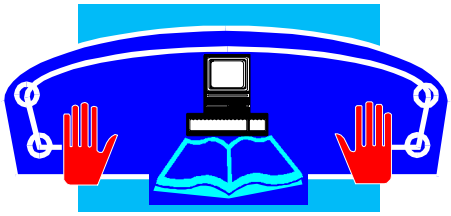

Ellesmere Island National Park Reserve - Park Conservation Plan

Type of Study: Policy Material/related
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Ellesmere Island National Park Reserve

Park Conservation Plan

Environment Canada
Canadian Parks Service
Prairie and Northern Region

Environnement Canada
Service canadien des pares
Région des Prairie et du Nerd

Canada

INTERIM PARK CONSERVATION PLAN
ELLESMERE ISLAND NATIONAL PARK RESERVE

Bill Smith
Natural Resource Management Officer
Canadian Parks Service
Prairie and Northern Region
Winnipeg, Manitoba
March 1989

APPROVAL PAGE

ELLESMERE ISLAND NATIONAL PARK

Recommended by:

W E Thorpe March 6/89
Chief Park Warden

Approved by:

Superintendent

Chief, Natural Resource Conservation

Director, Operations

Director General,
Prairie and Northern Region

REVISIONS

PIC #/TITLE	DATE	ADDITIONAL/DELETION MATERIAL	SUPERINTENDENT INITIAL

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ACKNOWLEDGEMENTS

The Author would like to thank all those who reviewed and provided comments on the drafts of this document. Their assistance was appreciated. L.Dick and P. Priess are acknowledged for authoring the PIC statement on Cultural Research Protection - Research Camps. The Author used previous Park Conservation Plans as models for format and content and they are referenced where directly quoted, however I accept responsibility for all errors and omissions in this document.
In particular I thank Mel Falk, P&NRO, for his support in this project.

1.1 BACKGROUND

On September 20, 1986 an agreement, setting the terms and conditions for the establishment of Ellesmere Island National Park Reserve (EINPR)(Fig.1 & Fig.2), was signed by representatives of the Government of the Northwest Territories and the Government of Canada (hereinafter referred to as the Agreement).The lands for the proposed Park Reserve were withdrawn by Order-in-Council (PC 1988-788) pursuant to the Territorial Lands Act (D.I.A.N.D. responsibility) . This Order-in-Council covered the period until the Park Reserve was proclaimed in the Act.

The Park Reserve received formal, legal approval with the passage of Bill C-30, an "Act to Amend the National Parks Act", which was proclaimed on September 16, 1988. Section 12 of the Act sets aside the lands set out in Schedule III of the Act as a Park Reserve pending a settlement between the Government and the Tungavik Federation of Nunavut (TFN) ".. respecting the right, title or interest of members. ." of the TFN.

Section 13 of the Act provides for the application of the Act to the Park Reserve, "..as if it were a park.." including the "... exercise of traditional hunting, trapping and fishing activities by persons of native origin...". Section 14 allows the Governor in Council to proclaim the Reserve as a Park upon settlement of the land claims agreement with the TFN.

Park Reserve status does not prejudice the claims process. Until the Inuit claims are resolved natural resource matters related to wildlife management (e.g. wildlife harvest) will proceed with some uncertainty.
The Interim Management Guidelines (CPS, 1988) provides a more detailed, but concise overview of the Park Reserve area.

1.2 NATURAL RESOURCE MANAGEMENT PROCESS

In order to meet its obligations for managing the heritage resources of the Park Reserve, Parks will apply the Natural Resource Management Process (Parks Canada, 1979). This process provides a framework for:

1) the collection of resource information;
2) the formulation of resource objectives;
3) the setting of priorities; and
4) the development of implementation of strategies to meet the stated objectives.

The NRMP functions within the framework of the Park Management Planning Process (Fig.3). The PCP is the major component, that drives all subsequent components including the Basic Resource Inventory (BRI), Resource Description and Analysis (RDA), resource management studies and resource management plans. As the IMG's are not approved and the Park Management Plan does not exist, the PCP will be Interim (IPCP).

1.3 OVERALL PLANNING FRAMEWORK

Parks Policy (Section 3.2.2) requires that an integrated natural resource data base be developed and maintained for each park (Parks Canada, 1980). Budgetary considerations and contemporary resource management practice point to the need for a targeted data collection and applied research program which would respond to timely management problems as opposed to blanket "collect all you might need" approaches. In this case the need to resolve use conflicts in the Hazen-Tanquary area with the need to gain baseline data parkwide.

In the context of this plan the strategies used to resolve individual problems, issues and concerns (PIC's) will have, wherever possible, the objective of providing required information for incorporation into the Basic Resource Inventory and the Resource Description and Analysis.

1.4 INTERIM PLAN REVIEW

This document is an interim plan, covering the period preceding the settlement of the Inuit claims and the completion of a Park Management Plan. Nonetheless, the document must be reviewed for effectiveness and updated yearly as it is the primary mechanism in a recursive resource management process. A major review will be required when the Inuit claims are settled and when the Park Management Plan is approved. At this time the references to "interim" can be removed and the document will become the Park Conservation Plan.

As individual problems are resolved they will move from the body of the plan to the appendices in order to provide historical perspective on future management. It is the nature of many resource problems that they are not resolved in a final sense, but are merely changed or modified. It is important to future management decision making then, that the record of past management be maintained. We need not only the baseline resource date, but also the management record.

Figure 1.

Location of Ellesmere Island National Park Reserve.

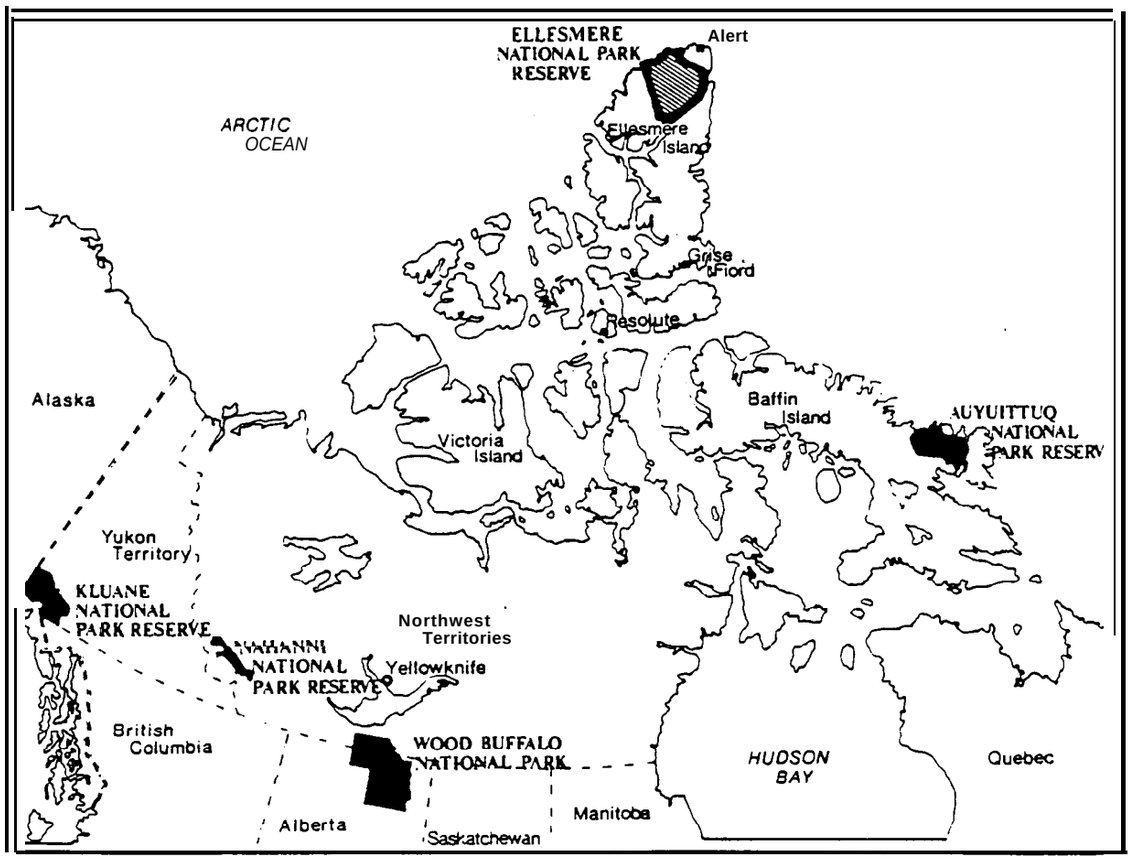


Figure *2.*

ELLESMERE ISLAND NATIONAL PARK RESERVE

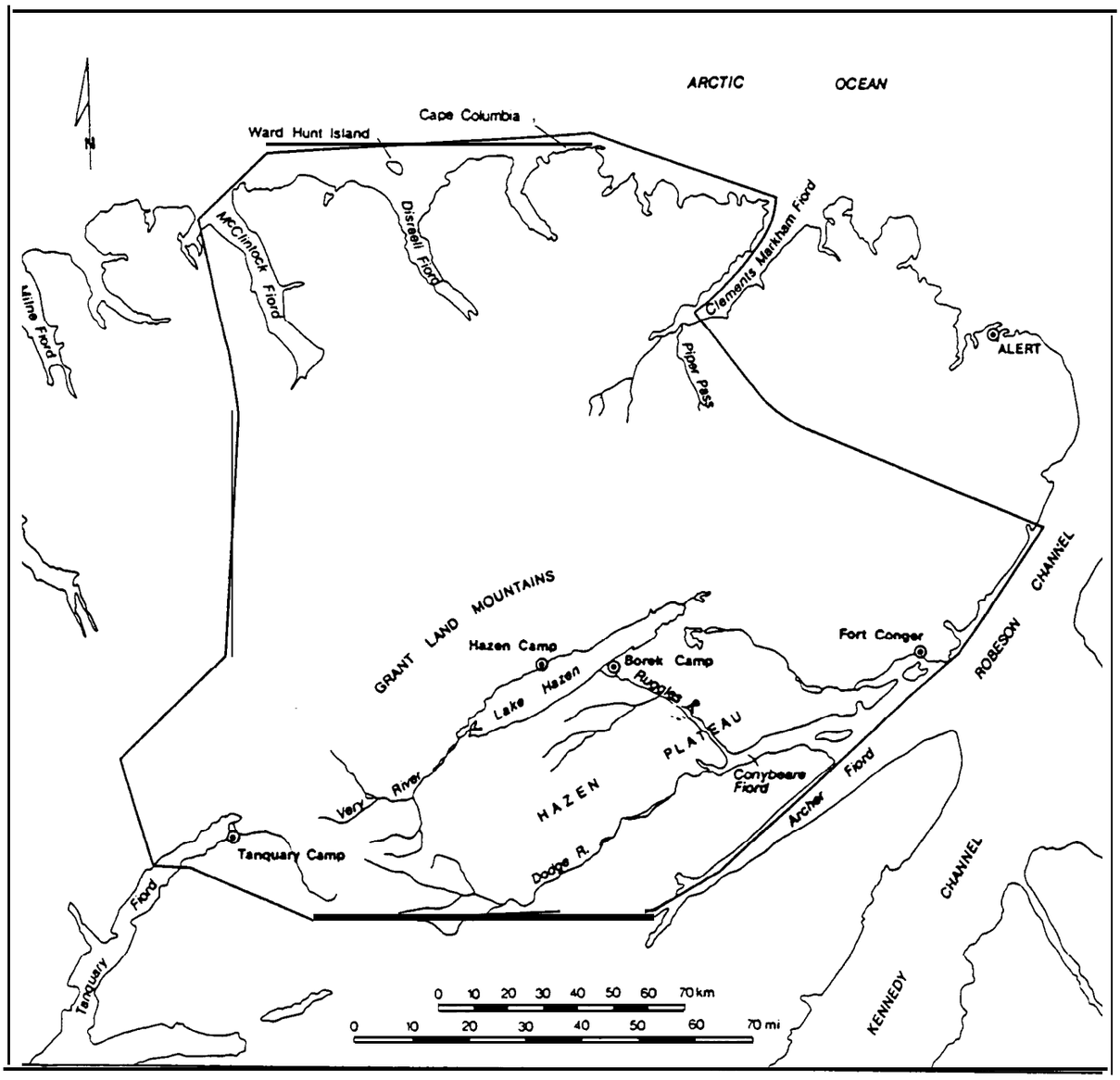
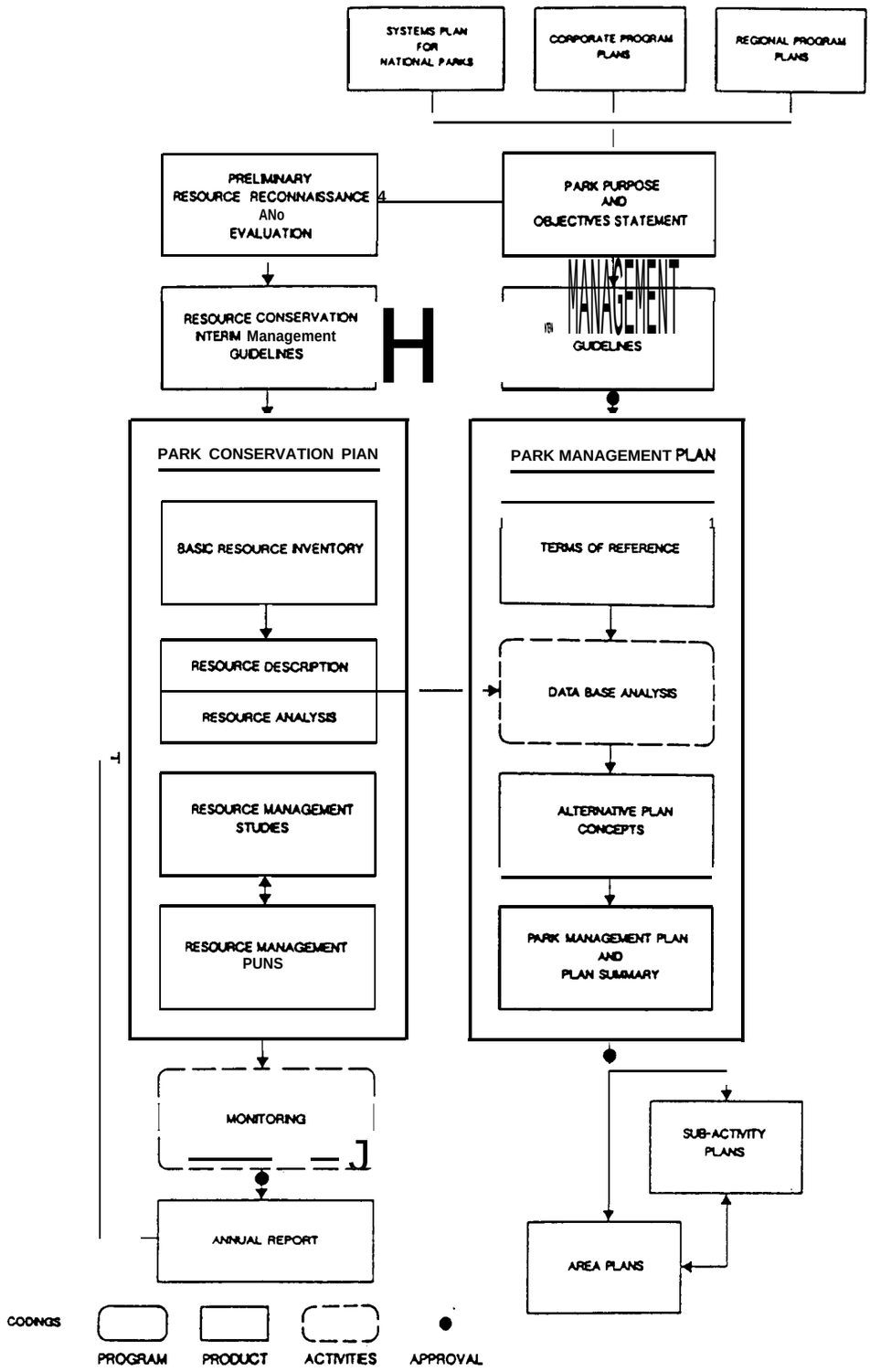


Figure 3.

NATURAL RESOURCE Management PROCESS AND MANAGEMENT PLANNING PROCESS FOR NATiONAL PARKS



2.0 PURPOSE AND OBJECTIVES

2.1 PARK PURPOSE

As this document is being developed concurrently with the Interim Management Guidelines (IMG's) there is no approved Purpose and Objectives statement. The IMG's are scheduled to be approved by October 1988. The IPCP will then be revised accordingly. The following statement is the preliminary Statement of Purpose from the Draft IMG's.

> "Ellesmere Island National Park Reserve protects a natural area of Canadian significance in the Eastern High Arctic Glacier Natural Region. A related purpose of the park reserve is to encourage public understanding, recreation and enjoyment but in ways that will leave the area unimpaired for this and future generations. The park reserve supports a rich ecology and is one of the most outstanding landscapes in the Canadian arctic archipelago."

2.2 MANAGEMENT OBJECTIVES

The following objectives were developed for this document, as detailed objectives for the Park Reserve do not exist and will be developed for the Park Management Plan.

The primary responsibilities of the Resource Conservation section as set out in the Role and Responsibility statements (Environment Canada, Parks, 1983) are as follows:

1) Natural Resource Conservation - to provide" for the protection of natural resources and the perpetuation of natural environments and features of national significance.
2) Cultural Resource Conservation - to provide for the protection of cultural resources and the perpetuation of historic structures, artifacts and environments of Parks.
3) Protection and Public Safety - to provide for the protection of park visitors and assets from threats to their safety.

2.2.1 NATURAL RESOURCE OBJECTIVES

The objective of Natural Resource Management, as stated in the IMG's is "... to protect and manage the natural resources in order to insure their perpetuation. Management activities will be aimed at reducing interference with natural processes, so that they may operate essentially unimpaired. "

2.2.1.1 Ecosystem Management

to protect and/or maintain with minimal interference to natural processes the ecosystems of the Park Reserve based upon substantive knowledge of the biotic and abiotic environment.

2.2.1.2 Terrain Management

to protect and/or maintain with minimal interference the terrain resources of the Park Reserve and the processes contributing to their evolution.

2.2.1.3 Water Management

to protect and/or maintain with minimal interference the natural hydrologic regimes and water quality of the Park Reserve.

2.2.1.4 Vegetation Management

to protect and/or maintain the mosaic of vegetation communities including the natural abundance and distribution of floral communities.

2.2.1.5 Wildlife Management

2.2.1.5.1 Harvested Species

to protect and maintain a natural abundance and distribution of wildlife species and natural population regulatory factors so that harvesting activities do not become a major factor in the regulation of harvested species.

2.2.1.5.2 Non-Harvested Species

to protect and maintain the natural abundance and distribution of the non-harvested species.

2.2.2 Human Use Management

2.2.2.1 Cultural Resource Management

to control visitor activities to protect park cultural resources, historic and prehistoric.

2.2.2.2 Non-Conforming Uses

- to reduce, control and/or prevent illegal, non-conforming, incompatible and hazardous activities and/or their adverse effects on the wilderness values of the Park Reserve.

2.2.2.3 Traditional Use

to manage traditional resource harvesting activities within the park according to the National Parks Act.

2.2.2.4 Recreational, Educational Visitor Use

to promote appreciation, enjoyment and compatible use of the Park Reserve by encouraging an understanding of the Resources and by reducing conflicts between Park users and the Heritage Resources.

2.2 Interim Park Conservation Plan and Objectives

2.3.1 Purpose

The Preliminary Resource Reconnaissance and Evaluation for the area produced three documents, a Resource Inventory (England et al, 1981), a preliminary Ecological Land Classification to the Ecodistrict level (Morrison, 1984) and a review of the mineral and hydrocarbon potential of the area (EMR, 1981).

The purpose of the IPCP is to provide for the identification and analysis of current and anticipated resource management problems and actions to resolve them and to document a priorized plan to prepare and implement such actions.

In addition to detailing more specific actions, the document addresses mandatory components of the N.R.M. Process (e.g.. BRI and RDA). Other components such as Resource Management Plans and Studies will not be generated as a matter of course, but only where the analysis of problems in the IPCP selects them as the appropriate response to resolving specific problems and/or where required by management directive (e.g. bear management).

2.3.2 Objectives

2.3.2.1 - to direct a Basic Resource Inventory (BRI) which provides information required for immediate management and planning needs, provides a basis for long term monitoring programs and establishes a framework for an Ecological Land Classification of the Park Reserve.

2.3.2.2 - to guide the preparation of the Resource Description and Analysis (RDA) which will present and interpret the Park Reserves resource data to Park Reserve staff, to the public and serve as input to the Park Management Plan and the Environmental Assessment and Review Process.

2.3.2.3 - to identify, analyse and set priorities for resource management Problems, Issues and Concerns (PICs) .

2.3.2..4 - to define preferred courses of action to resolve the PIC's identified in 2.3.2.3.

2.3.2.5 - to insure that resource management programs in Ellesmere Island National Park Reserve are integrated with Regional objectives, including agreements arising from the land claims negotiations.

2.3.2.6 - to provide the resource information in a manner that will allow for integration with the other components of the Resource Conservation sub-activity (law enforcement, public safety) to allow for the orderly development of an overall Resource Conservation program.

2.3.2.7 - to provide estimates of the financial and human resources required to implement the proposed actions, including an implementation schedule suitable for integration in annual workplans.

2.3.2.8 - to provide for an annual review of the effectiveness of the process and proposed strategies in dealing with the resource problems.

3.0 METHODOLOGY

In general, the methodology described in the Park Conservation Plan of the NRMP manual was followed (Parks Canada, 1979). This approach has two parts. First, broad goals and objectives for the management of the Park Reserves' Heritage Resources were established by Park and Regional Office staff (Sec. 2.2). Secondly, Heritage Resource problems, issues and concerns were identified; strategies developed to resolve them and priorities were established (Sec. 3.0 - 4.0).

3.1 PROBLEM IDENTIFICATION

Recent Park Conservation Plans (Frandsen et al, 1986; Hurd, 1987) have focused on Problems, Issues and Concerns which have been defined as follows:

Problem: a situation is considered to be a problem when there is ". ..a deviation to a recognized or established norm" (Parks Canada, 1979). A norm can be a law, regulation, policy an approved plan or approved objective.

Concern: "A potential or unproven problem in which no deviation can, or has yet, been demonstrated (g. aircraft overflights and wildlife disturbance)" (Hurd, 1987).

Issue: "A situation or disagreement which may become a problem or concern when a decision is made" (Frandsen et al, 1986) e.g. the settlement of the Inuit claims.

The material reviewed, was collected during the PRRE, through discussion among Park Reserve and Regional office staff, from field reconnaissance trips and during the development of the IMG's. Subsequently, the list was refined by reviewing the material produced for the literature review (LGL, 1988) and by having it reviewed by knowledgeable people, both within and outside of Parks. The use of the PIC format was applied to components of the BRI and RDA.

Initially, the broad issues were identified in a matrix format. This matrix plotted activities on one scale and resources on the other. This method highlighted interactions between various components, problems that crossed across discipline boundaries and identified other broad issues. It allowed for groupings of broad issues into preliminary PICS statements. The preliminary PIC statements were plotted on a matrix to identify interactions among the statements.

The preliminary statements were then circulated internally for comment and refinement into the format outlined in 3.2.1.

3.2 PROBLEM ANALYSIS

3.2.1 Format

3.2.1.1 PIC Title, Code and Date.

A succinct, explanatory title, code and date was assigned which allowed for tracking by computerized data base management systems. It indicates the priority of the PIC in terms of type (e.g. Resource Management, Cultural Management, Wildlife, etc.), the position in the plan relative to all other PICs, and the position relative to the other PICs in the particular section. e.g. 4RM1, Identified the PIC as a Resource Management issue ranked 4th in the Plan overall and 1st in the Resource Management group. The date and code allows for tracking PICs over time.

3.2.1.2 Problem Statement

A concise, informative statement of the PIC with reference to the deviation from an established norm.

3.2.1.3 Background and Policy

A description of the resource and circumstances of the PIC with reference to the Act, Policy, Directives, etc., including an indication of probable cause(s).

3.2.1.4 Goal and Objectives

On the basis of the foregoing a goal for each PIC was defined. The goal could provide for the resolution of the PIC when the cause is known or it may provide for the steps needed to identify the cause(s). Where necessary the goal may be further refined by setting out objectives which attain the goal.

3.2.1.5 Options

The course(s) of action and/or alternative courses of action which would achieve the goals and objectives.

3.2.1.6 Preferred Option/Tasks

The preferred option for achieving the goal including the supporting rational. Where necessary this option may be broken into its component tasks.

3.2.1.7 Resources/Responsibility

Estimates of the dollars and person-year requirements to implement the preferred option and its component tasks including the identification of the authority (sub-activity, program) responsible for accomplishing

3.2.2 Priorities

The priority of each PIC was established according to the criteria set out in the Sec. 6.3.1 of the N.R.M.P. manual (Parks Canada, 1979), using the form entitled “Problem Significance Ratings, Form” (Appendix 1).

The priority assigned an individual PIC was derived from the equation PRIORITY = PROBLEM SIGNIFICANCE - PROBLEM CONSTRAINTS. This process recognizes not only the intrinsic importance of a particular problem, but also the relative ability (resources, training, etc.) of Parks to deal with it. Problem significance criteria are identified in Appendix II.

The priority of the BRI and RDA PIC’s will not be indicated as outlined here. They are required by the Policy and the Agreement and will be considered and implemented as mandatory components.

4.0 PIC STATEMENTS

4.1 BASIC RESOURCE INVENTORY

Environment Canada, Parks is committed by Policy and the Agreement to implementing the Natural Resource Management Process. Section 3.2.2 of the Policy requires that "An integrated natural resource data base will be developed and maintained for each Park". The BRI provides information required for Park management purposes, planning and sub-activity operation. A knowledge of the Park Reserves ecosystems, natural resources and their driving variables is fundamental to resource management. Knowledge of baseline data is critical in applying the NRMP and the Environmental Assessment Review Program (EARP).

The size and remoteness of the Park Reserve present difficult problems for data collection. The cost of data collection is very high, logistical support is complicated, the field season is short and weather is a limiting factor. Innovative field techniques and careful planning are required. The following section deals with the individual components of the BRI. An overriding solution objective in each of them is the coordination and integration of field activities.

BRI PIC's will have the BRI designation in the code area.

PIC STATEMENT

TITLE : Air Quality Monitoring CODE BRI DATE 12/87

PROBLEM STATEMENT : Airborne pollutants from industrialized areas are an increasing threat to naturally functioning ecosystems. In order to determine the norm and subsequent deviations from it, baseline data and regular monitoring are required. The magnitude of the deviations and the rate of change indicate the level of threat posed.

BACKGROUND AND POLICY: Due to its remoteness it was believed that the Arctic was immune to pollution. The "Arctic haze" phenomena and increasing knowledge about airborne pollutants have changed this perception. The location of the Park Reserve downwind from industrialized areas in Europe and Eurasia is a potential threat. In response to the global threat Atmospheric Environment Service (A.E.S.) has established a monitoring program at Alert.

GOALS & OBJECTIVES:

1. To obtain baseline data for Air Quality at Park Establishment.
2. To provide for regular long term-monitoring of Air Quality.
3. To provide for an assessment of the threat posed by documented changes in Air Quality.
4. To prepare the RDA Chapter on climate including Air Quality references.

OPTIONS :

1. React to perceived threats ad hoc.
2. Establish the ability to collect data and monitor "in-house".
3. Assess the applicability of the A.E.S. program and provide for cooperation to meet Parks goals.

PREFERRED OPTION/TASKS: Option three is preferred. Preliminary indications are that the Alert program can meet CPS goals at minimum cost .

1. Consult with A.E.S. with the aim of establishing a program that will provide baseline data, regular monitoring, threat assessment and the preparation of RDA Chapter.
2. Formalize the program via M.O.U. between A.E.S. and CPS.
3. Implement the program.
4. Write the RDA Chapter on climate.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK YEAR LEAD	O&M PERSON DAYS			CAPITAL	
	PARK	REGION	HQ	PARK	REGION
				$ PD	$ PD
1 87/88 Region	2	--	--	- - - -	- - - -
2 88/89 Park	3	--	--	- - - -	- - - -
3 on-going Park	1	--	--	- - - -	- - - -
4 88/89 Region	--	--	--	- - - -	5.0 5

PIC STATEMENT

TITLE : Weather Monitoring CODE BRI DATE 12/87

PROBLEM STATEMENT: It is clear that a minimum of weather data is required, for a variety of reasons, for the Hazen-Tanquary area. It is not clear how extensive and detailed a program is required park-wide to meet operational needs and provide the data base for future research and information needs.

BACKGROUND AND POLICY: Weather information is required for public safety, visitor use management, resource management! visitor information and operational purposes. Climate is the most important driving variable in ecosystem function, it constrains all ecosystem activity. It is the single most unique feature of the park reserve. A.E.S. stations at Alert and Eureka provide a generalized climate picture but are too remote to provide the required detail. The sporadic historical data provides an incomplete picture. Due to size (37,775 sq Km) and physical diversity, the area encompasses a number of regimes and microclimates. England et al (1981) identified 4 regimes. Barry and Jackson (1969) in describing the summer weather for Tanquary Camp highlighted the importance of micro climates in the High Arctic, citing the lack of any precipitation correlation with Eureka and the importance of local winds (Fohn). The need to describe these regimes and microclimates in detail must be balanced against present data needs and the cost of data collection. As operational experience is gained the need for and placement of, more monitoring stations will become clearer.

GOALS & OBJECTIVES:

1. To provide for the minimum of data, with real time and data storage capabilities to allow for reasonable, safe visitor and operational activities in the Hazen-Tanquary area including public safety requirements.
2. To define the minimum program which would provide for the various needs, for the long term, for the entire park.
3. To describe the climate of the park reserve and identify the major regimes for the R.D.A.

OPTIONS :

1. Provide minimum monitoring capabilities at Tanquary and Hazen and consult with A.E.S. to develop Terms of Reference for the R.D.A. chapter. Develop minimum program based on R.D.A. chapter and monitoring experience at Hazen and Tanquary Camps.
2. Delay monitoring at Hazen-Tanquary until R.D.A. chapter is written and minimum program is developed.

PREFERRED OPTION/TASKS: Option one is preferred as it meets recognized needs in the Hazen/Tanquary area and provides experience in monitoring capabilities, equipment, etc. which will be valuable in developing and assessing options for a park wide program.

1. Acquire and install basic monitoring equipment for data collection and storage at Hazen Camp and Tanquary Camp.
2. Consult with A.E.S. and develop T.O.R. for R.D.A. chapter.
3. Write R.D.A. chapter in conjunction with Auyuittuq N.P.R.
4. Define "minimum program" and prepare a Climate Monitoring Plan.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL	
			PARK	REGION	HQ	PARK	REGION
						$ PD	$ PD
1	87/88	Region	5	--	--	-- --	5 5.0
1	88/89	Region	5	--	--	-- --	1 8.0
2	88/89	Region	--	1	--	- - - -	10 --
3	88/89	Region	--	1	--	-- --	10 5.0
4	90/91	Park	25	2	--	-- --	-- --

PIC STATEMENT

TITLE : Water Quality Monitoring CODE BRI DATE 12/87

PROBLEM STATEMENT: Water quality monitoring is required for two purposes. First, to confirm (and reconfirm at regular intervals) that the sources of drinking water for visitors and staff are potable and safe. Secondly, to provide baseline descriptions of the characteristics of selected water bodies to allow for future comparisons and to meet the descriptive needs of the R.D.A. No program presently exists, it must be established.

BACKGROUND AND POLICY: Visitors and park staff rely on natural water bodies as the source of drinking water (e.g. Lake Hazen, Macdonald River) . It is assumed, but not documented that these sources are potable and safe. These sources are susceptible to pollution from human and wildlife activity. Additionally, as most techniques for determining water quality are comparative, baseline data (background levels) are required. Descriptive information on the water characteristics of Lake Hazen is required for the R.D.A. As the largest body of freshwater above the Arctic Circle L. Hazen has intrinsic scientific importance as a benchmark. Data from "Operation Hazen" may be useful for comparison (McLaren 1961, 1964).

GOALS & OBJECTIVES:

1. Provide baseline data of selected water bodies for comparative purposes (ie. water characteristic, fingerprinting).
2. Provide for regular monitoring of drinking water sources.
3. Provide descriptive information on Lake Hazen to describe this unique natural resource for the R.D.A.

OPTIONS:

1. Collect baseline data on water quality for selected sites on a project basis prior to the completion of the R.D.A. and provide for regular long term monitoring of visitor activity needs.
2. Collect baseline data on an opportunistic basis in conjunction with other research projects and provide for regular long term monitoring of the visi-tor activity needs.
3. Determine potability of known visitor activity area water sources.

PREFERRED OPTION/TASKS:

Option one is preferred.

1. Determine locations and variables to be monitored and kinds of analysis required.
2. Identify agencies and logistics required for analysis.
3. Prepare a monitoring plan for long term monitoring of potability, reporting and data storage.
4. Implement the plan.
5. Obtain fingerprint data of Lake Hazen.
6. Prepare RDA Hydrology chapter.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENT.S

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Park	5	--	--	- - - -		--	--
2	88/89	Park	5	--	--	---	-	- - - -	
3	89/90	Park	30	1	--	--	--	- - - -	
4	ongoing	Park	To be determined						
5	89/90	Region	1	--	--	---	-	5.0	5
6	90/93	Region	--	--	--	- - - -		5.0	10

PIC STATEMENT

TITLE : Base Maps CODE BRI DATE 12/87

PROBLEM STATEMENT: The park reserve has not been mapped at 1:50,000 or larger scales suitable for natural resource management, site-specific problem resolution or for public safety/visitor use needs. "

BACKGROUND AND POLICY: Maps are fundamental tools in natural resource management for the collection, collation, storage and display of information. Accurate maps are crucial to all aspects of public safety/visitor use, from trip planning to search and rescue. Existing maps are all small scale (1:250,000; 1:500,000). There is complete panchromatic air photo coverage (1959) of the park reserve. Some preliminary discussion leading to 1:50,000 mapping has taken place with the Department of Energy, Mines and Resources. CPS has identified 4 priority levels of mapping at 1:50,000 with the Hazen/Tanquary area the highest priority (1) and areas of ice cap having no priority (4). It is expected that working maps of priority 1 areas will be available for the 89/90 field season with lower priority areas available in succeeding years.

GOALS & OBJECTIVES:

1. To provide resource protection, visitor use and public safety information for the Hazen-Tanquary area for the period prior to 1:50,000 map production.
2. To provide for map coverage of the Park Reserve at 1:50,000.
3. To provide standardized base map specifications for projects requiring mapping at 1:50,000 or larger scales.

OPTIONS:

1. Produce 1:50,000 maps for the park reserve by private contract. "
2. Continue to pursue 1:50,000 maps with EMR and go to private contract where EMR timing is not desirable. Draft and produce photo maps where necessary "in-house".
3. Delay projects until EMR or private contract maps are available.

PREFERRED OPTION/TASKS: Option 2 is preferred. "In-house" photo maps can meet interim public safety concerns, etc. in the Hazen/Tanquary area. Every indication is that EMR working sheets will be available coincident with field studies. The cost factor to produce the maps under private contract as opposed to EMR sheets is significant ($17,500 vs $150 per map).

1. Produce photo mosaics in-house.
2. Continue liaison with EMR and adjust schedules where critical.
3. Provide for air photo's as a storage/recording medium until such time as maps are available.
4. Provide base map specifications on a project basis.

TITLE : Base Maps (Continued) CODE BRI DATE 12/87

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL	
			PARK	REGION	HQ	PARK	REGION
						$ PD	$ PD
1	87/88	Region	3	20	--	- - - -	1.1 2.0
2	87/88	Region	--	--	--	- - - -	--- 2
	88/89	Region	--	--	--	- - - -	1 1
3	87/88	Region	--	--	--	-- --	10.0 15

PIC STATEMENT

TITLE: Vegetation Mapping CODE: BRI DATE: 12/87

PROBLEM STATEMENT: A knowledge of plant communities and their distribution is fundamental to managing use, understanding wildlife population dynamics and is inextricably linked with permafrost and soil sensitivity to use. Accurate maps are required for resource protection and management. They do not presently exist.

BACKGROUND AND POLICY: CPS is committed to implementing the NRM Process by agreement with the GNWT and a a matter of Policy (3.2.2). The description, classification and distribution of the biotic resources of the park is fundamental component of the BRI and the RDA. The relative abundance and diversity of vegetation occurring at these latitudes, including rare species and species at the limits of their range, is a unique feature of the park reserve. Soper and Powell (1985) cataloged 127 species of vascular plants at Lake Hazen, reporting on the phenology (flowering period) of 102 species and seed dispersal in 19. Brassard (1976) lists 116 species of moss for N. Ellesmere island including 116 for L. Hazen.

The Geological Survey is presently conducting a vegetation mapping program at 1:250,000 in the Arctic. Sections of Ellesmere Island were being mapped in 1988. Discussions are ongoing to investigate the possibilities of adjusting the schedule in order to map the Park Reserve within the BRI time frame. The preparation of a catalogue of vegetation/landscape photographs is required as preliminary component of this work.

GOALS & OBJECTIVES:

1. Map, classify and describe the vegetation features of the park reserve at a scale of 1:250,000.

OPTIONS : Options exist as to the scale of mapping. Budgetary considerations dictate this scale park wide.

PREFERRED OPTION/TASKS:

1. Develop criteria for describing and mapping the vegetation communities at 1:250,000, providing for hierarchical integration with communities described in the research at smaller scales.
2. Prepare a catalogue of existing vegetation photographs.
3. Describe, classify and map as specified at 1:250,000.
4. Prepare the RDA Vegetation Chapter.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Region	--	--	--	--	--	---	20
2	88/89	Region	--	--	--	--	-.	8.0	10
3	89/90	Region	2	--	--	--	--	25.0	10
	90/91	Region	2	--	--	--	--	---	10
4	90/91	Region	--	--	--	--	--	15.0	10

PIC STATEMENT

TITLE : Terrain Mapping (Bedrock Geology, Surficial Geology) CODE BRI DATE 12/87

PROBLEM STATEMENT: Accurate mapping of the geology of the Park Reserve and the spatial distribution of its features is necessary for the production of the RDA as well as providing information critical to visitor management and resource protection. Mapping of the bedrock geology at a reconnaissance level is complete for the park. The surficial geology has not been mapped.

BACKGROUND AND POLICY: CPS is committed to implementing the NRM Process by agreement with the GNWT (para. 5) and as a matter of Policy (3.2.2). The classification, description and distribution of the physical features of the park resource (geology, geomorphology, landforms) is a fundamental component of the BRI and the RDA. Additionally, the PRRE, supported by a considerable body of literature indicates that due to permafrost, areas of the park reserve are susceptible to impairment resulting from use (soil compaction, devegetation, etc.). Babb and Bliss (1974a) note that in the High Arctic parent materials (bedrock) exert a strong control on the plant communities. The sensitivity to use varies with soil properties, landform and genetic material. Consequently, accurate descriptions and mapping is required to not only describe resources, but also to protect them. The Geological Survey of Canada has mapped and described the bedrock geology of the Park Reserve (e.g. Christie, 1964; Trettin, 1987). Initial discussions have taken place with the University of Alberta, Department of Geography (J. England) to provide for mapping the surficial geology.

GOALS & OBJECTIVES:

1. To classify, describe and map the physical terrain features of the park reserve ie. bedrock geology, surficial geology, landforms, wetlands, and soil genetic materials at a level of detail suitable for generalized descriptions at a scale of 1:250,000.

OPTIONS : Options exist as to scale of mapping 1:250,000 is recognized as the most cost effective.

PREFERRED OPTION/TASKS:

1. Describe, classify and map bedrock geology parkwide at 1:250,000.
2. Write the RDA chapter.
3. Describe, classify and map surficial geology, parkwide at 1:250,000.
4. Write the RDA Chapter.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Region	--	--	--	- - - -		---	10
2	88/89	Region	--	--	--	- - - -		10.0	10
3	88/89	Region	--	--	--	- - - -		---	10
	89/90	Region	--	--	--	- - - -		20.0	10
	91/92	Region	--	--	--	- - - -		---	5
4	90/91	Region	--	--	--	--	--	15.0	10

PIC STATEMENT

TITLE : Terrain Sensitivity (Trafficability) CODE BRI DATE 12/87

PROBLEM **STATEMENT:** Various terrain types have different sensitivities to use. This is especially true in permafrost landscapes. In order to protect the landscape the different sensitivities to use of the various terrain types and the spatial distribution of these types must be identified. Additionally, programs designed to assess the impacts of use (initial and cumulative) must be established so that management actions can be taken to avoid damage; as rehabilitation is highly problematic in this environment.

BACKGROUND AND POLICY: The mapping of soils (genetic classification and description) has, in the past, been considered a fundamental component of the BRI. The soils of EINPR will not be mapped. The size of the Park and the need to "target" research precludes this approach for EINPR. Soil classification mapping will only be undertaken on a site specific, problem specific basis where the information is necessary for problem resolution.

It is well known that permafrost landscapes are particularly sensitive to use. Disturbance of the insulating layer can precipitate a chain of events that results in massive disturbance of the landscape (thermokarst). Although the common forms of degradation in the High Arctic are sheet and gully erosion, as opposed to the thermokarst of more southerly areas, the susceptibility of areas with high plant cover (e.g. Lake Hazen) are similar to more southerly areas and the effects of disturbance are greater as these areas comprise the majority of the energy base for the food webs of the areas (Babb & Bliss, 1974). Kevan (1971) documents the long lasting effects of terrain disturbance by tracked vehicles at Hazen Camp. Babb (1977) investigated disturbances in the High Arctic on Devon Island and confirms the long lasting effects of disturbances and the difficulties of rehabilitation using natural species. In response to oil exploration in the 1970's most of the research has been directed at the effects of industrial disturbance. Little information is available on the affects (initial and cumulative) of the proposed park uses (hiking, camping) on the terrain. What is evident are the long lasting impacts and the apparent inability of the landscape to rehabilitate itself (terrain weathering, mass wasting, plant growth) on any reasonable time scale. It is evident that all energies must be directed at avoiding damage as rehabilitation does not seem to be an alternative.

Despite a general awareness of this problem and considerable knowledge, supported by extensive research, damage still occurs (eg. Kenn Borek airstrip). In order to be able to avoid damage from the development of park facilities and the recreational use of the park lands (hiking, camping) information is required in two areas. One, what is the sensitivity to the various uses of the different terrain types (vegetation + soil + genetic materials) and two, what is the spatial distribution of these types. This information will assist in establishing use limits, seasons of use, use scenarios

(restricted vs dispersed) and limitations for development. A monitoring program must be implemented in order to determine the effects of the various uses and the effectiveness of the various management scenarios in order to make adjustments to avoid permanent damage.

GOALS & OBJECTIVES:

1. To identify the sensitivity to use of the various terrain types found in the EINPR.
2. To identify (map) the distribution of these types for the EINPR.
3. To provide monitoring programs to assess the effects of use.

OPTIONS :

1. To do nothing and react to problems ad hoc.
2. Identify sensitivities, establish monitoring programs and map park wide.
3. Identify sensitivities, establish monitoring programs and map for areas of proposed use and development.

PREFERRED OPTION/TASKS: Option three is preferred as the only areas at high risk are those with significant use.

1. Develop Terms of Reference and methodology for the study.
2. Acquire 1:20,000 air photo of study area.
3. Identify, classify and map study areas.
4. Develop use strategies to mitigate sensitivities e.g. party size/length of stay limitations, areal and temporal closures, dispersed vs trail use, etc.
5. Develop monitoring programs to establish the effectiveness of the use strategies.
6. Prepare RDA Chapter.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Region	--	--	--	---	-	--	20
2	88/89	Region	--	--	--	- - - -		45.0	20
3	89/90	Region	5	--	--	---	-	30.0	15
	90/91	Region	5	--	--	- - - -		20.0	20
4	90/91	Park	10	--	--	- - - -		--	--
5	90/91	Region	10	--	--	- - - -		5.0	10
6	90/91	Region	--	--	--	---	.	5.0	--

PIC STATEMENT

TITLE : Wildlife Data Collection & Monitoring CODE BRI DATE 12/87

PROBLEM STATEMENT: Wildlife information, specific to the Park Reserve, in the detail required for basic resource management does not exist. Species presence/absence is documented for the larger mammals and birds, but may be lacking for other vertebrates and invertebrates. Information on distribution, population size/dynamics, population movements and critical habitats is lacking for all species. The resources required to obtain this information as a base-line, in any meaningful, quantitative manner are not available. The establishment of a wildlife data collection program (monitoring plan) is required for the long term and a data collection/storage program is required for the interim.

BACKGROUND AND POLICY: The lack of wildlife data, identified in the PRRE (Morrison, 1984) is a result of the size and remoteness of the area and subsequently, the high cost of data collection. This will continue to be a fundamental problem for management of the park reserve. Management of the Park Reserve will have to take place in the absence of concrete wildlife data for some time simply because this data collection is very expensive.

The majority of the wildlife information presently available is the result of two large and one small scientific expeditions to the area. The first was associated with the International Polar Year 1882-83, centered at Fort Conger (Greely expedition); the second was associated with the International Geophysical Year 1957–58, centered at Hazen Camp (Operation Hazen) sponsored by the Defence Research Board and the third, also centered at L. Hazen from 1963-64 was sponsored by the Entomological Research Institute of the Dept. of Agriculture.

The infrastructure provided by operation Hazen and later Operation Tanquary has attracted other researchers to this area of the High Arctic. Consequently, there is a relatively large body of scientific information available for such a remote area. Unfortunately, wildlife data collection was a secondary objective for most of these projects. This has resulted in sporadic coverage and limited scope, both in time and space, of wildlife information for the park Reserve. For example approximately 25 papers have been written on the invertebrates (mosquitoes, nematodes) at Hazen Camp but only one cursory survey for mammals and birds has been conducted for the Park Reserve area (Tener, 1963) .

Tener's comments on survey design (ibid) are particularly relevant today, even though written in 1961.

> "The design of the survey presented a number of problems. There was little factual information about the numbers and distribution of animals. . . . The reports of geologists . . . . while helpful were not detailed enough in their sightings to be a real value in selecting the method of survey. With little knowledge available it was decided that it would be impossible to stratify the sample in a manner necessary to take into account differences in distribution which might exist . . . . . in general, systematic sampling was chosen as best designed to provide data on both geographical distribution and numbers. Its chief disadvantage is...no confidence limits can be placed on population estimates. . . .Such a situation is difficult to avoid when an initial survey of a large biologically unknown area is being carried out." (emphasis mine).

We remain in a similar position today (27 years later). It is further noted that 600 hrs.of aircraft time were flown (205 in support alone) which would cost approx. $360,000 today. This survey covered the whole of the Queen Elizabeth Islands, however, any detailed study of the Park Reserve would likely cost as much and still provide us with wide confidence limits (if any) for the estimates.

The consensus of wildlife experts (F.Miller of C.W.S., Dr. C. Shank of the G.N.W.T. and R. Leonard of P&NRO, C.P.S.) at a workshop conducted for EINPR was that large scale wildlife surveys would not be cost effective due to the presumed low density of wildlife, the inability to stratify the sample and the subsequent high cost of intensive surveys. It was felt that the limited resources would be best put toward developing a methodology for the long term monitoring of wildlife populations, within the manpower and financial limitations of the Park Reserve in the belief that long term repeatable observations of limited scope would be of greater value than a limited burst of activity.

It is recognized that, at least initially, wildlife information will be heavily dependent upon opportunistic sightings. A standardized format for collection and storage of this information is required. This information, along with the historical record, in conjunction with operational experience will provide the basis for the development of survey methodologies for long term monitoring.

Local extinctions and recolonization have been documented for both caribou and muskox in the Arctic (Gunn et al,1981; Miller et al,1977; Tener,1965.) consistent with Island Biogeography theory (MacArthur and Wilson, 1967). Meldgaard (1984) documents a 100 yr cycle for these extinctions and recolonization for caribou in Greenland. Consequently long term monitoring programs, with the robustness to identify shifts in small populations may be required.

GOALS & OBJECTIVES:

1. To provide for the standardized collection and storage of wildlife sightings on an opportunistic basis until such time as a monitoring plan is in place.
2. To collect and store in a standardized format, historical wildlife observations.
3. To provide for the development of a long term Wildlife Monitoring Program, consistent with the preservation mandate of CPS and consistent with the available resources.

OPTIONS :

1. Develop data collection, storage and retrieval methodologies with present resources. Collecting data in a small scale incremental fashion until such time as sufficient data and experience are acquired to assess alternate methodologies for long term monitoring.
2. Apply for an increase in present resources sufficient to survey the major mammals and birds, parkwide, in order to provide baseline data at park inception for comparative purposes.

PREFERRED OPTION/TASKS: option one is preferred as funding increases in the order of magnitude required to effectively survey the Park Reserve are unlikely at this time. Option one accepts the risk that it will be some time before the capability exists to understand or even identify wildlife management problems or speak authoritatively to possible solutions.

1. Develop a report/storage format for the Interim period, with supporting documentation.
2. Provide for the collection and consolidation of the historical record of wildlife observations, with supporting documentation.
3. Begin, a a co-operative exercise with various wildlife agencies, territorial government and universities, to assess the alternatives for long term monitoring.
4. Prepare a Wildlife Monitoring Plan for the Park Reserve.
5. Prepare the RDA chapter on wildlife.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Park	40	10	--	--	--	---	--
	89/90	Park	40	10	--	--	--	---	--
2	88/89	Park	40	5	--	--	--	--	--
	90/91	Park	20	5	--	--	--	--	--
3	88/89	Region	6	5	--	--	--	10	20
	89/90	Region	5	" 2	--	--	--	--	10
4	unknown	Park		unknown					
5	90/91	Region	--	10	--	--	--	5.0	30

PIC STATEMENT

TITLE : Data Management CODE BRI DATE 12/87

PROBLEM STATEMENT: There are, at present, no data management systems for natural resources in place for the Park Reserve. They must be established.

BACKGROUND AND POLICY: Natural resource management requires the storage and manipulation of large volumes of data, in a variety of forms, from a variety of disciplines and the need to update it in a usable format on a timely basis.

Traditionally storage, integration and manipulation was accomplished using maps and tabular data. Main frame computer technology improved on this capability (eg. CANSIS, CGIS), however, it still did not provide timely data in a usable form to the manager especially when a number of options required analysis. Present technology (micro-based GIS systems) seems to have overcome this problem. Headquarters has done extensive research into a variety of systems and has recommended the adoption of a system (TYDAC-SPANS) (Welch, 1987). P&NRO has acquired such a system and is applying it to NYNP on a pilot demonstration basis. The Ellesmere data collection program will coincide with this program and benefit from it in terms of knowledge and experience.

GOALS & OBJECTIVES:

1. To implement a micro-computer based Geographic Information System (GIS) as the basic data management program for Ellesmere Island National Park Reserve.

OPTIONS :

1. Implement the program immediately.
2. Delay implementation 1-2 years behind the implementation schedule for NYNP.

PREPERRED OPTION/TASKS: Option two is preferred as the program will benefit from the problem solutions of the NYNP project. It appears at present that no delay will be required in reality as present schedules are phased in this manner.

1. Where possible acquire data in a digital format suitable for TYDAC-SPANS.
2. Provide for digitizing data not in digital format.
3. Assess hardware capabilities in Park, update as required.
4. Acquire TYDAC-SPANS capabilities (software, hardware) for the park.
5. Provide for staff training.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Region	NO ADDITIONAL REQUIREMENTS						
	89/90	Region							
	90/91	Region							
2	90/91	Region	--	10	--	- - - -		20.0	20
3	89/90	Region	To Be Determined						
4	89/90	Region	To Be Determined						
5	89/90	Region	To Be Determined						

4.2 RESOURCE DESCRIPTION AND ANALYSIS

The Resource Description and Analysis is "... a digest and analysis of all pertinent natural resource information" (Parks Canada, 1979). It presents the material collected in the BRI in a manner suitable for planning and management purposes.

RDA's in the past have been criticized for lacking an ecosystem view of the resources. This may be a function of the format whereby chapters are devoted to individual resources, however it may also result from a lack of emphasis on the analysis part of "... description and analysis". While conforming to the format (one chapter per resource) emphasis will be focused, insofar as possible, on the analysis. The limitation remains that much of ecosystem function in the high Arctic is not well understood. Only two major efforts in this area are known (Bliss, 1977; Svoboda and Freedman, 1980).

PIC STATEMENT

TITLE: Resource Description and Analysis CODE RDA DATE 12/87

PROBLEM STATEMENT: Existing data and the data collected during the BRI must be organized and analyzed to provide Park planners and managers with natural and cultural resource data in a manner that contributes to Park Management-and Planning.

BACKGROUND AND POLICY: CPS is committed by Policy and the Agreement to implementing the NRM Process. The Resource Description and Analysis portion of that process interprets that data collected in the BRI from a park management perspective in an integrated ecological (holistic) manner. The variety of scales, formats and detail of the BRI needs consolidation for management applications. The data needs analysis often to be applicable to park management.

GOALS & OBJECTIVES:

1. To provide planners and park managers with a highly visual and consolidated description and analysis of the Park Reserves natural resource base.
2. To assist in setting park management objectives and program direction per the Park Management Planning Process.
3. To assist in public understanding of the park.

OPTIONS :
There are no options.

PREPERRED OPTION/TASKS:
Tasks
1. Data preparation (BRI and GIS).
2. Data Synthesis and Description
   - thematic chapters for RDA
3. Integrated Resource Analysis
   integration of thematic data for ecosystem analysis.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	87/88	Region			AS PER INDIVIDUAL PIC's				
	88/89	Region							
	89/90	Region							
	90/91	Region							
2	88/89	Region			AS PER INDIVIDUAL PIC's				
	89/90	Region							
	90/91	Region							
3	90/91	Region							

4.3 NATURAL RESOURCE/USE MANAGEMENT

The challenge of Canadian National Parks management is in managing the apparent preservation/use contradiction contained in the “dedication” clause of the National Parks Act (Sec. 4). Making use of the parks natural resources while preserving them for future generations creates potential conflicts. Managing these conflicts is central to park management and is particularly critical to Arctic environments insofar as the ability to mitigate or ameliorate damage resulting from use is low to non-existent compared to more southerly Parks. The following section identifies the main use/preservation conflicts presently known, however inclusion in this section and the distinctions between these PICS and those of Sections 4.4 and 4.5 are somewhat arbitrary.

PIC STATEMENT

TITLE : Sport Fishing CODE 7RM4 DATE 12/87

PROBLEM STATEMENT: It is evident that sport fishing in the Park Reserve is and will continue to be a major visitor activity. Char are known from the Lake Hazen system and Lake Alexandra. At present the fishing is essentially unmanaged. In accordance with the management directive (4.4.1) a program to manage fishing on a sustained yield basis is required.

BACKGROUND AND POLICY: Sport fishing in the Lake Hazen system has been, and will continue to be a major visitor activity. The information needed to manage the fishery on a sustained basis has either not been collected or is not written in a manner that is useful to management. As it has essentially been unmanaged the amount of pressure the stock has received is largely unknown. Basic research on the Char of Lake Hazen was carried out in 1958 and 1981 but has not been written up or consolidated in a form useful to managers. Information about the char (life history, population size) and the pressure (magnitude, timing) is needed to regulate and manage the fishery. Additionally the char populations of the Park Reserve are of scientific interest due to their northern location, the lack of commercial exploitation and the presumed pristine nature of the lakes. The Greely expedition caught char in Lake Alexandra (Greely,1886). Other lakes along the coast may contain char (Heintzelman, Murray, Beaufort), but there is no record of this. The presence of char and the potential for a sport fishery must be established for these systems.

GOALS & OBJECTIVES:

1. To obtain baseline information about the Lake Hazen Char stocks for the BRI.
2. To initiate a program to manage the sport fishery in the Lake Hazen sys tern.
3. To identify what other lake systems have Char and what their potential for a sport fishery is.

OPTIONS :

1. Obtain and consolidate the available information about the fishery and develop a resource management plan based upon that information.
2. Formulate an integrated research program (fish stocks, fishing pressure) and develop a plan based upon that research.
3. Do nothing and continue the present unmanaged situation.

PREFERRED OPTION/TASKS: Option one is preferred. Initial indications are that enough information is available to develop a sound program for the interim which will highlight knowledge gaps for future research. Initial discussions have taken place with the Department of Fisheries and Oceans, Freshwater Institute (Moshenko and Kristofferson, Pers. Comm.) to provide for the consolidation and publication of the information and data obtained in 1958 and 1981.

PREFERRED OPTION/TASKS: (Continued)

1. Obtain and consolidate available information on the fish stocks.
2. Obtain previous use estimates.
3. Based on 1 & 2 develop a resource management plan as required by Directive 4.4.1 aimed at protecting fish stocks, documenting use and identifying research needs (resource monitoring - anglers, angling success and fish stocks).
4. Prepare RDA Chapters.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Region	--	--	--	--	--	--	10
2	89/90	Park	10	--	--	- - - -		--	--
3	89/90	Park	20	--	--	- - - -		--	--
4	90/91	Region	--	--	--	--	--	5.0	10

PIC STATEMENT

TITLE: Rare, Threatened and Endangered Species CODE 5RM3 DATE 12/87

PROBLEM STATEMENT: Ellesmere Island National Park Reserve contains, and can be expected to contain over the life of the park species designated rare, threatened or endangered. Local extinctions and recolonization, operating on long time frames, have been documented for Arctic areas. A strategy for defining, identifying, verifying and managing these species must be developed for the Park Reserve as a special situation as present policy and direction may not be adequate for management purposes.

BACKGROUND AND POLICY: At the most basic level Parks exist not only to protect "representative natural regions", but also to protect individual resources. Section 3.2.1 of the policy (Parks Canada, 1980) provides generally for the "passive" management of resources) but allows active manipulation to protect rare or endangered species or species prescribed as representative in the Park Objectives (Section 3.2.3, Ibid). Management Directive 2.4.3 provides guidelines for the designation of species as rare, threatened or endangered by recognizing COSEWIC designation, provincial/territorial designation or "interim" designation by managers for special circumstances. Fogden (1986) points out that many species would not receive "appropriate resource management priority" relying solely on COSEWIC designation and consequently, Ontario Region provides for "official" recognition if the species has international status (IUCN, Red Book) or COSEWIC status and "Interim" status if designated by "professional" bodies. In EINPR, Caribou (Rangifer tarandus pearyi) are designated threatened by COSEWIC. Polar Bear (Ursus maritimus) are not designated by COSEWIC, but are listed in the IUCN Red Book (IUCN, 1982). Local extinctions and recolonization in the High Arctic are documented for caribou (Gunn et al, 1981; Meldgaard, 1984) and muskox (Miller et al, 1977; Tener, 1965). This is consistent with Island Biogeography Theory (MacArthur and Wilson, 1967) and can be expected over the life of the Park Reserve A consistent, reasoned strategy for the definition, identification, verification, designation and management of rare, threatened or endangered species is required as local extinctions are probable and re-introduction by "active" means would be exceedingly difficult and expensive, if possible at all .

GOALS & OBJECTIVES: To develop guidelines for the definition, identification, verification, designation and management of Rare, Threatened or Endangered Species for Ellesmere Island National Park Reserve.

OPTIONS :

1. Develop guidelines for the Park in the absence of regional direction.
2. Press for the development of regional guidelines and then develop park specific guidelines.

PREFERRED OPTION/TASKS:
Option two is preferred.

PREFERRED OPTION/TASKS: (Continued)
1. Review and assess applicability of Directive 2.4.3 and the Ontario Regional Guidelines to the park situation and the need for regional direction.
2. Request assessment of the need for Regional Direction.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TO BE DEVELOPED BY NRC P&NRO

PIC STATEMENT

TITLE: Polar Bear - Human Use Conflicts CODE 1RM1 DATE 12/87

PROBLEM STATEMENT: Polar Bears densities are thought to be very low in the Park Reserve. As obligate carnivores they are presumed to be a threat to visitor safety. National Directive 4.4.15 "Bear Management in National Parks" and Regional Directive #12 (1987) required that Bear Management Plans be prepared for Parks with bear populations. A general objective of the plans is to provide for the protection and preservation of the bear populations while providing for safer visitor use. No bear management plans exist for the park reserve.

BACKGROUND AND POLICY: Present knowledge indicates that Polar Bears occur in very low densities in the park reserve (Fleck and Herrero, 1988). Since 1882 only three observations have occurred in the Park Reserve, all in coastal areas (England et al, 1981). In approximately fifteen field seasons John England and parties have observed sign once (Clements Markham Inlet) (pers. comm.) In all of the activities prior to and during Operation Hazen, polar bear sign was observed once (Clements Markham Inlet) (Christie, 1964; Hattersley-Smith , 1975). Greely observed a polar bear at Ft. Conger in 1882. In the wildlife survey of the Queen Elizabeth Islands the C.W.S. observed no polar bears in the park areas (Tener, 1963). There have been approximately the same number of observations on the sea ice and on the coast in areas adjacent to the Park Reserve in the same time period, for a total of approximately six observations. It is felt that due to low seal population densities and the existence of multi-year ice, visits to land by bears are unnecessary and infrequent. None of the usual land habitats (denning areas, summer retreats, fall staging sites) are known to be present in the Park Reserve (Fleck and Herrero, 1988).

Concern for the continuation of the species lead the circumpolar nations to establish the "Agreement On the Conservation of Polar Bears, 1973" under the auspices of the I.U.C.N. (Lyster, 1985). Canada is a signatory to the agreement which provides for the protection of habitat and limits the "taking" of polar bears to scientific purpose or to native peoples. Norway and Russia allow no hunting. Canada accounts for 75% of the world take (Ibid). The Canadian harvest is restricted through a quota system on sub-populations allocated to various Arctic communities. Quotas are thought to be at, or over, the maximum allowable harvest and some communities have reduced the quota (Fleck and Herrero, 1988).

Accepted practise in the arctic is for people to arm themselves for protection from polar bears. The G.N.W.T. recommends carrying firearms when traveling in bear country. The National Parks Act restricts the possession of fire arms and prohibits anyone but Wardens and Peace Officers from discharging firearms (Section 20, Wildlife Regs. N.P.A.).

Canadian Parks Service, Prairie and Northern Region, recognized that polar bear/human conflicts were poorly understood vis a vis other species (Leonard, 1987). A contract was let to rectify the knowledge gap (Fleck and Herrero, 1988). The report makes eleven recommendations with various options for park/bear management (Ibid).

GOALS & OBJECTIVES: To provide for the preparation of a bear management plan in accordance with National and Regional directives, including the determination of the level of threat posed to visitor safety in various areas of the park reserve and the identification of measures to mitigate any threat.

OPTIONS : There are no options from both a legal and organizational perspective the plan is mandatory. It is recognized that it may take some time to develop the plan as outlined in Directive #12, in Leonard (1987) and in Leonard et al (1983). An interim "operational" plan should be prepared in order to respond to potential and actual bear/human interactions until such time as the management plan is prepared and approved.

PREFERRED OPTION/TASKS:

1. Prepare an operational plan to respond to bear/human interactions for the interim.
2. Prepare a Bear Management Plan for the Park Reserve in accordance with National Directive 4.4.15, Regional Directive #12, Leonard et al (1983) and Leonard (1987).

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL	
			PARK	REGION	HQ	PARK	REGION
						$ PD	$ PD
1	88/89	Park	40	--	--	-- --	-- --
2	88/89	Park	100	--	--	-- --	-- --

PIC STATEMENT

TITLE : Wildlife - Human Use Conflicts CODE 4RM2 DATE 12/87

PROBLEM STATEMENT: At present use levels there is a potential for negative impacts on both Park Reserve wildlife and the visitor experience. Impacts may vary, but can include habitat abandonment, human habitation, stress leading to decreased survivorship and the potential for human injury. Balancing the opportunities for viewing wildlife (plus related camping and hiking) and the coincident harassment potentials may be difficult, especially for animals already stressed by coping with the harsh climate and at the limits of their range.

BACKGROUND AND POLICY: Three generalized responses of wildlife not used to human activity are recognized upon exposure to human activity (harassment). One, abandonment of territory (habitat), two habituation to humans and three population decline. This can lead to local extirpations, and human injury, “beggar” animals and increased disease. It is recognized that species at the limit of range and/or experiencing climatic stress are particularly susceptible to additional cumulative stress added by human activity. Miller and Gunn (1979) document the responses of Peary Caribou and Muskox to helicopter harassment, present a schema of potential effects and provide recommendations for mitigating aircraft and ground activity harassment. The effects of harassment are most severe in the late winter period (March to May) which coincides with the timing of Polar Flights in the Hazen area. Protection of natural resources is the primary mandate of Parks. This is recognized both in Policy and in the Act. Regulations made pursuant to the act provide mechanisms to control human activity and mitigate impacts. Determining mitigations and appropriate application of these mechanisms may be critical to the protection of Park Reserve wildlife. Additionally, certain wildlife behaviour may induce unfamiliar visitors to violate “thresholds”, possing an unusual public safety hazard (e.g. muskox and wolves).

GOALS & OBJECTIVES: To identify the species at risk due to human activities, the magnitude of the risks and appropriate methods for mitigating the risks.

OPTIONS :

1. React ad hoc.
2. Review and assess current literature with respect to identifying species, areas and mitigations and develop appropriate use strategies.
3. Conduct research into identify species specific responses to activities and develop appropriate use strategies.

PREFERRED OPTION/TASKS: Two is the preferred option as there is relevant research in the literature.

1. Review the literature with respect to identifying conflicts between park species and park activities.
2. Identify appropriate responses to mitigation of conflicts.
3. Implement a mitigation strategy as a component at backcountry/visitor management.
4. Evaluate the-effectiveness of the strategy.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL	
			PARK	REGION	HQ	PARK	REGION
						$ PD	$ PD
1	89/90	Park	40	--	--	-- --	- - - -
2	89/90	Park	20	--	--	- - - -	- - - -
3	90/91	Park	20	--	--	-- --	- - - -
4	Ongoing	Park			UNKNOWN		

PIC STATEMENT

TITLE : Wildlife Impacts - Birds CODE 9RM6 DATE 12/87

PROBLEM STATEMENT: Visitor and operational activities in the Hazen-Tanquary area could have significant impacts on Park Reserve bird populations if the following two conditions are met. One, if the breeding populations is small, and two, if a significant proportion of the suitable habitat was located in the area. Nest disturbance at critical times over succeeding years could lead to nest abandonment and a subsequent reduction of Park Reserve populations.

BACKGROUND AND POLICY: Forty four species of birds occur in Northern Ellesmere, half of which are Charadriformes. Most of the research has been directed at this group. The breeding ecology for Turnstones, Knots and Jaegers at Hazen Camp is documented (Nettleship, 1973,1974; Maher, 1970). Maher (Ibid) notes the absence of quantitative data on lemming populations but proposes that the breeding densities and nesting success of Jaegers fluctuates with lemming numbers with "most or all" territories being abandoned in low lemming years. Nest abandonment due to human disturbance is also documented.

R.I.G. Morrison (1984) summarizes the migration patterns for a number of species including those of the old ,world species of Knot, Ruddy Turnstone, Ringed Plover and Sanderlings moving from Ellesmere to Europe. Concern is expressed for the conservation of the Red Knot which occurs in relatively few locations, has specialized food requirements and is also susceptible to disturbance. "Twinning of Parks" is proposed as a conservation measure.

Little is known about waterfowl breeding and moulting areas. Few raptor nests have been located. Both are susceptible to human disturbance (LGL, 1988). The size of breeding populations and location of breeding habitats is not well documented for the Park Reserve.It is clear that the majority of the human activity for the immediate future will take place in the Hazen-Tanquary area and that the potential for adverse impacts is greatest in this area.

GOALS & OBJECTIVES:

1. To determine the potential for adversely impacting the breeding bird populations of the Park Reserve as a result of the proposed activities in the Hazen-Tanquary area.
2. To add to the general knowledge of birds in the Park Reserve and input into the RDA.

OPTIONS :

1. Do nothing.
2. Conduct a detailed study Parks wide to determine critical nesting areas.
3. Conduct a study in the Hazen-Tanquary area to determine the potential for adverse impacts as a pilot project for determining needs/methodologies for such a study park wide.

PREFERRED OPTION/TASKS: Options three is preferred as it will provide information critical to park management in the initial years and provide insight into future needs.

1. Assess the present information base to identify affected species and their habitat requirements.
2. Identify nesting habitats and species specific timing factors in the Hazen-Tanquary area.
3. Assess the potential for adverse impacts in the Hazen-Tanquary area and the need for park wide studies.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL	
			PARK	REGION	HQ	PARK	REGION
						$ PD	$ PD
1	90/91	Park	40	--	--	- - - -	--- -
2	90/91	Park	20	--	--	- - - -	--- -
3	90/91	Park	10	--	--	- - - -	-- --

PIC STATEMENT

TITLE : TFN Agreement/Inuit Resource Harvest CODE 10-RM-7 DATE 12/87

PROBLEM STATEMENT: The information to manage a resource harvest is different from that required for non-harvested populations (timing, level of detail, etc.). The strategy proposed for the BRI assumes that there will be no hunt. There is a potential for harvest as a result of the Inuit land claims negotiations.

BACKGROUND AND POLICY: Parks policy (3.2.11) recognizes that traditional subsistence hunting can continue in new parks. The Inuit land claims are based on the rights of the Inuit to have access to and hunt in their traditional areas. There has, historically, been no Inuit hunt in the Park Reserve. Inuit have hunted here in support of white exploration and Greenland natives may hunt here illegally. The distance from Grise Fiord makes a hunt in this area improbable, however, it is subject to negotiation by the TFN.

GOALS & OBJECTIVES:

1. To clarify the position of the TFN with respect to an Inuit hunt in the Park Reserve Area.

OPTIONS :

1. Develop and maintain liaison and discussion with TFN re: native harvest while proceeding under the assumption that there will be no harvest.
2. As in 1, but proceed under assumption that there will be a harvest.

PREFERRED OPTION/TASKS: Option 1 is preferred as it is the most probable. However, it is necessary to establish direct dialogue so that Parks might know as early as possible if the assumption does not hold.

1. The Superintendent must establish liaison/discussion with TFN.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Park			ONGOING				

PIC STATEMENT

TITLE : Wildlife Impacts - Poaching CODE 11RM7 DATE 12/87

PROBLEM STATEMENT: The Park Reserve is home to many relatively rare species, many of which carry trophy status. The size and remoteness of the area, while lessening the potential poaching pressure also makes monitoring and enforcement difficult. An assessment of the potential for poaching and an assessment of strategies to control and/or monitor the activity is required.

BACKGROUND AND POLICY: The Park Reserve is home to a number of trophy species which have recognized black markets (Polar Bear, Gyrfalcon). Additionally, the area may be subject to illegal harvest by Greenland natives. Due to the size and remoteness of the area, manpower limitations, potential international implications and the potential costs involved in monitoring, a careful assessment of the potential for poaching and optional strategies for dealing with the potential must be developed.

GOALS & OBJECTIVES:

1. To assess the potential for poaching in the Park Reserve including identification of vulnerable species and areas.
2. To identify options for dealing with the potential identified in 1.
3. To implement the strategy identified in 2.

OPTIONS :

1. Respond to poaching ad hoc.
2. Develop a poaching plan (detection/protection) identifying potential, strategies and resources for implementation.

PREFERRED OPTION/TASKS:

Option 2 is preferred.

1. Assess the potential for poaching in cooperation with other Agencies eg. G.N.W.T. , Greenland Government.
2. Identify alternative strategies for dealing with the potential identified in 1.
3. Identify resources required for implementing preferred strategy.
4. Prepare a Poaching Plan.
5. Implement, monitor and evaluate the plan.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	90/91	Park	10	--	--	--	--	--	--
2	90/91	Park	10	--	--	- - - -		--	--
3	90/91	Park	10	--	--	- - - -		- - - -	
4	90/91	Park	60	--	--	- - - -		--	--
5	90/91	Park	to be determined						

PIC STATEMENT

TITLE: Rabies CODE 8RM5 DATE 7/88

PROBLEM STATEMENT: The Rabies virus is endemic in domestic dogs, wolf and fox in the high Arctic. Human anti-rabies treatment must begin soon after exposure as death is not preventable once clinical symptoms develop (Sikes, 1981). The risk of exposure to visitors and staff is increased due to the propensity of Arctic Fox to become camp pests and for the inquisitiveness of the Arctic wolf. The risks post exposure are heightened because of the uncertainty of timely evacuation due to remoteness and inclement weather. No operational procedures or mechanisms are presently in place to deal with these risks.

BACKGROUND AND POLICY: Rabies is one of the oldest recorded infectious diseases. It is known from every continent except Australia (Sikes, Ibid). Cyclical epidemics are documented. Transmission of the virus is primarily by direct contact (saliva) and the infectious period is short. The entire clinical course of the disease is 2-4 days in the Red Fox (Ibid). Rabies is density dependent and is more prevalent in large populations (Heidt et al, 1982). The incubation period is variable (2-12) weeks, but may be shorter than 10 days. Consequently, human antirabies treatment, post exposure should begin immediately. Pre-exposure immunization has been recommended for high risk groups (Sikes, 1981) and many GNWT wildlife officers are vaccinated yearly (Anne Gunn, GNWT, Pers. Comm.).

Little is known of the occurrence of Rabies in the Park Reserve (LGL, 1988), but an Arctic Fox from Grise Fiord tested positive in 1986 (A. Gunn, Pers. Comm.) so it exists in the population on Ellesmere Island. Another possible vector is from dogs in Greenland.

The behaviour of both Arctic Fox and Arctic Wolf are known to bring these species into close contact with humans. The former due to its propensity to become a camp pest. The latter due to its inquisitiveness and unfamiliarity with humans. These behaviors may be mitigated by education and guidelines for park visitors.

The presumed low probability of contact is confounded by the uncertainties of travel in the High Arctic due to remoteness and inclement weather. Positive identification of Rabies is only reliable through laboratory analysis. This is confounded by the fact that suspected animals may not be readily captured for examination. Rabies is a “reportable disease” under the Animal Disease and Protection Act (R.S.c A-13) and transport of the animal (parts) is covered by the Transport of Dangerous Goods Act.

Directive 4.4.3 "Public Safety Management” provides a mechanism (Preliminary Hazard Assessment and Evaluation) to assess the level of risk posed to visitors and staff and provide for the appropriate operational responses.

GOALS & OBJECTIVES: To assess the level of threat posed by Rabies to Park Reserve visitors and staff and provide for the appropriate operational responses integrated with other Public Safety concerns.

OPTIONS : 1. Assess the Rabies problem on an ad hoc basis.
2. Assess the Rabies problem as a component of an overall Preliminary Hazard Assessment and Evaluation as provided for in Directive 4.4.3

PREFERRED OPTION/TASKS: Option two is preferred as it is apparent that a standardized evacuation policy is required for emergencies.
1. Prepare a Preliminary Hazard Assessment and Evaluation.
2. Update it yearly.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1.	88/89	Park	20	--	--	--	--	--	--
2.	ongoing								

4.4 CULTURAL RESOURCE MANAGEMENT

Cultural Resource protection is a priority resulting from Policy (Sec. 3.2.13, 3.2.14) and the Agreement (para. 11).

Significant Paleo-Eskimo and historic (Euro-North American) sites exist within the Park Reserve and are proposed as Zone I sites (Special Preservation) in the Interim Management Guidelines.

Removal of natural artifacts (antlers, skulls, fossils) is a significant problem.

PIC STATEMENT

TITLE: Cultural Resource Protection - Paleo Eskimo CODE 2CM1 DATE 12/87

PROBLEM STATEMENT: Hiking, camping and recreational activity may subject Paleo-Eskimo sites to damage that will result in the loss of scientific and cultural information. Impacts will vary with each particular site but are generally associated with permafrost problems (mass wasting), theft of artifacts and disturbance of surface materials (loss of information).

BACKGROUND AND POLICY: There are a relatively large number of paleo-eskimo sites (Independence I and II, Thule) within the Park Reserve area that present a significant cultural resource. The route from Tanquary Fiord to Lake Hazen to the Lady Franklin Bay area has been called the "Muskox Way" and proposed as route of migration of Paleo-eskimo culture from west to east (Alaska-Greenland) following the faunal resources of the time (Steensby, 1910; Knuth, 1967). The distinction between the cultures lies, in part, with the particular arrangement of stones and materials used in house construction. Some sites contain house structures and artifacts for a number of cultural periods as a result of repeated use over a long period of time. There is a potential for disturbance and mixing of artifacts and information. There have been archaeological surveys and excavations, but much is unknown and the un-excavated (even unknown) sites represent a repository of considerable important knowledge. The sites are at risk from inadvertent misuse (movement of house stones in unrecognized sites), deliberate misuse ("pot hunting", unauthorized excavation, theft of surface artifacts) and cumulative impacts (thermokarst resulting from overuse of sensitive terrains). Paragraph 11 of the Agreement outlines conditions for the conduct of archaeological research and the storage of artifacts. Sections 3.2.13 and 3.2.14 of the Policy provide for protection of these resources.

GOALS & OBJECTIVES: To develop a management strategy for the protection of sites and artifacts that addresses the needs for visitor access, interpretation and resource protection within the context of the CPS resources.

OPTIONS:

1. Develop the strategy "in-house".
2. Develop the strategy on contract.

PREFERRED OPTION/TASKS: Option one is preferred utilising Archaeological & Historic services, P&NRO. The strategy should:

1. Inventory sites and establish priorities.
2. Excavate priority endangered sites.
3. Monitor known sites.
4. Establishing use guidelines (ethics, area closures).

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TO BE DEVELOPED IN CONJUNCTION WITH ARCHAEOLOGICAL AND HISTORIC SERVICES P&NRO

PIC STATEMENT

TITLE : Cultural Resource Protection - Fort Conger CODE 6CM2 DATE 12/87

PROBLEM STATEMENT: The cultural resources at Fort Conger are at risk as a result of deterioration from exposure to the elements, vandalism and theft. Historic information and artifacts may be lost. It is Parks mandate to protect the natural and cultural resources under its protection. Changing philosophy's in cultural resource management lend confusion to the issue of what should be done with the artifacts (left "in situ", removed to museums for preservation).

BACKGROUND AND POLICY: Fort Conger is the site of the first white exploration and habitation in the Park Reserve area. Many artifacts and remains at the site date back to the Nares and Greely expeditions of the mid-to-late 1800's. The Peary expeditions to the North Pole used the site as a base camp. The most obvious artifacts are the huts constructed by Peary from the building and materials left by Greely. Some artifacts have been removed to museums for safekeeping while much remains "in situ". That so many artifacts remain attests to the remoteness of the site and its low weathering rates. There are differing opinions as to how the area and artifacts can best be protected and interpreted (on-site, "in situ", reconstructed, museum, off site, etc.). Paragraph 11 of the Agreement outlines conditions related to the conduct of archaeological research and artifact storage. Sections 3.2.13 and 3.2.14 of the policy for protection of these resources.

GOALS & OBJECTIVES: To develop a management strategy for the area and artifacts that address the needs for visitor access, interpretation and resource protection in the context of CPS resources.

OPTIONS :

1. Develop the strategy "in-house".
2. Develop the strategy on contract.

PREFERRED OPTION/TASKS: Option one is preferred utilizing Archaeological and Historic Services.

1. Monitor and assess visitor impacts during the Interim Management period.
2. Develop a management plan for the area (Archaeological Historic Services, P&NRO).

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TO BE DEVELOPED IN CONJUNCTION WITH ARCHAEOLOGICAL SERVICES, P&NRO

PIC STATEMENT

TITLE: Cultural Resource Protection - Research Camps CODE 15CM3 DATE 10/88

PROBLEM STATEMENT: Continuing use of the camp facilities at Tanquary Fiord and Lake Hazen poses some threat to the survival of evidence of use and development of these camps as research bases during the past four decades. The threat comes from the continuing need for camp facilities for park management and research with the associated need for change and improvement. However, in the continuing process of keeping the camps useable, evidence of their history is being lost; a process that has probably been going on since the camps were established.

BACKGROUND AND POLICY: Since the late 1950's there has been extensive research in the Canadian High Arctic, much of it carried out from long term research camps such as at Lake Hazen and Tanquary Fiord. This research was an important source for the present understanding of the Arctic. The presence of researchers for extended periods also provided a statement of Canadian sovereignty. These activities have not yet been declared to be of national historic importance, but they have also yet not been considered by the Historic Sites and Monuments Board of Canada. Interpretations provided in the park should include information on their history, including artifacts where possible. Although the remains of past research activities doe not compare in date with the other cultural resources in the park they are nevertheless also cultural remains - sources of information about and interpretation of the use of the area by humans. An additional factor is that the remains are in many instances still useable supplies and equipment and may be claimed by the agencies. that first brought them into the area. Although they may be available for research of the history of recent research, they may not be available for display or interpretive purposes and may eventually be consumed or relocated elsewhere by continuing research.

GOALS & OBJECTIVES: To develop a management strategy for the protection of artifacts that addresses the need for interpretation and resource protection.

OPTIONS:

1. Develop the strategy "in house".
2. Develop the strategy on contract.

PREFERRED OPTION/TASKS: Option one is preferred, utilizing Archaeological and Historical Services, P&NRO. The strategy should:

1. Inventory resources.
2. Establish ownership and plans for use.
3. develop an interpretation/display using available resources.
4. Identify resources which can be removed as part of a clean-up program for the camp.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS "

TASK YEAR LEAD	O&M PERSON DAYS			CAPITAL	
	PARK	REGION	HQ	PARK	REGION
				$ PD	$ PD
TO BE DEVELOPED IN CONJUNCTION WITH ARCHAEOLOGICAL AND HISTORICAL SERVICES P&NRO .					

4.5 PARK MANAGEMENT

Operational and Administrative concerns related to Park Reserve Operation are considered.

PIC STATEMENT

TITLE: Arctic Garbage Cleanup CODE 12PM3 DATE 08/88

PROBLEM STATEMENT: Due to the high transportation costs involved with the backhaul of materials and the requirement to be self sufficient for extended periods, large amounts of garbage have accumulated at various sites throughout the Arctic, including the park Reserve. The garbage at these sites has a significant negative impact on the Arctic wilderness experience Parks is attempting to provide. Any cleanup will be expensive and logistically complicated and will of necessity involve a number of federal and territorial agencies.

BACKGROUND AND POLICY: The high cost of transportation and the short term "expedition" mentality has resulted in the accumulation of large amounts of industrial and domestic garbage at a number of sites in the Park Reserve (e.g. Tanquary Camp, Hazen Camp, Ward Hunt Island, etc.). In many cases ownership, or responsibility for the material cannot be established.

The problem is not limited to the Park Reserve and is recognized Arctic wide. In general, present policies of all agencies are such that the problem is not increasing (back haul and clean up policies have been instituted.). However, there is still a substantial backlog of material which requires consideration.

The Chief Park Warden has, with the cooperation of various private companies and agencies, attempted to reduce the number of barrels in the Park Reserve by backhauling on empty flights. Unfortunately, this program cannot be continued in an ad hoc manner as, without the cooperation of other agencies it merely transports the problem and does nothing to resolve it, as the receiving agencies do not have the resources to deal with the problem effectively. With the cooperation of the station manager at the A.E.S. site at Eureka, barrels will continue to be backhauled in 1989 with the dedication of Park P.Y. to assist with handling at Eureka.

It is recognized by the various mid-level operational managers responsible for the various sites, that a concerted, co-operative initiative is required, by a number of the federal agencies operating in the Arctic, to resolve the problem. To this end low level discussions have taken place between CPS, AES, PCSP and DND. What is needed is a program with high level support. Significant political benefits are seen to accrue from such an initiative.

GOALS & OBJECTIVES: To define and identify support for a co-operative program to clean up the backlog of garbage at various sites throughout the Arctic.

OPTIONS : 1.)To do nothing.
2.)To define the program and continue the present initiative.

PREFERRED OPTION/TASKS:
Option two is preferred.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK YEAR LEAD	O&M PERSON DAYS		CAPITAL			
	PARK	REGION HQ	PARK		REGION	
			$	PD	$	PD

To be determined.

PIC STATEMENT

TITLE: Garbage Management CODE 10PM2 DATE 8/88

PROBLEM STATEMENT: At present the garbage generated by the Park Reserve operation is being backhauled to a Landfill at the AES site at Eureka. There is no operational landfill site in the Park Reserve. I

BACKGROUND AND POLICY: The operation in the Park Reserve generates varying amounts of garbage of different kinds. The wastes range from domestic kitchen wastes (organic) to trade wastes (building materials) and hazardous wastes (solvents and chemicals).

At present some of these wastes are reduced in volume by burning in a forty-five gallon drum, however this still leaves a residual waste. Additionally, many wastes cannot be burned or are hazardous and must be handled in a legally prescribed manner.

As the park is only in the first season of operation it has not generated large volumes. As this problem is cumulative storing on site is not satisfactory and a solution to garbage disposal must be found for the long term.

Solutions to the problem are confounded by:
ethical and environmental considerations related to establishing a landfill in the Park Reserve, and
ethical and administrative problems associated with transferring the problem to sites that may not be equipped to handle it or are already having difficulty grappling with their own problem.

GOALS & OBJECTIVES: To provide for the long term disposal of the garbage generated by the Park Reserve operation in an environmentally and ethically responsible manner.

OPTIONS:
1. Investigate the alternatives and provide for disposal.
2. Delay a response until initiatives regarding the Arctic cleanup are established.

PREFERRED OPTION/TASKS:
Option one is preferred.
1. Assess the present situation in terms of the potential volumes which might be generated in the various classes of waste.
2. Investigate the alternative methods of disposal available for each class.
3. Implement the selected method.

ESTIMATED HUHAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Park	20	--	--	--	--	--	--
2	88/89	Park	20	--	--	- - - -		---	-
3	88/89	Park	To Be Determined						

PIC STATEKENT

TITLE: Human Waste Management CODE 3PM1 DATE 8/88

PROBLEM **STATEMENT:** The presence of permafrost and the low rate of biological activity in the soil precludes the use of the more common methods of handling human waste in remote areas (e.g. pit privies, weeping tile beds, etc.) and may require more innovative approaches. The volume of waste being produced is presently beyond our capability to handle it. It is incumbent upon the Canadian Parks Service to establish high standards and provide leadership in this regard.

BACKGROUND AND POLICY: Human waste management poses difficult problems in the Arctic environment. Many communities rely on "honey wagons" which are used to pump out individual toilet holding tanks. (e.g. Grise Fiord). The wagons are then emptied into the ocean. A few communities have sewage treatment plants (e.g. Resolute Bay), but it is unclear how reliable they are. Federal government facilities for handling wastes at remote sites varies from site to site. At Mould Bay sewage is pumped directly onto the land. At Eureka a settling pond has been constructed, but it is unclear how effective it is. (T. Monastyrski, pers.comm.).

At present there are no satisfactory mechanisms in place for handling human wastes in Ellesemere Island National Park Reserve. The problem is, obviously, more critical in concentrated use areas (e.g. Tanquary Camp, Hazen Camp and Fort Conger) than in the backcountry.

Three general variations on the problem are recognized:

1) Tanquary Camp - where relatively large numbers of people are concentrated for extended periods (e.g. researchers using Polar Continental Shelf Facilities, park visitors and staff). Additionally the infrastructure and activities produce large amounts of grey water (kitchens, showers, washing machines etc.)

2) Remote fly - camps e.g. Hazen Camp, Fort Conger and research camps occupied for extended periods. Besides solid wastes these camps can also produce relatively large amounts of grey water.

3) Backcountry hiking - obvious camping areas e.g. Lewis Lake have a potential to be affected by cumulative impacts.

Presently a "latrine" system, with used forty-five gallon drums as the receptacles, is utilized at Tanquary Camp. In the summer of 1988 partially full drums were flown to the A.E.S. station at Eureka for disposal. This system has proven unworkable, for a number of reasons, the most obvious of which is the "physical" handling problem related to aircraft use. It is clear to all concerned that the problem must be handled on site and cannot be transported." In the interim, until a permanent solution is found, the drums are being stored as runway markers on the airstrip.

Approximately $370,000 was spent establishing Park Reserve infrastructure" (Weatherport Sleepers, Kitchen and washing facilities etc.) in the summer of 1988. No satisfactory provision for dealing with wastes was included in the project.

At Hazen Camp the commercial operator (High Arctic International) employs a "honey bag" system. The honey bags have, variously been buried on-site or transported out. Wolves have been known to dig up buried honey bags (B. Jesudason. pers. comm.) The current draft (4) of the IMG's provides for establishing toilet facilities at Hazen Camp and Fort Conger. In 1988 CPS provided a "weatherport" latrine facility at Hazen camp, but no provision was made for handling the wastes. Not only must provision be made for these wastes, but also the wastes generated from various research camps.

Backcountry hikers are advised to handle wastes in the same manner as the wildlife and instructed to pack out or burn the toilet paper. Some sites will have to be monitored for cumulative impacts.

It should go without saying that the Canadian Parks Service must be above reproach in the handling of human wastes in the Park Reserve and should provide leadership in the region, by example.

GOALS & OBJECTIVES:

1) to investigate the alternative methods available for disposing of human wastes, including "grey water", in the Park Reserve.

2) to select and implement that method which best supports the ideals espoused by the Canadian Parks Service.

OPTIONS :

1) to investigate the alternatives using D.P.W., A&E in-house resources.
2) to contract the option analysis to outside engineering firms.

PREFERRED OPTION/TASKS:

Option two is preferred.

1) Develop the Terms of Reference for an "Option Analysis".
2) Contract the "Option Analysis".

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	88/89	Region	10	20					
2	88/89	Region						20.0	10

PIC STATEMENT

TITLE: Fuel Caches CODE 13PM4 DATE 12/87

PROBLEM STATEMENT: The operational requirement to have fuel caches located in strategic areas throughout the Park Reserve gives rise to the problems associated with hydrocarbon spills in sensitive areas. Additional problems concern the disposal of outdated fuels in abandoned caches, in deteriorating containers. Guidelines for the storage and handling of fuels including the containment and cleanup of spills are required.

BACKGROUND AND POLICY: Due to the remoteness of the area fuel caches are required to meet operational needs. Presently aviation fuel is dropped off in 45 gal drums and pumped into aircraft as needed. Past practices have lead to an accumulation of full, empty and partial drums at unknown and/or remote locations in containers which will inevitably deteriorate. The risk posed by spills is mitigated by the probability that they will be small in size (45 gal). The ability to contain and clean up potential spills is required. National Park Fire Protection Regulations (5.1) provide control for the Superintendent with regard to the terms and conditions of possession; transport and storage of fuels and flammable liquids.

GOALS & OBJECTIVES: To develop guidelines for the possession, transport and storage of fuels and flammable liquids including requirements to deal with potential hydrocarbon spills.

OPTIONS :

1. Develop guidelines on a case by case basis.
2. Develop generic guidelines.

PREFERRED OPTION/TASKS:

Option two is preferred.

1. Identify and assess capability to deal with potential spills.
2. Develop guidelines for the possession, handling and transport of fuels.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL	
			PARK	REGION	HQ	PARK	REGION
						$ PD	$ PD
1	88/89	Park	20	--	--	- - - -	- - - -
2	88/89	Park	20	--	--	- - - -	-- --

PIC STATEMENT

TITLE: Research Activities - Polar Continental Shelf Project CODE 16PM5 DATE 12/87

PROBLEM STATEMENT: Historically, research has been a primary activity of the Park Reserve. Polar Continental Shelf Project has provided logistic support to Arctic researchers including operations of an airstrip and camp at Tanquary Fiord. A Memorandum of Understanding, primarily aimed at co-operating at the Tanquary Fiord site, has been signed by CPS and PCSP. The M.O.U. provides for research activities to be guided by Management Directive 2.4.5, Research and Collection Permits. Consultation will be required for implementing Directive 2.4.5 and for ongoing cooperation at Tanquary Camp.

BACKGROUND AND POLICY: Polar Continental Shelf Project if responsible for providing logistical support to Arctic researchers. Excluding the military they have been the primary federal agency operating in the Park Reserve area. PCSP has maintained the runway and camp at Tanquary Fiord since it was established by the DRB. The M.O.U. allows PCSP to maintain its camp at Tanquary Fiord and provides for cooperation between he two agencies. The M.O.U. recognizes that research activities will be governed by Management Directive 2.4.5, Research and Collection.

GOALS & OBJECTIVES: To implement the Memorandum of Understanding between Environment Canada - Parks and Polar Continental Shelf Project which allows for one, cooperation in the operation of Tanquary Camp and two, implementation of Management Directive 2.4.5, Research and Collection.

OPTIONS :

There are no options.

PREPERRED OPTION/TASKS:

1. Establish contact and maintain liaison with PCSP relative to the operation of Tanquary Camp on an ongoing basis.
2. Consult with PCSP in order to establish a mechanism by which Directive 2.4.2, Research and Collection will be implemented.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQuIREMENTS

TASK	YEAR	LEAD	O&M PERSON DAYS			CAPITAL			
			PARK	REGION	HQ	PARK		REGION	
						$	PD	$	PD
1	89/90	Park	ONGOING						

PIC STATWENT

TITLE: Military Activities - Department of National Defence CODE 17PM6 DATE 12/87

PROBLEM STATEMENT: Military activity has historically been a major activity in the Park Reserve area. Military overflights, training exercises, servicing of military installations in the park and related recreational use by military personnel may have significant impacts on natural resources (wildlife disturbance, fishing pressure, unregulated landings) and visitor experiences. The activities of the military in the Park Reserve are covered by a Memorandum of Understanding between the two departments. It must be implemented.

BACKGROUND AND POLICY: Until recently the military have been the major, regular user of the Park Reserve. Hazen Camp and Tanquary Camp were originally established by the Defence Research Board. Ward Hunt Island, although within Park Reserve boundaries will be retained by the military until such time as they have no use for it. The MOU provides for access to two microwave sites in the park and allows the military access to Hazen Camp for these maintenance purposes. Additionally there are regular overflights of the Park Reserve by aircraft accessing Alert and personnel from this site are known to fish at Lake Hazen with helicopter-access.

GOALS & OBJECTIVES: To protect Park Reserve resources and values from degradation due to military activities by implementing the Memorandum of Understanding agree to by the two departments.

OPTIONS :
There are no options.

PREFERRED OPTION/TASKS:
1. Establish contact with DND in order to discuss implementation of the MOU .
2. Monitor and document impacts.
3. Amend the MOU as required.

ESTIMATED HUMAN AND FINANCIAL RESOURCE REQUIREMENTS

TASK YEAR LEAD	O&M PERSON DAYS		CAPITAL	
	PARK REGION HQ		PARK	REGION
			$ PD	$ PD
ONGOING				

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APPENDIX I

PNHO
M H.F.

9-4-87

PROBLEM SIGNIFICANCE RATINGS (Form 1)

	PROBLEM SIGNIFICANCE FACTORS (+)																																	CONSTRAINT FACTORS (−)					
	MUST															WILL/SHOULD												MAY											
PROBLEM STATEMENT	LEGAL					POLITICAL									TOTAL	VISITOR						RESOURCE					TOTAL	PROBLEM CHARACTERISTIC					TOTAL	HUMAN RESOURCE	FINANCIAL RESOURCE	TIME REQUIRED	TECHNOLOGY	PROBLEM DEFINITION AND OBJECTIVE	TOTAL
	a	b	c	d	e	a	b	c	d	e	f	g	h	i		a	b	c	d	e	f	a	b	c	d	e		a	b	c	d	e							

APPENDIX II

APPENDIX II: PROBLEM SIGNIFICANCE CRITERIA

1. LEGAL FACTORS:	SIGNIFICANCE:
a. Legislation.	1.0 National Parks Act. 1.0 Other Legislation. Legislation implies the action. 0.0 No Legislation.
b. Federal/Territorial Agreement.	1.0 Legal Agreement in place. Legal Agreement pending. 0.0 No agreement.
c. Geographic Impact	1.0 Existing impact on neighboring land/potential impact on international lands. Potential to impact on neighboring lands. 0.0 Criteria does not apply.
2. POLITICAL FACTORS:	
a. Policy.	1.0 Failure to alleviate this concern undermines the integrity of the Park. There is a direct connection between alleviation of this concern and consistency with Parks Policy. 0.0 Criteria does not apply.
b. Ministerial commitments	1.0 Direct reference to this concern exists in Management Plan and/or a ministerial commitment to alleviate concern has been stated. Aspects of concern are referred to in the plan or other documents approved by Minister, DM, or ADM. 0.0 Criteria does not apply,
c. Intergovernmental Programs	1.0 Program in existence. Program planned/proposed. 0.0 Criteria does not apply.
d. Public pressure/support	1.0 Extremely high profile and the potential to be a disruptive issue. Has or potential for Widespread/national support. Moderately high profile or an emerging issue. Has or potential for local/regional support.

	Localized concern/potential for controversy.
	0.0 Criteria does not apply.
e.Park Purpose Statement	1.0 Component of statement. Implied in statement.
	0.0 Not in statement.
f.International Heritage	1.0 Recognized program (e.g.MAB). World class heritage significance.
	0.0 No significance.

3.VISITOR FACTORS:

a.Public Safety	1.0 Existing public safety concern.
	- Potential concern.
	0.0 No concern.
b.Intensity of demand/use	1.0 High demand. Moderate demand.
	0.0 Criteria does not apply.
c.Quality of visitor Experience.	1.0 High quality. Acceptable.
	0.0 Criteria does not apply.

4.RESOURCE FACTORS:

a.Importance.	1.0 Rare,threatened or endangered. Fragile or sensitive. Characteristic or typical.
	0.0 Criteria does not apply.
b.Nature of impact (i.e. area/magnitude/severi ty).	1.0 Extensive area/severe impact. Moderate area/damage. Small area/damage.
	0.0 Criteria does not apply.
coexisting condition.	1.0 Pristine environment. Modified.
	0.0 Severly altered.
d.Ecological relationships.	1.0 Ecological processes not capable of natural repair. Processes may induce recovery in long term. Capable of natural recovery.
	0.0 Criteria does not apply.

5. CONSTRAINT FACTORS:

acknowledge resources.	4.0 Existing knowledge could resolve the problem. Requested resources could resolve the problem. 0.0 Knowledge to resolve problem not available.
b. Financial resources.	4.0 Existing funds could resolve the problem. Requested funds could resolve the problem. 0.0 Money could not solve problem.
c. Time.	4.0 existing manpower has the time to resolve the problem. Requested manpower would have the time. 0.0 Time could not resolve the problem.
d. Technology	4.0 Technology readily available. - Technology not readily available. 0.0 Technology not available/does not exist.