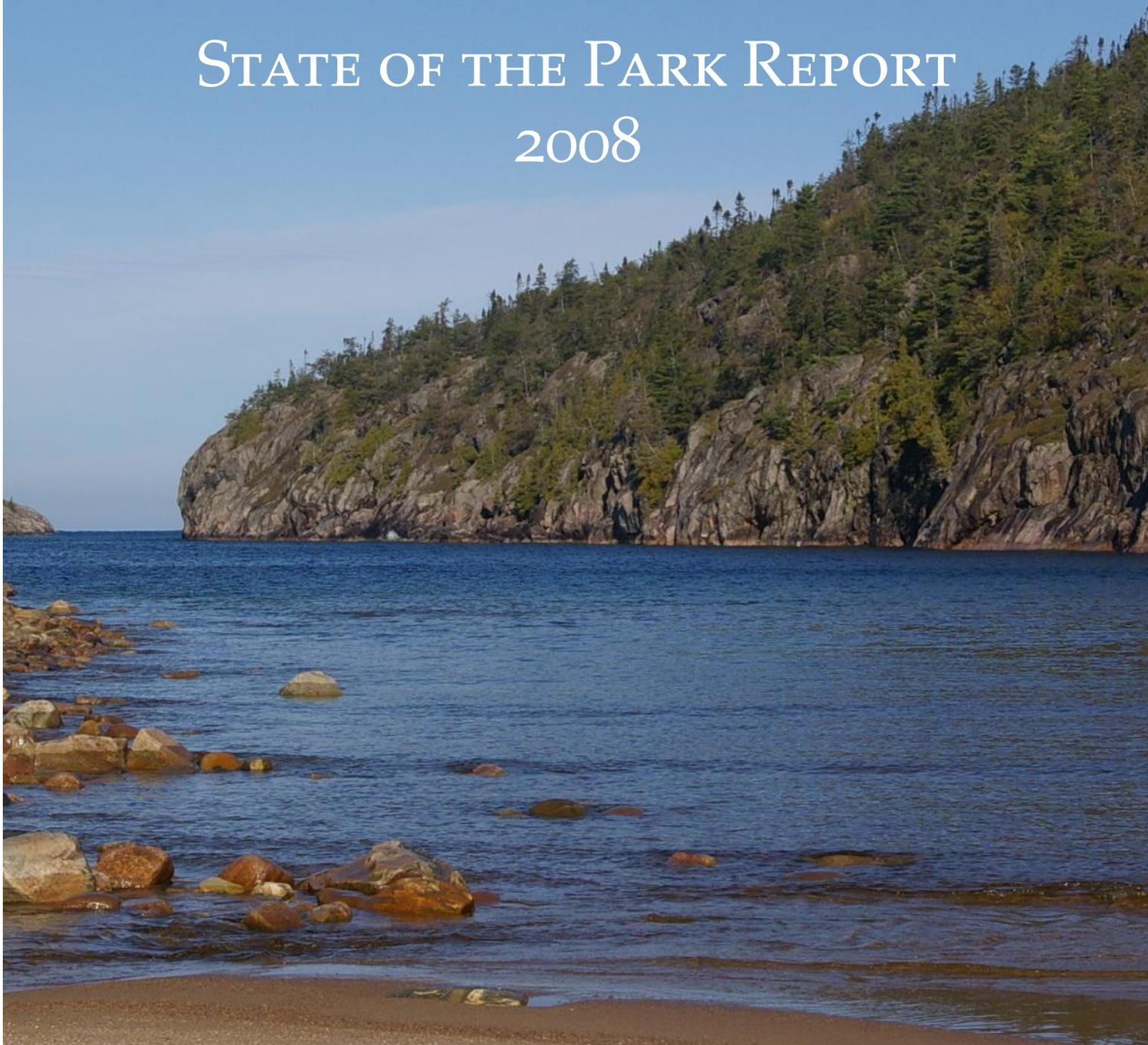


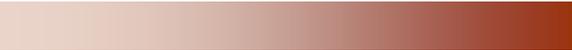


PUKASKWA

NATIONAL PARK OF CANADA

STATE OF THE PARK REPORT 2008





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Cover page caption: Lake Superior coast in Pukaskwa National Park (credit: Mark Yeates)

RECOMMENDATION / APPROVAL PAGE

Recommended by:

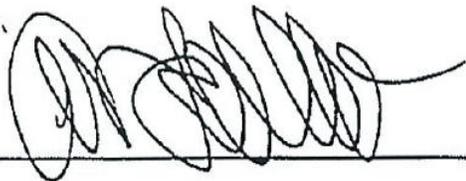


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EXECUTIVE SUMMARY

This report represents Pukaskwa National Park’s first State of the Park Report (SOPR). The purpose of a SOPR is to report to Canadians on the state of a national park with respect to its Aboriginal Perspectives, Ecological Integrity (EI), Cultural Resources, and Connection to Place. In addition, SOPRs provide an evaluation of park management actions since the last Management Plan, the condition of its information base, and an assessment of key issues. SOPRs also provide an essential adaptive management element by which key information is brought together, analyzed, and interpreted so that it can be applied to the planning and management of national parks. As such, SOPRs are a required component of Parks Canada’s park management planning guideline (2008) and must be updated every 5 years.

Table 1 provides a summary of key management actions that have been completed and/or initiated since the completion of the park’s last management plan in 1995. Since this time the park has made strategic investments with respect to forest disturbance management, aquatic management, wildlife management, cultural resources, land use planning, and visitor experience. Among these investments is the completion and implementation of the park’s fire management plan and the completion of a comprehensive, multi-year large mammal predator-prey study. This latter study provides a solid foundation for moving ahead with caribou restoration in future. The park has recently improved relations and developed positive partnerships with key stakeholders. Pukaskwa has had a consistent number of visitors over the past five years and the majority of visitors are very satisfied with their visit.

The state of Aboriginal perspectives regarding Pukaskwa National Park is currently considered fair – it is not totally negative but does need significant improvement. Following discussions with the Pic River First Nation, some members

of the community stated that they “feel like outsiders on their own land”. Approximately 50% of park employees are Aboriginal and fishing, hunting and trapping by members of the Robinson Superior Treaty Group continues within the park.

In this report, the condition and trend of a range of indicators is reported using the labeling system in Figure 1. Each indicator is comprised of numerous measures. The status and trend assessments for each measure are combined to generate a composite status and trend assessment for the indicator as a whole. Collectively, these indicators provide an assessment of the status of Pukaskwa National Park in the areas of Ecological Integrity, Species at Risk, Cultural Resources, Connection to Place, and Information Base. However, given that this is the park’s first SOPR, trends for most indicators are not reported. A summary of the state of Pukaskwa National Park in 2008 is provided in Table 2.

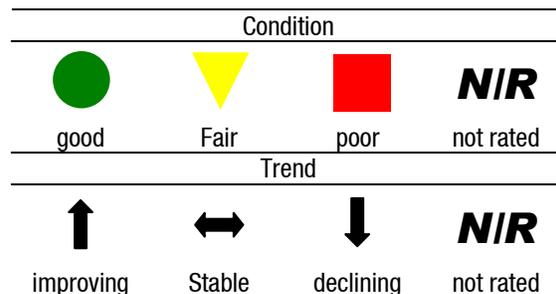


Figure 1. Labels used to identify the condition and trend of indicators and measures.

The condition of the EI of Pukaskwa National Park is fair to good. The “Forests” indicator, which has been the focus of active management efforts, is rated in good condition and the “Coastal Ecosystem” indicator is rated in fair condition. There are insufficient data to assess the status of the “Rivers and Streams” and “Inland Lakes” indicators at this time.

Cultural Resources are rated in fair condition. Significant Cultural Resources evaluated in this SOPR are the “Pukaskwa Pits”. The Pukaskwa Pits are archaeological sites found within the park that are thought to represent a form of Aboriginal architecture. These “Pits” are cobble stone formations that occur along the coastal regions of the park and are thought to have been constructed around 1000 to 1500 AD or, perhaps, earlier. Parks Canada is investing in ongoing inventory and monitoring of these features to ensure their long-term protection.

“Connection to Place” is comprised of three indicators: Visitor Experience, Outreach Education and Stakeholder Relations. For the Visitor Experience indicator, the overall rating is “good”. Expectations from park visitors are often exceeded. Levels of visitation, particularly in front country campsites, are average for the area and have been consistent over the last 5 years. In the Outreach Education indicator, education programs are not well used by local schools. This indicator is rated “fair”. Pukaskwa National Park is an active participant in regional, multi-stakeholder planning processes and hopes to positively engage key partners in support of activities that provide opportunity for the local community while not impairing the state of the park. The current condition of the Stakeholder Relations indicator is “good”.

The Condition of the Information Base, upon which the park makes SOPR evaluations, is rated poor. Many natural and social science studies conducted within the park are outdated and not repeated. Pukaskwa is currently establishing its long-term Ecological Integrity monitoring program with permanent monitoring stations located within major park ecosystems. Recently, the park has hired

dedicated staff that will allow it to improve its natural and social science capacity. It is anticipated that the Condition of the Information Base will be much improved for Pukaskwa’s second SOPR.

This SOPR concludes with a brief synopsis of key issues that should be considered during the review of Pukaskwa’s park management plan. These key issues are:

1. Coastal ecosystems are rated in ‘fair’ health and the extirpation of the park’s caribou population is of concern
2. Fire regimes are modified due to a history of fire suppression
3. Resource information, such as natural resource inventories, monitoring, and research studies are out-of-date
4. Facilities, basic services, and interpretive programs need improvement so that visitors have a more enjoyable experience
5. A renewed approach to outreach is needed to enhance the level of engagement, appreciation and support by Canadians
6. Effective cooperative management with First Nations needs to be developed.



Table 1. Summary of key management strategies and actions.

Key Strategies & Actions	Completed	Ongoing	Not Completed
FOREST DISTURBANCE MANAGEMENT			
Update and implement draft fire management plan (1992)	X		
Implement a comprehensive, integrated and proactive Fire Management Plan within 5 years (1994/1995 – 1999/2000)	X		
Continue research into the use of fire as a resource management tool.		X	
Develop an interactive computer model integrated with fire management to better understand the role spruce budworm plays in the greater park ecosystem.			X
AQUATIC MANAGEMENT			
Develop a comprehensive, integrated, and pro-active aquatic management strategy.		X	
Complete Aquatic Resources Inventory Program that will provide the information needed to help develop a management strategy for sport fishing.	X		
WILDLIFE MANAGEMENT			
Survey Moose and Woodland Caribou populations and ensure protection of key Woodland Caribou habitat through zoning and visitor access strategies.	X		
Complete the predator/prey study to determine Woodland Caribou, Moose and wolf population size, structure and dynamics.	X		
Ensure an up-to-date bear management plan.	X		
Complete avifauna research to better understand and ensure the sustainability of this element of the park ecosystem.		X	
CULTURAL RESOURCES MANAGEMENT			
Revise 1984 Cultural Resource Management Plan that will identify the means and procedures whereby the Park's Cultural Resources will be protected.			X
Identify and pursue opportunities for input from the Robinson Superior Treaty Group.		X	
LAND USE PLANNING			
Work with other partners to deliver an integrated land stewardship program.		X	
Achieve recognition of Parks Canada as a review agency for planning and land development activities adjacent to the park.		X	
VISITOR EXPERIENCE			
All themes and messages will be interpreted through a variety of personal and non-personal programs to visitors and local communities.		X	
Provide a front country experience on the "Edge of Wilderness" to all visitors with high degree of interaction with the environment with low risk.		X	
Provide an exceptional wilderness backcountry experience for kayakers and hikers.		X	

Table 2. Summary of the state of Pukaskwa National Park in 2008.

Indicator	Condition*	Trend**	Highlights
ECOLOGICAL INTEGRITY			
Forest		N/R	3 measures are in good condition, 1 in fair condition, and 2 are not rated
Coastal Ecosystem		N/R	2 measures are in good condition, 1 in fair, 1 in poor, and 2 are not rated
Rivers and Streams	N/R	N/R	1 measure is in good condition and 2 are not rated
Inland Lakes	N/R	N/R	1 measure is in fair condition and 2 are not rated
SPECIES AT RISK			
Pitcher's Thistle	MA1	N/R	Critically imperiled. Only two remnant populations in the park. One is a result of restoration efforts.
Woodland Caribou	MA1	N/R	Critically imperiled. Declines in the population have been observed for last 20 years. Population is at an all-time low.
Peregrine Falcon	MA2	N/R	Imperiled. Three territories have been regularly occupied in the park for the last four years.
Monarch Butterfly	MAU	N/R	Unknown population status. Research is required to assess the rank of this species.
CULTURAL RESOURCES			
Resource Condition		N/R	Pukaskwa Pits in stable condition but under threat from disturbance.
Management Effectiveness		N/R	Inventory and evaluation are underway but not yet complete. Cultural resource plan and Cultural Resource Value Statement (CRVS) not completed.
CONNECTION TO PLACE			
Visitor Experience		N/R	2 measures are in good condition and 2 are in fair condition
Outreach Education		N/R	3 measures are in fair condition and 1 is not rated
Stakeholder Relations		N/R	1 measure is in fair condition and 1 is in good condition
CONDITION OF INFORMATION BASE			
Condition of Information Base			Majority of datasets are missing, outdated, or of insufficient sample size. However, internal capacity is in place to improve the situation for both Ecological Integrity and Connection to Place datasets.

* For Species at Risk, the species is the indicator, the condition is the managed area rank and the trend will be assessed in the next SOPR based on the rank at that time (see Section 4).

**This report represents Pukaskwa National Park's first formal State of the Park Report. All indicators are assessed for the first time and most have insufficient information to assess a trend.

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1. INTRODUCTION

Pukaskwa National Park, designated in 1978, was established to represent a portion of the Central Boreal Uplands natural region of Canada. Situated in Ontario along the north shore of Lake Superior, 1878 km² in size, Pukaskwa is part of the longest stretch of undeveloped shoreline anywhere within the Great Lakes (Figure 2).

Pukaskwa National Park lies within the ancestral home of the Anishinaabe people, and these original residents are part of what makes Pukaskwa nationally significant. In light of the significant ministerial agreements between Canada and the Robinson-Superior Treaty Group regarding Pukaskwa National Park, Parks Canada and the local First Nations have a unique and

mutually beneficial relationship.

Significant cultural resources exist along the coast of Pukaskwa in the form of archeological structures known as Pukaskwa Pits that date back thousands of years. These structures have an important spiritual significance to local First Nation groups.

The park lies within a transition zone between the boreal forests to the north and the mixed deciduous forests of the Great Lakes / St. Lawrence Lowlands to the south. In the northern and eastern portions of the park, forest communities tend to be comprised of typical boreal mixed-woods with White Birch and Balsam Fir in upland

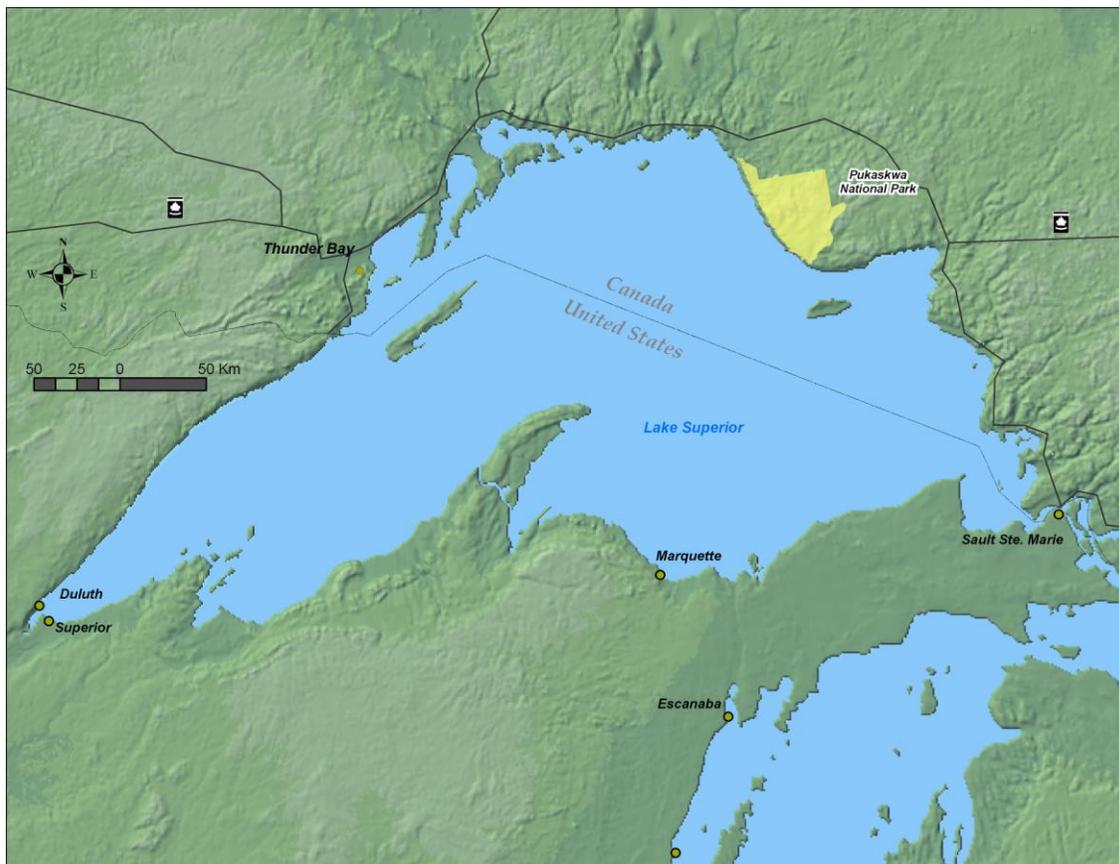


Figure 2. Regional context of Pukaskwa National Park.

areas and Black Spruce, Jack Pine and White Birch in lowland areas. In the southern portions of the park, tree species such as White Pine, Sugar Maple and Red Maple can be found. The geology of the park is predominantly Precambrian shield overlaid with shallow soils. This landscape is strongly influenced by natural disturbances such as fire, severe weather events, and insect infestations.

The Lake Superior coast is a feature that defines the rugged character of Pukaskwa. Rocky headlands, sheltered coves, and cobble beaches show evidence of occupation by generations of Aboriginal people that continues today. The cold winds off Lake Superior provide suitable habitat for dozens of arctic-alpine plant species that cling to the exposed bedrock. Pukaskwa is home to four Species at Risk: Pitcher’s Thistle (endangered), Woodland Caribou (threatened), Peregrine Falcon (threatened), and Monarch butterfly (special concern). Populations of large mammals such as Woodland Caribou, Moose, and Grey Wolves persist in the park, though their densities tend to be low. Other boreal species present in the park include the American Beaver, Snowshoe Hare, Canada Lynx, Pine Marten and over 100 species of

breeding birds. Bald Eagle, Great Blue Heron, and Herring Gulls are all relatively common along the coast.

Visitors to Pukaskwa National Park enjoy a unique wilderness experience. Kayaking along the rugged Lake Superior shore, canoeing the White or Pukaskwa Rivers, hiking the Coastal Trail, or camping at Hattie Cove are favorite activities of park visitors.

STATE OF THE PARK REPORTING

The Canada National Parks Act requires PCA to produce a State of Protected Heritage Area Report (SOPHAR) every two years at the national level. Parks Canada’s internal policy (*Guide to Management Planning 2008*) requires every National Park to produce a State of the Park Report (SOPR) every five years. The purpose of the SOPR is to communicate to the public the state of the park with respect to its Aboriginal Perspectives, Ecological Integrity, Cultural Resources, and Connection to Place, and to inform the production of the national SOPHAR. SOPRs also report on an evaluation of management actions, the

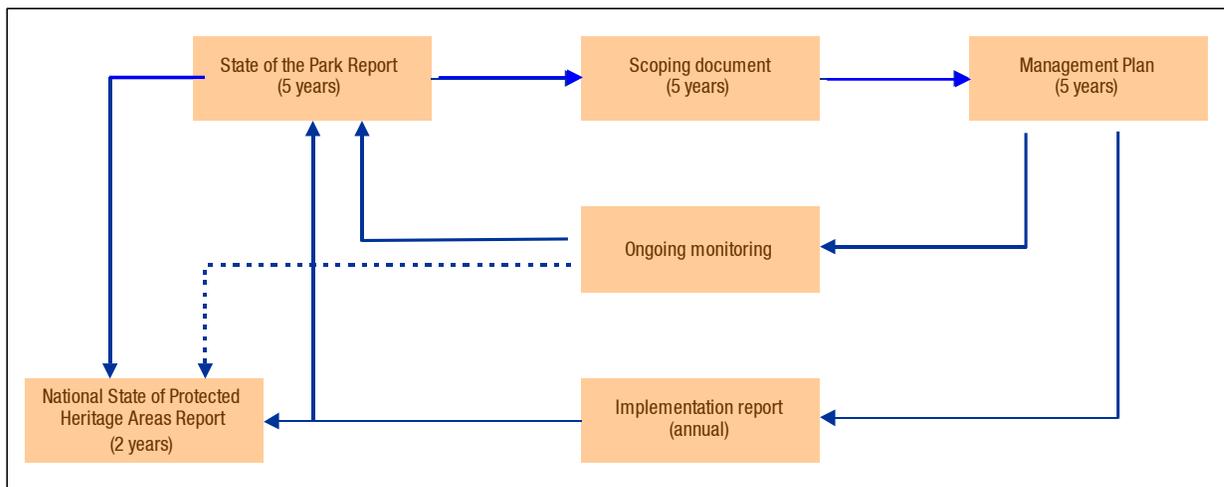


Figure 3. Parks Canada’s national park management planning process.

Condition of the Information Base used for planning and reporting purposes, and key issues to be considered in the next park management plan.

SOPRs are part of the Parks Canada Agency’s park management planning process (Parks Canada, 2008) (Figure 3). These reports are directly linked to ongoing Ecological Integrity monitoring programs and the review and revision of management plans. As such, SOPRs are integrated components of Parks Canada’s adaptive management cycle for national parks. This report represents Pukaskwa’s first SOPR.

In support of the park’s reporting requirements, Pukaskwa has been developing its Ecological Integrity (EI) and External Relations / Visitor Experience (ERVE) monitoring programs. Many aspects of these programs are still under development or in the initial stages of implementation. As a consequence, many information gaps exist at the time of writing this report. There is wide variability in the quality and quantity of information used to prepare this report.

Assessments for the SOPR are based on a range of indicators that represent Ecological Integrity, Species at Risk, Cultural Resources, and Connection to Place. In each of these areas, the indicators are:

- **Ecological Integrity:** The indicators are the major ecosystems of the park: Forests, Coastal Ecosystem, Rivers and Streams, and Inland Lakes.
- **Species at Risk:** The indicators are the species themselves: Pitcher’s Thistle, Woodland Caribou, Peregrine Falcon, and Monarch butterfly
- **Cultural Resources:** Resource Condition, Management Effectiveness

- **Connection to Place:** Visitor Experience, Outreach Education, Stakeholder Relations
- **Condition of Information Base:** Data Management Capacity, Information Quality

The condition and trend of the indicators are assessed on the following rating system:

Condition			
 good	 fair	 poor	NIR not rated
Trend			
 improving	 stable	 declining	NIR not rated

In the case of Species at Risk, the condition of each species is the Managed Area Rank, a nationally standardized system of rankings recently adopted by Parks Canada.

The indicator assessments are made following a review of the status of a number of measures. Explicit thresholds are used, where possible, to evaluate both the current condition and the trend for each measure. In these cases thresholds will be quantitative and based on baseline monitoring data, existing research information, or both. Where sufficient quantitative data are not available, evaluations are done through local ecological knowledge or professional judgment. In cases where the uncertainty is too large to comfortably make any kind of assessment, those particular measures will be assessed as “not rated” for either condition, trend, or both. Details on the establishment of specific thresholds pertaining to Ecological Integrity can be found in Pukaskwa’s Technical Compendium for the State of the Park Report (Vance et al., 2008).

2. ABORIGINAL PERSPECTIVES

This section provides a summary of Aboriginal perspectives related to the park and its landscape by describing the state of relations and state of the land based on traditional knowledge. *(Note: This chapter was written with significant input from the Pic River First Nation)*

In February 1978, the federal-provincial agreement to create Pukaskwa National Park was signed between the Province of Ontario and Canada. The park was created within that portion of Ontario subject to the Robinson-Superior Treaty of 1850. During discussions on the establishment of the park, there were ministerial commitments made to the Robinson Superior Treaty Group (RSTG) members that ensured treaty rights of hunting and fishing for domestic use plus continued trapping activities in the park. Also, free access and camping to carry out these activities would be permitted. In addition, every effort would be made to employ at least 50% of the park workers from the RSTG. In order to help achieve this 50% goal, in-service training would be provided to as many RSTG members as possible to ready them for employment opportunities with Parks Canada.

A draft Framework Agreement between the First Nations of the RSTG (as represented by the Ojibways of the Pic River First Nation) and the Minister of Canadian Heritage was created in the mid 1990's, but this framework was not signed by the First Nations nor by the Crown. No further work on this agreement has been done to the present time.

A recent survey conducted by the Pic River First Nation seeking the general impression of the relationship between Pukaskwa

National Park and their community showed that this relationship is average at best. It is not totally negative, but does need significant improvements.

Most feedback alluded to the fact that although Pukaskwa National Park sits directly within the First Nations' traditional territory, some members of the community "feel like outsiders on their own land".



Some of the feedback clearly expressed concern that Pukaskwa National Park excludes First Nation perspectives in relation to management planning as well as day-to-day operations for the Park.

Additionally, despite the commitment to employ at least fifty percent Aboriginal employees from the RSTG, there is the perception that this ratio is not being met. Although the current employment ratio of RSTG members in relation to other employees is around 50%, some of these positions are students, contracts or seasonal in nature. In addition, many full time park positions and higher level management positions are seen to have language or education barriers that prevent First Nation members from advancing into these better paying jobs.

3. ECOLOGICAL INTEGRITY

The purpose of this section is to report on the state of Ecological Integrity of Pukaskwa National Park. According to the Canada National Parks Act, the law governing national parks in Canada, "Ecological Integrity" means, with respect to a 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."

In plain language, ecosystems have integrity when they have their native components intact, including water, rocks, plants, animals, fire and flooding. Ecological Integrity is assessed through the Park's long term monitoring and reporting program. This program is in its early stages of implementation and is based on a set of indicators that represent major park ecosystems. Each indicator is supported by monitoring measures that represent key ecosystem drivers (important elements of park's biodiversity and ecological processes). The selection of measures was

informed by a multi-stakeholder workshop, supporting park research and natural resource inventories, and operational considerations. The park's Ecological Integrity Monitoring Program (EIMP) follows Parks Canada's Guide to Monitoring and Reporting Ecological Integrity in Canada's National Parks (Parks Canada, 2007).

A conceptual model for Pukaskwa's major ecosystems is presented in Figure 4. Table 3 lists the indicators and measures in the park's EIMP and gives an indication of the ecosystem components (biodiversity, processes, and stressors) that each addresses. The assessed status and trend for each indicator and its associated measures are reported in the corresponding sections of the document. These assessments are based on thresholds that are determined through statistical analysis, local ecological knowledge, and/or professional judgment. As the park's long term monitoring program matures, more information will become available to establish quantitative thresholds for each measure.



Ecosystem Characteristics

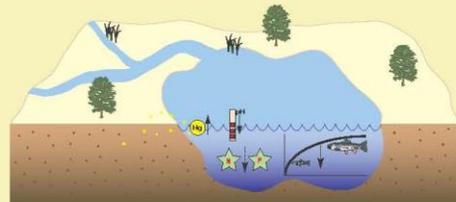
Inland Forest and Wetlands

Inland forest and wetland ecosystems in the park are characterized by dynamic habitat and species diversity resulting from randomly occurring natural disturbances and wildlife population cycles. Wide-ranging mammals respond to conditions across large spatial scales.



Inland Lakes, Rivers and Streams

Inland lakes, rivers and streams are nutrient-poor and display slow growth rates. Inland lakes are naturally acidic and high in metal content due to the low buffering capacity of regional soils and bedrock.



Coastal Zone

The coastal zone's maritime climate supports a distinct species assemblage compared to inland areas, including remnant woodland caribou and arctic-alpine plant populations. Rare dune grassland ecosystems provide habitat for the endangered Pitcher's thistle. Proximity to Lake Superior exposes the zone to Great Lakes watershed characteristics including water level fluctuation.

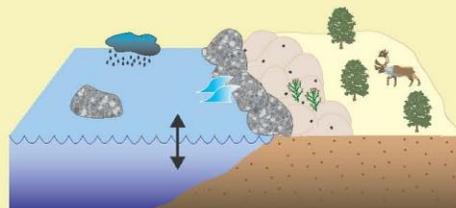


Figure 4. Conceptual Ecosystem Model of Pukaskwa National Park's major ecosystems

Table 3. Ecological integrity indicators and measures for Pukaskwa National Park. Each indicator with its associated measures are what Pukaskwa National Park is using to assess the health of different components of biodiversity and ecosystem processes, as well as to measure the impact of stressors on these ecosystems.

Indicator	Measure	Biodiversity	Processes	Stressor
Forest	Tree health	X	X	X
	Forest disturbance		X	
	Moose	X		
	Wolves	X		
	Forest birds	X		
	Forest productivity		X	
Lake Superior Coast	Caribou	X		
	Colonial waterbirds	X		
	Peregrine falcons	X		
	White-tailed deer	X		X
	Lichen	X	X	X
Rivers and Streams	Water quality		X	X
	Benthic invertebrates	X		
	Fish	X		
Inland Lakes	Water quality		X	X
	Benthic invertebrates	X		
	Fish	X		

3.1 INDICATOR: FORESTS

Condition



Trend

NIR

The status of forest ecosystems within Pukaskwa National Park is rated as good. This indicator has been the focus of active management efforts. No trend assessment is available at this time. Of the three reportable measures for the forest indicator, two are rated in good condition and one in fair condition. There were insufficient data to assign an overall trend for the indicator.

quantitative assessments for Pukaskwa’s next SOPR. In the interim this measure is not rated. Tree health is a composite monitoring measure that is comprised of a number of plot-based field variables. These variables include elements of forest biodiversity such as plant diversity and abundance, elements of ecological processes and stressors such as stand condition and stem defects. These variables follow standard field protocols developed by partner agencies and used elsewhere in the province (e.g. Growth and Yield protocols developed by the Ontario Ministry of Natural Resources and Tree Health protocols developed by the Ecological Monitoring and Assessment Network (EMAN)).

Measure: Tree Health	
Condition	Trend
NIR	NIR

Tree health is a new monitoring measure developed in 2008. Data will be available for

Measure: Forest Disturbance

Condition	Trend
▼	NIR

Forest disturbance occurs over large areas and over long periods of time. Following standard procedures, analysis included regional information in estimating rates of forest disturbance. The analysis uses an anthropogenic change dataset (i.e. forest activities, Lee 2007) that covers the Greater Park Ecosystem (GPE) in combination with the Ontario Fire Atlas to estimate the rate of disturbance (anthropogenic and fire) in the region between 1989 and 2001.

The GPE and park had a combined 1,015 km² of anthropogenic disturbance and 573 km² of burns between 1989 and 2001. Together these disturbances result in an annual disturbance rate of 0.86%, which is equivalent to a 116-year disturbance cycle. The Park's fire management plan assumes a 95-year natural fire cycle (1.05% burn rate) based on information in the literature and the ecological requirements of the constituent species. Similarly, the White River forest management plan assumes a 94-year fire cycle.

As a first approach to assessing disturbance, we set thresholds to within 20% of the 95-year fire cycle as green, within 30% as fair and >30% as poor. These thresholds are what would be expected within 2 and 3 standard deviations of the mean, a general principle followed in Parks Canada for setting thresholds (Parks Canada 2007). Since the average rate of disturbance was 116 years, the rate of disturbance that is currently occurring is considered to be in fair condition.

This measure will be developed further by the next SOPR by improving our

understanding of potential disturbance regimes in the park.



Measure: Moose

Condition	Trend
●	↑

Assessments of the status of Moose are based on three population measures (density, gender ratio, and age ratio) and habitat suitability analysis. Moose population monitoring is conducted using aerial surveys that began in 1976. Moose density is estimated using standard population calculations for stratified random sampling (Krebs 1989). Age and gender ratios are also estimated from aerial surveys.

Elevated numbers of Moose can provide increased predation opportunities for wolves and subsequently elevate wolf populations to unnaturally high densities. Wolf predation is believed to be a primary driver of the population dynamics of caribou, especially for small, isolated populations such as the one remaining in the park (Bergerud et al. 2007). For caribou, reproduction and mortality rates are equal at wolf densities of 6.5 wolves/1000 km² (Bergerud and Elliot 1986). Moose densities as low as 0.1 Moose/km² will support this

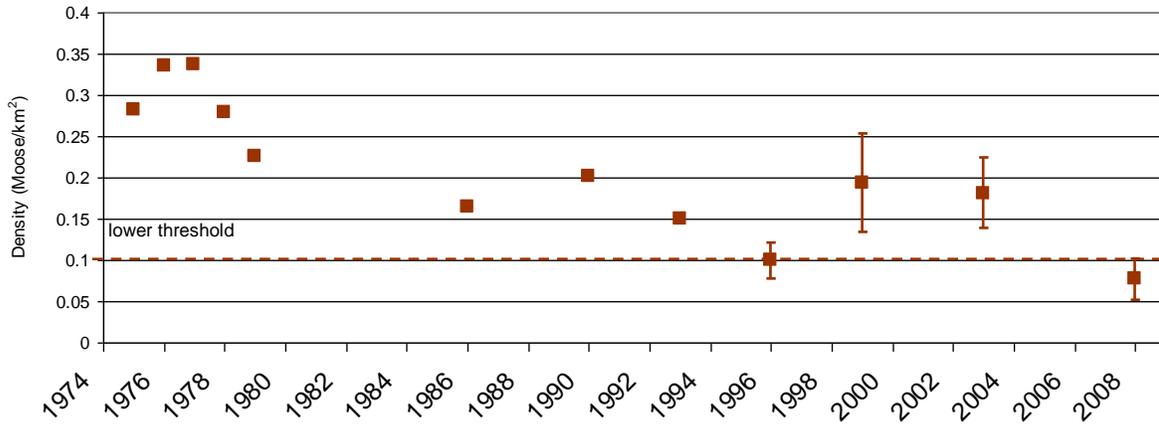


Figure 5. Estimated moose density in Pukaskwa National Park from 1976 - 2008. The lower threshold is 0.1 moose/km²; the upper threshold is currently undetermined.

density of wolves (Bergerud 1989). Therefore, a critical threshold of 0.1 Moose/km² is appropriate at this time, for the purposes of maintaining the remnant caribou population in the park (Figure 5).

Gender ratios of Moose during the survey period are stable and assessed in good condition compared to the Ontario Ministry of Natural Resources guideline (Vance et al., 2008). Age ratio, measured by estimating the number of calves per cow, is assessed in fair condition. Moose calf ratios tend to be low within the park. Mean calf ratio from the past seven surveys in Pukaskwa is 11.1% (range of 7.4% to 14.8%) with the ratio from the 2008 survey being 7.8% calves (the 3rd lowest recorded value). This translates to approximately 8 calves for every 100 adult Moose, which raises questions about the stability of the population.

Moose habitat suitability was evaluated using a habitat suitability index method (Vance et al., 2008). Using Forest Resource Inventory data, Geographic Information System models were developed that estimate the amount of browse and winter habitat available for Moose in the park. A threshold for this submeasure will be developed for the next SOPR.

Due to the low Moose density, which is favourable for maintaining caribou, coupled with the stable gender ratio, the “Moose” measure is assessed in good condition. Based on this measure, the declining population of Moose has improved the potential for Woodland Caribou on the landscape and overall Ecological Integrity.

Measure: Wolves	
Condition	Trend
●	↔

Several Grey Wolf packs exist in Pukaskwa National Park. As a large carnivore, wolves are an influential species. Wolves are the primary predator of both Moose and Woodland Caribou, and fluctuations in wolf density likely influence populations of these ungulates and vice versa (Forshner 2000, Schaefer 2003). Wolves are also sensitive to human-caused mortality (Krizan 1997) and wolf density may therefore be useful as an indicator of changes in the region.

Wolves are assessed through monitoring changes in relative abundance and estimated habitat amount. Monitoring of wolf abundance is conducted through aerial

survey concurrently with surveys for Moose and Woodland Caribou. Results from Moose and Woodland Caribou aerial surveys are analyzed separately to minimize bias.

Assessing wolf abundance is difficult, as wolf density within the park tends to be low and variable over time. Uncertainty around the extent to which monitoring results reflect the true health of wolves in Pukaskwa is high. Previous research has been conducted in the park on wolf density and behavior (e.g., Krizan, 1997 and Forshner, 2000) but sample size tends to be low.

The average number of wolves observed from Moose surveys (recorded since 1990) is 0.10 wolves/hour and 0.29 wolves/hour from caribou surveys (recorded since 1987). These values have been stable across survey years with no statistically significant trend.

Keeping in mind the high amount of uncertainty regarding the park's wolf monitoring data, wolves are assessed to be in good condition in the park with a stable trend.



Measure: Forest Birds	
Condition	Trend
NIR	NIR

Forest birds will be assessed through an evaluation of population trends and habitat

availability. Monitoring for population trends is a new program at Pukaskwa with implementation beginning in 2009. The monitoring protocol applies standardized Forest Bird Monitoring Program (FBMP) methods to point count stations that are dispersed throughout the park at permanent forest monitoring stations. As this is a new program at Pukaskwa, population trend assessments are not available for this SOPR but will be available for Pukaskwa's second SOPR.

Estimates of habitat availability are based on Habitat Suitability Index (HSI) models developed using GIS from Forest Resource Inventory data (Vance et al, 2008). HSI maps were developed for three forest bird guilds: *deciduous-closed forest birds*, *coniferous-closed forest birds*, and *successional-open forest birds*. The amount and spatial pattern of estimated suitable habitat for each guild were calculated but we were not able to determine thresholds for these values in the current report.

These habitat assessments will be updated with the renewal of Forest Resource Inventory information at the park.

Measure: Forest Productivity	
Condition	Trend
NIR	NIR

Forest productivity is a new measure to Pukaskwa's long-term Ecological Integrity monitoring program. This measure applies satellite imagery technology to the assessment of forest productivity. The methods, developed through a partnership between Parks Canada, the Canadian Centre for Remote Sensing, and the Canada Space Agency, involve the analysis of Landsat Thematic Mapper 7 imagery over time. Image analysis will be undertaken to assess changes in NDVI (normalized difference

vegetation index) and NPP (net primary productivity).

3.2 INDICATOR: COASTAL ECOSYSTEM	Condition	Trend
	▼	NIR



The Coastal Ecosystem indicator is assessed to be in fair condition. This assessment is based on three reportable monitoring measures: two in good condition and one in poor condition. Overall the trend for this indicator is not rated since more than one third of the measures have insufficient data for assessing trends.

Measure: Caribou	
Condition	Trend
■	↓

The Woodland Caribou population at the park is a remnant of a regional population that declined during the 20th century in response to landscape transformations caused by land use (Schaefer 2003). The park’s historical caribou population is estimated to be 200 but today is much lower and is likely restricted to the coastal zone. Pukaskwa’s population of Woodland Caribou is part of the larger boreal population, which is listed as Threatened under the federal *Species at Risk Act* and the provincial *Endangered Species Act*. The

Woodland Caribou population at the park is thought to exhibit density dependence due to caribou’s susceptibility to wolf predation (Bergerud 1989). Caribou densities are consistently low and caribou may be restricted to the coastal zone because higher Moose densities at inland locations can sustain high predation from wolves independent of caribou densities. Woodland Caribou viability is susceptible to changes in Moose and wolf density and distribution.

Caribou data have been collected by aerial survey at the park since 1972. In the surveys, the park’s caribou population is estimated based on direct observations of caribou and tracks. Figure 6 displays the results of these surveys. These observations show a consistent, statistically significant decline (an average -4.5% annual decrease, $p < 0.001$) in caribou occurrences with the lowest record occurring from the last survey in 2007 (five animals observed).

The thresholds for caribou are greater than 24 (good condition), between 15 and 24 (fair condition) and less than 15 (poor condition).



These thresholds are based on research within the park (Bergerud, 1989) and refer to

the stability of Woodland Caribou abundance as imposed by wolf predation. Due to the significant decline in observed

abundance and recent estimates below 15 animals, this measure is rated as poor.

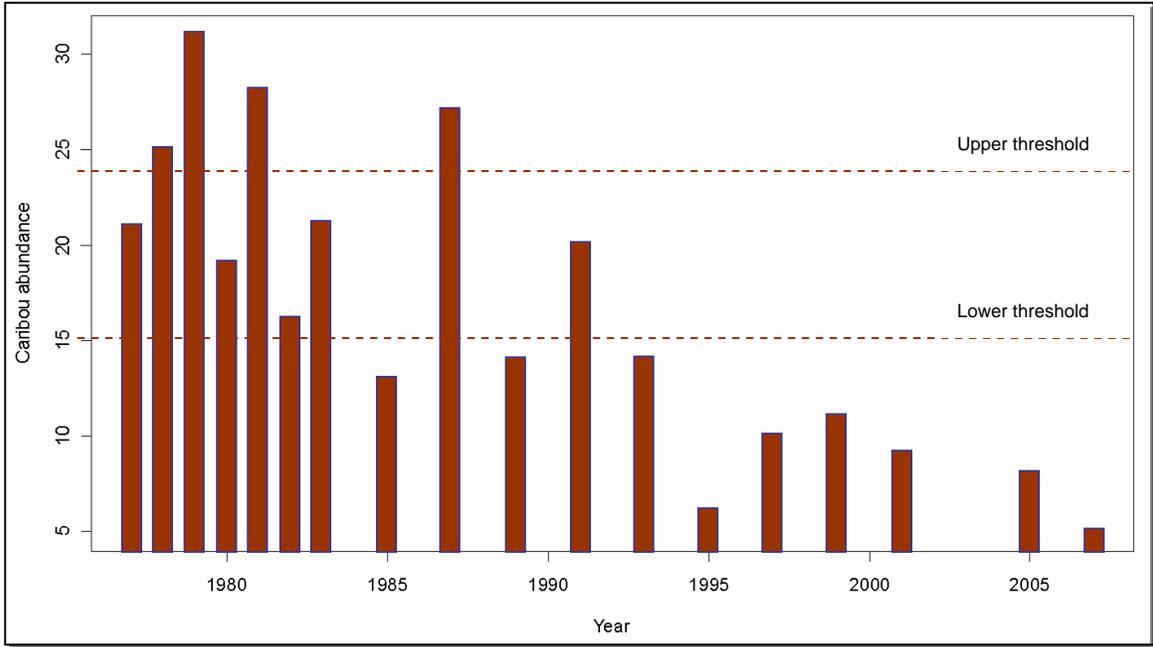


Figure 6. The number of Woodland Caribou observed during winter aerial surveys in Pukaskwa National Park from 1972 to 2007. Populations below the lower threshold are in poor condition, between the upper and lower threshold are in fair condition and above the upper threshold are in good condition.

Measure: Colonial Waterbirds	
Condition	Trend
●	↔

Colonial aquatic birds are good indicators of contamination and ecosystem health because they are near the top of the food web and they are generally abundant and easy to sample. As top-level predators, they are affected by the availability of forage fish in Lake Superior and are likely to accumulate contaminants that may be present in the lake. These species are also sensitive to fluctuations in water level. Low water levels can increase populations by creating more nesting habitat or decrease populations by increasing access for predators (Hughes et al. 2006). Due to colonial nesting birds' close association with

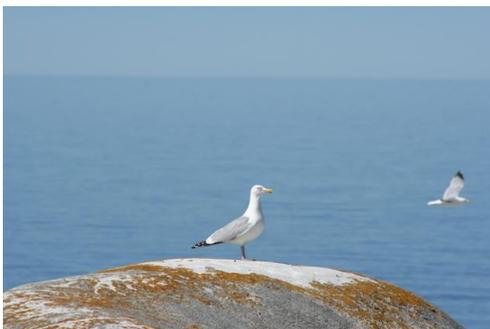
Lake Superior, they are attractive indicators of the status of the Lake Superior component of the coastal ecosystem, especially with respect to its capacity to support wildlife in the park.

A census of colonial waterbirds can be achieved by visiting nesting colonies and counting active nests. Active nest counts occurred at the Park in 1977, 1978, 1979, 1980, 1981, 1989, 1998, 1999 and 2008. Colonies that were not visited during one or more of the years were excluded from the analysis in order to maintain consistent sample effort across years.

Analysis focused on population trends in Herring Gulls, Great Blue Heron, Double-crested Cormorants, and Ring-billed Gulls. The condition of Herring Gulls in the park is rated as good with a stable trend. Abundance is lower from the last three surveys compared to the temporal average

but the magnitude of the decrease is not larger than what one would expect due to natural variation. Great Blue Heron is assessed in good condition with a decreasing trend. The Great Blue Heron count has been decreasing over the past five surveys. Although the decline has been gradual and is still within 2 standard deviations of the temporal average, there is only one colony remaining of the three that have historically occurred in the park. The trend for Great Blue Heron is therefore declining.

Although the presence of Double-crested Cormorants and Ring-billed Gulls increases the biodiversity of Pukaskwa, these species are not known to occur historically in regular or significant numbers. These species are known to capitalize on anthropogenic changes to their food sources, often feeding on introduced species (e.g. alewife) and in landfills. Therefore, their increased presence in the park is considered an anthropogenic stress to the existing ecosystem. Numbers of Double-crested Cormorant nests are between 2 and 3 standard deviations of the temporal average across the past eight surveys and the 18 nests observed in 2008 is an all-time high for the park. As a result, Double-crested cormorants are assessed as fair with a declining trend in EI reflecting the increasing population trend. Ring-billed gulls are rated as good and stable as no nests were found in the 2008 survey (Vance et al., 2008).



Measure: Peregrine Falcon	
Condition 	Trend 

Populations of Peregrine Falcons in Canada continue to recover from the low numbers of the 1970's. The anatum subspecies of the Peregrine Falcon is listed as threatened under the *Species at Risk Act*. Although this species is probably approaching full recovery in the north, it can be affected by local factors such as annual weather events, forest fires or other natural conditions that affect nesting sites and nesting conditions. Prey availability, competition from other raptors, and human disturbance can also play a role in limiting occupancy and reproduction. In addition to being an assessment for these potential stressors, the ease in sampling and low cost of monitoring makes this measure particularly appealing for inclusion in Pukaskwa's long-term monitoring program.

Pukaskwa National Park has been annually monitoring Peregrine Falcon (anatum subspecies) populations in the Park since 1999 to contribute to a larger monitoring program for this species in Ontario (Ratcliffe 2007). This project has attempted to complete a count each year on the Ontario side of the Lake Superior Basin since 1996. The project has included a number of variables to help assess the condition of the Peregrine Falcon population including: the number of territories (paired and unpaired), the number of breeding pairs and successfully breeding pairs, and the number of fledged young.

On the Lake Superior basin, all parameters measured have seen significant increases from the first period (1996-2001) to the second period (2002-2007) (Vance et al., 2008). The increasing trend is believed to be

attributable to the reduced use of harmful pesticides in North America (e.g. DDT) and successful reintroduction and subsequent breeding of captive individuals (Rowell et al. 2003). For the past two years there have been 44 territories on the Ontario side of the Lake Superior basin. More monitoring data are needed to know if the population will achieve stability for the long-term.

Within Pukaskwa National Park, the trend from the early period to the current period is stable. Currently there are three nesting sites in Pukaskwa National Park and a breeding pair has occupied each of these three sites since 2004. Given that the population in the GPE is increasing, specific thresholds should not be developed until the population reaches a more stable condition. In the interim, since this species has displayed a consistent increase in abundance in the GPE and has a stable population within the park over the last four years, this measure is rated in good condition and increasing.

Measure: White-tailed Deer	
Condition	Trend
NIR	NIR

White-tailed Deer is a potential stressor to the Ecological Integrity of Pukaskwa National Park. The range of White-tailed Deer in Ontario is limited to the north by winter severity. Within the GPE, they occur in very low numbers (Skibicki, 1995). The invasion of White-tailed Deer, in turn, may cause the extirpation of Moose and Woodland Caribou from the region due to parasites, competition and increased predation by wolves (Thompson et al. 1998).

White-tailed Deer abundance will be assessed using observations made during aerial surveys. This measure capitalizes on

incidental observations made during aerial surveys and is an index of abundance of the number of White-tailed Deer observed per flight hour. Since this is a new monitoring measure, White-tailed Deer are not rated. Sufficient park-scale monitoring data should exist to report on White-tailed Deer in the park's next SOPR.

Research is needed to determine how closely this index of abundance reflects true trends of the incidence of White-tailed Deer in the park.

Measure: Lichen	
Condition	Trend
NIR	NIR

Lichens are recognized as bio-indicators of air pollution because they exhibit varying tolerance levels to air pollution. Well-studied relationships exist between the diversity and abundance of lichen species and concentrations of specific air-borne pollutants.

This measure will be sampled by recording changes in arboreal species diversity in fixed plots over time using a standardized method developed and tested by Environment Canada (EMAN). For more information on this measure, see: www.eman-rese.ca/eman/ecotools/protocols/terrestrial/lichens/intro.html.

Lichens are a new addition to the park's long term EI monitoring program. The sampling design and initial implementation of this measure is schedule to begin in 2009/10. This monitoring measures, therefore, is not rated.

3.3 INDICATOR: RIVERS AND STREAMS

Condition
NIR

Trend
NIR



The Ecological Integrity indicator “Rivers and Streams” cannot be assigned a status at this time. Only one of its measures has sufficient information to be assessed, and the data are over ten years old. Pukaskwa’s monitoring program for this indicator is currently in the early stages of development. As of 2008, only three monitoring measures have been identified for this indicator, one of which has data for reporting in this SOPR. There is a lack of information to assess trend for this indicator at this time.

Measure: Water Quality

Condition	Trend
●	NIR

Rivers entering the park have the potential to carry contaminants emanating from land use in the broader region. To assess the condition of rivers entering the park, water quality in White River, West Pukaskwa River, and East Pukaskwa River was monitored annually between 1987 and 1996. White River and East Pukaskwa River were selected due to the presence of gold mines along these rivers. In contrast, West Pukaskwa River does not have mines located along it and was selected as a control. Although the monitoring program is ten years out of date, it provides the most

recent water quality data for rivers located in the park and was used to assess the status and trend of park river water quality.

The monitoring program collected a range of water quality parameters including metals, major ions, nutrients, physical parameters and turbidity. To assess water quality status, the Canadian Council of Ministers of the Environment water quality index (CCME-WQI) was calculated from the river monitoring data. The water quality index is designed to summarize complex water quality data to provide a succinct water quality rating. The index is based on a comparison of water quality samples to guidelines designed to protect aquatic life. The index combines three types of information: 1) scope, which refers to the percentage of water quality variables that exceed guidelines; 2) frequency, which is the percentage of total samples that exceed guidelines; and 3) amplitude, which refers to the degree to which observation exceed guidelines.

The CCME-WQI ranges from 0 to 100 with a score of 100 representing excellent water quality. The index was assessed for 1988-1995 for White River and 1988-1994 for West and East Pukaskwa Rivers. From these data all three rivers are assessed to have excellent water quality with CCME-WQI scores of 99.92, 100.00, and 99.63 for the White, West Pukaskwa and East Pukaskwa Rivers respectively.

Despite this assessment, however, some metals that are not considered in the calculation of the WQI exist at concentrations exceeding water quality guidelines. Aluminum concentrations, in particular, frequently exceeded the guideline adopted by the Canadian

Environmental Sustainable Indicator (CESI) initiative (Government of Canada, 2008). The aluminum threshold was exceeded in all years for East and West Pukaskwa Rivers, whereas the threshold was not exceeded for White River. Cadmium and cobalt guidelines were also occasionally exceeded but only during 1991 and 1992 and by the end of the monitoring program these metals were within the guideline. More research is needed to determine if the high levels of aluminum are the result of acid rain or if they are natural levels for this area.

Due to the high CCME-WQI scores for all three sampled rivers this measure is rated in good condition. Since water quality monitoring data do not exist for the park from 1996 no trend assessment is given.



Measure: Benthic Invertebrates	
Condition	Trend
NIR	NIR

Benthic invertebrates offer a variety of benefits to a monitoring program. For example, they respond to a range of stresses that may impact watersheds, including changes in water and sediment quality. They also have a range of life cycles allowing a measure of both chronic and

episodic pollution. Invertebrates are also an important food source for birds, fish, amphibians, etc. Many species complete their entire life cycle in one area, making them good measures of site-specific conditions. Finally, they are very ubiquitous, making them easy to collect and are readily identifiable.

A benthic macro-invertebrate monitoring program using standardized protocols will be implemented in 2009. The measures for reporting on the status and trends in benthic invertebrate communities are species richness and the proportion of sensitive taxa. Pukaskwa will begin reporting on benthic invertebrates for the River / Stream indicator in its next SOPR.

Measure: Fish	
Condition	Trend
NIR	NIR

There are in excess of 20 distinct watersheds in PNP, all draining to Lake Superior and most originating outside of park boundaries (Scheifer and Fellbaum 1996). As a result, the cumulative impacts of various point and non-point pollution sources could affect PNP rivers/streams. The health of PNP rivers/streams is critical to many fish species in the region. Fish diversity responds to a number of stresses and can be easily measured.

Permanent sites in PNP rivers/streams will be sampled each year using standardized protocols beginning in 2009. Where possible, sites selected for sampling will be based on current land use (e.g. mining or hydroelectric developments in the GPE) and will include locations with historical data.

3.4 INDICATOR: INLAND LAKES	Condition NIR	Trend NIR
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The Ecological Integrity indicator “Inland Lakes” cannot be assessed at this time. Only one of its measures has sufficient information to be assessed, and the data are over ten years old. Similar to the Rivers / Streams indicator, the monitoring program for Inland Lakes is in the developing phase. Currently, this indicator is comprised of three measures: water quality, benthic invertebrates and fish. There is insufficient information to assess trend at this time.

Measure: Water Quality	
Condition 	Trend NIR

A monitoring program to effectively sample water quality based on CCME guidelines (see Rivers / Streams water quality) is currently under development. In the interim, this assessment is based on existing park data on pH and aluminum. These data come from two comprehensive studies that were undertaken in the park in the 1980’s (Sutton et al., 1983) and 1990’s (Schiefer and Fellbaum, 1996).

Acidity of inland lakes is assessed due the sensitivity of park lakes to acidification and the severity of potential impacts of acidification to biodiversity. Sampling of 39 inland lakes at the park in the early 1980’s, as part of the Acid Precipitation in Ontario Study, concluded that Pukaskwa lakes are among the most acid sensitive in Ontario (Sutton et al. 1983). Acidification has numerous biological impacts including extirpation of species with low acid tolerance such as invertebrates and small fish. Common shiner, fathead minnow and slimy sculpin all have minimum pH

survival thresholds of 5.9. Larger aquatic species can also be negatively affected; Lake Trout reproduction requires pH in excess of 5.6 (Suffling and Scott 2000). The loss of such species subsequently impacts predators such as waterbirds due to reduced prey availability (Morrison 2004). In addition to direct effects to organisms, acidification causes the leaching of heavy metals from catchments that can inhibit growth, reproductive success and resistance to disease of aquatic organisms. At Pukaskwa National Park, aluminum is the metal of greatest concern. Sampling of 59 lakes during 1989 and 1990 detected aluminum concentrations that exceeded the Ontario threshold for the protection of freshwater aquatic life (0.10 mg/L) in 90% of the 59 lakes sampled during 1989 and 1990 as part of an acidification susceptibility study (McCrea et al. 1990).

Based on a sample of 45 lakes in Pukaskwa taken between 1991 and 1994, 61.4% of lakes were rated as having “good” condition with respect to pH, 20.5% were rated as “fair”, and 18.1% were rated in “poor” condition. Overall, pH within inland lakes in Pukaskwa is rated in good condition. Data from the same study indicate that 83% of the 45 sampled lakes show aluminum concentrations that exceed the Canadian Environmental Sustainability Indicator threshold (Government of Canada, 2008) and are rated in poor condition based on this measure. 17% of lakes were rated in good condition based on aluminum concentrations. The aluminum monitoring measure, therefore, is rated “poor” for the park. Considering the lack of more recent park-scale studies, the “good” rating for pH, and the “poor” assessment for aluminum, the Inland Lake water quality measure is rated as “fair”. No current trend information is available for reporting for this SOPR.

Measure: Benthic Invertebrates	
Condition NIR	Trend NIR

This is a new monitoring measure to Pukaskwa National Park's long-term Ecological Integrity monitoring program. Like the benthic invertebrate measure for the Rivers / Streams indicator, this program is currently under development with initial implementation scheduled for 2009. This program will employ standardized monitoring methods. Data for this measure will be available for the park's next SOPR.

Measure: Fish	
Condition NIR	Trend NIR

Many park lakes support fish populations, although productivity and species richness is typically low due to a number of factors

including cool climate, small littoral zones, low availability of nutrients, and colonization barriers caused by the park's rugged topography. Typical species include Northern Pike, Yellow Perch, Brook Trout, and White Sucker. Angling and acidification are two stressors that may impact the park's fish populations, and sensitivity to these stressors may be high because of low productivity and diversity (Schiefer and Fellbaum 1996).

A long-term inland lake fish monitoring program does not exist at the park. However, two studies with comparable methodology have occurred at the park within the past 25 years. Biological surveys of park lakes conducted in 1984 (Schiefer and Lush 1986) and 1991/92 (Schiefer and Fellbaum 1996) sampled fish populations using gill nets, making it possible to calculate a standardized catch per unit effort in order to compare fish populations between the two sampling periods. The sampled lakes were Buchanan, Louie, Lurch, South Soldier, Widgeon, and Willow. Schiefer and Lush (1986) assessed these

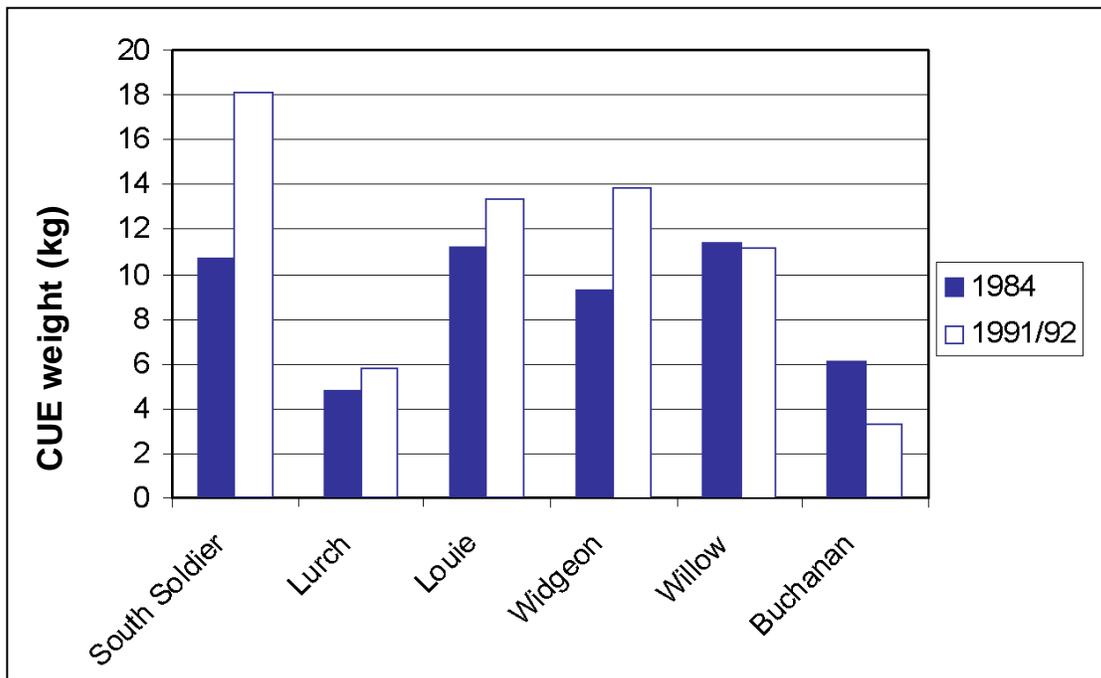


Figure 7. Trends in body weight of trout and sucker (kg/catch per unit effort (CUE)).

lakes as being accessible to some degree by anglers. Sampling at Lurch Lake assessed White Sucker, sampling at Buchanan Lake assessed Lake Trout and White Sucker, and sampling at the remaining lakes assessed Brook Trout and White Sucker.

The catch per unit effort for both species (trout and sucker) combined increased for most lakes between 1984 and the early 1990's, with the exception of Buchanan where catch per unit effort declined by almost 50% (Figure 7). The tendency for fish biomass to increase suggests that the status of fish populations at the lakes either

remained constant (i.e. within the range of natural variability) or improved between 1984 and the early 1990's. The two sampling periods are insufficient to determine whether the change in fish biomass between the two sampling periods is beyond what can be expected from the natural variability of lake ecosystems, and Ecological Integrity thresholds were not set. Given the lack of more recent data, this monitoring measure is not rated for this SOPR. Based on these studies, however, a sampling design for the park's Ecological Integrity monitoring program is currently in development.



4. SPECIES AT RISK

Species at Risk are an important component of ecosystems in Pukaskwa National Park. There are currently four Species at Risk listed on Schedule 1 of the *Species at Risk Act* (Table 4). To date Pukaskwa has been monitoring and/or researching its populations of Woodland Caribou, Pitcher’s Thistle and Peregrine Falcon. Monarch butterflies are also known to occur but little is known of their density and/or distribution in the park.

The status for Species at Risk at a national scale, assigned by COSEWIC, does not necessarily reflect the status at local or

regional scales. For that reason, Parks Canada uses a system of Managed Area (MA) ranks to monitor and assess the status of Species at Risk in the national parks. Parks Canada’s corporate target is that 90% of Species at Risk will have a stable or improved condition over the next 5 years. Comparing MA ranks for regularly occurring Schedule 1 Species at Risk that occur in the park will assess whether a population of a Species at Risk has been maintained or improved. Because MA ranks have only recently been assigned, trend is not assessed in this report.

Table 4. Species at risk present in Pukaskwa National Park that are listed on Schedule 1 of the *Species at Risk Act*. Status, from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), occurrence in the park, and managed area ranks are listed for each species. ‘Present’ = species that occur year round; ‘Regular’ = species that spend a portion of their life in the park. Managed area ranks are also provided.

Common Name	COSEWIC Status	Occurrence	Managed Area Rank
Pitcher's Thistle	Endangered	Present	MA1 - Critically imperiled
Woodland caribou - Boreal population	Threatened	Present	MA1 - Critically imperiled
Peregrine Falcon anatum subspecies	Threatened	Regular	MA2 - Imperiled
Monarch butterfly	Special Concern	Regular	MAU - Unrankable*

* due to a lack of information

4.1 PITCHER’S THISTLE

Condition

MA1

Trend

NIR

Population Status

Endemic to the Great Lakes coast, Pitcher’s Thistle occurs in sand dune habitat. The species is sensitive to extreme weather events, trampling, herbivory, and suppression of the natural variability in lake level that sustains sand dune habitat over the long-term.

Pitcher’s Thistle colonies have occurred in the park at Creek Beach, Crescent Beach, and Middle Beach and annual censuses of these sites have been implemented since 1982 (Figure 8). The minimum population size below which there is thought to be an unacceptable risk of extirpation of the Pitcher’s Thistle population is two distinct colonies, one primary and one secondary, with 50 and 25 plants respectively.

Pitcher’s Thistle abundance at Creek Beach has fluctuated but stayed above the 50-plant threshold. The Crescent Beach colony has declined in recent years and presently no plants are located at the site. To compensate for this decline, however, the Middle Beach colony (an introduced colony as part of an active restoration) has plants in excess of 50 individuals since 2000.

The number of flowering plants varies dramatically from year to year. In recent years, however, at least two flowering plants have been present at both the Creek and Middle Beach colonies.

The status of Pitcher’s Thistle in the park is assessed as critically imperiled (MA1) because it is extremely rare, has undergone steep declines recently and is especially vulnerable to extirpation.

Recovery Planning

Because Parks Canada Agency has the most land holdings with Pitcher’s Thistle of any

federal agency, it is the SARA Responsible Authority (SRA) for this species. This means that Parks Canada is responsible for the development of the Recovery Strategy. The park actively participates in the development and implementation of the Dune Grasslands Recovery Plan—of which the Pitcher’s Thistle is a part.

Active Management

The park has undertaken active management initiatives to improve the health of local Pitcher’s Thistle populations. The Middle Beach colony was established by park staff in 1992 to reduce the risk of extirpation from large mortality events, as occurred in 1985 and 1986 when 60% of the population was lost as a result of storm damage and a flash flood. This restoration project has been highly successful with the Middle Beach colony becoming well established with numbers above the monitoring threshold.

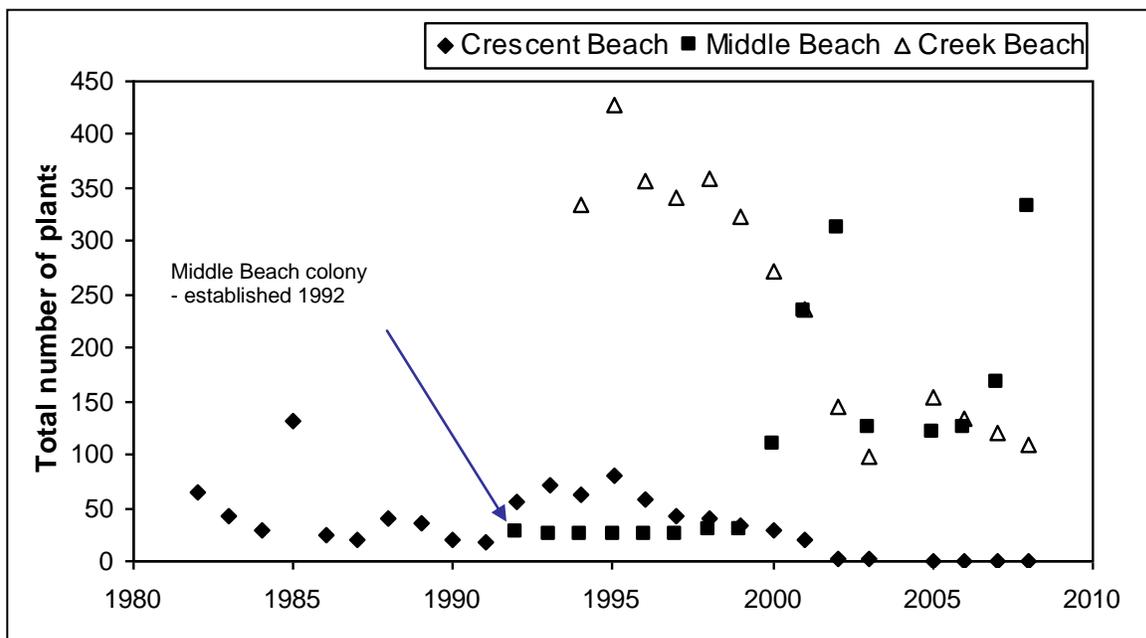


Figure 8. Trends in Pitcher's Thistle abundance at 3 locations within Pukaskwa National Park.

4.2 WOODLAND CARIBOU

Condition
MA1

Trend
NIR

Population Status

Woodland Caribou, in addition to being a Species at Risk that occurs within the park, is also selected as a measure of Ecological Integrity for the Coastal Ecosystem indicator. More information on caribou in Pukaskwa can be found in section 3.2 of this report. Estimates of abundance of caribou in Pukaskwa, already considered low compared to other populations, have been in decline since the park began aerial surveys. The record of only five observations (occurrences of individual animals or confirmed animal sign such as scat or tracks) in 2007 is an all time low. Due to its vulnerability to extirpation from the park, the managed area rank for this species is critically imperiled (MA1).

Recovery Planning

Environment Canada is leading recovery planning for this species and Parks Canada is a SARA Participating Agency. Parks Canada National Office, Ontario Service



Centre and Pukaskwa National Park are actively involved in both the provincial and federal recovery planning for Woodland Caribou.

Active Management

Home ranges for local populations of Woodland Caribou extend beyond the boundaries of the park. The scales at which these animals move throughout the landscape make active management strategies very challenging. Efforts to date are highlighted by an intensive, multi-year research project focusing on the predator-prey dynamics between caribou, wolf and Moose. Results from this research have provided information on habitat use by caribou within the park and influences of predation. This information has provided valuable input into recovery planning.

Other efforts include the aerial surveys conducted by the park since 1972. These surveys are expensive and logistically complicated to implement. The detection probability of this species is low (due to the terrain, density of the forest canopy, and the secretive behavior of the animal), and relative abundance values are under estimates of the true caribou population size in the park. At the time of writing, research is underway into an alternative survey technique, forward-looking infra-red (FLIR) that may help to improve future monitoring efforts for this species.

4.3 PEREGRINE FALCON

Condition
MA2

Trend
NIR

Population Status

Peregrine falcons (anatum subspecies) have been breeding regularly in the park since 2004. The provincial population has experienced increases that are credited to the ban of DDT in early 1970's and a captive release program initiated across Ontario in 1977. The Ontario population has demonstrated an increasing population every year since the release. Although recovery of this species is looking positive, the species is ranked as imperilled in the park (MA2) due to its restricted range, and relatively small numbers. Since 2000 there have been three breeding pairs in the park.

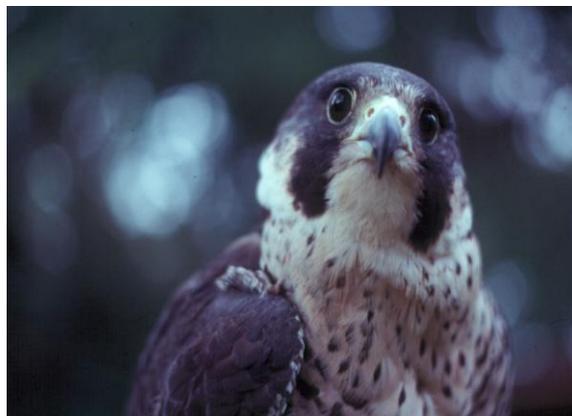
Recovery Planning

The provincial government in Ontario is leading the development of a Recovery Strategy for this species. Pukaskwa has provided input into that process. In addition, a national Recovery Team is also developing a strategy to address limiting

factors for this species that extend beyond provincial boundaries.

Active Management

Since 1999 Pukaskwa has participated in the nation-wide Peregrine Falcon surveys conducted every five years as part of the National Recovery Plan. These surveys are to determine site occupation and productivity, and to monitor population trends. In addition to the 5-year surveys, Pukaskwa also monitors Peregrine Falcon breeding activity annually at a lower intensity as part of its Ecological Integrity Monitoring Program and in partnership with the Ontario Recovery Team. As part of this work, information on nest productivity and recruitment is collected and, since 2002, 24 Peregrine Falcon nestlings have been banded in Pukaskwa. This research will contribute information to both national and provincial recovery planners on many of the knowledge gaps identified for the species.



4.4 MONARCH BUTTERFLY

Condition
MAU

Trend
NIR

Population Status

Although the Monarch Butterfly is known to occur in Pukaskwa National Park, no information is available on its distribution and abundance in the park. Thus, its current Managed Area Rank is MAU ('unrankable'). Inventories are required before a MA Rank can be assigned.



Recovery Planning

Environment Canada is leading recovery planning for this species. As a species of Special Concern, a management plan instead of a recovery strategy is required for this species. The management plan is still in draft form. Pukaskwa National Park has not participated in the preparation of this document.

Active Management

There have been no active management efforts directed towards Monarchs in the park. Once the National Management Plan is in place, Pukaskwa will use it to guide in-park management activities that may help improve the status of this species.

5. CULTURAL RESOURCES

The purpose of this section is to describe the state of Cultural Resources in Pukaskwa National Park. Specifically, two indicators:

Resource Condition and Management Effectiveness, are evaluated.

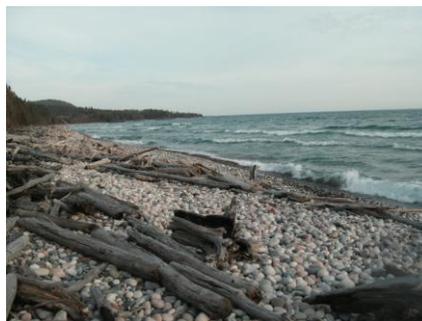
5.1 INDICATOR: RESOURCE CONDITION	Condition ▼	Trend NIR
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A significant cultural resource found within Pukaskwa National Park is the *Pukaskwa Pits*. These “Pits” are cobble stone formations that occur along the Lake Superior coastal zone in the park. These cobble stones have been piled up, removed, or shifted to form walled enclosures, simple pits, or flat floors. The Pukaskwa Pits are thought to represent a form of Aboriginal architecture. Such features occur in clusters of up to several dozen. These archaeological pits have been reported as far west as Thunder Bay, Ontario and as far south as Georgian Bay. However, the features in Pukaskwa are considered to be the most outstanding examples known to exist.

Pukaskwa Pits have been interpreted as copper nugget mines, duck blinds, fish weirs, or spiritual “vision quest” pits. While a few features are undeniably the result of historic commercial operations (e.g. fisheries and lumbering), most are now thought to be the remains of Aboriginal lodges, windbreaks, tent rings, storage pits, and hearths. Research on the surface hardness of

the cobbles used in their construction suggests that some of these pits may date from ca. A.D. 1000 to 1500. It is, however, possible that some “Pits” may predate this time period. Because these stone features are readily apparent to the untrained observer and are easily disturbed, Pukaskwa Pits are threatened as much by innocent curiosity as by intentional vandalism.

Due to the attraction that these intriguing Cultural Resources hold for curious park visitors and the decay caused by natural elements, Pukaskwa has located and documented many of these stone features within the park. Ongoing systemic exploration of Pukaskwa’s coastline is undertaken to re-examine previously reported sites to confirm the presence and condition of features. Due to the archaeological significance of the Pukaskwa Pits, the potential threat for disturbance, and the need for ongoing monitoring and education, the resource condition of these archaeological sites is rated “fair”.



5.2 INDICATOR: MANAGEMENT EFFECTIVENESS	Condition 	Trend NIR
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Pukaskwa National Park has made a significant investment in protecting the park’s Cultural Resources. This section assesses the effectiveness of these management actions. The assessment is made from 4 measures: inventory, evaluation, monitoring, and cultural resources management strategy. These measures are rated fair, fair, good, and fair, respectively. Overall, the effectiveness of current management practices for Cultural Resources is rated “fair”.

Measure: Archeological Inventory	
Condition 	Trend NIR

As of 2007, park staff, in association with archaeologists from the Ontario Service Centre, have systematically inventoried approximately 33km of the Lake Superior shoreline starting at the southern end of the park. All of the sites along this stretch have been documented through site plans, record photographs, beach terrace cross-sections, and some stereoscopic oblique views. More recent site recording has been done using electronic methods such as handheld GPS (global positioning system) locations and digital survey equipment. Thus far, over 570 features have been recorded from 62 sites throughout the park. The inventory is incomplete however, and so this measure receives a “fair” rating.

Measure: Site Evaluations	
Condition 	Trend NIR

The Pukaskwa Pits are stone features that can take several forms. They were typically constructed by piling up, removing, shifting, or otherwise realigning naturally occurring cobbles on a beach, with no soil used to hold them together. They are man-made structures that usually can be distinguished from the surrounding cobble beach ridge with relative ease. These features typically take one of 5 forms:

1. Stone-lined pit features outline by piled stones (e.g., walls) with an interior depression
2. Simple features marked by a depression only
3. Stone outlines—features characterized by flat areas without depressions or walls
4. Leveled area—features characterized by flat areas without depressions or walls
5. Mounds—features characterized by piled stones (eg, cairns) (Dawson, 1975).

Like the inventory process, the evaluation process of these features is not yet complete within the park and so receives a “fair” rating.

Measure: Site Monitoring	
Condition 	Trend NIR

Parks Canada has established a formal monitoring program for the Pukaskwa Pits in order to detect and assess physical damage to these features. Vertical scale-rectified photography, or stereophotogrammetry, is used at these sites. This approach generates images that can be used to produce a comprehensive and architecturally accurate photo-mosaic of an entire site.

In preparation for monitoring, semi-permanent monuments, or datums, are erected at each threatened site, in sufficient number and arrangement so as to provide full coverage of the site. Baselines are established between these datums, and camera stations are identified along them at specified distances and compass bearings necessary to view the various features. Photographs are then taken at each station by park staff and compiled into a report documenting any changes in stone orientations and alignments. Sites to be monitored are scheduled into groups based on shared geographic location. Formal monitoring began in 1982 at only three sites. Monitoring has since been expanded to 16 sites within the park. Each site in the program is to be formally monitored at least once every 4 years. More complex and larger sites may receive more frequent and less formal visual inspection to ensure that problems have not developed in the interim. To date the monitoring program has demonstrated that many of the sites south of the terminus of the coastal hiking trail are not in immediate threat. Visitation at these sites is limited and impact is typically negligible. Continued monitoring and

inspection of the most accessible and prominent known sites will continue. Due to the presence of a dedicated, ongoing effort to monitor the state of the Pukaskwa Pits, this measure is rated good.

Measure: Cultural Resource Management Strategy	
Condition 	Trend NIR

Pukaskwa National Park has completed a Cultural Resources Management Plan (Parks Canada, 1984). This plan establishes a framework for the identification and evaluation of significant cultural resources and provides guidelines for their protection. The Plan’s objectives are to protect and manage all cultural resources, provide interpretation, and direct future research. The plan places a strong emphasis education. The park provides information regarding the significance and sensitivity of these features on its website, brochures, interpretive programming, and backcountry visitor orientation. Additional work needs to be done to strengthen the involvement of the First Nations in protecting cultural resources. While the park has a Cultural Resources Management Strategy in place, it is now almost 25 years old and in need for review in light of new inventories and monitoring and a need for educational direction. There is a need to complete a Cultural Resource Values Statement with First Nations as a part of the revision of the Cultural Resources Management Plan. For these reasons this measure is rated “fair”.

6. CONNECTION TO PLACE

The mandate of Parks Canada is to protect and present heritage places for the people of Canada so as to leave them unimpaired for future generations. A fundamental component of achieving this mandate for Pukaskwa National Park is to foster public appreciation and understanding for the park’s natural and cultural heritage, to provide high quality visitor experiences, and to develop key partnerships with

stakeholders in the surrounding area. These ideas, collectively, are referred to here as fostering a “Connection to Place” with Pukaskwa National Park. This section will evaluate the state of park programs aimed at fostering a Connection to Place through the following three indicators: Visitor Experience, Outreach Education, and Stakeholder Relations.



6.1 INDICATOR: VISITOR EXPERIENCE	Condition 	Trend NIR
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The assessment for the Visitor Experience indicator is based on four measures: Visits, Learning, Enjoyment, and Connection. Though national guidelines for reporting on visitor experience are still in draft form, where targets are in place these were used to assess the condition of each of the measures. The primary data sources for the assessments are the overall visitation statistics as well as the Visitor Information Program (VIP) Report for Pukaskwa

National Park (Parks Canada, 2006). The condition of the Visits and Learning measures are rated fair, and the Enjoyment and Connection measures are rated good. Overall, Visitor Experience is rated good. Pukaskwa has opportunity to make improvements in personal and non-personal interpretation and other services.

Measure: Visits	
Condition 	Trend NIR

In the past five years (from 2004 to 2008), approximately 7,000 visitors have come to Pukaskwa National Park each year. During this time, the number of visits declined by 4%. The 2006 VIP report (Parks Canada, 2006) indicated that the average party size among all visitors is 2.4 people. For groups with children it is 3.9, and groups without children averaged 2.0 people per party. Fifty-five percent of parties visiting Pukaskwa are adults between the age of 18 and 60. Twenty-three percent come with children under 18 and 16% are seniors over the age of 60. The majority of visitors are from Ontario (59%), followed by visitors from the United States (27%). Visitors from the rest of Canada represent 12% and only 2% come from foreign countries not including USA.

Front country represents about 90% of the total visitation, the remaining 10% occurs in the backcountry. The frontcountry has approximately 60% occupancy during the peak season, a rate that is comparable to other Provincial Parks in the area (Ontario Parks, 2008). The majority of visitors are very satisfied with their experience and 42% of visitors are repeat visitors (Parks Canada 2006). However, the 2006 visitor experience assessment provided low ratings for issues related to marketing and promotion, and gave low scores for “availability of park information prior to visit”. Also, the VIP survey identifies the webpage as a weakness for trip planning. It is also important to ensure that facilities in the park meet the changing expectations of the traveling public. A high potential target market is the circle tour travelers who drive by the park

without stopping. A more focused effort on marketing with key tourism initiatives and partners along the north shore will ensure Pukaskwa is up-to-date with changing demographics (Parks Canada 2002). For these reasons, the rating for the Visits measure is “fair”.

Measure: Learning	
Condition 	Trend NIR

Parks Canada’s national target is that 50% of park visitors will participate in an interpretive activity. It is through interpretive programming, personal and non-personal, that the park is able to convey information and educate the visitor about Pukaskwa’s natural and cultural heritage. The 2006 VIP (Parks Canada, 2006) revealed that an estimated 81% of surveyed visitors participated in some kind of interpretive activity (which is above the 50% target and the national average of 70%). However, the majority of respondents engaged in non-personal learning activities (e.g. viewed the exhibits at the Visitor Centre), and only 21% participated in a staff-led program.

Park’s Canada’s national target for levels of visitor satisfaction with various program elements is that 50% will report being “very satisfied”. Satisfaction levels for evening programs, “meet an expert,” and guided hikes all exceeded the 50% target. Of the visitors who viewed the visitor centre exhibits, only 46% reported being “very satisfied”, below the national target. Satisfaction ratings for the Anishnaabe encampment and for interpretive activities overall were both below the target (see Figure 9).

Due to the combination of high participation in interpretive activities but low participation in staff-led activities; and high

levels of satisfaction with some but not all interpretive programs, the overall rating for the Learning measure is “fair”.

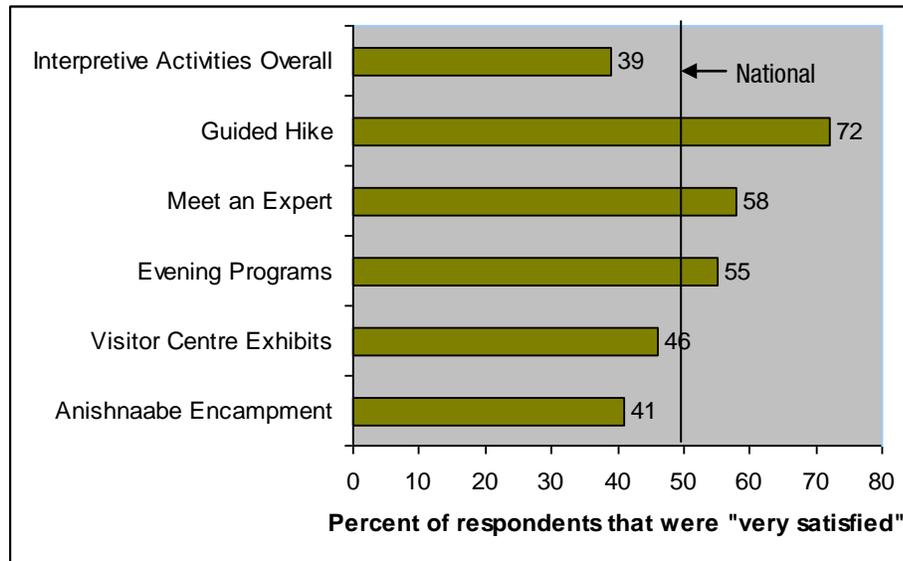


Figure 9 . Level of visitor satisfaction with interpretation activities (Parks Canada 2006)

Measure: Enjoyment	
Condition	Trend
●	NIR

The assessment for visitor enjoyment was based largely on the 2006 VIP report (Parks Canada, 2006) in which respondents rated their level of satisfaction with various aspects of their visits. As stated above, the general PCA target is that at least 50% of visitors will report being “very satisfied”. PCA has outlined five separate categories for assessing visitor enjoyment:

1. Overall enjoyment
2. Quality of activities
3. Availability of activities
4. Quality of facilities and services
5. Availability of facilities and services.

As there was no question asked to assess overall enjoyment, no data are reported in this

category. In the *quality of activities* category, interpretive activities have already been discussed under the Learning measure and presented in Figure 9. One may also consider here the visit as a recreational experience. Seventy percent of respondents were very satisfied with this aspect of their visit, well above the national target. This high level of satisfaction is likely due to the wilderness character of the park that provides exceptional recreational opportunities.

The *availability of activities* category fell well below national targets. Only 28% of respondents indicated that they were “very satisfied”, a full 22 percentage points below the national target of 50%. Some visitors commented that canoe and kayak rentals should be made available.

Almost all of the visitor assessments in the *quality of facilities and services* category met national targets (Figure 10). Only the value

for camping fee and value for entry fee fell below the targets. The authors also noted a need for improvements with basic services as many comments were received from visitors indicating a need for clean washrooms and well-maintained campsites and trails.

In the *availability of facilities and services* category, targets were met for both the availability of park staff (54% “very satisfied”) and the availability of campsites (73% “very satisfied”). As most of the targets for visitor enjoyment were met or exceeded, the overall rating for the Enjoyment measure is “good”.

Measure: Connection	
Condition	Trend
●	NIR

“Connection” is defined here as a sense of value-added—a feeling on behalf of visitors that the park provided an experience that went beyond their expectations. A “connected” park visitor is one whose overall expectations were met or exceeded. In the 2006 VIP assessment, 86% of respondents stated that the park exceeded

their overall expectations, 52 % of visitors were satisfied with value for dollar and 42% of visitors were repeat visitors. The lack of satisfaction with value for dollar is a problem for Parks Canada nationally, as this metric has declined nationally for the period 2005 to 2007, perhaps in response to newly introduced fee structures.

Overall, the Connection measure is assessed as “good” since most targets were exceeded, and the repeat visitation is good.

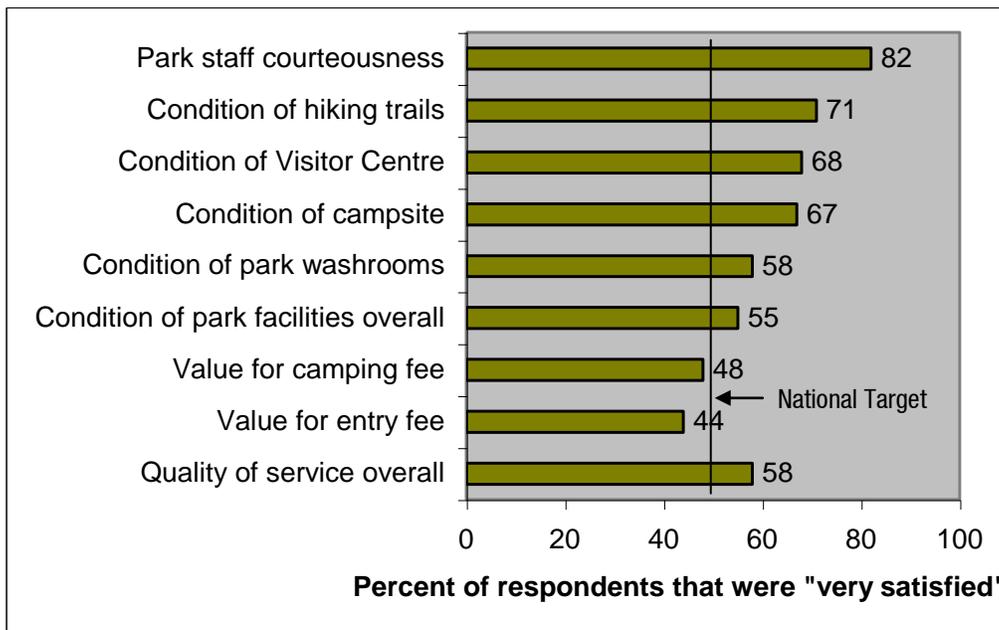


Figure 10. Level of visitor satisfaction with quality of facilities and services, from the 2006 VIP report

6.2 INDICATOR: OUTREACH EDUCATION

Condition



Trend

NIR

The assessment for the Outreach Education indicator is based on four measures: understanding, appreciation, support and engagement. The condition of the Understanding measure is not rated due to insufficient information, Appreciation is rated fair, Support is rated fair, and Engagement is rated fair. Overall, the Outreach Education indicator is rated fair. This indicator will soon see improvements as an Agency-wide renewal of Visitor Experience and External Relations was initiated at the time this document was being finalized.

Measure: Understanding

Condition

NIR

Trend

NIR

This measure reflects the extent to which audiences understand and retain park messages following participation in outreach education activities. This measure has not been assessed in many years, so it is not possible to give a condition at the current time. The current outreach education offer is an education kit that is somewhat outdated. Capacity affects the park's ability to improve this measure but with a renewed focus on visitor experience and external relations, this measure will see notable improvements in the next SOPR.

In 2002, Pukaskwa National Park developed a Strategic Marketing Plan that identified and evaluated its primary and secondary markets. Through this exercise a SWOT (strengths, weaknesses, opportunities, and threats) analysis was undertaken to better refine outreach education programming, marketing and communications to selected groups. Pukaskwa should consider

updating and implementing a Strategic Marketing plan by 2013.

Measure: Appreciation

Condition



Trend

NIR

Appreciation is measured for this report from a values and attitudes survey (Quinn and Potter, 1997) of local residents that measured their appreciation for protected areas in general and Pukaskwa National Park in particular. As part of the survey respondents were asked to identify particular locations in the area that they felt were "extremely special"; Pukaskwa was named in highest frequency compared to all other areas in the region, however it was below 50%. This survey found that local residents had a deep-rooted sense of place and described the area with words such as "remote", "wilderness", "small community" and "resource-based".

As further measure of appreciation, we evaluated local visitation: 59% of visitors are from Ontario (Parks Canada 2006); 50% of frontcountry use is 'day-use'; and members of the Robinson-Superior Treaty Group, the local First Nations, represent an average of 10% of visitors between 2004 and 2008, all suggesting a strong appreciation for the Park.

Despite these positive signs, a values and attitudes survey has not been recently updated, nor has it been expanded to include other stakeholder groups such as park staff, Aboriginal leaders, forest industry planning teams, municipal leaders, non-government organizations and schools. A goal of the park is to improve the rate of

responses listing Pukaskwa as “extremely special” to greater than 50%. For these reasons, the appreciation measure is assessed as ‘fair’.



Measure: Support	
Condition ▼	Trend NIR

Support is assessed through surveys of local and regional residents and through participation in park-developed school programs. Partnerships with local schools are a key component to garnering support for the park through the education of young people and future local leaders.

As part of the “sense of place” survey, a concurrent attitude survey was undertaken to assess the level of support for protected areas along the north shore of Lake Superior (Cantrill and Potter, 1997). This study suggested that residents of the north shore have a deep attachment to the natural character of the area. There were moderate levels of support for existing protected areas, but limited support for creating new protected areas, or regulating land use near

protected areas. Cantrill and Potter (1997) found that: “People seem to intuitively know that protected areas are important but lack sufficient information to understand the general range of benefits afforded by protected areas”.

Regarding school programming involving Pukaskwa National Park, the park has developed an “Edukit” program that provides park-based educational materials to local schools. The concept of the Edukits was useful but the park has lacked capacity to market them and evaluate their effectiveness. The relationship with local schools needs to be strengthened. Given the moderate local support for protected areas and the low participation in school programming, this measure is rated “fair”.

Measure: Engagement	
Condition ▼	Trend NIR

“Engagement” in this report refers to the active participation in environmental activities that support the park. If outreach education programs at Pukaskwa are successful then they will lead to greater support for and engagement with the park. Examples of activities that represent a form of engagement are citizen science and volunteer programs such as environmental monitoring, Christmas Bird Count, and NatureWatch programs.

Pukaskwa has had limited, but some capacity developing and implementing programs aimed at engaging local communities. During the last five years annual open houses have been held at the Park administration building and the park has hosted nine backcountry camping experiences for First Nations. There have been over 6600 hours of volunteer work completed in the park in the past five years.

The Friends of Pukaskwa actively engage the community in multiple initiatives and support of this group has increased over time.

Although many efforts are underway, opportunities exist for strengthening community engagement. Other programs that could be developed are school-based

citizen-science monitoring programs that follow methods promoted by EMAN (Ecological Monitoring and Assessment Network). As a result, the engagement measure is currently assessed as “fair”.

6.3 INDICATOR: STAKEHOLDER RELATIONS	Condition 	Trend NIR
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Stakeholder relations are assessed through two measures: support and engagement. These measures are similar to those found in the Outreach Education indicator but focus specifically on key stakeholder groups within the greater park ecosystem.

Measure: Support	
Condition 	Trend NIR

Developing effective stakeholder relationships requires a concerted effort and strategy on behalf of the park. Not only do stakeholders need to be identified, but their associated mandates, jurisdictions and supporting legislation need to be assessed with respect to their potential influence on the management goals of the park (Zorn et al. 2001). A stakeholder analysis has been started and an appropriate communications strategy is being implemented in order to share information and foster effective relationships that further the goals of the park.

This measure is assessed through the development of a comprehensive stakeholder analysis that includes identification of key stakeholders, their areas of influence, jurisdictions, mandate,

List of Pukaskwa’s Key Stakeholder Groups

- Forest Industry Planning Teams
- Mining Industries
- Ontario Ministry of Natural Resources (Wawa District, CNFER, OFRI)
- Environment Canada
- Atmospheric and Environmental Services
- Robinson Superior Treaty Group - Governing Members
- Department of Fisheries and Oceans
- Canadian Coast Guard
- Natural Resources Canada (Canadian Forest Service)
- Environmental Non-Governmental Organizations (e.g. Wildlands League)
- Municipal Government
- Lake Superior Basin Area Managers
- Rescue Control Centre Trenton (RCC)
- Friends of Pukaskwa
- Canadian Wildlife Service
- Lakehead University
- Local Print Media
- Local Radio Stations

policies, and supporting legislation. The park has fostered positive relationships with many of its stakeholders and has gained support on many issues that are related to the management of the park. New investments in staffing in this area have

helped improve and solidify these relationships.

Support is also measured through instances where the park is positively mentioned in external media, particularly media developed by key stakeholders (e.g. local newspapers, newsletters, websites, etc.). The park currently does not have statistics on the instances of positive media attention but plans to undertake this kind of analysis for the next SOPR. However, it appears that the park is mentioned more favourably in the media over the last two years. This measure is currently rated fair.



Measure: Engagement	
Condition 	Trend NIR

Engagement in stakeholder relations is measured through the effective participation in regional partnerships that are in support of Parks Canada’s mandate. For Pukaskwa National Park, engagement with stakeholders has improved considerably.

Pukaskwa has recently invested in increasing its capacity for stakeholder relations and partnership development. The park is currently involved in a number of positive partnerships involving key stakeholders. For example, Pukaskwa is a member of the Crown Land Use Atlas Harmonization (CLUAH) process whereby a new land use policy is being proposed for Crown Land adjacent to the park. Other initiatives include the Zone of Cooperation Working Group, Tourism Action Committee, outdoor education with universities, and participation in the forest management planning process and in mine closure process in areas around the park. The engagement measure is thus rated good.

7. INFORMATION BASE

Information Base	Condition 	Trend 
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The Condition of the Information Base speaks to the management, quantity, and quality of information used for reporting and management purposes. The assessment of the Condition of the Information Base for this SOPR is based on the following measures:

1. In-park information management
2. Participation in national information
3. Information sources for Ecological Integrity
4. Information sources for Cultural Resources

5. Information sources for Connection to Place
6. Information quality (e.g. sufficient sample sizes).

Based on these six measures, assessed in Table 5, the Condition of the Information Base at Pukaskwa National Park is rated as “poor”. However, the trend is improving due to newly acquired capacity to improve the information base in the areas of both Ecological Integrity and Connection to Place.

Table 5 – Condition of Information Base at Pukaskwa National Park

Condition	Measure	Comments
	Dedicated in-park data manager and information management system	Pukaskwa National Park has a dedicated data manager. This position is responsible for the ongoing management of the park’s information base. The current data management system is due for an update to ensure that data and reports are readily accessible to park staff, partners, and stakeholders.
	Participation in national information systems with monitoring information available	Pukaskwa has completed entry of its Ecological Integrity monitoring information into Parks Canada’s national information system—ICE (Information Centre on Ecosystems). To date, only the park’s summary monitoring information and basic metadata are available.
	Ecological Integrity information base current and up-to-date	Much of the park’s long-term Ecological Integrity monitoring program is in the early implementation phase and no data exist in support of many measures. Much of the ecological data used to report here are from isolated inventory or research studies that have not been duplicated or have not been updated in over 10 years
	Cultural Resources information base current and up-to-date	The park’s monitoring program of the Pukaskwa Pits is active and ongoing (in association with the Ontario Service Centre). Given available resources and capacity the information base for Cultural Resources are kept current and relevant for reporting purposes.
	Connection to Place information base current and up-to-date	The information base for Connection to Place is largely based on isolated studies or initiatives that have not yet been replicated over time (e.g. Sense of Place study, 1997). The park has recently invested in capacity to further develop and implement its visitor experience, outreach education and stakeholder relations initiatives and the information base for this section should improve for the next SOPR.
	Information quality is sufficient to support status and trend assessments	Many datasets are small and possibly biased (e.g. wolves). The main reason for this is the size, ruggedness, and remoteness of the park. The majority of the park is accessible by air only. Aerial surveys and air transportation for on-the-ground field activities is expensive and the need surpasses the park’s financial resources. New and innovative sampling designs are needed to improve the quality of the information base in a way that is cost -effective.

8. EVALUATION OF MANAGEMENT ACTION

Of the many goals and objectives established in the 1995 Pukaskwa National Park Management Plan, many have been accomplished. Some were adjusted due to new partners and new legislation including the revised *Canada National Parks Act (2002)*, and the new *Species at Risk Act (2002)*.

The following tables provide examples of key strategies outlined in the 1995 Management Plan, the main objectives for each strategy and what actions were initiated to accomplish these objectives. Many initiatives have been successful such as fire management in the boreal forest. Pukaskwa has an approved fire management plan and has successfully used fire as an ecological tool since 2002. Also, the full integration of the park in forest management planning and land-use policy meetings has improved stakeholder relationships.

However, more has to be done to establish a stronger relationship with the Robinson-Superior Treaty Group (RSTG). The development of the Anishinaabe Camp as well as new First Nations interpretation products have helped to strengthen relationships with local First Nations and integrate Aboriginal knowledge into park messages. Education programs have been created for schools in the local area and programming continues in the park for visitors on Species at Risk, Fire Management and bear safety.



8.1 KEY STRATEGY #1 – FOREST DISTURBANCE MANAGEMENT

The purpose of this strategy is to ensure that Pukaskwa National Park remains representative of the boreal forest with emphasis on inland boreal mixed-wood ecosystems while also recognizing an increasing presence of elements of the Great Lakes/ St. Lawrence forest region throughout the Park.

Objectives	Key actions	Action Status	Outcomes
1. Fire Management	<p>Action 1: Update and implement draft fire management plan (1992).</p> <p>Action 2: Implement a comprehensive, integrated and proactive Fire Management Plan within 5 years (1994/1995 – 1999/2000).</p> <p>Action 3: Continue research into the use of fire as a resource management tool.</p>	<p>Completed</p> <p>Completed</p> <p>Ongoing</p>	<p>The approved plan has guided the fire program in the park.</p> <p>Fire reintroduced on the landscape has helped improve the EI of the park. We still need to ensure our fire program is restoring fire on the landscape to within the desired fire cycle. Several scientific papers including a Masters Thesis provide more information to better understand and manage fire as an ecological tool.</p>
2. Forest Insects and Disease	<p>Action 1: Develop an interactive computer model integrated with fire management to better understand the role spruce budworm plays in the GPE.</p>	<p>Not completed but research is continuing with fire modeling</p>	

8.2 KEY STRATEGY #2 – AQUATIC MANAGEMENT

The purpose of this strategy is to ensure the viability, and diversity of representative habitats, species, and dynamic processes associated with Lake Superior, with an emphasis on Precambrian Shield lacustrine, riverine, wetland, and coastal ecosystem components characteristic of the Lake Superior drainage basin.

Objectives	Key actions	Action Status	Outcomes
1. Aquatic Management	Action 1: Develop a comprehensive, integrated, and pro-active aquatic management strategy.	Initiated	<p>Historical data have been used to help develop a long-term aquatic monitoring program that enhances the park's ability to manage these systems.</p> <p>We still need to report on the condition of the Inland Lake and Rivers/Stream Indicators.</p>
	Action 2: Complete Aquatic Resources Inventory Program that will provide the information needed to help develop a management strategy for sport fishing.	Completed	<p>Recommendations for sport fishing management of lakes have been outlined and are being considered for implementation.</p>

8.3 KEY STRATEGY #3 –MAMMAL MANAGEMENT

The purpose of this strategy is to ensure continued viability, and diversity of representative species that depend on the habitats and dynamic processes associated with the boreal mixed-wood forest, the Lake Superior coastline, and the transitional Great Lakes/St. Lawrence forests found within the Pukaskwa ecosystem.

Objectives	Key actions	Action Status	Outcomes
1. Mammal Management	Action 1: Survey Moose and Woodland Caribou populations and ensure protection of key caribou habitat along the coast through zoning and the development of visitor access strategies.	Completed	Up-to-date surveys of Moose and Woodland Caribou (SAR) are used to track trends in both populations. Visitor access strategy for Otter Cove area has been implemented to improve visitor experience and protect EI.
	Action 2: Complete the predator/prey study to determine Caribou, Moose and wolf population size, structure and dynamics.	Completed	Information used for resource management planning related to these species. We still need to complete a study for caribou restoration
	Action 3: Ensure an up-to-date bear management plan.	Completed	Information used by park staff and visitors to evaluate the appropriate response to bear encounters. Information used to communicate the “Bear Aware” program in the park to reduce visitor/bear conflict.
2. Avifauna	Action 1: Complete Avifauna research to better understand and ensure the sustainability of this element of the park ecosystem.	Initiated/Ongoing	Ongoing monitoring of Peregrine Falcon (SAR), colonial water birds, owls and forest birds provides trend information and potential threats to these species.

8.4 KEY STRATEGY #4 – CULTURAL RESOURCES MANAGEMENT

The Cultural Resource Management Plan will continue to provide strategies for preservation and use of the park’s Cultural Resources that form a part of the cultural landscape of the region. The need to work with our partners (especially the RSTG) to protect this cultural landscape will continue.

Objectives	Key actions	Action Status	Outcomes
<p>1. Develop a Cultural Resource Management Plan for the park.</p>	<p>Action 1: Revise 1984 Cultural Resource Management Plan that will identify the means and procedures whereby the Park’s Cultural Resources will be protected.</p>	<p>Not Completed but research and monitoring is continuing</p>	<p>A Cultural Resource Values Statement (developed with local First Nations)</p>
<p>2. Parks Canada will encourage increased involvement by the RSTG in identifying, interpreting, and protecting the Park’s Cultural Resources.</p>	<p>Action 1: Identify and act upon opportunities for input from the RSTG.</p>	<p>Ongoing</p>	<p>Visitors have a greater understanding and appreciation for the role of First Nations in the park and surrounding area.</p> <p>Community relations have been strengthened through the development of the Anishinaabe Camp and new First Nation Interpretation products.</p> <p>Continue First Nation Youth Camps to increase the opportunities for young people to learn traditional skills and knowledge.</p> <p>Still need to develop cooperative management agreements with local First Nations.</p>

8.5 KEY STRATEGY #5 – LAND USE PLANNING

An essential component of achieving the goal of protecting the Park within the Lake Superior basin is a creative approach to land-use planning. Parks Canada will promote and use a variety of land-use mechanisms such as land stewardship and land-use planning that will help the park and its partners fulfill the vision for the area.

Objectives	Key actions	Action Status	Outcomes
1. Increase participation in land-use planning programs that better enable the park to help direct the future environment of the Lake Superior area.	Action 1: Work with other partners to deliver an integrated land stewardship program.	Ongoing	Park values have been better integrated into management decisions on adjacent lands through the park's involvement with the Zone of Cooperation Working Group and the CLUAH process.
	Action 2: Achieve recognition of Parks Canada as a review agency for planning and land development activities adjacent to the park.	Ongoing	Have strengthened engagement through increased involvement with local land managers Involvement with local stakeholders and land managers needs to continue (E.g. Pukaskwa is a Community of Interest for Hemlo Mines)

8.6 KEY STRATEGY #6 – VISITOR EXPERIENCE

The purpose of this strategy is to provide one of the most accessible wilderness areas in Ontario with a variety of front country and backcountry experiences. Pukaskwa has the most wilderness character of any national park in Ontario and protects a portion of the longest stretch of undeveloped coastline in the Great Lakes. This provides incredible opportunities for visitors who want to explore the wilderness of this unique area of Canada.

Objectives	Key actions	Action Status	Outcomes
<p>1. Provide a wide range of educational opportunities for visitors so they can learn about the park and have a safe and enjoyable experience.</p>	<p>Action 1: All themes and messages will be interpreted through a variety of personal and non-personal programs to visitors and local communities.</p>	<p>Ongoing</p>	<p>Better understanding of various aspects of the park’s natural and human history through a variety of park programs.</p> <p>Students understand the important role that ecological monitoring plays in the park.</p> <p>Still need to update strategic marketing plan, improve the percent of local residents who see the park as extremely special.</p>
<p>2. Provide a variety of visitor experiences and amenities for different visitors who want to experience the “Wildness” of the park.</p>	<p>Action 1: Provide a front country experience on the “Edge of Wilderness” to all visitors with high degree of interaction with the environment with low risk.</p>	<p>Ongoing</p>	<p>Improved visitor experience of a variety of ecosystems (e.g. beaches, headlands, inland lakes) in a safe environment.</p> <p>Still need to improve visitor satisfaction with the Visitor Centre and Interpretive Activities</p> <p>Still need to ensure facilities meet changing expectations of visitors and continue to improve campgrounds, washrooms and trails.</p>
	<p>Action 2: Provide an exceptional wilderness backcountry experience for kayakers and hikers.</p>	<p>Ongoing</p>	<p>Improved visitor backcountry experience through improved basic services such as backcountry campsites and trails.</p> <p>New backcountry reservation system implemented ensuring a higher degree of solitude along the coastal trail.</p>

9. KEY ISSUES

Through the process of developing Pukaskwa National Park's State of the Park Report a number of key issues have been raised that should be considered during the review of the park's management plan. A brief discussion of these issues is presented here.

9.1 Coastal Ecosystem

The coastal ecosystem is a top priority for Pukaskwa National Park for several reasons: it is currently assessed as having a 'fair' status, there is no information at all for two measures, and it is home to three Species at Risk (one imperiled at the site and two critically imperiled at the site). Monitoring to date has revealed downward trends for both Species at Risk. If Pukaskwa wishes to reverse these trends, improve Ecological Integrity and the status of these species, active management is required. The coastal ecosystem is also the main access corridor for visitors and the location of the most important cultural resources (the Pukaskwa Pits). As such, the coastal ecosystem holds great potential to meet Parks Canada's corporate priorities around Ecological Integrity, Species at Risk, Cultural Resources and Visitor Experience in an integrated program.

9.2 Modified Fire Regime

Fire is an important process that contributes to the natural forest heterogeneity and biodiversity of Pukaskwa. Fire suppression for the past eight decades has altered the natural conditions (i.e. forest composition and age-class) that previously resulted from fire disturbance, thereby negatively impacting on the Ecological Integrity of the park. Pukaskwa's role in reintroducing this disturbance regime is an important

challenge that needs to be met in an integrated manner. In achieving this goal, it will be particularly important that the concerns of neighbors and regional stakeholders be respected.

9.3 Resource Information

For this SOPR, many desirable assessments could not be made due to a lack of information. Those that were made were often based on incomplete or dated inventories, often 20 years old or more. This places the park in an information deficit whereby management decisions may be based on inaccurate information. Many indicators and measures could not be assessed due to a lack of information. Whether these indicators are in good, fair or poor health is unknown. As a result, informed park management planning is compromised. New investments need to be made to recapitalize the park's information base for Ecological Integrity, Species at Risk, Cultural Resources, and Connection to Place.

9.4 Enjoyable Visitor Experience

Pukaskwa has an iconic landscape and wilderness character that has potential to draw in many Canadians. The park has elaborate infrastructure to facilitate a variety of visitor activities. However, there is clearly a need to improve visitor experience in the areas of basic services (washrooms, campsites and trails) and personal interpretation. Declining visitation also needs to be addressed. An updated marketing strategy that identifies key markets, and the needs of these visitors will guide the renewal of visitor services assets and interpretation in the park.

9.5 Engagement, Appreciation and Support

Based on limited information, it appears that engagement, appreciation and support for Pukaskwa by Canadians is poor. Acquiring better information on Canadians' engagement with the park will be used to develop and refocus outreach products. Future outreach activities may include products to target the formal education market, and programs to facilitate public involvement in ecosystem restoration efforts. By improving our understanding of key markets, developing products to meet their needs, and evaluating the success of these efforts, Canadians' engagement, appreciation and support for Pukaskwa will increase.

9.6 Effective Cooperative Management with First Nations

A recent survey conducted by the Pic River First Nations seeking the general impression of the relationship between Pukaskwa National Park and their community revealed that some members feel that Pukaskwa National Park excludes First Nation perspectives in relation to management planning as well as day-to-day operations for the Park. For Parks Canada, it is both a corporate priority and, in the case of Species at Risk, a legal obligation to have consultations with First Nation communities. There is a strong need to strengthen involvement by members of the Robinson Superior Treaty Group in overall park management.

10. CONCLUSION

Pukaskwa National Park's first SOPR demonstrates that much of the park's monitoring and reporting program is still in development or in early stages of implementation. This report represents Pukaskwa's best assessment of the state of the park given available information. From this assessment, the state of the park's Ecological Integrity, Cultural Resources, and Connection to Place are all rated in fair-to-good condition. The Condition of the Information Base is rated poor, and there is a clear need to improve the representation of Aboriginal Perspectives in the park.

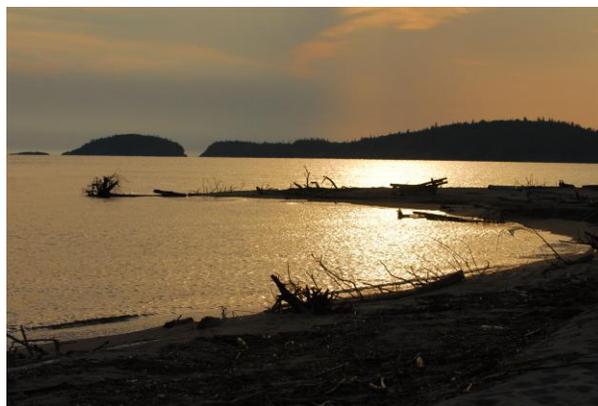
Recovery planning for Species at Risk is ongoing. Some successes have been made for Pitcher's Thistle and Peregrine Falcon. Due to the complex interactions of habitat, predator-prey dynamics and the small size of the herd, Woodland Caribou remain a major challenge. The park should focus on restoration efforts for this species over the next five years.

Since the completion of Pukaskwa's last management plan in 1995, the park has completed or initiated key strategies in forest disturbance management, aquatic

management, wildlife management, cultural resources, land use planning, and visitor experience. Many of these strategies are ongoing.

The Condition of the Information Base is a key issue that Pukaskwa must address during the next planning cycle. The park has made significant investments in enhancing its monitoring program over the past two years. In association with key partners, the park intends to significantly improve the quality of information for reporting and management purposes by the next SOPR.

Other key issues that the park needs to address include: the coastal ecosystem that is in fair condition and is home to two critically imperiled Species at Risk; a modified fire regime due to historical fire suppression; ensuring an enjoyable visitor experience; enhancing Canadians' engagement, appreciation and support for Pukaskwa, and developing effective cooperative management with First Nations. As Pukaskwa moves forward with its management planning these issues should be explicitly considered.



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