



Research Strategy Ontario Parks, Northwest Zone 2007



Northwest Zone

Research Strategy (2007)

This research strategy will be used to guide research projects throughout the Northwest Zone following 2006. The strategy will be reviewed periodically and updated as required to reflect current knowledge.

I am pleased to approve this Research Strategy for the Northwest Zone of Ontario Parks.



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Zone Manager
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Date of Approval

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Cover illustration: Woodland caribou/snowshoe hare exclosure project, Slate Islands Provincial Park (photo taken by Steve Kingston).

EXECUTIVE SUMMARY

Ontario Parks recognizes the merit of both pure and applied research as a basis for making responsible planning and management decisions. Relevant provincial legislation and policy document the importance of scientific research, as well as the value of parks and protected areas in providing points of reference to support the monitoring of ecological change on the broader landscape. The active adaptive management approach also recognizes the critical role of protected areas as benchmarks (controls) for the broader landscape, where various management prescriptions are experimentally compared by evaluating alternative hypotheses (treatments) about the system being managed. This approach can also be practiced within parks through appropriate zoning to design robust experiments and scientifically evaluate park management practices. If properly implemented, the adaptive management approach will provide resource managers, including park managers, with scientifically defensible information to help them make management decisions.

A critical component of this strategy is the Northwest Zone Research Strategy Questionnaire in that it was designed to: 1) evaluate the current status of research in Northwest Zone parks, 2) provide a means of tracking changes in the status of research over time, and 3) generate a list of research needs, resources available, and ways to encourage research in Northwest Zone parks. Responses to the questionnaire demonstrated that research is highly valued by Ontario Parks' managers and planners in the Northwest Zone and has been relevant to their decision making. All eleven respondents were willing to commit staff time and park resources, as well as be directly involved with research in their parks. The highest ranked research need categories were life science and cultural, followed by socio-economic, recreation, and earth science research. A list of research needs, resources available, and ways to encourage research in Northwest Zone parks are provided as appendices in this strategy.

The overall goal of this strategy is to foster a research milieu that focuses on protected areas and surrounding landscapes, to provide useful, relevant, and timely information to help decision makers, including park managers, meet the principle of the maintenance of ecological integrity as specified in the new Provincial Parks and Conservation Reserves Act (2006). Based on this goal, three directly related and measurable objectives are identified in this strategy: 1) Increase the number of research projects occurring in the Northwest Zone, 2) Increase the usefulness and relevance of research for decision makers (e.g., park managers) in the Northwest Zone, and 3) Increase the number of research partnerships in the Northwest Zone. Each objective will be re-evaluated in five years through the Northwest Zone Research Strategy Questionnaire to measure the effectiveness of this strategy.

Strategies that help to meet the overall goal of this research strategy are described and explicitly linked to the objectives. The five strategies are: 1) Identify research needs, 2) Build partnerships, 3) Promote research needs, 4) Practice adaptive management and 5) Improve our information management capabilities. Implementation of these strategies will be dependent on staffing and funding levels, availability of partners and general interest from the scientific community, as well as the continuing support of Northwest Zone park managers to help researchers provide useful, relevant, and timely information that will help decision makers meet the principle of the maintenance of ecological integrity as specified in the Provincial Parks and Conservation Reserves Act.

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1.0 INTRODUCTION

Ontario Parks recognizes the merit of research as a basis for making responsible planning and management decisions (Ontario Parks, 1997). The need for overall direction for research activities was identified in the initial Northwest Zone Research and Information strategy (Ontario Parks, 2000). Since that initial strategy, several MNR documents have been developed and updated (e.g., Provincial Parks and Conservation Reserves Act, Ontario Biodiversity Strategy, Our Sustainable Future, Science for Our Sustainable Future) that provide direction for research in Ontario Parks. This document revises and broadens the previous Northwest Zone research strategy. Many of the concepts and structural components of this strategy were also based on those found in: the South Eastern Zone Research Strategy (Ontario Parks, 2001), the draft Southwestern Zone Research and Information Strategy (Ontario Parks, 2002), and the Central Zone Research and Information Strategy (Korol 2004).

1.1 Legislative and Policy Context

The Provincial Parks Act was recently updated to the Ontario Parks and Conservation Reserves Act, 2006. This new act enshrines some of the previous policies of Ontario Parks in legislation. The purpose of the act is to “permanently protect a system of provincial parks and conservation reserves that includes ecosystems that are representative of all of Ontario’s natural regions, protects provincially significant elements of Ontario’s natural and cultural heritage, maintains biodiversity and provides opportunities for compatible, ecologically sustainable recreation” (Provincial Parks and Conservation Reserves Act, 2006). Following this purpose, the maintenance of ecological integrity is the first priority and guides all aspects of the planning and management of Provincial Parks and Conservation Reserves.

Several sections of the new legislation relate directly to research. For example, one of the objectives of establishing and managing both provincial parks and conservation reserves is:

“To facilitate scientific research and to provide points of reference to support monitoring of ecological change on the broader landscape”.

(Provincial Parks and Conservation Reserves Act, 2006)

Furthermore, the objectives of nature reserve, cultural heritage, and aquatic class parks specifically mention their role in supporting scientific research.

“Applied research and sharing of scientific and technological knowledge and innovative technologies must be fostered to support the sustainable development of natural resources”.

(MNR, 2005a, p. 7)

Our Sustainable Future (MNR, 2005a) and the related science strategy, *Science for Our Sustainable Future* (MNR, 2005b), both identify science as one of the key tools to support decision making and policy development and note the importance of incorporating science staff expertise into the policy development process.

Ontario Parks directives PM 2.45 and PM 2.45.01 address research activities in parks. The purpose of the policies is to provide overall direction for research activities associated with provincial parks, including guidelines and review/approval processes. The policies clearly state

that a research application must be completed for: 1) any research project proposed by researchers outside MNR and 2) any project proposed by MNR staff which has potential for adverse effects on park resources or visitors.

1.2 Context

The geographical extent of the Northwest Zone administrative unit ranges from the United States border in the south, north of Big Trout Lake; and from approximately Marathon in the east, west to the Manitoba border (Figure 1). Northwest Zone is the second largest administrative zone of Ontario Parks at approximately 4.2 million hectares (43% of the provincial area). By number, Northwest Zone is responsible for the planning and management of 178 (27%) of the province's 654 protected areas (i.e. provincial parks, conservation reserves, wilderness areas). By area, the Northwest Zone contains a very large proportion of the province's nature reserve (59%), wilderness (48%), and waterway (64%) class parks (Table 1). Four of the six largest provincial parks in Ontario are located in the Northwest Zone: Wabakimi, Quetico, Opasquia, and Woodland Caribou.

Table 1: Provincial representation by park classification in the Northwest Zone (as of December, 2006).

Park Classification	Province		Northwest Zone		Provincial Representation of Northwest Zone	
	Area (ha)	Number	Area (ha)	Number	% Area	% Number
Wilderness	4,823,745	8	2,306,885	5	48	63
Nature Reserve	114,354	108	67,697	42	59	39
Natural Environment	1,462,954	79	84,111	17	6	22
Waterway	1,444,618	62	930,716	21	64	34
Recreation	36,756	66	1,813	7	5	11
Historical	6,735	6	0.00	0	0	0
Total	7,889,163	329	3,391,221	92	43	28

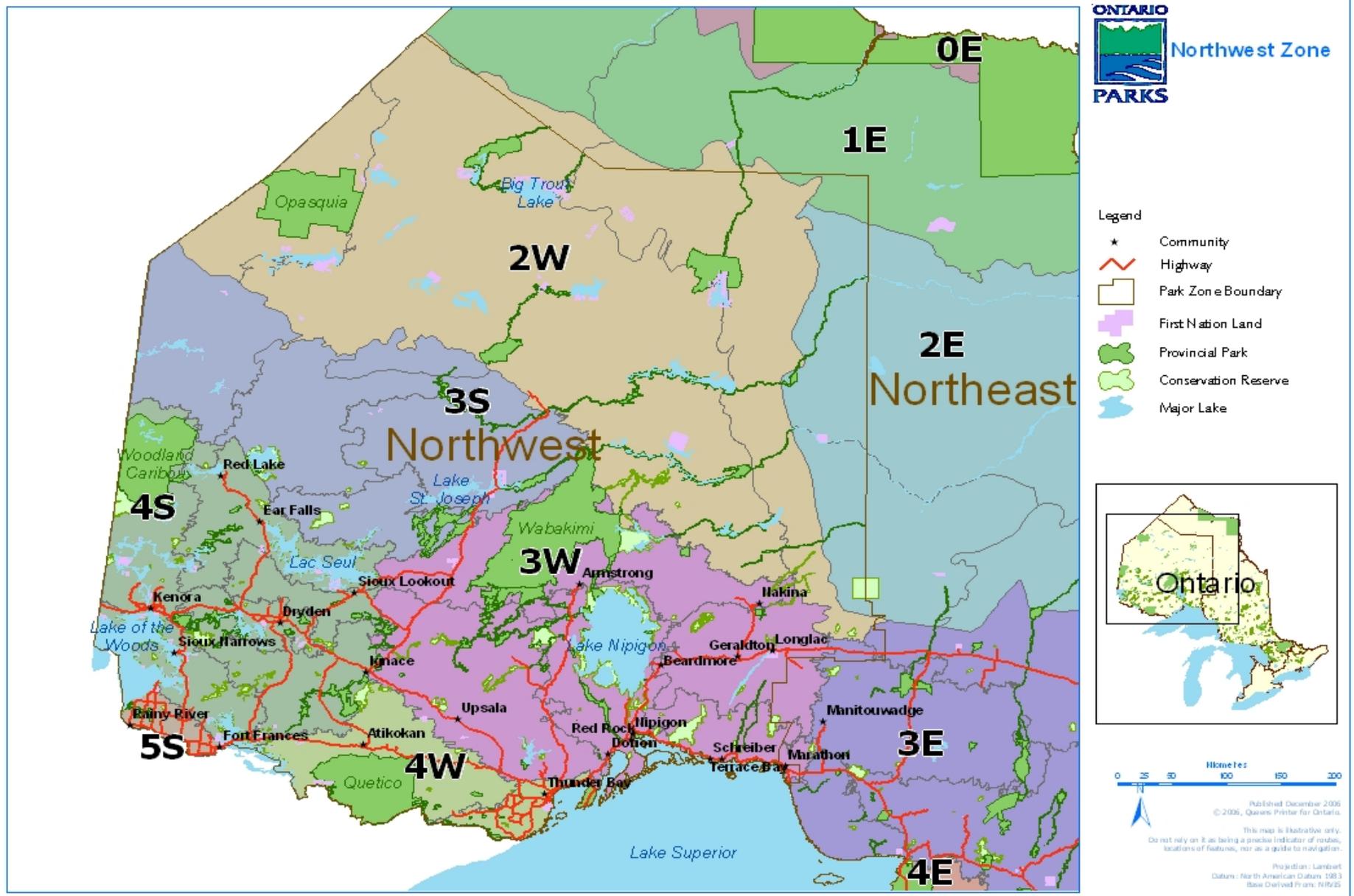
The large extent of the Northwest Zone captures a great variety of ecological areas with varying earth science and life science features. This diversity can be noted by the variety of ecological regions within the zone boundary. A large proportion of the zone is within the Ontario Shield Ecozone (Ecoregions 2W, 3W, 4W, 3S, 4S, 5S, 3E), with a smaller section within the Hudson Bay Lowlands Ecozone (Ecoregions 1E, 2E) (Figure 2). A total of 29 ecodistricts either totally or partially overlap the Northwest Zone.

From a recreation perspective, Northwest Zone parks hosted 722,880 visitors in 2005, including 320,000 day-use visitors and 402,067 camper nights (MNR 2006). There are 18 operating and 74 non-operating parks in the Northwest Zone. Six of the operating parks are operated under a contract agreement.

Figure 1: Northwest Zone Geographical Extent



Figure 2: Ecoregions of the Northwest Zone



1.3 Past and Current Research

Traditionally, the Northwest Zone has received limited attention from researchers. Mulrooney *et al.* (1999) examined all approved research projects (n=1059) in provincial parks from the 1930s to 1997. With only 93, or 9%, of the projects, Northwest Zone ranked fourth out of the six zones with Algonquin having the majority at 399, or 38% of the projects. The general historical trend for research activity has been an increase toward a peak during the 1970s. This period coincided with a rapid expansion of the Parks system and a high point in the environmental movement (Mulrooney *et al.*, 1999). Approved research projects have declined sharply since this peak period. The vast majority of research has focused on life science projects (n=785, 82%); other categories (i.e., earth science, social science, integrating disciplines, planning, technical) have contributed the remaining 175 (18% of the total) projects.

At the time of writing this document, 11 and 13 research proposals were on file at the Northwest Zone office for 2006 and 2005 respectively. The majority of the research occurred in Quetico (10) followed by Kakabeka Falls (3), Slate Islands (3), Sleeping Giant (3), Neys (2), Ruby Lake (1), Pakwash (1), and English River (1).

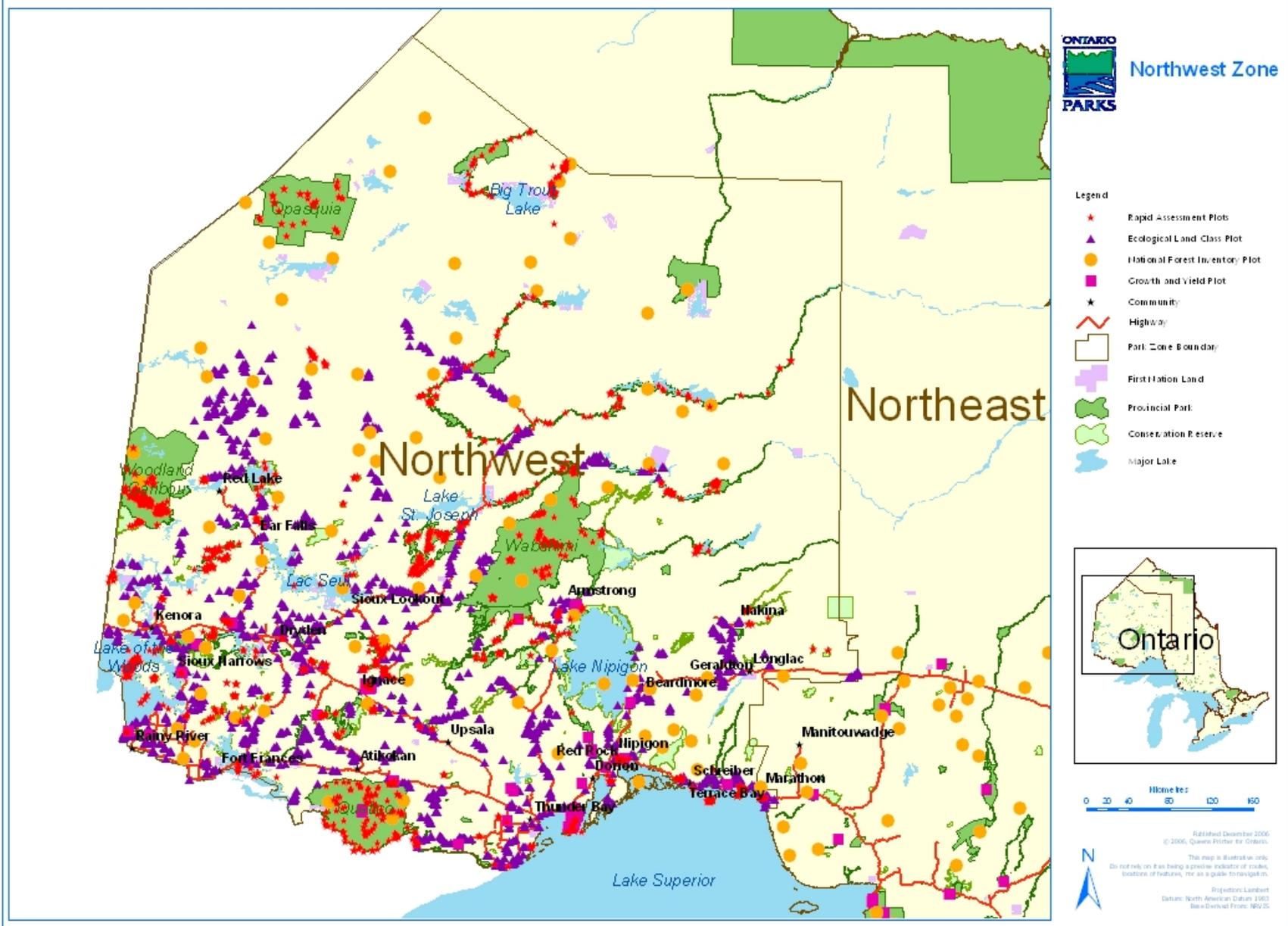
In addition to the 24 research projects mentioned above, the zone office has taken the lead on four long-term research projects:

1. A caribou/snowshoe hare exclosure project at Slate Islands Provincial Park to evaluate the effects of herbivory in a predator-free/predator-limited environment.
2. A passive adaptive management project to evaluate potential disturbance to peregrine falcon nesting from future development at Ruby Lake Provincial Park.
3. A caribou metapopulation study to understand the genetic structure of woodland caribou across Ontario.
4. A bat hibernacula monitoring project at Cavern Lake Provincial Nature Reserve.

As with the historical trend, the majority of the current research (n=28) in the Northwest Zone is life science focused (n=25, 89%) with two earth science projects (8%) and one cultural-science project (4%).

Several ongoing government led inventory and monitoring programs can provide valuable information for research projects. Three of the main vegetation and/or soil inventorying and monitoring projects that are useful to Ontario Parks in the Northwest Zone are: 1) Rapid Assessment Plots – rapid vegetation and soil assessments based on Ecological Land Classification procedures, 2) Ecological Land Classification Plots – vegetation and soil assessments used for classifying forest and wetland communities, and 3) National Forest Inventory – a nationally consistent, plot based system to monitor traditional forest inventory attributes (Figure 3).

Figure 3: Research Plot Locations in the Northwest Zone



1.4 Adaptive Management Approach

“Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Its most effective form - ‘active’ adaptive management - employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.”

Nyberg, 1998, p.1

The main premise behind adaptive management is that ecosystems, including park ecosystems, are complex and dynamic (Nyberg, 1998). The result is that our understanding of these ecosystems and our ability to predict how they will respond to our management actions is very limited. These knowledge gaps lead to uncertainty over how best to manage our parks and protected areas to meet the obligation of maintaining ecological integrity specified in our legislation. Despite these uncertainties, however, park managers must make decisions and implement plans. Adaptive management is a way for park managers to proceed responsibly in the face of such uncertainty, as it provides a sound alternative to either ‘charging ahead blindly’ or ‘being paralysed by indecision’, both of which can foreclose management options, and have social, economic and ecological impacts (Nyberg, 1998).

In its most pure form, active adaptive management treats the ecosystem as an experiment with different management prescriptions representing treatments. Parks and protected areas play a critical role for active adaptive management on the broader landscape by potentially providing the critical benchmarks (controls) that allow for the evaluation of these broader landscape management prescriptions. This value of parks and protected areas is identified in the new Provincial Parks and Conservation Reserves Act (see section 1.1).

Protected area managers can also take advantage of the adaptive management approach at the individual park scale through the careful consideration and implementation of management prescriptions within a protected area to be used as treatments in the adaptive management framework. Park zoning provides an important tool to provide managers and researchers with opportunities to design robust adaptive management experiments. For example, by the very nature of the high level of protection placed on Nature Reserve zones, they can provide the critical control areas (i.e., reference points) to evaluate park management options within the park boundaries.

Implementing an adaptive management approach not only allows researchers to design robust experiments to evaluate management options, but also provides park managers with directly relevant and scientifically defensible information to help them make management decisions.

2.0 NORTHWEST ZONE RESEARCH STRATEGY QUESTIONNAIRE

2.1 Questionnaire Purpose

The Northwest Zone Research Strategy Questionnaire (see Appendix 1) is a critical component of this strategy in that it was designed to: 1) evaluate the current status of research in Northwest Zone parks, 2) provide a means of tracking changes in the status of research over time, and 3) generate a list of research needs, resources available, and ways to encourage research in Northwest Zone parks. The first section of the questionnaire (i.e., questions 1-9) asked respondents for their opinions related to research activities in their parks based on an ordinal ranking scheme. The second section of the questionnaire asked open ended questions related to research. The questionnaire was completed in November 2006 by the zone manager (n=1), zone planners (n=2), and park superintendents in the northwest zone (n=8). The intent is to have the same positions complete the questionnaire in 5 years (i.e., 2011) to re-evaluate research in Ontario Parks including an evaluation of the goal and objectives of this strategy (see sections 3.0 and 4.0 of this report).

2.2 Questionnaire Results

Responses to the first section of the questionnaire demonstrated that research is highly valued by Ontario Parks' managers and planners in the Northwest Zone and has been relevant to their decision making (Figure 4). All respondents were willing to commit staff time and park resources, as well as be directly involved with research in their parks. The highest ranked research need categories were life science and cultural, followed by socio-economic, recreation, and earth science research. Most respondents believed that they were actively promoting research in their parks. The only indecisive answer from the respondents related to the amount of staff time that was committed to research in their parks.

Responses to the second section of the questionnaire were grouped into categories and compiled with additional comments from the Northwest Zone Meeting held November 7th and 8th, 2006 in Thunder Bay, as well as comments from a meeting of the ecologists and biologists in the zone held on September 27th, 2006 in Thunder Bay. Responses to the open ended questions are listed in Appendix 3-8 (see Table 2).

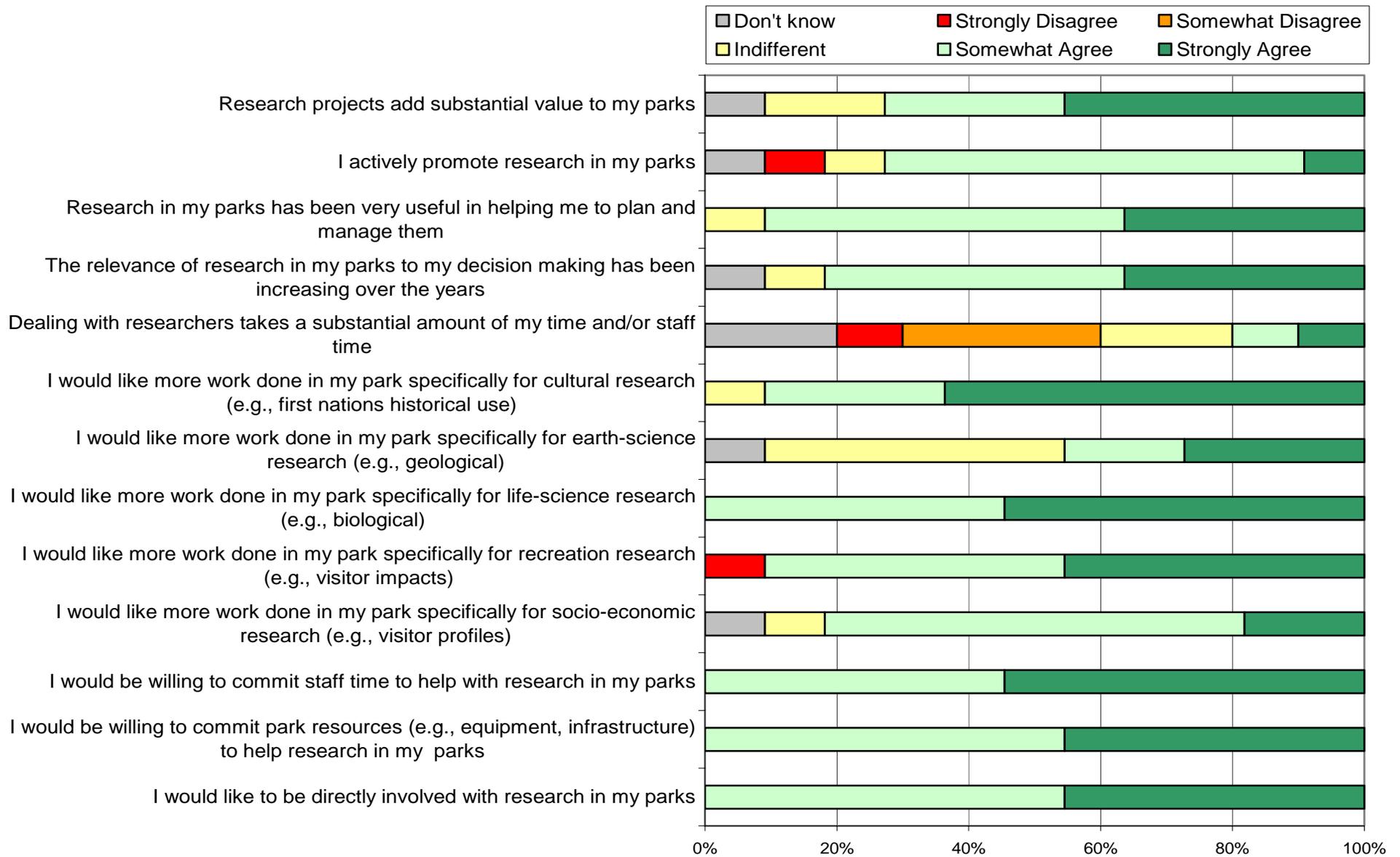


Figure 4: Results of Northwest Zone Research Strategy Questionnaire for ordinal questions (i.e., questions 1 to 9) from zone manager, zone planners, and park superintendents of the northwest zone (n=11).

Table 2: List of Northwest Zone Research Strategy Questionnaire open ended questions and the corresponding appendix with the list of responses.

Northwest Zone Research Strategy Questionnaire question	Appendix	Page #
10) The five priority research needs for my parks are	3	22
11) The five best ways that Ontario Parks can encourage research are	4	24
12) The main resources that I can make available to researchers in my parks are	5	25
13) If you answered “somewhat agree” or “strongly agree” to question 5 above, please list how you and your staff time is consumed by research in your park	6	26
14) If you answered “somewhat agree” or “strongly agree” to question 9 above, please explain how you would like to be directly involved with research in your parks	7	27
Please add any additional comments that you think are relevant	8	28

3.0 GOAL

This Research Strategy has been prepared to help coordinate and facilitate research conducted in Northwest Zone provincial parks and environs to maximize their associated benefits given the limited funding and resources available. Ontario Parks recognizes the need and importance for research, science, inventorying, monitoring and assessment activities in order to make responsible decisions regarding park management, planning and operating practices. The focus of this strategy is on the research in parks and protected areas within the Northwest Zone, but is not limited to that geographical extent as many processes and issues extend far beyond park zone boundaries (e.g., climate change, invasive species, acid rain, fauna migratory routes, water flows). In order to protect the values within parks, a greater park ecosystem approach is often advocated (e.g., Slocombe and Dearden, 2002). Both pure and applied science are valued by Ontario Parks, Northwest Zone, because they provide the fundamental understanding required to make sage park planning and management decisions and meet our legislated commitments, including the maintenance of ecological integrity.

3.1 Overall Goal

The goal of this strategy is to foster a research milieu that focuses on protected areas and surrounding landscapes, to provide useful, relevant, and timely information to help decision makers, including park managers, meet the principle of the maintenance of ecological integrity as specified in the Provincial Parks and Conservation Reserves Act (2006).

4.0 OBJECTIVES

The Northwest Zone research objectives are to:

4.1 Increase the number of research projects occurring in the Northwest Zone.

The amount of information that decision makers need to be confident that their planning and management actions are meeting the principle of the maintenance of ecological integrity far exceed the quantity of research currently occurring in Ontario Parks in the Northwest Zone; thus an objective of this strategy is to increase the amount of research occurring in the Northwest Zone. This objective will be measured by tracking the number of approved research permits that are on file in the Northwest Zone office on an annual basis. The approved permits will also be categorized (e.g., life science, earth science, cultural science, socio-economic) and tracked by category. An increase in the number of approved research permits over the next five years would demonstrate an accomplishment of the first objective. Increases in some of the historically neglected categories (e.g., cultural science, earth science, socio-economic) would also be an accomplishment.

4.2 Increase the usefulness and relevance of research for decision makers (e.g. park managers) in the Northwest Zone.

Sound decision making requires not only much more research to occur in parks, but for research to be focused on projects that will help the decision makers meet the principle of the maintenance of ecological integrity. This objective will be measured by tracking the responses from park superintendents and other park planners and managers, to the 'Northwest Zone Research Strategy Questionnaire'. The questionnaire will be completed in 2006 and again in 2011. Insights into the accomplishment of objective 2 can be tracked over the five years through responses to questions 1, 3 and 4 (see Section 2.0 & Appendix 1) of the questionnaire.

4.3 Increase the number of research partnerships in the Northwest Zone.

Research partnerships between Ontario Parks and other agencies can be effective in increasing the number of research projects, and helping to ensure they meet the needs of decision makers. Thus, research partnerships will be essential to the success of meeting the overall goal of this strategy. This objective will be measured by tracking the number of partnerships identified in the approved research permits on file in the Northwest Zone office, as well as those described in the yearly planning and research budget. Partnerships can include, but are not limited to: universities (e.g., Lakehead, Trent, Guelph, Waterloo), colleges (e.g., Confederation), other branches in the MNR (e.g., Species at Risk Unit, Lake Superior Management Unit, Centre for Northern Forest Ecosystem Research), other governmental agencies (e.g., Ministry of the Environment, Parks Canada), non-governmental agencies (e.g., Ontario Nature, Ducks Unlimited Canada), and industries (e.g., tourism, forestry, mining).

5.0 STRATEGIES

The following strategies set direction for meeting the above goal and objectives and are not listed in terms of their priority, although some are sequential in nature:

5.1 Identify Research Needs

The identification of the research needs of park managers, as well as other zone and park staff, will be crucial to meeting the goal and objectives of this strategy. The Northwest Zone will need to clearly understand its research needs so that they can be communicated to other potential partners in the hope of increasing the resources available to complete research projects. Many groups may be interested in partnering with Ontario Parks, but are simply not aware of our research needs. This strategy will help meet the goal (3.1) and all of the objectives (4.1, 4.2, and 4.3) of this report.

5.1.1 Utilize the 'Northwest Zone Research Strategy Questionnaire' to identify current and future research needs

The 'Northwest Zone Research Strategy Questionnaire' provides a start to identifying current needs in the Northwest Zone (see Section 2.0). Specifically, questions 6 and 10 provide insights, which in combination with other discussions (e.g., Northwest Zone Annual Fall Meeting) has helped to create a list of research needs that will be made available to potential partners. The list is not static nor a priority listing, but a 'living document', in that it will be constantly updated as new needs arise. The current list of research needs can be found in Appendix 2.

5.1.2 Establish and distribute a list of current research needs in electronic format

An electronic copy of current research needs will be made available to potential partners and other interested parties via the Internet on the Ontario Parks website. This list can then be updated to reflect changes as new needs arise and existing needs are met.

5.1.3 Seek guidance on research direction

Although the identification of research needs has begun with staff working in the Northwest Zone, guidance will also be sought from members of the academic community, individuals from Ontario Parks Planning and Research Section, as well as from active researchers in other MNR branches and natural resource management agencies. By engaging other individuals working in related fields, we can identify shared and additional issues. This will allow us to obtain a more holistic view of current issues and areas of research interest facing protected areas, and can provide an early warning of issues that parks and protected areas in the Northwest Zone may be faced with in the future.

5.2 Build Partnerships

In order to attract and implement relevant research in the Northwest Zone, we will need to engage researchers, by providing them with a clear statement of goals and research needs, improving connections with existing partners, offering partnership opportunities, and expanding the existing range of partners. This strategy will directly help meet the goal (3.1) and objective 4.3 of this report.

5.2.1 Create a list of potential partners

One of the first steps in expanding our network will be to create a list of potential contacts at various government agencies, including land managers in adjacent regions and jurisdictions, such as the United States and Manitoba. Once created, this list can be used as a starting point to forming new partnerships with other interested individuals.

5.2.2 Establish a local research network

Before reaching out to the larger community, involving researchers from our local community is a logical first step in building a research network. Geographically, Lakehead University and Confederation College are our closest links to the academic community and at present represent the only two post-secondary institutions located within the Northwest Zone. Other members of our local research network include Science and Information Branch, other MNR program areas (e.g., Species at Risk Unit, Lake Superior Management Unit, Centre for Northern Forest Ecosystem Research), other governmental agencies (e.g., Ministry of the Environment, Parks Canada), non-governmental agencies (e.g., Ontario Nature, Ducks Unlimited Canada), and industries (e.g., tourism, forestry, mining).

5.2.3 Organize an annual workshop to discuss research goals and needs

To foster partnerships and build relationships, the Northwest Zone could organize an annual workshop with interested individuals from the research community, in which individuals present an overview of work that has been carried out in Ontario Parks, as well as discussing future research needs and partnerships. In this way we can work together with researchers to develop new projects, build on existing relationships, establish interest early on for developing partnerships for various projects, as well as having a larger pool on which to bounce ideas off of.

5.2.4 Nurture relationships and encourage scientists to conduct research in parks

Effective communication between Ontario Parks' Northwest Zone staff and researchers is critical to ensuring good relations, and to increase scientist's understanding of the value and risks of science in parks, the kinds of research appropriate in parks, and the level of support that can be provided. Once partnerships have been established, Ontario Parks must continue to work closely with researchers by helping them to understand the processes in place for undertaking research in parks. This includes providing clear permitting guidelines, and providing guidance on what activities are allowed in various zones within different park classes. Ontario Parks could also prepare a brief welcome package that contains a note of welcome and encouragement, a list of current contact information for various park personnel, and descriptions of logistical support that may be available.

5.3 Promote Research Needs

Ontario Parks actively promotes the value of research through its legislation (see legislative and policy context section) and policy statements (MNR, 1992). This high level promotion of research in Ontario Parks provides a framework to encourage research. Strategies such as this one can provide more specific direction to help link researchers (both internal and external) with the needs of the decision makers, including park managers. Thus, a focus of this strategy is to promote our research needs to the variety of potential partners that can provide useful, relevant, and timely information to decision makers, including park managers. This strategy will directly help meet the goal (3.1) and objectives 4.1 and 4.3 of this report.

5.3.1 Develop a list of promotion methods

The Northwest Zone Research Strategy Questionnaire provides a start to compiling a list of ways that Ontario Parks can encourage research (Question 11), as well as provide a means of tracking the general level of the promotion of research by Ontario Parks staff in the Northwest Zone (Question 2, see Appendix 1). The list will not be static or a priority listing, but will be constantly updated as various promotion methods are used or new methods are identified. The current list of promotion methods are listed in Appendix 4.

5.3.2 Establish a website that advertises our desire to work with others

In addition to the above methods of forming partnerships, the Ontario Parks website can be used to advertise our desire to work with others on various projects. This site could also provide some guidance as to the types of support that Ontario Parks can provide, and can give some information on who to contact to initiate research in the northwest.

5.3.3 Active participation in PRFO

One avenue to stimulate research interest in Northwest Zone parks, as well as protected areas in general, is for Northwest Zone and park staff to continue being active participants at the Parks Research Forum of Ontario (PRFO). This forum is an annual meeting with the purpose to promote and facilitate park and protected area research (<http://www.prfo.ca/>). Membership in PRFO includes: Ontario Parks, Parks Canada, University of Waterloo, The University of Western Ontario, York University, Lakehead University, The University of Guelph, Trent University, Canadian Council on Ecological Areas, and Ecological and Monitoring Assessment Network.

5.3.4 Promote research in parks in the Northwest Zone and other jurisdictions

To expand beyond our existing range of partners, the Northwest Zone will need to actively promote research in our parks to our neighbours (e.g., academic and governmental institutions within Ontario and beyond). As a starting point, partnerships should be sought with researchers in other parts of Ontario, as well as individuals in Manitoba and the United States. Although we are somewhat isolated geographically, several of the parks located in the Northwest Zone have international appeal because of their relatively large, intact wilderness areas. Promotion in other jurisdictions could include the establishment of an e-mail distribution list to broadcast our research needs to potential partners.

5.4 Practice Adaptive Management

Practicing the adaptive management approach (see Section 1.4) requires careful consideration by park planners, managers, and researchers so that the greatest benefit can be realized. When implemented appropriately, the adaptive management approach can provide park managers with directly related, scientifically defensible information to help them make management decisions. The adaptive management approach is also an efficient management approach in that it provides the fastest rate of knowledge return compared with other forms of management, and in its most effective form (active adaptive management) can establish cause-effect relationships. This strategy will directly help meet the goal (3.1) and all three of the objectives (4.1, 4.2, and 4.3) of this report.

5.4.1 Consider the adaptive management approach in park management planning

Park management planning sets direction on resource stewardship, operations, and development within provincial parks. Zoning is the main tool used to spatially set this

direction in parks and provides a great opportunity for designing robust experiments using the adaptive management approach. Nature reserve zones, for example, are given a high level of protection and thus can provide critical control areas (i.e., reference points) to scientifically evaluate park management options within the park boundaries, as well as evaluate the effects of management actions outside of park boundaries. Within the park management planning process, the delineation of zones, particularly nature reserve zones, should consider and promote the value of research and the adaptive management approach.

5.4.2 Promote the adaptive management approach to researchers and park planners and managers

While not directly appropriate for all research projects (e.g., pure science), the adaptive management approach should generally be encouraged as this approach can provide managers, including park managers, with scientifically robust and directly relatable results.

5.5 Improve our Information Management Capabilities

Information is an important asset that needs to be managed properly to ensure that it is not only captured and stored correctly, but also that it is efficiently disseminated to the appropriate managers, planners, researchers, and decision makers. Currently, several tools are available or being developed to assist in Information Management related to research. This strategy will directly help meet the goal (3.1) and objective 4.2 of this report, and will help track our progress towards meeting objective 4.1.

5.5.1 Establish and maintain a system for secure storage of data and research reports

The Ontario Parks website hosts the application to conduct research in Ontario Parks (<http://www.ontarioparks.com/english/form2.html>). This application can be completed and forwarded to Ontario Parks online for approval. The new Ontario Parks Gateway will provide a means of storing and querying actual research reports (<http://lrctptbogs00005:8181/imf-ows/imf.jsp?site=parksgateway>). The new Ontario Parks Inventorying and Monitoring Database provide a means of storing and querying both systematically and non-systematically collected life science and recreation information. Finally, the Natural Resource Values Information System (NRVIS) is the MNR's standard tool used for storing, querying, and editing spatial information (<http://intra.omafra.gov.on.ca/lrcluster/nrvis/index.htm>).

5.5.2 Track changes in the status of research in the Northwest Zone

@PAR provides a tool to enter and track the status of research projects in Ontario Parks (<https://secure.lrc.gov.on.ca/webapp/mnradministration/login.jsp>). The 'Northwest Zone Research Strategy Questionnaire' provides a means of tracking changes in the amount and relevance of research over time. The questionnaire was completed in November 2006 by the zone manager (n=1), zone planners (n=2), and park superintendents in the northwest zone (n=8). The intent is to have the same positions complete the questionnaire in 5 years (i.e., 2011) to re-evaluate research in Ontario Parks including an evaluation of the goal and objectives of this strategy.

5.5.3 Establish a process for effective dissemination of research results

In order to effectively implement the adaptive management approach, data must be synthesized and disseminated to inform resource management decision-making. This can be done by producing an annual report or presentation that summarizes research

that has been conducted in protected areas in the Northwest Zone to existing and potential partners. To communicate research results effectively to Ontario Parks' staff and managers, a presentation could be made at the Northwest Zone annual meeting that summarizes research efforts and findings from the previous year. This way, the resource managers are aware of new information that can help to inform decision-making.

6.0 IMPLEMENTATION

Implementation of the above strategies will be contingent upon staffing and funding levels, availability of partners and general interest from the scientific community. The Northwest Zone ecologist with the support of other zone ecologists (Sr. Assistant Zone Ecologist, and Ecologist Intern) and park biologists (Quetico and Wabakimi Park Biologist) will take the lead in implementing the strategies of this document. The ultimate success of this strategy will be dependent upon, not only the ecologists and biologists, but also the continuing support from all Northwest Zone managers to help researchers improve the current research milieu and provide useful, relevant, and timely information to help decision makers meet the principle of the maintenance of ecological integrity as specified in the Provincial Parks and Conservation Reserves Act.

7.0 LITERATURE CITED

- Korol, B. 2004. Research and Information Strategy, Ontario Parks, Central Zone (2004-2009). A report prepared for the Central Zone Office, Ontario Parks, Huntsville.
- Ministry of Natural Resources (MNR). 1992. Ontario Provincial Parks: Planning and Management Policies Update. Queen's Printer for Ontario.
- MNR. 2005a. Our Sustainable Future, Ministry of Natural Resources Strategic Directions.
- MNR. 2005b. Science for Our Sustainable Future: A Science Strategy for the Ontario Ministry of Natural Resources.
- MNR. 2006. Ontario Provincial Parks Statistics, 2005. Queen's Printer for Ontario.
- Mulrooney, D.R., R.J. Davidson and T.J. Beechey. 1999. An Analysis of the Scientific Research Undertaken in Ontario Provincial Park. Pages 465-473 in Parks and Protected Areas Research in Ontario 1999. Proceedings of the Parks Research Forum of Ontario (PRFO) Annual Meeting, April 22 & 23, 1999, Guelph, Ontario.
- Nyberg, J.B. 1998. Statistics and the Practice of Adaptive Management. Pages 1-7 in Statistical Methods for Adaptive Management Studies, V. Sit and B. Taylor, (editors). Land. Manage. Handbook 42, B.C. Ministry of Forests, Victoria, BC.
- Ontario Parks. 1997. Research Strategy and Information Strategy: Setting Priorities. Ontario Parks, Planning & Research Section, Miscellaneous Paper 1.
- Ontario Parks. 2000. Ontario Parks Northwest Zone Research and Information Strategy. Unpublished paper prepared for Ontario Parks, Northwest Zone, Thunder Bay.
- Ontario Parks. 2001. Research and Information Strategy – Ontario Parks, South Eastern Zone (2001-2006). Unpublished paper prepared for Ontario Parks, South Eastern Zone, Kingston.
- Ontario Parks. 2002. Ontario Parks Southwestern Zone Research and Information Strategy (Draft). Unpublished paper prepared for Ontario Parks, Southwestern Zone.
- Provincial Parks and Conservation Reserves Act. 2006. Provincial Parks and Conservation Reserves Act, 2006 at www.e-laws.gov.on.ca/DBLaws/Statutes/English/06p12_e.htm.
- Slocombe, D.S. and P. Dearden. 2002. Protected Areas and Ecosystem-based Management. Pages 295-320 in Parks and Protected Areas in Canada, 2nd Edition. P. Dearden and R. Rollins (editors), Don Mills, Oxford University Press.

Appendix 1: Northwest Zone Research Strategy Questionnaire

Please check the adjacent box that most closely represents your opinion	Do not know	Strongly Disagree	Somewhat Disagree	Indifferent	Somewhat Agree	Strongly Agree
1) Research projects add substantial value to my parks.	<input type="checkbox"/>					
2) I actively promote research in my parks.	<input type="checkbox"/>					
3) Research in my parks has been very useful in helping me to plan and manage them.	<input type="checkbox"/>					
4) The relevance of research in my parks to my decision making has been increasing over the years.	<input type="checkbox"/>					
5) Dealing with researchers takes a substantial amount of my time and/or park staff time.	<input type="checkbox"/>					
6) I would like more work done in my park specifically for:						
i) cultural research (e.g., first nations historical use)	<input type="checkbox"/>					
ii) earth-science research (e.g., geological)	<input type="checkbox"/>					
iii) life-science research (e.g., biological, ecological)	<input type="checkbox"/>					
iv) recreation research (e.g., visitor impacts)	<input type="checkbox"/>					
v) socio-economic research (e.g., visitor profiles)	<input type="checkbox"/>					
7) I would be willing to commit staff time to help with research in my parks.	<input type="checkbox"/>					
8) I would be willing to commit park resources (e.g., equipment, infrastructure) to help research in my parks.	<input type="checkbox"/>					
9) I would like to be directly involved with research in my parks.	<input type="checkbox"/>					

10) The five priority research needs for my parks are (feel free to expand upon the five if necessary):

- i) _____
- ii) _____
- iii) _____
- iv) _____
- v) _____

11) The five best ways that Ontario Parks can encourage research are (feel free to expand upon the five if necessary):

- i) _____
- ii) _____
- iii) _____
- iv) _____
- v) _____

12) The main resources that I can make available to researchers in my parks are (feel free to expand upon the list if necessary):

- i) _____
- ii) _____
- iii) _____
- iv) _____
- v) _____

13) If you answered “somewhat agree” or “strongly agree” to question 5 above, please list how you and your staff time is consumed by research in your park.

14) If you answered “somewhat agree” or “strongly agree” to question 9 above, please explain how you would like to be directly involved with research in your parks.

Please add any additional comments that you think are relevant.

Appendix 2: Research Needs

The results of the questionnaire in 2006 in combination with discussion meetings with park ecologists and biologists can be nested into three project themes:

- Threats to the resource
- Status of the resource
- Restoration of degraded ecosystems

1. Threats to the Resource

The identification of existing and potential threats to the ecological integrity of parks and their greater park ecosystems, as well as early advice on options to mitigate and better manage threats, is crucial to the well being of protected areas. As such, it is listed as one of the top priorities for research in the Northwest Zone. The following are some of the threats that have been identified as those that currently face protected areas in the Northwest Zone, and are listed in alphabetical order:

1.1 Anthropogenic influences

- Impacts of dam removal and/or dam construction on fish and vegetation

1.2 Climate change

- Effects of climate change on weather, lake, stream and terrestrial parameters including wildlife populations – need to establish research networks with others studying similar monitoring sites elsewhere

1.3 Fire

- Use of prescribed fire – working towards a let it burn strategy
- Monitored and modified fire responses
- Fire behaviour
- How can recreational activities be balanced with the use of prescribed fire, and monitored and modified fire response
- Natural fire cycles
- Effects of seasonality & fire intensities

1.4 Greater park ecosystems

- Watershed studies – impacts of mining and other industrial activities on the larger landscape
- Use of pesticides in parks and/or adjacent lands

1.5 Invasive species (native and non-native)

1.6 Overabundant wildlife

1.7 Recreational impacts

- Effects of camping on lake water quality
- Impacts of outpost camps and other park users on fish populations
- Impacts of recreational activities on wildlife populations (e.g., caribou nursery sites, impacts of snowmobiles, planes, and boats)
- Impacts of visitors on cultural sites
- Impacts of visitors on trails (especially mountain bikes and horses)
- Thresholds and visitor capacity

2. Status of the Resource

As ecological integrity is the first priority and guides all aspects of the planning and management of Provincial Parks and Conservation Reserves, having a clear picture of the status of natural resources in protected areas and their greater park ecosystems in the

Northwest Zone is critical. For this reason, the following are research needs that will enhance our understanding of the current status of natural resources in Northwest Zone protected areas:

2.1 Enhancing sampling/inventory/monitoring techniques

- Working with First Nations to incorporate TEK into monitoring and park planning activities
- Non-destructive fish sampling technique

2.2 Inventory and monitoring

- Focal species approach to inventory and monitoring
- Monitoring populations of rare species
- Population dynamics of large fauna
- Monitoring fish populations
- Wildlife movements (thresholds of impacts)
- Monitoring changes in forest composition over time with FRI
- Visitor trends – use trends and user trends
- Socio-economic impacts of parks on surrounding area
- Life science inventories
 - Including wildlife, vegetation (i.e., all information necessary to develop a park vegetation, wildlife, and fire stewardship plan)
- Earth science inventories – including geomorphology
- Cultural inventories
 - Including First Nations and use by early Europeans/voyageurs
 - Healing plants
 - Archaeology
- Recreational inventories
 - Trails used for trapping and other commercial activities
 - Trails used for recreation (e.g., hiking, portaging, etc.)

2.3 Ecological (or life science) representation

- Test surrogate of biodiversity concept – “L/V” approach
- Conduct gap analyses

3. Restoration of Degraded Ecosystems

At a time when ecosystems are becoming more degraded and impacted by anthropogenic influences, the role of restoration is becoming an increasingly important component of natural resource management. As such, the restoration of ecological integrity is one of the planning and management principles in the new Provincial Parks and Conservation Reserves Act (2006).

3.1 Use of fire as a tool to restore and maintain:

- Red and white pine communities
- Prairie species

3.2 Restoration of wetlands

Appendix 3: Compiled list of research needs for Ontario Parks, Northwest Zone.

Question 10 of the Northwest Zone Research Strategy Questionnaire:

The priority research needs for my parks are:

- **Wildlife:**
 - impact of overabundant wildlife on park ecosystem
 - monitoring populations of rare species
 - focal species approach
 - recreation impacts on wildlife populations (e.g., caribou nursery sites, impacts of snowmobiles, planes, and boats)
 - population dynamics of large fauna
 - wildlife movements (thresholds of impacts)

- **Fisheries/aquatics:**
 - impact of outpost camps and other park users on fish populations
 - general monitoring of fish populations
 - impacts of dam removal on fish and vegetation
 - long-term effects of invasive species
 - fish inventory techniques (e.g., non-destructive sampling)
 - water quality (e.g., phosphorus, bacteria) of lakes used heavily for camping

- **Life science inventories**

- **Use active adaptive management approach**

- **Ecological (or life science) representation:**
 - test surrogate of biodiversity concept - “L/V” approach
 - conduct gap analyses

- **All research necessary to develop a park vegetation and wildlife stewardship plan, including fire**

- **Integration of TEK into park planning**
 - *Note:* TEK could/should nest under several of these categories (e.g., fire, vegetation, wildlife, etc.), rather than being a stand alone item

- **Vegetation:**
 - restoration ecology
 - red and white pine communities
 - changes in forest composition over time with FRI

- Effects of climate change on weather, lake, stream and terrestrial parameters including wildlife populations – establishing networks with other similar sites elsewhere is also valuable
- Fire:
 - effects of seasonality and fire intensity
 - prescribed fire – working towards a let it burn strategy
 - use of modified and monitored responses to fire
 - how can we balance recreation with the use of prescribed fire, and modified and monitored fire responses
 - fire behaviour
 - natural fire cycles
- Air pollution
- Watershed studies – e.g., impacts of mining/other industrial activities on the larger landscape
- Earth science inventories – also geomorphology
- Recreation inventories
 - trails used for trapping and other commercial activities
 - trails used for recreation
- Cultural inventories:
 - first nations (esp. far north)
 - healing plants
 - archaeology
 - historical cultural research – i.e., on use by Europeans/voyageurs
- Visitor impacts:
 - on cultural sites
 - on trails (esp. impacts of horses & mountain bikes)
 - thresholds/visitor capacity
- Visitor trends – use trends, and user trends
- Socio-economic impacts of parks on surrounding area

Appendix 4: Compiled list of ways that Ontario Parks can encourage research.

Question 11 of the Northwest Zone Research Strategy Questionnaire:

The five best ways that Ontario Parks can encourage research are:

- Establish zone-wide research priorities with measurable targets
 - create a list of research projects/ideas for distribution
- Summarize data into usable reports that are readily available
- Engage managers
- Funding, funding, funding! (including dedicated research funding)
- Appropriate staffing levels
- Use of research base to co-ordinate activities
- Partnerships:
 - Work with first nations – can increase \$\$\$
 - Work with universities and involve graduate students
 - Network with researchers – at regional meetings, research meetings, travel to research centres
 - Work with research organizations
 - Tourism operators
 - NGOs – can increase \$\$\$ and resources
- Promotion on website, including a list of potential projects
- Contribution of in-kind resources:
 - Equipment (boats, lodging, vehicle)
 - Staff time (possibly NHE)

Appendix 5: Compiled list of resources available for researchers.

Question 12 of the Northwest Zone Research Strategy Questionnaire:

The main resources that I can make available to researchers in my parks are:

- Accommodations (campsite, office space)
- Base camp support
- Limited historical records/data
- General staff knowledge/time
- Field supplies/equipment
 - maps/air photos/NRVIS data
 - camping equipment
 - boat
 - vehicle
 - flights
- Links with partners
- Links with outfitters
- Waiving park fees

Appendix 6: Compiled list of how staff time is consumed by research.

Question 13 of the Northwest Zone Research Strategy Questionnaire:

How is your/staff time consumed by research in your park?

- Reviewing research applications
- Talking with researchers
- Pestering researchers for reports
- Reviewing reports/data
- Organizing equipment

Appendix 7: Compiled list of how people would like to be directly involved with research.

Question 14 of the Northwest Zone Research Strategy Questionnaire:

Please explain how you would like to be directly involved with research in your parks.

- Developing research priorities
- Developing research approach
- Involvement with all stages of research project, including updates on status/progress, results, and final report
- Get out in the field
- Involvement with project design
- Would like to be involved in the beginning with research applications and project proposals, even those received via main office through web link
 - Awareness and approval of projects
- Park biologist should be main liaison with researchers in park, preparing park research strategy, soliciting researchers, working with partners, etc.
- Have copies of all research permits and results
- Involve partnered first nations in all projects
- Develop a central research centre/library for park to attract /engage further research

Appendix 8: Compiled list of additional comments on the questionnaire.

Final question of the Northwest Zone Research Strategy Questionnaire:

Please add any additional comments that you think are relevant:

- Additional work on research needs beyond advice of superintendents should be conducted. Although superintendents may know what they want, they may not be aware of all research that needs to be conducted.
- Research partnerships with First Nations are critical in northern parks
- Engaging tourist operators on research topics may foster stewardship
- Critical to make a strong case for this type of research/work
- Large parks like Wabakimi have huge potential for research – need to involve our partners and a “research centre” to highlight this feature and manage/coordinate results