears to be the same. This could be best described as ‘why did we do it this way’? The Discussion chapter identifies and explores the practical and conceptual motivating factors at each organization and determines how they influence their ability to achieve their management objectives. The Discussion chapter will be broken into four sections; environmental preservation and conservation, visitor planning and management, stakeholder participation, and management planning and action. The major points from each section of the Discussion chapter are summarized in Table 9.

Study Limitations

During data collection and analysis, potential limitations arose that the Investigator acknowledges may influence the findings of the study. Several methodological were identified that the Investigator recognized and worked to mitigate during data collection and subsequent analysis. The semi-structured interview selection process was designed to target both protected area staff and major stakeholder groups associated with visitor use at each site. The effect of any self-reporting bias during interviews was mitigated through the recruitment of both protected area staff and visitation related stakeholders. For sites where visitation related
stakeholder recruitment was difficult, the availability of documents and reports were significantly richer which provided the Investigator with sufficient data to mitigate any self-reporting bias.

The phrasing of questions for semi-structured interviews remained consistent with the three central themes however it was noted that as the management goals differed at each site, so did the context in which the questions were interpreted. Three noted areas that this study did not address that warrant further investigation are: i) the integration of social science methods into visitor management, ii) the influence of First Nations as stakeholders for protected areas in eastern Ontario, and iii) the influence of resource extraction stakeholders protected areas with municipal governance.

The Investigator also noted both examples of both longitudinal and personal bias with this study. The data analysis and discussion noted that management and planning for each site was dynamic and influenced by changes in funding, political change, and highly dependent on the skills and experience of individuals involved in their management. The study was intended to be a current characterisation of eastern Ontario’s protected spaces. Further research does warrant an investigation of the longitudinal factors experienced by the study sites, especially changes in funding. Personal bias derived from the Investigator’s preference for hiking and mountain biking was mitigated during the course of the study through continual recognition that ‘good’ visitor use must be consistent with management goals and the resource should be ‘sustainable’ to allow similar opportunities for future visitors.
Table 9: Discussion point summary across three case study sites

<table>
<thead>
<tr>
<th>Environmental Preservation and Conservation</th>
<th>St. Lawrence Islands National Park</th>
<th>Frontenac Provincial Park</th>
<th>Limerick Forest</th>
</tr>
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<tbody>
<tr>
<td>Monitoring for Ecological Integrity</td>
<td>Significant investment in monitoring. Funding available for research collaborations. Published and unpublished research and comprehensive reporting documents.</td>
<td>Significant investment in monitoring required as part of the core mandate. Research opportunities are supported but not pursued due to a lack of funding. Few examples of research or reporting documents.</td>
<td>Few examples of EI monitoring or forest inventory related monitoring. No evidence of documents reporting EI. Comprehensive EI data last acquired by OMNR in 1980’s. Environmental management policy on EI data acquired</td>
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<tr>
<td>Environmental Management Strategies</td>
<td>Frequent use of active environmental management to maintain or improve desired EI indicators.</td>
<td>Infrequent use of active environmental management. Favours passive environmental management in response to limited funding.</td>
<td>Passive environmental management relying primarily on exclusion zoning in areas provincially designated ANSI or PSW. Use of forestry best practices and observational evidence to mitigate forest activity impacts.</td>
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<td>Utilizing LEK and TEK</td>
<td>Little evidence for the integration of LEK into management beyond the public consultation phase of management planning. It appears TEK is recognized for productive collaboration rather than for merit.</td>
<td>Some evidence for the integration of LEK into management through the use of citizen science initiatives. TEK is solicited through ‘duty to consult’ policy but appears to be a form of stakeholder appeasement rather than holding merit.</td>
<td>LEK and observational data are the predominate sources of information guiding management. Wide acceptance and understanding by collaborators and management. TEK was absent due to the lack of recognized FN cultural features.</td>
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<tr>
<td>Connecting Visitor Use with EI Impacts</td>
<td>EI monitoring and research are frequently linked to visitor impacts and behaviour. Includes visitor-centric research and eco-centric research identify links. Evidence of policy changes in response to visitor impacts. EA for new development integrates adaptive management.</td>
<td>One visitor-centric study and recommendations were not integrated into policy. EI monitoring appears to link visitors to EI impacts but not explicitly recognized and rarely integrated into policy.</td>
<td>LEK and observational evidence is used to link recreation use with impacts. Aesthetic and recreation infrastructure degradation are noted impacts. No links have been made between EI monitoring and visitor impacts.</td>
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<td>Visitor Planning and Management</td>
<td>St. Lawrence Islands National Park</td>
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<td>Actively promoted with environmental preservation remaining a pre-requisite to use. Onsite unit dedicated to visitor experience. Surveys to determine visitor expectations with results integrated into policy. Objective for high quality customer service and recreation experience. Investment in park interpretive and education programs. Not dependent on user fees but there is an implicit link to funding.</td>
<td>Actively promoted with permitted uses consistent with environmental preservation objectives. Visitor planning and management a shared responsibility between park and regional office staff. Visitor expectations from voluntary feedback and informal communication. Customer service is a high priority. Some investment in interpretive and education but conducted primarily by volunteers. Operating budget depends on user fees.</td>
<td>Actively promoted with a large diversity of permitted use. Permitted use reflects needs of the community and economic benefits. Objective to ensure quality of recreation experience and infrastructure is sustainable. Visitor expectations established in public consultation and ongoing collaboration. No institutional customer service objective, user groups maintain recreation infrastructure. Operating budget is dependent on forestry revenue.</td>
<td></td>
</tr>
<tr>
<td>Visitor Experience and Environmental Preservation – Competing Objectives</td>
<td>Well managed and part of organizational culture and ideology. New development is targeted and integrated into management planning. Public consultation is considered but does not drive development process. EA process is conducted and adaptive management is used for follow-up.</td>
<td>Part of organization culture and ideology. New development is restricted by funding levels benefiting preservation objectives. Visitor feedback drives recreation development. Some concern that 1974 management plan sets a balance that may no longer be relevant. EA process is conducted but rarely integrates adaptive management.</td>
<td>Not considered competing objectives. Impacts are evaluated for their negative effect on visitor experience (aesthetic, recreation experience). Exclusion zoning separates recreation from environmentally sensitive areas and is required by provincial legislation. EA process is mentioned but not utilized.</td>
</tr>
<tr>
<td>Stakeholder Participation</td>
<td>Required by legislation with the emphasis on the public consultation phase of management planning.</td>
<td>Required by legislation with the emphasis on the public consultation phase of management planning.</td>
<td>Policy requirement with the emphasis on the public consultation phase of management planning.</td>
</tr>
<tr>
<td>Interactive Participation</td>
<td>Not observed. Higher funding levels, power imbalance between the Park and stakeholders, rigid environmental preservation ideology, and well defined PCA management objectives make it impractical.</td>
<td>Not observed. Power imbalance between the Park and stakeholders, rigid environmental preservation ideology, and well defined Ontario Parks management objectives discourage its use.</td>
<td>Utilized during the management planning process. Stakeholders shared power with UCLG. Once a common vision in the management plan was achieved, interactive participation became fractious with competing agendas.</td>
</tr>
<tr>
<td>St. Lawrence Islands National Park</td>
<td>Frontenac Provincial Park</td>
<td>Limerick Forest</td>
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<tr>
<td><strong>Functional Participation and Participation for Incentives</strong></td>
<td>Under consideration for remote unstaffed properties in order to provide management presence in exchange for preferred access. Not currently utilized at SLINP except with FN and for regional (outside the park) initiatives.</td>
<td>Actively used by the Park with the ‘Friends of Frontenac’. Encourages shared responsibility, common vision, and pooled resources, allowing the Park to deliver services it is unable to do unilaterally. Primarily visitor experience focused.</td>
<td>Actively used by the UCLG with the ‘Friends of Limerick’ and other user groups. Encourages shared responsibility, common vision, and pooled resources, allowing Limerick Forest to deliver services it is unable to do unilaterally. Major component of infrastructure maintenance and development.</td>
</tr>
<tr>
<td><strong>Passive Participation, Participation in Information Giving, and Participation by Consultation</strong></td>
<td>The standard level of participation engaged primarily through the public consultation phase of the management planning cycle. Occasionally utilized for discrete issues.</td>
<td>The standard level of participation engaged primarily through the public consultation phase of the management planning cycle. Any pre-existing relationships established with stakeholders may bias the integration of feedback.</td>
<td>Very few examples were noted. They were primarily centred on non-visitor related activities (forestry or environmental) or with stakeholder groups who prefer to engage in more superficial consultation.</td>
</tr>
<tr>
<td><strong>Managing Stakeholder Participation Positively</strong></td>
<td>Use of visitor survey data and staff expertise to evaluate and mitigate negative stakeholder interactions. Use of park-stakeholder power imbalance. Integration of stakeholders to minimize impact on management objectives.</td>
<td>Frequent use of informal communication and voluntary visitor feedback to understand stakeholder issues. Highly dependent on staff expertise. Minimize change in the park and support traditional visitor uses.</td>
<td>Frequent use of two-way communication between management-stakeholders. Ongoing work and shared responsibility with stakeholder partners.</td>
</tr>
<tr>
<td><strong>Self-Mobilisation</strong></td>
<td>Managed through pro-active planning, very strategic use of communication, large power imbalance, and engagement of critical stakeholder groups. Enjoys political support.</td>
<td>Managed by minimizing policy change, soft enforcement of regulations, engaging frequent visitors as stakeholders, and supporting traditional uses. Very vulnerable to individual and stakeholder complaints due to lack of political support.</td>
<td>Managed by the continuous engagement of stakeholders and the integration of feedback into both policy and management. Policy direction influenced by highly involved stakeholders creates credibility and a buffer against complaints and self-mobilisation.</td>
</tr>
<tr>
<td>Use of LEK and TEK to Reduce Stakeholder Conflict</td>
<td>St. Lawrence Islands National Park</td>
<td>Frontenac Provincial Park</td>
<td>Limerick Forest</td>
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<tr>
<td>No observed examples of LEK integrated into policy to reduce stakeholder conflict. TEK appears to be used strategically to maintain positive collaboration with FN.</td>
<td>Citizen science initiatives for EI monitoring and developing a shared understanding of EI in the Park. TEK is recognized through the ‘duty to consult’ for new development. It appears to be a very inefficient method for engaging FN and does not appear to be used to develop a more productive partnership.</td>
<td>LEK is the predominate form of EI monitoring in Limerick Forest. It shares wide support and understanding in the community and stakeholder groups. Engagement of FN and use of TEK is absent, primarily due to the lack of cultural significance to FN groups.</td>
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| Managing Visitor Conflict and Non-Compliance | Supported by messaging and communication (park office, staff, website, publication). SLINP benefits from enforcement powers though results indicate that lack of enforcement may be an issue. | Supported by messaging and communication (park office, staff, website, publication) though on a smaller scale than SLINP. Park staff benefit from enforcement powers though soft-enforcement of regulations was noted as a visitor relations strategy. | Supported by messaging and communication (website, staff, peer enforcement). No enforcement powers for Forest regulations. Provincial and municipal laws are enforced by local law enforcement. Vulnerable to non-compliance disrupting positive inter-stakeholder relationships. |

| Management Planning | Required to conduct 5 year management plan review cycles. Currently complying with 5 year frequency and well supported by management. | Required to conduct five year management plan review cycles. Not complying with requirement due to insufficient resources. Original management plan (1974) in force with reviews conducted in 1981 and 1997. | Required to conduct 5 year management plan review cycles. Nearing the end of the first 5 year cycle. There was no indication that a new planning cycle would not begin. Some concern that insufficient new Forest resource and EI data may impact the relevance of a new planning cycle. |

<p>| Organizational Structure | Supported by onsite management, enforcement, natural science, and visitor experience expertise. Further resources are available at regional service centres though availability is limited. | Supported by onsite management and enforcement which also support customer service. Regional office provides natural science and park planning expertise. | No onsite management. Limerick Forest staff consists of a Forest Manager and Forestry Technician. Primary job responsibility is in support of forestry activities though staff do liaise and support partnerships with recreational user groups. |</p>
<table>
<thead>
<tr>
<th>Workplace Culture</th>
<th>St. Lawrence Islands National Park</th>
<th>Strong environmental preservation and customer service culture. Large organization appears to restrict individual roles. Observed a job protectionist culture resistant to innovation and stakeholder collaboration.</th>
<th>Frontenac Provincial Park</th>
<th>Strong environmental preservation and customer service culture. Staff must be ‘jack of all trades’. Welcoming of assistance from stakeholder groups as long as it is not disruptive to management objectives. Frustration expressed due to restricted funding forcing staff to be passive witnesses to declining indicators of park condition.</th>
<th>Limerick Forest</th>
<th>Strong culture of sustainability (economic, social, environmental). Staff must be ‘jack of all trades’ and facilitate collaborative relationships.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding and Resources</td>
<td>Highest level of funding of all the sites. Funding is indirectly tied to visitation and directly tied to management objectives. Some revenue is derived from user fees however Park operation does not appear to be dependent on it.</td>
<td>Lower funding level than SLINP. Funding is directly tied to visitor revenue (user fees) and in-directly tied to management objectives. Examples of non-compliance with the PPCRA due to restricted funding.</td>
<td>Lowest level of funding of the three sites. Revenue generated from forestry and aggregate extraction support base management objectives. Recreational user groups provide the majority of resources to maintain recreation infrastructure. No user fees.</td>
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<table>
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<tr>
<th>Table Abbreviations</th>
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<tr>
<td>EA: Environmental Assessment</td>
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<td>EI: Ecological Integrity</td>
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<td>FN: First Nations</td>
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<tr>
<td>LEK: Local Ecological Knowledge</td>
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<td>OMNR: Ontario Ministry of Natural Resources</td>
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<td>PPCRA: Provincial Parks and Conservation Reserves Act</td>
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<td>SLINP: St. Lawrence Islands National Park</td>
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<tr>
<td>TEK: Traditional Ecological Knowledge</td>
</tr>
<tr>
<td>UCLG: United Counties of Leeds and Grenville</td>
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</table>
Environmental Preservation and Conservation

The management goals and objectives for each site originated from the guiding force of legislation. What the ‘law’ dictates a site needs to do and the goals they hope to achieve helps shape the management ideology for each organization and guides management objectives, planning, and action. Regardless of the ideology and goals set by guiding legislation, that is only the potential of what could be done. Problems can arise when legislation is either too rigid or overly flexible, vulnerable to political interference, or simply suffers from non-compliance facilitated by weak wording or a lack of political will (Eagles, 2010).

The legislation for SLINP and Frontenac Provincial Park share a strong environmental preservation ideology in both legislation and policy (Eagles, 2010). Each park system’s vision, goals, and enforcement powers are consistent with the expectations of a National Park system (Dudley, 2008). The focus on preserving natural heritage is noted in in PPCRA as the first and fourth management objective in the Act;

1. To permanently protect representative ecosystems, biodiversity and provincially significant elements of Ontario’s natural and cultural heritage and to manage these areas to ensure that ecological integrity is maintained.
4. To facilitate scientific research and to provide points of reference to support monitoring of ecological change on the broader landscape.

(Government of Ontario, 2006 c. 12, s. 2 (1))

The Parks Canada Agency Act also explicitly outlines the requirement for environmental preservation in the first, third, seventh, and eleventh objectives;

(a) to protect the nationally significant examples of Canada’s natural and cultural heritage in national parks, national historic sites, national marine conservation areas and related heritage areas in view of their special role in the lives of Canadians and the fabric of the nation,
(c) to carry out Canada’s international obligations and agreements to protect, conserve and present that heritage and to contribute towards the protection and presentation of the global heritage and biodiversity,

(g) to maintain or restore the ecological integrity of national parks,

(l) to maintain ecological and commemorative integrity as a prerequisite to the use of national parks and national historic sites, and....

(Department of Justice Canada, 1998, c. 31, preamble; 2002, c. 18, s. 33.)

In contrast to the legislation passed by the Provincial and Federal Governments, UCLG enacted the Limerick Forest Long Range Management Plan as a County by-law, requiring County council approval for revisions (United Counties of Leeds & Grenville, 2003). The overall environmental management ideology reflects one of passive management guided by sustainability and conservation rather than environmental preservation which was observed at SLINP and Frontenac Provincial Park. It is apparent in objective four of the Limerick Forest Long Range Management Plan that the ecological protection framework is more ambiguous and permissive and does not prioritize EI over other forest uses:

Objective #4: Protect the ecological features and values of Limerick Forest.

i) Identify and describe Limerick Forest ecosystems and their functions;

ii) Identify the challenges and opportunities to cooperate with traditional users;

iii) Identify areas for research and study;

iv) Identify and describe requirements for protection (e.g. removal of alien species) including exclusion from other uses.

(United Counties of Leeds & Grenville, 2003 p. 36)

It was interesting to note that legislation guiding SLINP and Frontenac Provincial Park originates exclusively from the federal and provincial governments respectively and is self-regulated which may facilitate a lack of regulatory enforcement and selective non-compliance. With the exception of the self-regulated Limerick Forest Long Range Management Plan, Limerick Forest must comply with any applicable Provincial legislation as it subject to external enforcement
powers and penalties. This includes legislation and policy statements regarding species at risk, requirements for environmental assessment, land use planning, and environmental protection of recognized environmentally sensitive areas (ANSI, PSW, ESA). When observing the effectiveness of self-regulation, SLINP was observed to be the most compliant while Frontenac Provincial Park was the least compliant primarily due to the challenges impacting progress on a new Park Management Plan which had not been reviewed since 1997.

**Monitoring Ecological Integrity – Recording and Reporting**

Limerick Forest’s Management Plan and applicable provincial environmental legislation do not specify a requirement for EI monitoring. This includes any areas that have been provincially designated as ANSI, PSW, or an identified population of a SAR. Compliance with Provincial legislation requires Limerick Forest to appropriately protect such areas through zoning and use restrictions but does not include monitoring or reporting requirements. Though the Limerick Forest Management Plan does indicate the establishment of Ecological Monitoring and Assessment Protocols, participant LF3 noted that EI monitoring in Limerick Forest was infrequent and confined mostly to Limerick Forest North. This strategy meets Limerick Forest’s ecological objectives and its legal requirements but reflects a hands off ideology that generally fails to identify any changes in EI that have occurred in Limerick Forest since NRVIS data was last collected by the OMNR in the 1980’s (Byford, 2007). Without EI data that reflect any changing conditions in the field, there is a potential that declining or improving ecological conditions will not be observed or that previously unknown SAR populations will remain unrecognized. In the context of Limerick Forest’s overall management objectives, this serves to avoid potentially complicated or costly changes in management planning yet it likely impacts
management’s ability to comply with EI objectives (Objective #4) though it is difficult to evaluate due to the lack of current EI. Limerick Forest was also unique among the three sites by permitting revenue generating forestry operation within the forest. Forestry derived revenue does contribute to Limerick Forest management costs but may not be sufficient to maximize a sustainable forestry revenue stream despite its priority status in Limerick Forest’s Long Range Management Plan (United Counties of Leeds & Grenville, 2003). The Limerick Forest Management Plan (Byford, 2007) indicated a lack of current forest inventory data collection work as an existing gap that may serve to reduce the productivity and value of forest resources over the long term. This gap does not appear to be initiated by Limerick Forest management but rather by politically driven decisions influenced by lack of forestry expertise, limited funding, and a short-term planning window.

SLINP and Frontenac Provincial Park are much more committed to EI monitoring and maintaining or improving the condition of SAR and environmentally sensitive areas. That commitment by SLINP and Frontenac Provincial Park to EI monitoring is supported by their mandate and their guiding legislation. It also reflects the original intent for creating both SLINP and Frontenac Provincial Park, to protect areas of outstanding natural heritage which is a sharp contrast with Limerick Forest’s status as a working forest. As LF4 responded in regard to natural heritage preservation; “there are better examples elsewhere”. At the site level, SLINP and Frontenac Provincial Park engage in long term ecosystem health monitoring and specific monitoring projects that examine SAR, hyper-abundant species, invasive species, visitor impacts, and regional ecosystem health (F1,F3) (Francis & Leggo, 2004). There is however, a disparity in investment between PCA and Ontario Parks that makes it impractical for Frontenac
Provincial Park to achieve the same level of EI monitoring, provide funding for research opportunities, or facilitate active environmental management as SLINP is able to do. EI monitoring was noted by participants (F1, F3) as having been assigned a high priority by Ontario Parks though resourcing still appears to restrict the scope and magnitude of work. The EI monitoring work at Frontenac Provincial Park appears to be a relatively cost efficient way of collecting and generating data to meet Ontario Parks’ ecological preservation mandate. While collecting data is critical for good environmental planning, it is also most often only the prerequisite. Frontenac Provincial Park demonstrated a willingness to engage in collaboration with NGOs and utilize citizen science to acquire EI data at reduced expense, albeit within the expertise of collaborators. EI monitoring however, does not generally benefit from the same magnitude of volunteer support and fundraising capability as visitor related infrastructure due to a comparative lack of specialized expertise, general awareness, and direct benefits. As a result, Frontenac Provincial Park staff noted that meeting Ontario Parks’ environmentally related reporting requirements consumed the vast majority of resources to the extent that staff are unable to network with other agencies or seek professional and academic collaborations. Park staff must then rely on potential collaborators to initiate contact which may result in valuable research but not always in areas of immediate need to the park.

**Environmental Management Strategies**

SLINP appears to utilize EI data more actively than Frontenac Provincial Park. There are many references in the literature regarding the collection and interpretation of EI data, the State of the Park Report, and the use of data to guide environmental management strategies at SLINP, much more so than at Frontenac Provincial Park (SL3) (Bowman & Smith, 2012; Bradford, 2003;
Bradford & Leggo, 2003; Bradford & McIntyre, 2005; Francis & Leggo, 2004; McPherson, 2006; Parks Canada, 2010). Those strategies, such as prescribed burns, shoreline remediation, habitat restoration, and hyper-abundant species control are conducted to facilitate improvements in ecosystem health (SL3). While Frontenac Provincial Park appears to gather sufficient EI monitoring data to identify and justify active environmental management strategies, passive environmental management appears to be a more frequent outcome. Analysis suggested that engaging in active environmental management strategies generally exceeds the resources available to Frontenac Provincial Park staff. An ongoing challenge however, is the need for staff to continually triage park management action in response to funding. Frontenac Provincial Park activities, including reports interpreting data, development of project specific procedures, environmental assessment, public consultation, implementation, reporting, and adaptive management all generally appear to require significantly more resources to execute than EI monitoring. An example noted by participant F1 highlighted this issue. This participant indicated that Ontario Parks’ Cormorant population management at Presque-Ile Provincial Park consumed a disproportionate amount of F1’s time resulting in other EI monitoring work having to be deferred contrary to F1’s professional opinion. F1’s response further supports the observation that restricted funding tends to focus environmental preservation towards EI monitoring and passive environmental management strategies rather than active environmental management. Other outcomes of restricted environmental preservation funding that were apparent in the case study results at Frontenac Provincial Park include:

- Strong focus on meeting reporting requirement set out by Ontario Parks and applicable legislation and less flexibility to investigate environmental issues not previously identified as an area of concern;
• Little motivation to pursue visitor impact work not included in reporting mandate or likely to result in management action;
• Concentration on active environmental strategies that have a high probability of success, require few resources, or are conducted to improve study outcomes for reporting requirements;
• Discourages the generation of publications and sharing of findings despite established professional networks such as CASIOPA and;
• Insufficient time and funding to coordinate and engage peers, external assistance, or to develop synergies with NGOs and academic institutions.

For Frontenac Provincial Park, it appears that a conscious decision by Park staff has been made to avoid pursuing environmental initiatives that involve long term implementation windows, significant planning or implementation resources, multi-disciplinary coordination, and poor public perception which appears to be directly linked to a lack of funding, uncertainty of continued Ontario Parks support, and an uncertainty regarding future management priorities.

Unlike Frontenac Provincial Park, the investment by Parks Canada in SLINP was observed to be consistent with their identified environmental preservation ideology, vision, goals, and objectives. While current funding at SLINP facilitates not only supports the acquisition of EI data, but the implementation of active environmental strategies, concern was noted by interview participants regarding the impact of decreased funding for Park management.

Two of the interview participants noted that though funding had remained static over the preceding years (as of spring 2011) (SL1; SL2) yet expectations have increased which has presented challenges requiring the identification of efficiencies or the re-alignment of scope of work. This concern was re-iterated by participant SL3 in spring of 2012 in response to indications that the Federal Government would be reducing Parks Canada’s budget. An analysis of the implementation of budgetary changes should be studied in greater detail to determine
how SLINP will be impacted. Findings indicated job preservation may take precedence over program preservation, a concentration of resources to internal park activities rather than regional initiatives, fewer active environmental management strategies, and a greater focus on core mandate activities. It does not appear that funding reductions will be so drastic that SLINP will be unable to meet its management objectives or cause sufficient organizational culture change to force a redistribution of work or sharing of resources between volunteers, NGOs, and park personal for internal park activities. There appears to be some risk that decreased funding will reduce the role of SLINP as an observed regional leader in environmental preservation and, that the resources and expertise provided by SLINP to other agencies and organizations with less funding and a dependence on that expertise to meet their mandate, may be reduced or cease entirely. Further research should be considered that examines the impact of funding changes on active environmental management and the outcomes relative to stated environmental preservation objectives at Parks Canada and Ontario Parks. This should include the British Columbia parks system (BC Parks) in such research should be considered as participant F1 specifically noted them as “being a mess” relative to their Ontario counterparts.

Limerick Forest appears to favour passive environmental management strategies over EI monitoring and active management. With a weaker environmental mandate compared to the other sites, Limerick Forest has a relatively low direct investment in environmental preservation but this approach is consistent with the quality of the natural heritage being protected. There was little evidence that Limerick Forest regularly invests in any ecological monitoring or invested at all in active environmental management strategies. The management budget priorities facilitate a passive environmental strategy that favours exclusion zoning and natural
regeneration. This approach works well in Limerick as the natural features most sensitive to damage do not provide sufficient sustainable forest resource value or present desirable recreational opportunities to high impact recreational use.

**Utilizing Local and Traditional Ecological Knowledge**

Though the environmental ideology reflected by Limerick Forest management places less emphasis on ecological science, LEK is heavily utilized and supported in management action. Integrating science into Limerick Forest’s management ideology appears to have been largely unsuccessful despite the efforts of a small minority of stakeholders. There is a risk that small incremental EI changes over time or changes lacking easily observable indicators may not be recognized through LEK but its use in Limerick Forest is consistent with the stated environmental management objectives. The area’s long tenure as a multi-use ‘working’ forest tends to negate the benefit of implementing strict environmental preservation values, does not warrant the increased precision or scope of ecological science, and primarily demonstrates the values of community members and stakeholders involved in management planning. TEK in Limerick Forest appeared to be entirely absent and was attributed to the lack of intact FN cultural heritage and participation by FN groups in consultation or collaboration during the development of the Limerick Forest 20 Year Forest Management Plan (Byford, 2007). When exploring the use of LEK and TEK at both SLINP and Frontenac Provincial Park, they did not appear to play a significant role in environmental planning or management or serve to complement EI science but rather acted as a method to meet stakeholder consultation obligations and to preserve cultural heritage. The lack of LEK and TEK integration into EI science could be attributed their status as government agencies with a strong culture of EI science and
a commitment to the environmental preservation mandate which may be in conflict with input
derived from LEK and TEK. As a form of stakeholder participation, LEK serves the same role in
Limerick Forest but in the absence of an EI science ideology, it also tends to assume a dominant
role in determining the direction of environmental management.

**Connecting Visitor Use with EI Impacts**

Despite a large body of literature linking visitor use to environmental impacts (Castley et al.,
2008; Pickering et al., 2009a), Frontenac Provincial Park and Limerick Forest appear to largely
ignore that link in their monitoring and assessment activities. SLINP was the strongest at linking
visitors with environmental impacts by conducting studies that focused on visitor activity or
behaviours, or identified visitor impacts indirectly through the course of other EI work
(SL3)(Bowman & Smith, 2012; Bradford, 2003; Bradford & Leggo, 2003; Bradford & McIntyre,
2005; Bulté et al., 2010). Additionally, participant SL3 noted a close relationship between the
ecology and visitor experience groups as well as follow up assessments and mitigation of
impacts caused by park infrastructure projects, demonstrating an adaptive management
response that was virtually absent at the other sites.

The link between visitors and environmental impacts at Frontenac Provincial Park appeared to
be largely limited to the EA process that precedes new development. Any subsequent
evaluation of environmental impacts or an adaptive management response was not observed.
Another example at Frontenac Provincial Park, noted by participant F1, described how none of
the recommendations contained within the sole study directly linking visitors to environmental
impacts were implemented by Ontario Parks. In another case, the monitoring and assessment
of trout populations in Frontenac Provincial Park appeared to be geared more towards EI
reporting requirements (F1), yet the link to the Park’s recreational fishing is evident though not openly acknowledged. At Frontenac Provincial Park in general, it was unclear to the Investigator how the Park uses monitoring and assessment data in developing a management response. For Limerick Forest, visitor impacts are less of a concern due to more permissive environmental objectives, plus the absence of visitor impact studies make it impossible to characterize any impact magnitudes. Of greater concern to Limerick Forest staff and volunteers is the quality and maintenance of the recreation infrastructure. Relying heavily on observational data, visitor impacts are evaluated for any degradation in both forest aesthetics and visitor expectations which guide appropriate management action. Though exclusion zoning is implemented for environmentally sensitive areas, Limerick Forest does not use visitor impact science to evaluate the effectiveness of exclusion zoning relative to ecological integrity. One interview participant’s (LF3) response summarized both the management ideology and the attitude to towards visitor impacts by noting that: i) forestry activities in Limerick Forest have a massive relative footprint to visitor impacts; and ii) ecosystem resilience erases observable trail evidence after 24 months of disuse. That ideology may be consistent with Limerick Forest’s management objectives but also demonstrates shortcomings in an LEK and observable impact culture; that there is little capacity to evaluate the health and diversity of biota along trail corridors in order to quantify change, and that minimizing visitor impacts is moot for areas slated for forestry activities.

The overall analysis regarding environmental ideology for each site reflects a distinct increasing emphasis on an environmental preservation ideology from the municipal level to the federal level. SLINP reflects the strongest environmental ideology which could be described as being
somewhat technocratic but having strong leadership, a sense of long term stability, a strong program for action on the ground, and providing the impression of an outdoor museum that is supported by the most generous funding model among the three sites. Frontenac Provincial Park shares the technocratic aspect of SLINP’s strong EI monitoring programs and reporting requirements and a similarly strong environmental preservation ideology supported by legislation. The less frequent use of active environmental management however, may result in Park staff being forced to be passive witnesses to undesired changes in ecological integrity. This situation has been aggravated by a funding model that appears to be insufficient to meet Ontario Parks’ environmental preservation mandate despite the dedication of local Park staff. Limerick Forest places a lower value on environmental preservation ideology than the other sites but it is entirely appropriate given the resource being protected, the community’s values, and the stated management objectives. Forest resource monitoring and assessment work does seem to be negatively impacted by limited budgets and an LEK centric culture despite its direct use in planning forestry activities. Further study should be conducted to determine the role of funding versus the role of ideology at Limerick Forest regarding limited forestry monitoring and assessment work despite clear benefits in generating revenue and achieving management objectives.

**Visitor planning & management**

**Providing Opportunities for Public Visitation**

The guiding legislation and policy at each of the three sites contains management objectives that must provide opportunities for public visitation. For SLINP, the Parks Canada Agency Act describes the purpose of visitation as providing "Canadians with an opportunity to enjoy
Canada’s special places” (Department of Justice Canada, 1998 p. 2). Further objectives explicitly state that maintaining the integrity of natural and cultural heritage features is a “prerequisite” to visitor use and that visitor use and tourism opportunities must be managed in an enduring and sustainable manner to ensure a “quality experience” is maintained for “future generations” (Department of Justice Canada, 1998 p. 2). The Act does not include any specific provisions for providing outdoor recreation opportunities or describe what an appropriate activity might be. That flexibility allows SLINP to evaluate outdoor recreation activities and policies during the management planning process and to develop visitor management objectives suited to the context of the park, the expectations of visitors and stakeholders, and the Park’s preservation objectives.

In contrast, the PPRCA contains explicit objectives that require Frontenac Provincial Park to provide “ecologically sustainable recreation opportunities” and allow “visitors to increase their knowledge and appreciation of Ontario’s natural and cultural heritage” (Government of Ontario, 2006 c. 12, s. 2 (1)). Ontario Parks’ Bluebook supports the PPRCA with a whitelist of recreation activities permitted in specific park classes and zones (Government of Ontario, 2006; Ontario Ministry of Natural Resources, 1992). Unlike Parks Canada, the more prescriptive and centralized approach by Ontario Parks leaves Frontenac Provincial Park staff with less flexibility to adapt visitor management policy to local circumstances. Ontario Parks also appears to lack a formalized and comprehensive process to evaluate the suitability of new and emerging trends in outdoor recreation which may increase the risk of unmanaged use, unrecognized impacts, and unrealized opportunities. Despite requirements for an EA process prior to developing new opportunities for visitation, Frontenac Provincial Park appears to be more vulnerable than
SLINP to political influence to increase revenue and visitation despite insufficient data to support such development. That vulnerability may also be enhanced by the absence of a recent management plan. The management plan reviews of 1981 and 1997 did not address or modify the management objectives included in the 1974 management plan or significantly alter the initial development plan for the Park (Hough Woodland Naylor Dance Limited, 1997; Hough, 1974; Ministry of Natural Resources, 1981). Staff at Frontenac Provincial Park continue to adapt management objectives to reflect contemporary issues around visitor expectations and natural heritage preservation though the 1974 document remains in force despite a potential lack of relevance. Ontario Parks also explicitly encourages “associated economic benefits” as a result of outdoor recreation, an objective absent from the Parks Canada Agency Act yet present in the Limerick Forest Range Management Plan (Ontario Ministry of Natural Resources, 2009 p. 2).

The foremost ideological position UCLG appears to have adopted for Limerick Forest is a requirement to generate direct and in-direct economic benefit through forest management. Unlike the other sites which utilize visitor management frameworks more characteristic of Limits of Acceptable Change (LAC), Limerick Forest appears to have implemented a framework more characteristic of the Recreation Opportunity Spectrum (ROS) framework that matches outdoor recreation opportunities with user expectations and demand. This framework and strategy facilitates a more adaptable ‘make everyone happy’ strategy for recreational forest use. With respect to visitation and visitor management, Limerick Forest has a mandate to provide social and economic benefits by facilitating a broad spectrum of activities that meet the
community’s expectations while minimizing inter and intra-use conflict, maintaining high quality recreation infrastructure, and support sustainable visitor use.

**Visitor Experience and Environmental Preservation – Competing Objectives**

Parks Canada Agency (PCA) ideology suggests that visitation leads to public appreciation which leads to political support, which ultimately leads to funding (Shultis & More, 2011). PCA’s mandate calls for the delivery of quality recreation opportunities with the goal to increase visitation and improve visitor experience. For the dual mandate of preservation and visitation, opportunities for visitation must be a balance between the demand for recreation and PCA’s preservation ideology. SLINP is supported by a dedicated visitor experience department, visitor surveys to establish visitor needs, demands, and expectations, and social science expertise at the Regional Service Centre. The data and level of precision utilized by SLINP to plan and implement high quality visitor experiences reflects a higher level of investment than observed at the other two sites. Though SLINP was the most proactive of the three sites in linking visitor use to EI, Shultis and More (2011) suggest that the dual mandate ideology may favour visitation over preservation as a likely outcome in response to static or declining visitor numbers.

These concerns voiced by Shultis and More (2011) regarding Parks Canada are more evident at Ontario Parks. Frontenac Provincial Park does not have the same level of funding to conduct surveys of visitor expectations or the funding to engage in substantial visitor infrastructure upgrades. There are several negative implications to this situation: visitor management becomes more reactive; service delivery may deviate from visitor expectations; and management direction will tend to favour engaged stakeholders. The result in Frontenac
Provincial Park is a strong tendency to support the existing customer base but few initiatives to increase visitation or provide opportunities to non-traditional park users. Shultis and More (2011) would support this outcome noting that static or declining use benefits environmental preservation objectives. The concern, however, is that Frontenac Provincial Park is the most dependent of the three sites on revenue generated directly from visitation to fund park operations and Ontario Parks supports increased visitation to achieve increased revenue. Without sufficient data to evaluate the success or impacts of new recreation infrastructure development, Ontario Parks’ objective to increase visitation and revenue has the potential to favour development over preservation.

In contrast to SLINP and Frontenac Provincial Park, recreation management and environmental preservation at Limerick Forest are ‘shoe horned’ into forest management practices and must meet requirements of environmental legislation, meet visitor expectations, and be managed in a sustainable fashion that ensures resource quality is maintained. Unlike the spectrum between visitation and environmental preservation seen at the other two sites, Limerick Forest supports a permissive use regime with hard limits that are characterized as environmentally sensitive zones exclusion zones. Environmental preservation and outdoor recreation objectives do not appear to be in competition, they are simply zoned in different areas.

**Stakeholder Participation in Planning**

The results of the study have highlighted how the approach and attitudes of ‘feet on the ground’ staff can engage stakeholders in a participatory fashion and combine resources to work towards a shared vision. There can be drawbacks to the highly participatory approach
however; management decisions may tend to reflect public perception and management mandates without an immediate observable impact or those requiring specialized expertise may be eroded, principally environmental preservation objectives. In contrast, a more unilateral approach to protected areas management facilitates the creation of policy unfettered by competing objectives or public sentiment. Unfortunately, an approach that excludes or diminishes the role of stakeholders and the public can result in self-mobilisation to circumvent the management processes in place, resulting in highly adversarial relationships with stakeholders, disconnected management action, and eroded political support. From autocratic to collaborative approaches, how each of the three case study sites manages their relationship with civil society does set the stage for successes and challenges in implementing protected areas planning and management.

Each of the sites is required by their guiding legislation or by-law to engage stakeholders and local communities during the management planning process in order to provide direct feedback into park management planning. The Parks Canada Guide to Management Planning describes the process as building “a sense of connection to the heritage place, to share its passion for the use and enjoyment of these special places, and to build commitment to long-term ecological and commemorative objectives” (Parks Canada, 2008 p. 11). Once the obligation for public consultation had been achieved however, it was noted that SLINP and Frontenac Provincial Park tended to reduce the role of the public to passive participation or participation through information giving (Table 7) (Pimbert & Pretty, 1997; Pretty, 1994). This reduction in public participation was more evident at SLINP than at Frontenac Provincial Park as management relies less on volunteerism to facilitate management action.
Both SLINP and Frontenac Provincial Park are more traditional institutional models (paternalistic management) that are able to tolerate a more adversarial relationship with stakeholders than Limerick Forest (participatory management) because the power imbalance between stakeholders and management is greater (LF1) (Wondolleck & Yaffee, 2000). The interaction between management objectives at Frontenac Provincial Park and SLINP are also more complex than at Limerick Forest which offers fewer opportunities and flexibility for integrating stakeholder consultation in management planning when negative interactions between management objectives is more likely to occur. All sites had demonstrated examples that utilized existing positive and productive collaborative relationships with stakeholder groups as a buffer against disruptive and adversarial stakeholders.

**Interactive Participation**

Limerick Forest was the only case study to site to show clear evidence of an interactive participation planning and management process. When UCLG resumed management responsibilities from OMNR, the community was given the opportunity to become involved on the ground floor in setting the management direction for Limerick Forest. The management policy and permitted uses when under OMNR management was highly reflective of the stakeholder groups who became involved in the Limerick Forest Advisory Committee (LFAC), likely due to an established sense of place and the threat that change may have a negative impact on their specific interests. It was noted previously that stakeholders who had confidence that their interests would be preserved in management policy or did not place significant use values on Limerick Forest tended not to participate in interactive participation.
Stakeholders who promoted environmental conservation values appeared to be the only position seeking to increase their influence in Limerick Forest’s management direction.

The interactive participation planning process conducted for Limerick Forest did present a high value for UCLG. The local community was given the opportunity to participate in creating a shared vision for Limerick Forest which in turn supports tolerance and understanding between Forest users, between users and UCLG, and a shared responsibility in policy development. This greatly reduces the development of adversarial relationships or incidence of self-mobilisation. Non-compliance and lack of respect for other users were noted as a continuing issue caused by a small minority of local residents. In that particular scenario, it was assumed by participant LF1 and the Investigator that disruptive non-compliant users feel a personal sense of ownership for the Forest that is not compatible with shared use or collaborative processes.

While presenting significant advantages in establishing a participatory management process with stakeholders, interactive participation may increase the level of complexity when implementing policy elements or management objectives required through legislation or organizational ideology as a result of opposing ideological positions and competing objectives. Both Frontenac Provincial Park and SLINP have a more rigid position for their management goals that reflects strong environmental preservation values and passive recreational use, both of which could be eroded in a collaborative planning process if the decision making power was truly shared between stakeholders and land managers. Even in the case of Limerick Forest, the interactive participation that was so useful in developing consensus in Limerick Forest’s management direction proved to be an impediment during day to day management which
resulted in the disbanding of LFAC and creation of the Friends of Limerick Forest group in its place.

**Functional Participation and Participation for Incentives**

Both Limerick Forest and Frontenac Provincial Park engage at this level of collaboration on an ongoing basis. This level of collaboration allows both case study sites to engage volunteers, external organizations, and funding sources, allowing land managers to attain goals that could not be achieved unilaterally. For recreational goals, the incentive for organizations to participate may be through an enhancement of their sense of place, increased recreational opportunities, or a threat of exclusion. Land managers benefit by developing allies and enduring relationships with stakeholders which provides direct management support and increases positive political support (Wondolleck & Yaffee, 2000). The ‘Friends of’ groups are an excellent example of this level of participation and have allowed both Limerick Forest and Frontenac Provincial Park to improve recreation infrastructure beyond the ability of the organization. Even SLINP, which historically appears to have been able to meet all its management objectives through internal resources, is considering the ‘Friends of’ model for the Main Duck Island property to increase SLINP’s management presence on the island. A challenge for land managers that can occur with either functional participation or participation for incentives is a pressure to modify planning and management policy in order to maintain a participatory relationship without incrementally moving away from a desired management state.

Unfortunately, this level of collaboration does not appear to work as well for environmental initiatives as it does for outdoor recreation initiatives at each of the case study sites. This may
be due to a relative abundance of stakeholders desiring improved visitor access and high quality recreational opportunities who are also able to contribute financially. In contrast, environmental initiatives did not appear to share a similar level of stakeholder interest or funding unless there was an outdoor recreation aspect associated to a project such as Muskie Canada’s association with SLINP or Ducks Unlimited with Limerick Forest.

SLINP appears to retain a greater ability to provide desired incentives for collaborative environmental preservation initiatives than Frontenac Provincial Park thanks to more generous funding but they appear to restrict such collaboration to projects outside Park boundaries. The benefit of this level of collaboration to SLINP appears to be limited to engaging highly specialized expertise or exerting influence for regional initiatives where SLINP lacks the ability to control directly. Similar projects within the Park boundaries appear to be conducted unilaterally demonstrating neither a reliance on outside expertise or funding. The resistance of SLINP to this level of collaboration for internal park activities may be attributed to three factors: a) a lack of organizational flexibility, b) the financial and political support to act unilaterally, and c) uncompromising implementation of ideology. Despite that evaluation, functional collaboration does occur when there is a greater risk of stakeholder self-mobilisation.

**Passive Participation, Participation in Information Giving, and Participation by Consultation**

Unlike the previously sections discussing levels of participation, this section reflects a minimum standard for consultation at all three organizations described in guiding legislation. The results indicate that with the exception of Limerick Forest, this is the standard level of consultation that is regularly utilized during the management planning cycle. Document analysis also
indicated that future five year management plan review cycles for Limerick Forest recommend this level of participation over interactive participation. From the perspective of land managers, this level of participation eases the management planning process by condensing complicated stakeholder issues and competing stakeholder objectives into several public meetings where the only incentive to implement feedback into the management plan arises from the risk of stakeholder self-mobilisation. While higher levels of stakeholder engagement improve the capacity of land managers for management action, it appears to be an impediment to management planning and policy through the erosion of long term and environmental planning objectives in favour of recreational, short term, and economic benefits.

In contrast to the comparatively minor role public participation plays in SLINP management and planning, the duty to engage stakeholders is strongly pursued for regional initiatives as part of Parks Canada’s objective to maintain influence and regional leadership for environmental, tourism, and research initiatives. It appears that Park staff recognize Parks Canada is unable to act unilaterally to meet objectives outside Park boundaries and must use collaboration and incentives to facilitate a desired outcome. For SLINP, the external engagement of stakeholders and regional partners is especially important due to its small size and highly fragmented land holdings, both of which are potential threats to Parks Canada’s environmental preservation, visitor experience, and research and education mandates as well being beyond Parks Canada’s ability to directly control an outcome. Though the other sites participated in regional conservation and tourism initiatives, it was characterized more as participatory role to build regional relationships, share information, and share resources when appropriate in order to facilitate direct and in-direct benefits to the protected area.
Managing Stakeholder Participation Positively

Stakeholder self-mobilisation was considered a very undesirable outcome by all three case study sites as it consumes time and resources to resolve, can reflect poor job performance, and may result in uncoordinated changes in the implementation of a management plan. At each case study sites, land managers utilized a variety of methods to assist in predicting the emergence of conflict, pro-actively minimize the magnitude of conflict, and reactively manage existing conflict. Despite a clear commitment to engage the public and stakeholders in the management planning process at all three sites, there were clearly additional factors observed that encouraged Limerick Forest to utilize public participation in an ongoing capacity while serving to discourage it at the provincial and federal levels of government (Table 10).

Table 10: Factors affecting public participation in protected area management and the relative change in their influence across levels of government.

<table>
<thead>
<tr>
<th>SLINP (national)</th>
<th>Frontenac Provincial Park (provincial)</th>
<th>Limerick Forest (municipal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relatively equal statements ‘on paper’ requiring a consultation process be initiated with the stakeholders. Decreasing emphasis on First Nations engagement and an increasing emphasis for local community consultation.</td>
<td>An increasing dependence on local public volunteerism and donations to facilitate management action.</td>
<td>More accountability regarding management-stakeholder conflict arising from local issues. More vulnerable to self-mobilisation by stakeholders (Pimbert &amp; Pretty, 1997).</td>
</tr>
<tr>
<td>An increasing obligation to provide local social and economic benefits.</td>
<td>Obligation to provide ecological integrity benefits for the ‘greater good’ decreases.</td>
<td>An increasing obligation to provide local social and economic benefits.</td>
</tr>
<tr>
<td>Decreasing levels of traditional institutional and paternalistic aspects in management (Wondolleck &amp; Yaffee, 2000)</td>
<td>Decreasing quality of natural and cultural heritage requiring protection.</td>
<td>Decreasing aspects of a technocratic policy ideology allowing for greater acceptance of alternate sources of information (LEK, observational evidence, direct and informal visitor feedback, etc.).</td>
</tr>
</tbody>
</table>
Self-Mobilisation

Initiated by stakeholders, this form of participation tends to be more adversarial and rarely integrates compromise into an outcome which can result in a disruptive influence on management and planning. Management ideology may can serve to mitigate and aggravate both the frequency and susceptibility to self-mobilisation through their engagement with stakeholder groups and integration of stakeholder concerns into management action. SLINP appeared to have the lowest frequency and susceptibility towards stakeholder self-mobilisation of the sites. Five primary tools used by Parks Canada were identified:

i) As a federal agency, PCA has the largest power imbalance between stakeholders and management which drives stakeholders towards dis-engagement rather than self-mobilisation.

ii) The use of strategic messaging and communication as a tool to mollify stakeholder positions.

iii) Pro-active engagement of stakeholder groups for which tools ‘i’ and ‘ii’ are less effective.

iv) Developing a shared sense of ownership and responsibility with stakeholders.

v) Redirecting stakeholder-management conflict towards stakeholder-stakeholder conflict by redirecting stakeholders with opposing positions.

The result at SLINP is a pro-active program to reduce and mitigate the risk of stakeholder self-mobilisation and to effectively manage any negative impacts on Park management and planning. The only example of stakeholder self-mobilisation noted by interview participants (SL1; SL2) was described as unanticipated. Interview participants (SL1; SL2) conceded that they underestimated the magnitude of impact a new regulation would have on the values of an educated, affluent, and connected stakeholder group and failed to employ strategic messaging or pro-actively engage the impacted stakeholder group. SLINP was noted as employing a more comprehensive and strategic process for minimizing stakeholder self-mobilisation than either of
the other two sites. When stakeholders did develop a negative perception of park activities and the relationship evolved into something more adversarial, Parks Canada leadership appeared to support SLINP with the burden of proof shifted to the complainant which provides inherent support to Park staff and serves to minimize any disruptive impacts on Park management and policy. Frontenac Provincial Park demonstrated the greatest vulnerability to self-mobilisation which was attributed to the use of a consultative planning process similar to SLINP but without the resources or political support to adequately resolve adversarial relationships with stakeholders. Frontenac Provincial Park utilizes a similar process as SLINP to engage stakeholders and shares a similar institutional context however unlike Parks Canada, interview participants noted that Frontenac Provincial Park staff are subject to the burden of proof by Ontario Parks in response to public complaints. Unlike the other two organizations, Ontario Parks does not appear to employ a validation process for complaints as a prerequisite to resolution and the negative professional implications of a Minister’s letter do not seem to be moderated by the validity, magnitude, or success of a resolution process. There were also indications that Frontenac Provincial Park did not have sufficient resources to implement pro-active strategies to mitigate the impact of adversarial stakeholder relationships and often avoided potentially contentious issues altogether.

Limerick Forest appeared to be the most successful in minimizing both the magnitude and the negative outcomes of conflict in the most cost effective manner. By utilizing interactive participation in the collaborative planning process, stakeholders who were most likely to engage in self-mobilisation were engaged very early in the planning process. Interactive participation was noted for allowing stakeholders to share their respective values and develop
tolerance and understanding of each other’s perspectives. The outcome resulted in shared responsibility for management planning and increased awareness of other Limerick Forest stakeholders and issues that may develop into conflict are resolved through communication between the involved parties. Incidences of self-mobilisation were still observed in the Forest but appear to be restricted to individuals or small groups who did not participate in the LFAC and are not associated with any of the major stakeholder groups associated with the Forest. Self-mobilisation in Limerick Forest appeared to be restricted to incidences of Forest regulation non-compliance, illegal activities, and complaints to UCLG. For the first two, both stakeholders and Forest management work in partnership to minimize negative impacts of non-compliant behaviour. For complaints to UCLG, the burden of proof rests on the complainant and credibility is assessed relative to their current level of participation in Forest management or in the management planning process. The management plan was developed using stakeholder collaboration rather than a more consultative process used at the other two sites, lending a public credibility to the management plan that may be absent at the other sites. The management plan also offers a high level of flexibility for recreational initiatives and collaboration opportunities which appears to have resulted in mostly participatory rather than adversarial stakeholder interactions. The shared sense of ownership stakeholders demonstrate in management and planning serves to redirect conflict directly between stakeholders rather than staff serving as the conflict locus which was evident at the other two sites. UCLG has invested heavily in a collaborative forest management approach which, through its partners, has accomplished more than an adversarial or unilateral action could have. The impact of continued non-compliance was observed as a threat to Limerick Forest and has the potential
facilitate adversarial relationships between users groups, between user groups and management, and to encourage reactive management responses.

**Use of LEK and TEK to reduce stakeholder conflict**

The integration of local ecological knowledge into natural science at Frontenac Provincial Park and SLINP has already been described as minor, but it does serve to facilitate stakeholder support for management and planning. Interview participants from SLINP implied that stakeholders attending public meetings (SL1; SL2) do raise concerns regarding management policy by utilizing LEK, an observation also noted by Drummond (2009) but there little evidence that LEK is integrated into management planning for its merit but rather for stakeholder appeasement. Frontenac Provincial Park is able to utilize LEK for both EI monitoring and public participation through their SAR citizen science program but does not appear to play a role in park management, planning, or policy. For Limerick Forest, use of LEK as a tool to promote positive public participation is ingrained in management and also serves to meet environmental management objectives.

Maintaining collaborative and positive relationships with First Nations is a common goal for all three sites. The use of traditional ecological knowledge (TEK) was noted at both SLINP and Frontenac Provincial Park but absent at Limerick Forest. While SLINP appears to use TEK frequently in management decisions (SL3) (Parks Canada, 2010), it was difficult to ascertain if the motivating ideology is: a) strictly policy related; b) necessary for enduring collaboration; c) valued for its role in cultural heritage preservation; or c) recognized for its merit and contribution to western science. Frontenac Provincial Park appears to utilize its duty to consult
with FN as a form of stakeholder appeasement rather than for cultural heritage preservation or for the merit of TEK as an alternative to western science. Frontenac Provincial Park staff also noted that planning policy requires that all park proposals be individually submitted to FN for feedback rather than establishing a more efficient collaborative framework to identify management action or zones requiring closer scrutiny while streamlining proposals with lower impact on FN values. While FN co-management is well documented for northern parks (Brown-John, 2006), additional research should be conducted to investigate the role and relevance of TEK in management and planning for protected areas located in regions with significant colonial and post-colonial impacts, large volumes of EI research, and high population densities. Limerick Forest noted that First Nations have not associated Limerick Forest with any significant cultural heritage and the use of TEK or cultural heritage preservation is absent in the Forest.

**Managing visitor conflict and non-compliance**

The sensitivity to visitor complaints at Frontenac Provincial Park is enhanced by Ontario Parks which places the burden of assumption and a very negative professional association on parks receiving complaints. Park staff tended to employ a level of diplomacy and direct visitor engagement not seen at any of the other three sites which included some soft-enforcement of Ontario Parks’ regulations and policy in order to increase customer satisfaction and minimize complaints. Some evidence of peer enforcement of Park regulation was noted though it was primarily conducted by volunteers with the Friends of Frontenac group.

Unlike legislation at the provincial and federal levels, the Limerick Forest Long Range Management Plan does not grant enforcement powers to Limerick Forest staff leaving Limerick
Forest more vulnerable to user non-compliance (LF1) (United Counties of Leeds & Grenville, 2003). Limerick Forest staff did express frustration regarding the lack of a direct enforcement capability and the non-compliance by a small minority of users. The high level of collaboration between management and stakeholder groups and a shared sense of ownership by Forest users did serve to create a self-regulating environment that included frequent peer enforcement of Forest regulations.

Unlike Limerick Forest and Frontenac Provincial Park, participants from SLINP did not mention any challenges with enforcement of park regulations or issues with non-compliance. It was assumed that the comparatively strong enforcement powers of Park wardens, an organizational culture rooted in procedure, and a greater resistance to the impact of negative public perception, that rigid enforcement of regulations would be observed. Instead, a perceived lack of enforcement was noted with Drummond (2009) stating that there was a perception that park regulations were rarely enforced. Further study should be conducted to reveal how park regulation enforcement is prioritized and what other factors influence Park wardens in their enforcement duties.

**Management Planning and Action**

**Management Planning**

Legislation at each of the three sites explicitly state that management planning cycles must occur on five year frequencies. The management planning cycle at each site consisted broadly of four phases: i) data acquisition through monitoring activities, ii) assessment of key indicators and success of management action, iii) a scoping phase integrating data, public consultation,
and management objectives, iv) development and implementation of the revised management plan (Byford, 2007; Ontario Ministry of Natural Resources, 2009; Parks Canada, 2008). SLINP was the only site that was observed to engage in management planning cycles on the required frequency. SLINP was also noted as having the most active EI monitoring, visitor impact monitoring, and visitor survey programs of any of the sites which it uses to assess the condition of the park against the desired condition and management objectives. The Park also issues a State of the Park document that summarizes the effectiveness of management action which guides the scoping phase of the management planning cycle. Procedural adherence appears to be prominent at the Park with observed examples such as the five year management plan review cycle, utilizing the management plan as a blueprint for management action, and use of EA procedures prior to management action. Though appearing rigid, SLINP does appear to be the most successful of the three sites in achieving its objectives and succeeding in comprehensive long-term planning while still integrating public consultation into management plan reviews. Planning windows are longer, more pro-active, and more detail oriented for virtually every aspect of management planning compared to the other two sites. This level of detail and long term planning provides SLINP staff with a consistent management and planning direction and is supportive of management action with long term, pro-active, and preventative benefits.

At the provincial level, Frontenac Provincial Park shares the same requirement for a five year management plan review cycle, highlighted in the new PPRCA legislation. In practice however, Frontenac Provincial Park has been unable to comply with this directive which has been deferred. Planning resources appeared to be dedicated to areas at greatest threat to
immediate negative impacts (social or environmental) reflecting a reactionary rather than a proactive planning approach. The lack of comprehensive reporting and adherence to the five year management review cycle at Frontenac Provincial Park appears to have a minimal impact on Park management which may be attributed to the relatively stable environmental and social condition at the Park. Despite the lack of current visitor data, Park staff possess significant knowledge and experience acquired through long employment tenure and actively maintain open communication with engaged stakeholder groups. A concern however, is in the lack of integrated management planning at the Park and the potential for small but incremental steps away from an overall desired park condition facilitated by minor but well intentioned reactionary responses to changing conditions.

Limerick Forest also has a stated goal to maintain a five year management planning cycle though not enough time has elapsed to determine if UCLG will comply with that policy. The development of the initial 20 year management plan was necessary to establish a management framework where one had not previously existed. The initial plan addressed complicated issues that included the development of a sustainable forestry plan, delivery of a broad range of outdoor recreation activities to the local community without degrading the recreation resource, and adopting a sustainable environmental plan that preserves the character of the Forest. As a municipality operating a community forest, generating sufficient operating funds and local community acceptance of management decisions were viewed as critical aspects during the development of the management plan (LF1). Progressing forward however, there is evidence that EI, visitor, and forestry related monitoring activities may be insufficient to sustain a relevant management plan. The same issue was noted in Limerick Forest’s initial management
plan, noting a recommendation to improve monitoring activities (Byford, 2007). If UCLG does comply with their objective of regular management planning cycles, there is likely to be a very strong bias towards LEK and stakeholder objectives without sufficient monitoring data to establish an existing condition.

Despite the requirement for regular management planning cycles identified in legislation, it was interesting to note that both enforcement and penalties were self-imposed by all jurisdictions. There an indication of that in the PPRCA, as aspects of the legislation regarding management planning are policy statements rather than legal requirements and there are no penalties for non-compliance (Eagles, 2010). Unfortunately, the lack of investment by Ontario Parks towards achieving Frontenac Provincial Park’s management objectives appears to have resulted in a triage situation resulting in a shared list of management priorities for all the Eastern Zone Office park sites. This was observed as a funding preference towards reactive management action and a focus on issues which have the potential to generate negative public perception. If the continued funding model continues, the Investigator predicts that a review and update of the current 1974 management plan (last reviewed in 1997) is not likely to occur until stakeholders demand it.

**Organizational Structure**

SLINP interview participants (SL1; SL2; SL3) all demonstrated a commitment to the key points in the Parks Canada charter: pursuing an environmental preservation mandate; providing high quality visitor experience opportunities; and educating Canadians about our natural and cultural heritage. The more generous funding received by SLINP in comparison to the other two
sites appears to directly support distinct departments for natural science and visitor experience and a greater number of staff than at the other two sites. SLINP benefits from greater onsite expertise rather than centralized expertise which appeared to facilitate a more responsive approach to management needs. Parks Canada’s Regional Service Centre in Cornwall, Ontario acts as a resource for more specialized expertise but participant SL1 noted that it was often difficult to engage staff at the Regional Service Centre due high workloads, echoing the situation at Frontenac Provincial Park.

In contrast to SLINP, lower funding levels at Frontenac Provincial Park facilitate an organizational culture that is small and cohesive, with on-site staff working closely with southeast zone office staff and working across disciplines to manage Frontenac Provincial Park as a team. Though the small team approach may have originated due to restricted funding at Ontario Parks, it has resulted in a workplace that appears to be more flexible, innovative, and capable of handling the challenges of competing management objectives. Staff are also highly committed to the management ideology defined in the PPRCA (Government of Ontario, 2006), including environmental preservation and outdoor recreation opportunities which draws them together in response to challenges originating through restricted funding and political influence.

Though the Limerick Forest management team is part of the greater UCLG municipal workforce, the team itself is small, consisting of two full time employees and summer students. Financial constraints experienced at the park level has resulted in staff being receptive to, and engaging NGOs and volunteers for internal park activities and fundraising. Limerick Forest’s ability to remain flexible and innovative lies in its roots as a community based organization rather than
an institutional one. Using a less restrictive policy direction to achieve its management objectives, Limerick Forest is able to adapt to unique circumstances by engaging LEK experts, project specific collaborations, and outside professional expertise.

The level of autonomy granted to SLINP and Limerick Forest for adapting policy to unique circumstances, does not seem to occur at Frontenac Provincial Park. Limerick Forest can be characterized as a small organization with limited funding that utilizes flexibility and innovation to implement solutions while SLINP is a large organization with a strong policy direction and sufficient funding to adapt policy to unique circumstances. In contrast, Frontenac Provincial Park combines a strong policy direction with limited financial capability which acts as an impediment to innovation and flexibility despite staff’s efforts. This appears to be aggravated by a more centralized management structure than SLINP that has concentrated expertise to realize efficiencies but now lacks flexibility to adapt management policy to unique circumstances at the site level.

**Workplace Culture**

The workplace culture at SLINP was observed as more hierarchical than the other two sites and concerns regarding job preservation were more apparent, especially in response to the threat of declining funding levels. Individually, interview participants demonstrated they are committed to PCA’s ideology. There were indications of a collective resistance against the use of volunteer labour or collaborative partnerships for recreational and environmental management action within the park. In the face of decreased funding, the workplace culture
appears to favour a reduction in programs rather than exploring innovative ways to do more with less.

Unlike SLINP, Limerick Forest and Frontenac Provincial Park did not appear to exhibit a similar job preservation culture, which could be attributed to a staff perception that each site is already operating with minimal staff. Operating on much smaller budgets than SLINP, both sites rely on fundraising, collaboration, and volunteerism to facilitate management action with staff acting as coordinators in addition to their core responsibilities. Staff at Frontenac Provincial Park did exhibit frustration with the lack of resources available to deliver on management objectives, essentially forcing staff to stand as witnesses to change but unable to act.

With a staff of two and one interview participant (LF1) a characterisation of Limerick Forest’s workplace culture was not possible. It was observed that the expectations placed on staff appeared to be consistent with the resources available for management action and a close relationship with participating stakeholder groups did facilitate a shared management, a quality that was absent at the other two sites.

**Funding and Resources for Management Action**

Frontenac Provincial Park was noted as being the most dependent on visitor associated revenue to fund park management activities. The details regarding funding amounts and sources for Frontenac Provincial Park were not examined during the case study however participant F2 indicated that a substantial proportion of operating funds were derived from revenue generated from user fees, specifically the admission fees collected at Sandbanks Provincial Park.
which are then shared across parks managed by the South East Zone Office. That observation was echoed in Eagles (2010) analysis of the PPRCA and raises a concern that visitor generated revenue may favour initiatives that maximize visitation revenue and diminish environmental initiatives. Frontenac Provincial Park also relies on the Friends of Frontenac volunteer group for volunteer labour and park fundraising which provides assistance in maintaining visitor services and recreation infrastructure. The Friends of Frontenac group was noted as generally opposing further development of the park or initiatives to increase visitation. Volunteers in the group were identified as highly educated, affluent, and politically enabled which, in addition to their management and fundraising contributions to the Park serve to effectively buffer proposals to increase visitor use.

Though SLINP does share a similar objective to Frontenac Provincial Park’s for increasing visitation, it does not appear to be driven by a need to generate revenue despite the user fees. As noted earlier, Parks Canada equates increasing visitation with relevance to the Canadian population and justification for increased political support and funding (Shultis & More, 2011). Participants (SL1;SL2) did note though, that management expectations continued to increase annually without a corresponding increase in funding. With the implementation of 2012 budget cuts to Parks Canada, work should be initiated to observe how SLINP adapts and if the Park can continue to achieve its stated objectives and continue to comply with applicable legislation.

The funding model at Limerick Forest departs significantly from the funding models seen at both Frontenac Provincial Park and SLINP. Limerick Forest is unique in that it generates
revenue from forest resource activities but not from recreational user fees. It is also the site with the fewest employees, the smallest operating budget, and vague environmental preservation objectives. The integration of forestry activities into Limerick Forest with an expectation that revenue generated from resource extraction should balance Limerick Forest’s annual budget does appear to prioritize forestry management over other management activities. Support for recreation management at Limerick Forest employs a more community based approach than the other two sites. While UCLG does contribute materials and some labour towards recreation infrastructure maintenance and development, recreational user groups appear to be the major contributor of labour resources through active volunteerism. This high level of volunteerism allows Limerick Forest to support an extensive trail network and a wide range of recreational activities in a sustainable manner with minimal public funding. This model is popular with a majority of Limerick Forest users who are against the implementation of any user pay systems.

The contribution to recreation infrastructure by recreational user groups was noted as being disproportionately provided by the Bytown Motorcycle Association (BMA). The BMA is the largest activity specific organized user group in the forest and is perceived as having a relatively high impact on recreation infrastructure (Warfield, 1997). In the case of BMA, investment in Limerick Forest appears to be motivated by several factors, all related to the quality of the recreation resource and the cost of maintaining it. By contributing to recreation infrastructure maintenance and development, the BMA is able to maintain a high quality and sustainable trail system where UCLG simply cannot afford to. That provides recreational benefits to other user groups and increases tourism related economic activity in UCLG, meeting two of Limerick
Forest’s management objectives. The investment is fourfold: it meets the immediate recreational need of the BMA, it proactively shifts the burden of overall recreation infrastructure maintenance and development away from UCLG, it contributes towards Limerick Forest’s management objectives, and mitigates the risk of Limerick Forest implementing an activity specific exclusion.
Chapter 6 - Conclusions

The management objectives, goals, and regulations applicable to each of the case study sites are clearly stated in the guiding legislation and management documents, but contemporary protected areas management presents challenges that impede organizations in their attainment of those management objectives and goals. Data collected at each of the three sites highlighted specific challenges, but two major factors were consistent across all sites: a) resources available to land managers are often insufficient to meet management objectives and expectations; and b) engagement of stakeholders, in either a collaborative or adversarial aspect, tend to favour economic and social issues over environmental issues. Regardless of the level of importance and protection granted to environmental features at each site, management objectives with economic or social benefits provided a constant and competing pressure to environmental preservation. Though legislation and supporting documents for each site defines what that balance should be, the sites that were most successful in balancing competing objectives were the ones that provided leadership and funding to facilitate action and a consistent management direction.

It was observed over the course of this project that the state of Ontario Parks, positive or negative, is not widely reported in Ontario. The absence of information in the popular media gives an impression of a park system in good health. The PPRCA (Government of Ontario, 2006) provides a world class framework, consistent with the requirements for IUCN I and II sites. The provincial park system in Ontario also protects areas of exceptional natural heritage and Frontenac Provincial Park, an IUCN II protected area is no exception. The truth, at the site level,
is a park managed on a shoestring budget by staff dedicated to maintaining the vision and goals set out in the PPRCA. Park staff struggle to meet management objectives with the resources available, often defaulting to passive management action in order to allocate resources towards management yielding the highest value. The Park’s management plan, essential to comprehensive and integrated policy implementation, has not been reviewed since 1997 and not substantially updated since it was first issued in 1974 (Bonta, 2005; Hough Woodland Naylor Dance Limited, 1997; Hough, 1974; Ministry of Natural Resources, 1981). Without resources to update the management plan or update visitor data, park staff must guide themselves through management without current and relevant management goals, relying on visitor feedback and professional experience to guide policy and minimize negative feedback. Environmental preservation objectives are achieved through EI monitoring and passive environmental management but with little capacity to engage environmental collaborators or external researchers. When active environmental management strategies are pursued, they appear to consume a disproportionate volume of resources.

Park staff need to continually call on their interpersonal skills as providers of quality customer service for park visitors. They are frequently required to use personal communication, conflict management skills, and diplomacy through the soft enforcement of Ontario Parks’ regulations to improve visitor experience. While exceptional customer service is a key component in the Ontario Parks mission statement, its emphasis and an organizational culture sensitive to negative public perceptions, may result in a trend towards prioritizing recreational objectives over environmental objectives. This trend is supported by a power balance that is in favour of stakeholders and Park users. The burden of proof for public feedback and complaints appears
to rest entirely with local park staff. The strong negative association with negative visitor feedback and a lack of support within Ontario Parks tends to favour visitor/stakeholder supported management objectives and erode objectives that have a negative public perception or minimal public awareness. With few resources to implement any strategic public awareness campaigns, management action is likely to increasingly become pro-stakeholder. The staff at Frontenac Provincial Park do frequently engage stakeholders who have shared recreational and environmental management goals in partnerships to contribute resources towards park management which also appears to have an added benefit of providing a moderate buffer against stakeholders desiring more intensive recreational uses.

The result is a park that is essentially unable to meet its management objectives or the requirements of the PPRCA due to a lack of political will, organizational leadership, and financial resources. The responsibility for any shortcomings are placed entirely on local park management making it difficult for staff to highlight systemic funding issues or redistribute funds towards non-recreational objectives for fear of stakeholder self-mobilisation. Until public awareness regarding the gaps between funding and management objectives can be increased, the current system of management objective triage at Ontario Parks will not improve.

SLINP has been the model for publically managed protected area management in eastern Ontario, protecting world class natural heritage with world class legislation supporting environmental preservation. The park is a leader in regional environmental preservation collaborations with other agencies and organizations depending on SLINP’s expertise and resources. Strong management planning, promotion of environmental research, and the
frequent use of active environmental management strategies set SLINP apart from the other case study sites. Visitors are well provided for with a dedicated visitor experience team and sufficient resources to maintain and develop new infrastructure without eroding competing management objectives. The Park also made highly effective use of strategic stakeholder consultation without allowing the hijacking or eroding of core management objectives. All this appears to be facilitated by a level of funding unparalleled at the other sites.

The more generous level of funding does appear to favour a culture of self-sufficiency with collaborative efforts established only when SLINP lacks direct control, professional expertise, or risks stakeholder self-mobilisation. As funding allocated for Park management changes, the effects on PCA should be observed. How will the scope of SLINP’s work change and will the organizational culture permit the integration of collaborative partnerships to meet resource shortfalls or will the management scope contract and become more insular? How will the potential outcome affect other agencies and organizations with existing funding constraints that currently depend on SLINP’s leadership and resources for regional initiatives? A longitudinal study of the impact of funding changes may be of merit to observe how competing management objectives at the Park will be balanced. Much like the situation at Frontenac Provincial Park, the gap between the level of public awareness and reality of management capability will increase, though recent funding changes are unlikely to result in the inability to meet SLINP’s management objectives.

Managed under the authority of UCLG, Limerick Forest differs from the other two sites by having only a regional commitment to stakeholders and leaving strong environmental
preservation objectives to other agencies. It is managed for the benefit of the community and combines economic, social, and environmental opportunities in a multi-purpose forest.

Management of these community benefits in Limerick Forest is reflected through interactive participation used in developing its management plan and ongoing collaborative partnerships with stakeholder groups. Limerick Forest effectively utilizes stakeholder resources to achieve its management objectives despite the smallest operating budget of the sites studied. Through flexible and permissive management objectives and ongoing communication with stakeholders, Limerick Forest is able to adapt to changing trends and the needs of the local community yet continues to maintain the sustainable use of the forest.

There are potential challenges in the future for Limerick Forest. Recreational use in the Forest continues to grow and though collaborative management efforts currently provide sufficient resources to manage use and ensure sustainable use, future growth may exceed management capacity and require the implementation of new visitor management strategies to avoid degrading visitor experiences and maintain visitor impacts at a level considered sustainable. Environmental awareness in the Forest appears to be predominately derived from the use of LEK. LEK is utilized by management because it is understood and supported by the majority of stakeholders and meets current management needs. The lack of scientific EI monitoring in Limerick Forest impedes the ability of management to identify previously unknown ESA, monitor changes over time, or to evaluate SAR status in the Forest. That approach is justified however, as Limerick’s role as a multi-use forest managed sustainably for the community is more valued than that of an island of environmental preservation.
Publicly managed protected areas carry an expectation that they exist for the benefit of the public which often favours economic and social benefits over environmental benefits. Environmental preservation however is still a critical aspect, especially when our public parks were often created to protect the finest examples of natural heritage. In a political and economic environment that favours reduced public spending, it appears that the remaining financial resources are increasingly dedicated to maintaining a positive public perception of protected areas, one that benefits visitors and enjoys the support of the majority, thus eroding management objectives that do not resonate with the public.

Is the current model, where public institutions are tasked with protecting the finest examples of natural heritage for Canadians while continuing to provide recreational opportunities for visitors, still effective? The funding model for Parks Canada and Ontario Parks is increasingly dependent on ‘use’ based values which favour reactive responses to accommodate visitors’ demand for recreational development. This trend was observed at Frontenac Provincial Park and SLINP in decreasing scopes for active environmental management activities and the recognition that collaboration with recreational stakeholders offers direct management benefits. Limerick Forest also demonstrates a ‘use’ based funding model but in a more appropriate context that remains consistent with its management objectives. Unlike Limerick Forest, both Frontenac Provincial Park and SLINP were established on the principles of ecological value though ‘use’ values have become more prevalent in management. As we move forward, governments must consider how to re-integrate ecological value and ‘use’ value into a funding model that allows management agencies to comply with both management policy and the guiding legislation.
References


Mockford, & S. O’Grady (Eds.), *Ecosystem Based Management: Beyond Boundaries*. *Sixth International Conference of Science and the Management of Protected Areas* (pp. 557-574) Wolfville, NS: Science and Management of Protected Areas Association.


Ref Type: Generic


Appendix A - Queen's GREB Approval

March 22, 2012

Mr. Simon Smith  
Master's Student  
School of Environmental Studies  
Biosciences Complex, Room 3134  
Queen's University  
Kingston, ON K7L 3N6

GREB Romeo #: 6005846  
Title: "GENSC-044-11 Visitor Management Plans in Eastern Ontario’s Protected Spaces: How Does Science Guide Policy?"

Dear Mr. Smith:

The General Research Ethics Board (GREB) has reviewed and approved your request for renewal of ethics clearance for the above-named study. This renewal is valid for one year from April 4, 2012. Prior to the next renewal date you will be sent a reminder memo and the link to ROMEO to renew for another year.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period. An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours. Report to GREB through either ROMEO Event Report or Adverse Event Report Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example you must report changes in study procedures or implementations of new aspects into the study procedures. Your request for protocol changes will be forwarded to the appropriate GREB reviewers and/or the GREB Chair. Please report changes to GREB through either ROMEO Event Reports or the Ethics Change Form at http://www.queensu.ca/ors/researchethics/GeneralREB/forms.html.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Yours sincerely,

Joan Stevenson, Ph.D.  
Professor and Chair  
General Research Ethics Board

c.c.: Dr. Graham Whitelaw, Faculty Supervisor
Appendix B - Notes from an informal interview with equestrian users in Limerick Forest

Limerick Forest (Nov. 2/2011) – South Forest Area #2.

Observations and informal conversation with visitors participating in equestrian activities

Conversation with three equestrian riders at trail head. I had noticed on October 29th that no horse trailers were parked at Area #1 on either October 29th or November 2nd. Also, there was no evidence of on-trail of horse waste or hoof prints in Area #1 on November 2nd. At Area #2, horse trailers were present on both days.

Three female riders on horses just setting out for a ride. Local, from Oxford Mills. They had ridden every day this week.

After introducing myself, I asked if they preferred Area #2 because of fewer motorized users. Essentially, were motorized users zoning themselves to Area #1 and horses to Area #2.

Answer: Motorbikes use both areas equally. Equestrian use Area #2 because of the availability of loops rather than out & back trails. Area #2 is also less hilly and more desirable for the horses. All the motorbike users are very courteous, stopping their bikes (& engines), and often removing their helmets while the horses pass. Horse encounters with motorized users is less frequent in the summer because a) equestrian arrive and leave early b/c of high temperatures, b) fewer overall visits by equestrian because of bugs. Motorized arrive later in the day. Encounters are more frequent in fall because horse and motorized are using the forest at the same time. Tolerance and accommodation appears to be practiced by both user groups (education, trail etiquette, tolerance, visitor densities may all be factors here? ) . Case in point: 60 equestrian on September 27th for an organized ride. The equestrian group requested that the motor bike group to stay out of Area #2 for a portion of the day because of less experienced equestrian riders visiting. Impression of equestrian users was very good compliance (no incidences). Equestrian understand that they do not have any user fees to use the forest while the motorbikes pay an $80 annual fee (not to Limerick directly, possibly By-town or OFTR?) so voluntary one day access restriction is a sacrifice.

Asked how mountain bikers accommodate equestrian?

Answer: No specific issues/incidences but not effusive about good relationship (may be slightly negative relationship or encounters not frequent enough?). Bright colours and helmets bother horses as does sneaking up from behind without verbal warnings. For mountain bikes, preference of equestrian is to have bikes pull off to the side and talk to the riders as the horses pass (does this come from a repetitive issue? What is the MTB education level of Limerick MTB users?)

General conversation:
I related my research to give further context to my questions. Also indicated I have talked with the Forest Manager.

I was asked who cleans up garbage dumped by the side of the road. Answered that the Forest Manager contacts the County to clean-up. Friends of Limerick members often contact the Forest Manager if they spot dumped garbage.

I was asked about trail maintenance...who does it? Answered that some is done by the Forest Manager but most is done by the By-Town motorbike volunteers. Equestrian indicated that they also do trail cleanup, specifically clearing more head room because people on horses are taller than motorbikes.

Discussion of user fees. Equestrian were not in favour of user fees. Felt a payment in kind with volunteer horse and commitment in cleaning up and minimizing impact was sufficient. They even clean-up horse waste at parking site. User fees for other jurisdictions (i.e. Ganaraska) gauged towards impact level was an interesting idea but not desired.

Discussion of zoning. Did not seem to be a desired feature for Limerick. Status quo seems to be ok with equestrian users. Except for ‘whoop-de-doos’ on fireroads (hard on horses back), trail preferences in Area #2 were compatible between the two groups. Conflict between groups does not seem to be an explicit issue.

Discussion of visitor use at Limerick: All were aware that little actual user data existed for who is using the south forest.

Discussion of motorbike users: Understanding that OFTR has seen significant restrictions in access regionally. OFTR are ‘bending over backwards’ to maintain a good working relationship with management and other users.

Discussion of north forest & other forest blocks: Their thought was the north forest near Merrickville was more suitable for mountain bikes because it was rockier. North forest also offered better opportunities for hikers & nature viewers. Said a boardwalk was recently completed in one of the north forest tracts. Rockier terrain was not good for their horses...sandy was preferred.

Discussion of winter use: They had talked with representatives of snowmobilers in Limerick forest about the impact of horses on the groomed trails. Equestrian were worried that b/c of ATV ban on groomed trails that horses would be a problem. Snowmobilers were not concerned with hoof prints or horse waste on the trail. ATV issue is likely a vehicle control/speed and by extension safety and liability concern. Some concern over education level of snowmobilers for horse interactions b/c it is not a traditional encounter. Some mention of XC skiing not compatible with hoof prints on trails but XC skiing is a secondary use of snowmobile trails.