ENVIRONMENTAL ASSESSMENT SCREENING REPORT

Cape Jourimain Nature Centre Project

Prepared by
Environment Canada
Canadian Wildlife Service

February 25, 1999

Canada

TABLE OF CONTENTS

	page
TABLE OF CONTENTS	i
LIST OF TABLE AND FIGURES	ii
INTRODUCTION	2
PROJECT PROPOSAL AND RATIONALE	2
SCOPE OF PROJECT	3
PROJECT DESCRIPTION	3
- Construction	5
- Operation	5
- Decommissioning	6
CONSULTATION	6
- Government	6
- Public	7
EXISTING ENVIRONMENT	7
- General	7
- Proposed Nature Centre, Jourimain Island	10
ENVIRONMENTAL ASSESSMENT FINDINGS	10
- Valued Environmental Components	10
CUMULATIVE ENVIRONMENTAL EFFECTS	13
IMPLEMENTATION OF MITIGATION MEASURES	13
FOLLOW-UP / MONITORING	14
ENVIRONMENTAL ASSESSMENT CONTACTS	14
RESPONSIBLE MANAGERS	14
ENVIRONMENTAL ASSESSMENT DECISION	16
KEY ENVIRONMENTAL ASSESSMENT RECORDS	17
APPENDIX A - Guidelines for Use of Treated Lumber	22
APPENDIX B - Key Elements of an Erosion and Sedimentation Prevention and Control Strategy	23

LIST OF TABLE AND FIGURES

		page
TABLE 1	Potential Project / Valued Ecosystem Interactions and Mitigation	11
FIGURE 1	Draft site plan of the Cape Jourimain Nature Centre Project	4
FIGURE 2	Location of Cape Jourimain National Wildlife Area, NB	8
FIGURE 3	Location and name of salient features within CJNWA, NB	9

Environmental Assessment Screening Report
Cape Jourimain Nature Centre

PROJECT NUMBER:
CJ 98- 6

PROJECT NAME:
Cape Jourimain Nature Centre

LOCATION:
Jourimain Island, Cape Jourimain National Wildlife Area, NB

LATITUDE / LONGITUDE:
46° 09' 41" N, 63° 49' 00" W

PROJECT CATEGORY:
Point

ENVIRONMENTAL ASSESSMENT START DATE: 1 December, 1998

SUBJECT DESCRIPTORS:
Environment

PROPONENTS:

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PO Box 28
Bayfield, NB E0A 1E0

Canadian Wildlife Service
Environment Canada
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Sackville, NB E4L 1G6

ESTIMATED START DATE OF THE PROJECT: 15 May, 1999

ESTIMATED OPENING DATE:
1 June, 2000

RESPONSIBLE AUTHORITIES AND ASSESSMENT TRIGGERS:

Environment Canada (Lead):	Proponent, Transfer of an interest in Land (Lease) and Law List (Wildlife Area Regulations (S.4))
Atlantic Canada Opportunities Agency:	Funding
Human Resources Development Canada:	Funding

TYPE OF ASSESSMENT:
Screening

INTRODUCTION

In accordance with the *Canadian Environmental Assessment Act* (CEAA), Environment Canada (EC), Canadian Wildlife Service (CWS) has prepared this Screening Report for the proposed Cape Jourimain Nature Centre (CJNC) to be located on Jourimain Island within the Cape Jourimain National Wildlife Area. The Screening Report summarizes the results of ongoing planning and impact studies related to the proposed project and provides a basis for assessment decisions by all Responsible Authorities pursuant to Section 20 of the CEAA. The Screening Report includes an overview of the project, a description of the existing environment, a summary of public and government consultations, a summary of the environmental effects of the project and a synopsis of mitigation measures designed to eliminate or reduce adverse effects.

The proponents intend for the Nature Centre to serve as a test bed for new approaches in interactive exhibit design, educational outreach and environmentally-friendly construction. The project will involve the preparation and implementation of an Environmental Management System (EMS), which will include an Environmental Protection Plan (EPP), a contingency plan, environmental monitoring program and provisions for independent environmental auditing. An EMS is a formal set of practices and procedures that forms an integral part of the overall management system and includes the organizational structure, planning, activities, responsibilities, practices, procedures, processes, and resources for developing, implementing and reviewing the environmental policy of an organization. The EMS will help ensure that the Nature Centre reflects the highest environmental standards.

PROJECT PROPOSAL AND RATIONALE

The Canadian Wildlife Service of Environment Canada has worked co-operatively with the community-based not-for-profit corporation, the Cape Jourimain Nature Centre (CJNC) Inc., to advance a nature-based tourism development strategy for the Cape Jourimain National Wildlife Area. Both organizations have a mutually held understanding that Cape Jourimain is a valuable resource in its natural state and that action is needed to control increased access to the National Wildlife Area resulting from the recent opening of the Confederation Bridge. On an annual basis, approximately 700,000 vehicles and 1.8 million people move through the National Wildlife Area enroute to the Confederation Bridge (CJNC Inc., Business Plan, 1997).

The Nature Centre has been proposed by CJNC Inc. and Environment Canada as a means of raising visitor environmental awareness and stewardship through interpretative, educational and "hands on" experiences at an active research installation. Operation of the Nature Centre will also provide the National Wildlife Area with "on site" staff. These trained staff will be able to control access to sensitive areas within Cape Jourimain and significantly reduce the potential for illegal activities such as unauthorized use of all terrain vehicles (ATVs) and unauthorized wood cutting and removal.

SCOPE OF PROJECT

Project Description

As set out in the CEAA, an environmental assessment should be conducted "as early as practicable in the planning stages of the project". Assessment of the proposed Cape Jourimain Nature Centre has been conducted on the basis of a preferred site that avoids sensitive environmental areas and on the basis of known project elements for which basic design criteria reflecting best management practices have been established (e.g., zero wastewater discharge). It is possible, however, that as the project continues to be refined during the final design stages, changes may be proposed that could result in environmental effects not considered during the assessment. Any such proposed changes will require a permit from Environment Canada under the Wildlife Area Regulations of the *Canada Wildlife Act* and must first be assessed in accordance with the CEAA.

Details regarding siting, design, construction and operation of the proposed project are presented in the Nature-based Tourism Development Plan, 1997. An overview is presented below. Figure 1 contains a draft site plan of the Cape Jourimain Nature Centre Project.

The project involves the construction and operation of a nature centre within the Cape Jourimain National Wildlife Area, New Brunswick. Cape Jourimain National Wildlife Area is a significant coastal headland situated on the tip of the Cape Tormentine peninsula in southeastern New Brunswick. Based on a review of alternate locations, an area of old field and second-growth forest on Jourimain Island has been identified by CJNC Inc. as the preferred site for the proposed project. This area is immediately adjacent to Route #16, leading to the Confederation Bridge.

The Nature Centre will consist of approximately 14,500 square feet (1350 square metres), split between 4 buildings (a visitor center; a reception module; an interpretation module and a lodging module). The buildings will be wood frame structures built to R-2000 standards.

In addition, a lookout deck, a paved parking lot, and a basic service road will be developed adjacent to Confederation Bridge. This will alleviate an unsafe highway condition (no safe stopping area for tourists) near the New Brunswick terminus of the Confederation Bridge. This parking lot would also serve as a parking area for the Nature Centre. The parking area will accommodate approximately 121 vehicles, as well as several buses, and will include entrance and exit ramps from the Confederation Bridge constructed on the south east side of the Confederation Bridge Right-of-Way.

The historic Cape Jourimain Light Station, located on the northeastern point of Jourimain Island, is a federally designated heritage building. Although not part of the presently proposed development, the building will be eventually used as a migratory bird monitoring station.

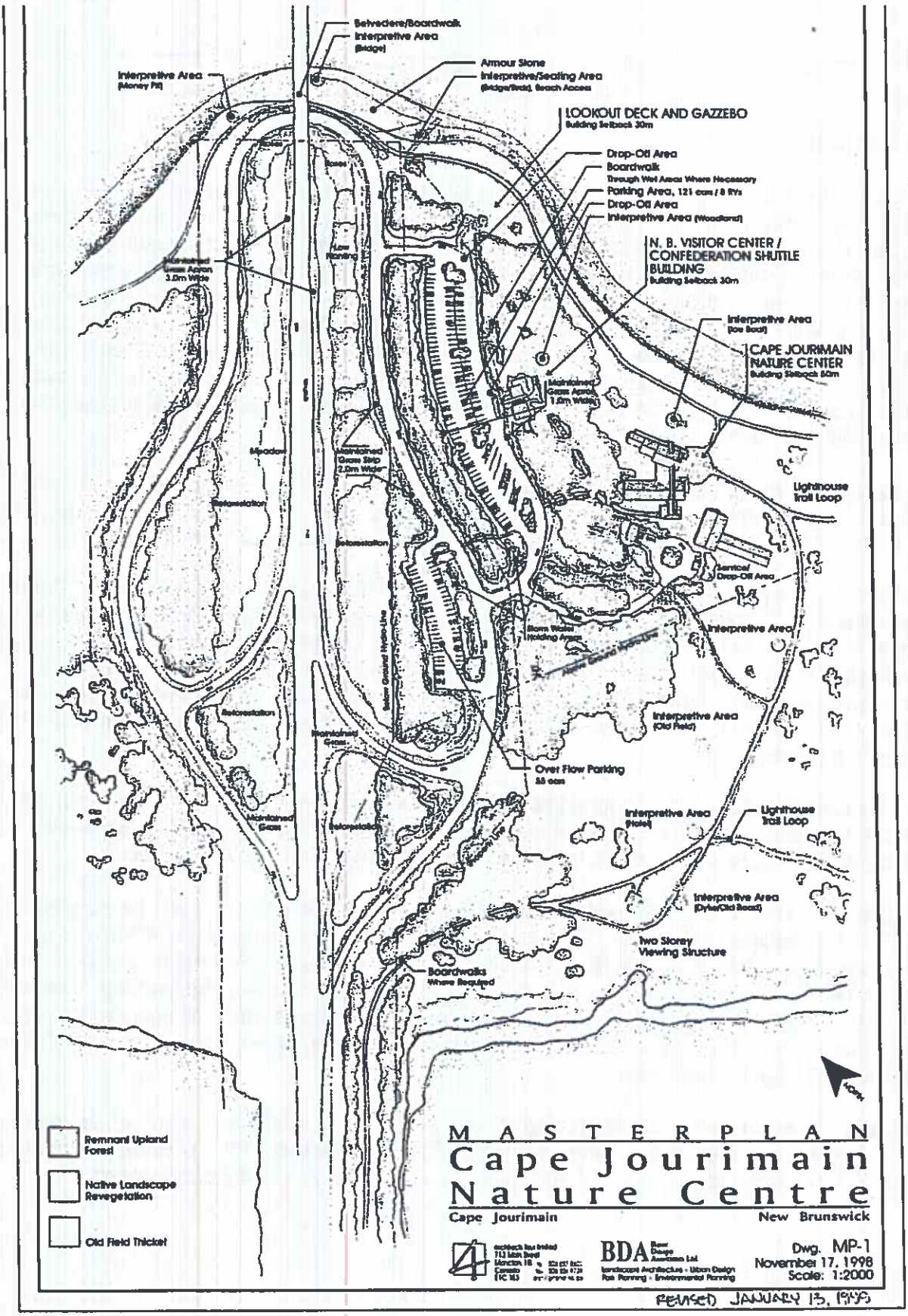

Figure 1 - Draft site plan of the Cape Jourimain Nature Centre Project

Construction

The construction phase of the project will involve typical activities, such as clearing, grubbing and excavating, as well as use of materials such as concrete, asphalt, paints and preservatives. Heavy machinery and associated substances (e.g., fuel) will be used. Pressure-treated materials may see limited use in viewing platforms or similar structures.

Operation

Operation of the Nature Centre will guide and direct the increased number of visitors to the National Wildlife Area as a result of the traffic spin-off from the Confederation Bridge. This will require provisions for management of solid waste as well as wastewater from washroom facilities. Standard building maintenance activities will also be periodically required.

The Nature Centre will be operated on a yearly basis, focused on 3 season (spring, summer, fall) activities. It is projected 50 to 75 thousand people will visit the Centre on an annual basis, with 85% of visitor flow expected between May 15 and October 15. Utilities will be designed at 130% of projected demands to facilitate potential increases in usage.

Standard wastewater treatment with discharge to an adjacent marsh was considered, but rejected on the basis of potential impacts. Consequently, wastewater treatment, both sewage and grey-water, will involve the use of zero discharge technologies. If soil types and groundwater characteristics permit, conventional septic tank and dispersion bed systems will be considered. Otherwise, alternative zero discharge technologies such as, but not limited to, composting or portable toilets, holding tanks, and evapo-transpiration will be employed. The selected design will be reviewed by Environment Canada's Environmental Protection Branch and the Canadian Wildlife Service, in consultation with the New Brunswick Department of the Environment, to ensure it is appropriate, prior to approval.

Surface run-off from the access roads and parking lot will be combined with existing run-off from the adjacent Route 16 highway and interchange, and ultimately enter the Northumberland Strait. Current plans call for a storm water holding pond located adjacent to the parking lot, which would be used to control solids, or facilitate clean-up of gasoline or oil spills / leaks from vehicles.

Various groundwater studies have been undertaken in and around the Cape Jourimain Nature Centre site in an effort to establish potable groundwater supplies. A water well log, pump test data and ground water chemistry are available for this site. Water well pump testing shows that sea water intrusion occurs at relatively low extraction rates (< 25 litres/min). Therefore, shallow dug wells into the bedrock with a skimming type pumping system will be used to help reduce water table draw-downs, thereby reducing the risk of sea water intrusion. Depending on the outcome of the well development, the installation of a cistern (e.g., rainwater collection) water source and holding tanks may be necessary.

Electrical power will be supplied by the provincial grid, using an underground cable connected to an existing above-ground line along existing Right-of-Ways. Innovative energy sources are also being investigated. One option is the use of earth energy, or geo-thermal heating / cooling, by means of a closed-loop water circuit into the existing aquifer using a bore-hole type design

(to avoid sea water intrusion, groundwater will not be withdrawn from the aquifer). In cold weather, the circuit would deliver heat from the ground to the Nature Centre, while the same process would be used in hot weather to cool the Nature Centre. Energy efficient technologies, such as in-floor radiant hot-water heating, are also being considered. These options, combined with R-2000 construction, will ensure that the Nature Centre is energy efficient.

A 13 km network of existing nature trails will be used to guide tourists away from sensitive habitats such as wetlands, dunes, coastal islands, and remnant hardwoods. Restriction of visitors to the trail system, enforced in part by Nature Centre staff, will serve to minimize uncontrolled access that currently threatens these sensitive areas. The trail network has already been developed and consists of four trails: the Jourimain Island Trail, the Trenholme Island Trail, Gunners Point Trail and the Walton Upland Trail. The trail system includes a number of bridges, small boardwalks, viewing platforms, and observation blinds. All the trails were previously assessed as separate projects under the CEAA.

Decommissioning

The proposed Nature Centre complex will be designed, built and maintained to operate efficiently with no planned closure. Any decommissioning will be undertaken in accordance with applicable regulations and standards.

CONSULTATION

Government

During preparation of the screening report, the following departments and agencies were consulted by Environment Canada:

- Canadian Environmental Assessment Agency (CEAA)
- Atlantic Canada Opportunities Agency (ACOA)
- Fisheries and Oceans - Habitat Management Division (DFO)
- Human Resources Development Canada (HRDC)
- Public Works and Government Services Canada (PWGSC)
- New Brunswick Department of Environment (NBDOE).

Based on notifications of federal authorities in accordance with the Federal Coordination Regulations under the CEAA, ACOA and HRDC confirmed that they would also be responsible authorities for the assessment. As an expert department, DFO raised concerns related to provisions for discharge of treated wastewater to receiving waters. However, these concerns will be addressed by the proponents' commitment to implement only zero discharge technologies for the nature centre complex.

NBDOE has indicated that environmental assessment may be required under the Environmental Assessment Regulation of the *Clean Environment Act*. This assessment requirement is largely dependent on the specific zero discharge technology ultimately selected for wastewater management at the Nature Centre. CJNC Inc. and Environment Canada will

continue to review the proposed development with NBDOE to ensure all necessary provincial approvals are sought and obtained in a timely manner.

Public

Public consultations and other activities have been conducted for the proposed Nature Centre Project to ensure an outreach to the community. These activities involved: meetings with the residents and consultants; public meetings; a project "open house"; teacher's workshops and press photos and stories. A description of these consultations is provided in the CJNC Project Community Contact Report, 1997. There were no significant public concerns identified. The CJNC Inc. has committed to ongoing contact with the public during development and operation of the Nature Centre.

EXISTING ENVIRONMENT

General

The existing environment in the area of the project is reviewed in detail in Harries (1996), Hicks & MacKinnon (1990), MacKinnon (1994), Keith (1998), and the Cape Jourimain National Wildlife Area (CJNWA) Nature-based Tourism Development Plan (1997). Salient features of the environment in the Cape Jourimain National Wildlife Area and the project site on Jourimain Island, are presented below.

The CJNWA borders the Northumberland Strait at the southeastern extremity of New Brunswick, two kilometers northwest of the village of Cape Tormentine (Figure 2). The 600 ha (1500 acres) coastal site was established as a National Wildlife Area in 1979 following the transfer of 205 ha from the federal Department of Public Works in 1977 and the purchase of additional privately owned lands in 1979. The location and names of key features within the National Wildlife Area (NWA) are indicated in Figure 3.

Cape Jourimain is an area of high geographic importance as it is one of the most prominent coastal headlands in the Northumberland Strait. The strategic importance of the Cape Jourimain headland has also been evident to developers. As far back as 1900, the site was identified as the most logical location to build a connection, "fixed link", between New Brunswick and Prince Edward Island. The first such link was initiated in the mid 1960's when the construction of a road and railway bed created two large brackish ponds out of what was once intertidal saltmarsh and irrevocably changed the character of the area.

The wetlands within CJNWA annually support upwards of 5000 migrating waterfowl. Twenty six species of shorebirds have been recorded on its marshes as well as a great diversity of other water birds. Endangered species such as the Peregrine Falcon have frequented the area while on-site breeders such as the Osprey (7 pair), Northern Harrier and Great Horned Owl (1 pair) are often observed.

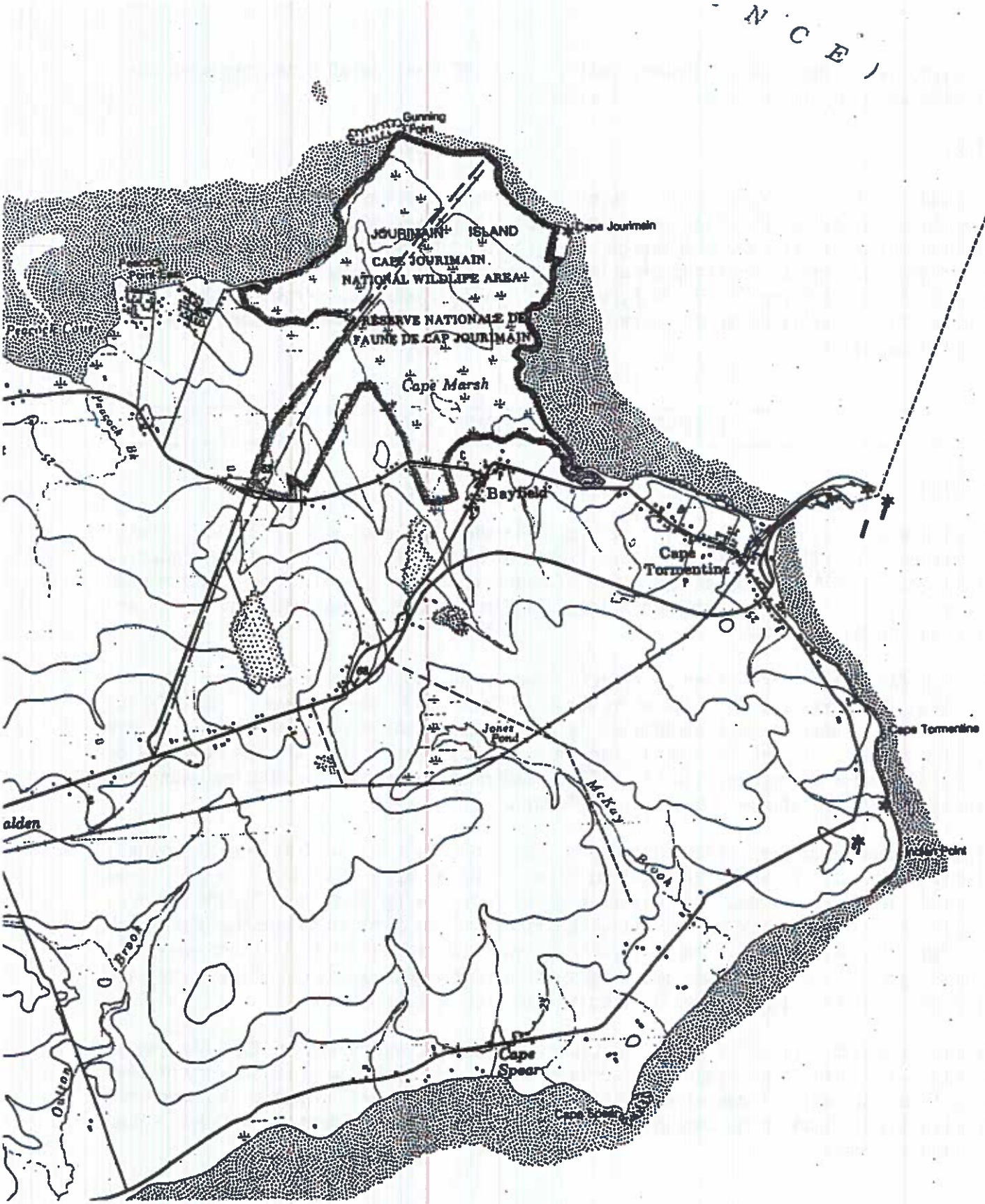

Figure 2 - Location of Cape Jourimain National Wildlife Area, NB

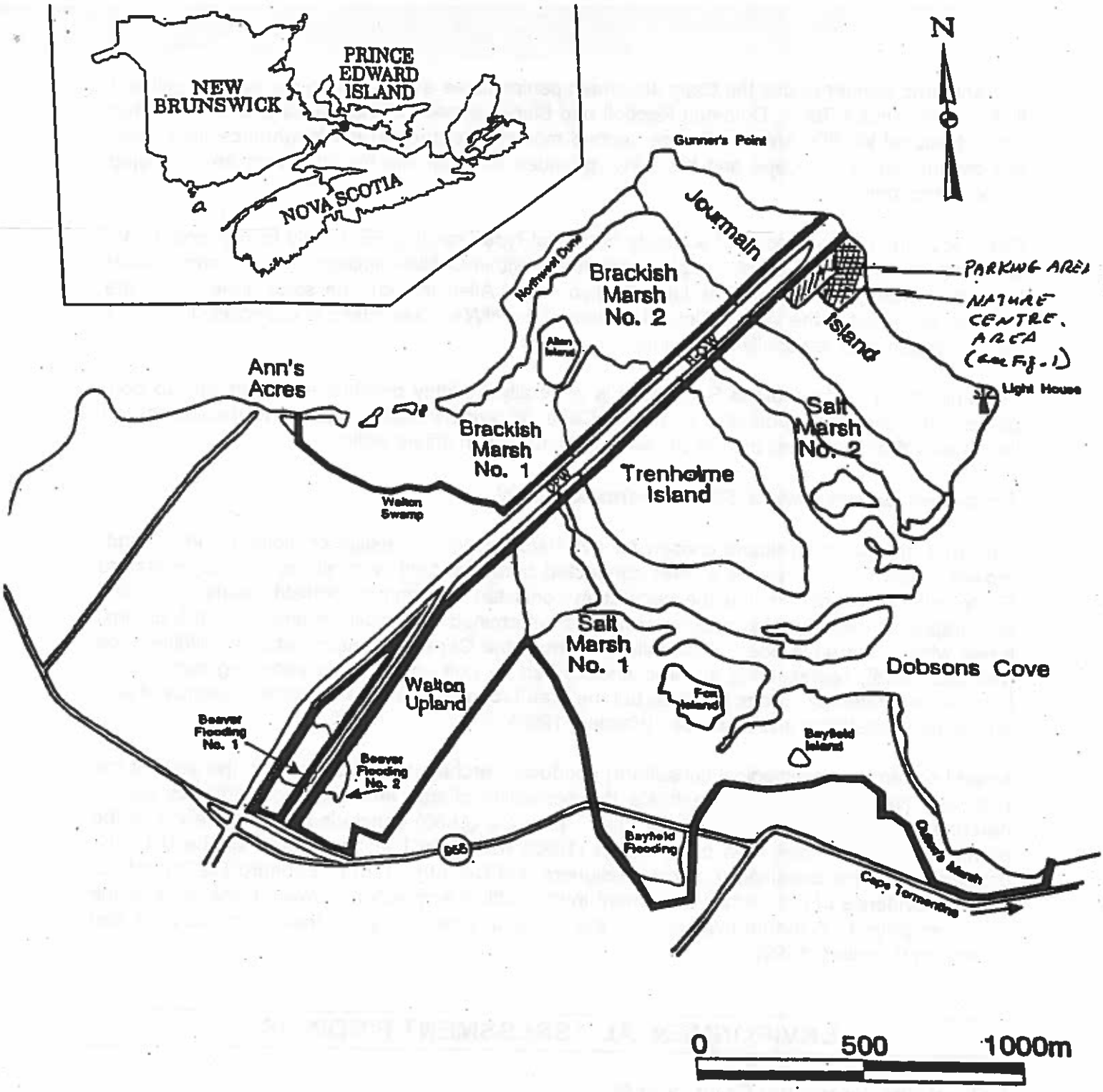

Figure 3 - Location and name of salient features within CJNWA, NB

Migrant birds appear to use the Cape Jourimain peninsula as a reference point since significant flights of American Robin, Common Redpoll and Black-capped Chickadee have been recorded in the National Wildlife Area. Offshore seabird movements through the Northumberland Strait are constricted at the Cape and this NWA provides an ideal site for observing and studying these phenomena.

Cape Jourimain is composed of a variety of habitat types ranging from early field successional to mixed and fir/spruce forest. Important features within CJNWA include the remnant coastal hardwood stand, known as "Oak Island" (also called Allen Island), the sand dunes, and the small cedar forest in the Walton Upland section of the NWA. Oak Island is especially important for the presence of regionally rare plants.

The underlying Carboniferous Sandstone is generally a highly productive aquifer due to both primary and secondary porosity. However, Cape Jourimain's close proximity to the ocean and its low elevation increases the risk of sea water intrusion in drilled wells.

Proposed Nature Centre Site, Jourimain Island

The area on Jourimain Island chosen for the Nature Centre consists of oldfield and second-growth mixed forest. Harries (1998) conducted botanical field work at the proposed Nature Centre site and reported that the vegetation consisted of common oldfield plants. The soil topography of the proposed parking area was determined to contain remnants of the original forest which may have been historically present in the Cape Jourimain National Wildlife Area (Harries, 1996), representing an area undisturbed by cultivation. The second-growth mixed forest is vegetated by common plants, but the area (Jourimain Island) contains evidence of pre-agricultural vegetation and land-use. (Harries, 1998).

Kevin Leonard (archaeological consultant) conducted archaeological surveys in the area of the proposed Nature Centre to investigate the possibility of any archaeological artifacts and to determine the location of the ice boat shed. Leonard (1998) concluded that the report of the prehistoric shell midden area by Goodwin (1893) has been lost as a result of the 0.4 m/yr erosion rate of the coastline (Eastern Designers and Co. Ltd., 1987). Leonard (1998) did not find any evidence of pre-historic settlement in the oldfield and second-growth forest area of the proposed project. A further evaluation of the "ice boat shed" suggests that it too has been lost to erosion (Leonard, 1999).

ENVIRONMENTAL ASSESSMENT FINDINGS

Valued Environmental Components

Valued Environmental Components (VECs) were identified based public and government consultation, the CJNWA management plan and the cumulative effects report (Keith, 1998). As required under CEAA, the screening focuses on how the construction, operation and decommissioning phases of the proposed project could impact these VECs. The VECs, description of impacts, and required mitigation are summarized in Table 1.

Table 1: Potential Project / Valued Ecosystem Interactions and Mitigation

VEC	Description Of Potential Impacts	Required Mitigation
Ground Water Quantity and Quality	Draw-down and resultant sea water intrusion.	Shallow dug wells into the bedrock, with a skimming type pumping system, and off-peak pumping to storage, will be utilized to reduce water table draw-downs, thereby reducing the risk of sea water intrusion. A cistern (e.g., rainwater collection) water source and/or holding tanks will be used if necessary. The groundwater level will be constantly monitored. In the event that a lowering of the water table is detected, water withdrawal will cease immediately and not recommence until an evaluation is completed and it is deemed that resumption of withdrawal poses no risk of sea water intrusion into the aquifer from further lowering.
	Contamination resulting from wastewater management.	Appropriate zero discharge technologies will be selected on basis of soil suitability and groundwater characteristics.
	Contamination resulting from the use of pressure-treated wood.	Appropriate precautions will be taken, as outlined in Appendix A.
Surface Water Quantity and Quality	Siltation resulting from excavation activities.	There are no surface waters within the project "footprint". Regardless, an erosion and sedimentation prevention and control strategy will be prepared and implemented during the construction phase. Such a strategy will place a priority on pollution prevention through minimization of extent and duration of soil exposure. A listing of all factors to be considered in development of an erosion prevention and control strategy is attached (Appendix B). Excavated soils will be reused within the project site or the Wildlife Area to ensure seedstock for native plants is preserved.
	Accidental release of lubricants, fuels, asphalt or other hazardous materials used during construction.	Machinery must be checked for leakage of lubricants or fuel and must be maintained in good working order. Refueling must be done at least 30 m from water and done with care to avoid drips or spills. A contingency plan will be prepared and any spills or leaks which occur will be promptly contained, cleaned up and reported to the 24-hour environmental emergencies reporting line (1-800-565-1633).

VEC	Description Of Potential Impacts	Required Mitigation
	Degradation of receiving water quality due to waste water discharge.	Only zero discharge technologies will be employed for waste water management.
Fish/Fish Habitat	While no fish habitat will be altered, water quality supporting aquatic life could be impacted by wastewater discharge.	Water quality supporting aquatic life will be protected by above measures.
Air Quality	N/A	
Vegetation	Forest and oldfield cover will be lost. Disturbance of sensitive habitats by visitors during operation.	Only the minimum amount of oldfield and second-growth mixed forest will be cleared, as required to safely and effectively complete the work. Clearing limits will be clearly marked prior to work. Where possible, merchantable timber will be recovered and vegetative debris chipped or used for habitat creation. Buildings will have minimum set-back from edge of natural vegetation to meet fire code. Visitors to the Nature Centre will be required to remain on the existing trails, which guide them through the NWA, avoiding sensitive habitats.
Wildlife and Birds	Construction and Operation phase disturbances. Disturbance of wildlife and birds.	Workers and visitors will be instructed to stay within project boundary and not disturb wildlife or birds. Project boundaries will be clearly identified. Visitors to the Nature Centre will be required to remain on the existing trails which guide them through the NWA, avoiding any sensitive habitats. Solid wastes that cannot be recycled will be disposed of in an approved manner. Clearing of vegetation will be completed in pre-breeding season (before the end of May).
Endangered Species	N/A	
Archaeology/ Heritage	Site may contain as-yet undiscovered artifacts which are archaeologically significant.	A previously conducted survey has not revealed archeological resources at the site. Should any artifacts or structures be unearthed during construction, the site will be left undisturbed until inspected by officials from the Canadian Wildlife Service. Work will be suspended at the location until permitted by the CWS.
Health & Safety	Potential safety hazards inherent to construction related operations.	Federal and Provincial safety requirements and labour laws will be strictly followed.

VEC	Description Of Potential Impacts	Required Mitigation
	Increased noise during construction activities.	All work will be completed according to local bylaws and as per the tender specification.
Current Use of Lands and Resources by Aboriginal Persons for Traditional Purposes	N/A	
Navigation	N/A	

CUMULATIVE ENVIRONMENTAL EFFECTS

A cumulative effects study that includes a consideration of the proposed Nature Centre has been prepared for CJNC Inc. (Keith 1998). In general, the parking lot for the facility will result in an additional 1.2 ha loss of upland forest habitats on Jourimain Island, or 1.4% of the original forest cover. Including all previous activities dating back to European colonization, this will bring the cumulative loss of forests on the island to approximately 81%. The loss of the additional 1.2 ha is not considered significant considering that the island was 95% cleared farm land in 1935. Thus compensation with similar habitat is not required. Instead, as part of a separate, but related, initiative, a 10 ha parcel will be transferred from Public Works and Government Services Canada into the National Wildlife Area. This transfer is in the interest of the Wildlife Area, as the 10 ha parcel is biologically more important. The parcel consists of an abandoned rail alignment and vegetated corridor that contains a valuable plant community. This plant community has been identified as important to migrating songbirds (MacKinnon and Hicks, 1990).

Increased visitation to the area, as a result of the Confederation Bridge, may have a potential impact on the coastal sand dunes, salt marshes and upland forest habitats. The Nature Centre and associated staff, will provide focus for visitors to help protect more sensitive habitats away from the site. The facility will have access to existing trails and visitors will be instructed to remain on these trails.

IMPLEMENTATION OF MITIGATION MEASURES

To ensure that all mitigation measures identified in this screening are fully incorporated into project activities, an Environmental Protection Plan (EPP) must be prepared by the Nature Centre Inc. and approved by Environment Canada before construction can commence. The EPP will describe, in practical terms, how the identified measures will be implemented, and best

management practices will be applied to all project elements. The EPP will comprise a central part of the Environmental Management System (EMS), which will also include contingency plans for dealing with environmental emergencies, such as spills, that may occur during construction or operation of the facility.

All contractors and staff involved in construction or operation of the Nature Centre will be required to attend orientation sessions delivered by CJNC Inc. in consultation with Environment Canada. These sessions will help ensure all contractors and staff fully recognize the environmental sensitivity of the National Wildlife Area and are familiar with EPP, contingency plan and other EMS requirements and procedures.

FOLLOW-UP / MONITORING

The primary monitoring effort will be directed at groundwater monitoring. However, as the project evolves, and as part of developing an EMS, other elements will be considered. For example, although no impacts are predicted to nesting waterfowl (because trails will keep disturbance away from these areas), terrestrial effects monitoring plans conducted for the Confederation Bridge have revealed a possible shift in waterfowl distribution, away from the busy bridge approach. In any event, CWS staff frequent the National Wildlife Area and will be able to observe any changes.

ENVIRONMENTAL ASSESSMENT CONTACTS

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ENVIRONMENTAL ASSESSMENT DECISION

Based on the screening results, the Responsible Authorities have reached the following conclusion in accordance with Section 20 of the CEAA:

> Where taking into account implementation of the identified mitigation measures **the project is not likely to cause significant adverse environmental effects** (paragraph 20(1)(a)).

Responsible Authority Decision Date: 25 February, 1999

Prepared by: _____ Date: 26 Feb., 1999
Colin MacKinnon
Senior Wildlife Biologist, CWS

Approved by: _____ Date: 02 Mar, 1999
Michael Sullivan
Director, HRDC

Approved by: _____ Date: 8 Mar 1999
Scot Jennings
Implementation Officer, ACOA

Approved by: _____ Date: 8 March '99
Elliott Keizer
A/Director, Policy Planning and Coordination
ACOA

KEY ENVIRONMENTAL ASSESSMENT RECORDS

A number of reports related to the proposed Cape Jourimain Nature Centre and its potential impacts on the National Wildlife Area were referenced during conduct of the screening, and provide more detailed rationale for screening results. These, reports listed below, are part of the Public Registry established for this project and are available from the following contacts. Photo-copying or other charges may apply.

Primary Contact:

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Phone: (506) 364-5038
Fax: (506) 364-5062
E-mail: kevin.davidson@ec.gc.ca

All records are in English only, unless otherwise indicated.

Title:	A study of avian habitat at the Cape Jourimain marshes, Westmorland Co., NB.
Author:	Andrew MacInnis
Publication Date:	11/17/72
No. Pages:	24 plus appendices 1 & 2
Medium:	Paper
Format:	Report

Title:	Waterfowl utilization of two coastal marshes at Cape Jourimain, NB.
Author:	A. MacInnis
Publication Date:	04/23/79
No. Pages:	161
Medium:	Paper
Format:	Thesis

Title:	Cape Jourimain National Wildlife Area, Nature-based Tourism Development Plan
Author:	Basic Design Associates Ltd.
Publication Date:	10/12/95
No. Pages:	80
Medium:	Paper
Format:	Report

Title:	CJNC, Nature-based Tourism Development Plan (Project Backgrounder)
Author:	Cape Jourimain Nature Centre Inc.
Publication Date:	10/24/97
No. Pages:	7
Medium:	Paper
Format:	Report (Also available in French)

Title:	Cape Jourimain Nature Centre Project Community Contact Report.
Author:	Cape Jourimain Nature Centre Inc.
Publication Date:	1997
No. Pages:	33
Medium:	Paper

Title:	Cape Jourimain Nature Centre, Inc., Business Plan
Author:	Cape Jourimain Nature Centre Inc.
Publication Date:	1997
No. Pages:	40
Medium:	Paper
Format:	Report

Title:	A five year management plan for Cape Jourimain National Wildlife Area, 1989.
Author:	Colin MacKinnon
Publication Date:	09/01/94
No. Pages:	51
Medium:	Paper
Format:	Report

Title:	An inventory of the aquatic birds of Jourimain National Wildlife Area, 1989.
Author:	C. MacKinnon & Randy Hicks
Publication Date:	1990
No. Pages:	12 plus tables, figures, and appendix A.
Medium:	Paper
Format:	Technical Report

Title:	Seabird and Seaduck movement through the Northumberland Strait, 1990.
Author:	C. MacKinnon, Richard Daury, & R. Hicks
Publication Date:	1991
No. Pages:	86
Medium:	Paper
Format:	Technical Report

Title:	Flora and soils of black spruce forests at Cape Jourimain, NB.
Author:	Hinrich Harries
Publication Date:	1998
No. Pages:	9
Medium:	Paper
Format:	Report

Title:	Floristic survey of potential localities at Cape Jourimain, NB.
Author:	H. Harries
Publication Date:	1998
No. Pages:	17
Medium:	Paper
Format:	Report

Title:	Plant cover and history at Cape Jourimain, NB - Part 1: Oldfields and forests.
Author:	H. Harries
Publication Date:	1996
No. Pages:	61
Medium:	Paper
Format:	Report

Title:	The flora of Cape Jourimain National Wildlife Area, NB.
Author:	H. Harries, Colin MacKinnon, & Chris Ellingwood
Publication Date:	1991
No. Pages:	25 plus appendices A-C
Medium:	Paper
Format:	Technical report

Title:	Terrestrial vegetation studies related to the proposed fixed link from Borden, PEI to Cape Jourimain, NB.
Author:	Island Nature Trust
Publication Date:	10/01/88
No. Pages:	126
Medium:	Paper
Format:	Report

Title:	Confederation Bridge (Northumberland Strait) Project, Terrestrial Environmental Effects Monitoring Program, 1997 results. Vol. A & B
Author:	Jacques Whitford Environment Ltd.
Publication Date:	04/01/98
No. Pages:	99 plus tables, figures and appendices
Medium:	Paper
Format:	Report

Title:	Preliminary report on archeological investigations on Jourimain Island, Cape Jourimain National Wildlife Area, NB.
Author:	Kevin Leonard
Publication Date:	07/31/98
No. Pages:	21
Medium:	Paper
Format:	Report

Title:	A report on archeological excavation of the cellar at the ice boat landing area on Jourimain Island, Cape Jourimain National Wildlife Area, NB.
Author:	K. Leonard
Publication Date:	01/10/99
No. Pages:	17
Medium:	Paper
Format:	Report

Title:	1979 Avifaunal census results for Shepody, Chignecto, and Cape Jourimain National Wildlife Areas.
Author:	L.D. Morton
Publication Date:	January 1980
No. Pages:	27
Medium:	Paper
Format:	Report

Title:	Humus layer pollen analysis of spruce-fir forests in New Brunswick, Canada.
Author:	Mark Purdon
Publication Date:	04/28/98
No. Pages:	76 plus appendices A-D
Medium:	Paper
Format:	Thesis

Title:	The ecology, culture, and economy of Cape Jourimain: The evolution of a Maritime landscape.
Author:	Nelson Bezanson
Publication Date:	April 1995
No. Pages:	103
Medium:	Paper
Format:	Thesis

Title:	An annotated list of birds of Cape Jourimain National Wildlife Area.
Author:	Stuart Tingley
Publication Date:	May 1980
No. Pages:	73
Medium:	Paper
Format:	Report (unpublished)

Title:	Cape Jourimain National Wildlife Area Cumulative effects.
Author:	Todd Keith
Publication Date:	October, 1998
No. Pages:	30
Medium:	Paper
Format:	Report

Title:	Environmental Assessment Screening - Digging of Archaeological Test Pits in Cape Jourimain National Wildlife Area. (Project # CJ 98-2)
Author:	Andrew Macfarlane
Publication Date:	July 3, 1998
No. Pages:	7 plus attachments
Medium:	Paper and electronic
Format:	Report

Title:	Environmental Assessment Screening - Trail Construction and Maintenance in Cape Jourimain NWA. (Project # CJ 98-1)
Author:	Andrew Macfarlane
Publication Date:	June 25, 1998
No. Pages:	7 plus attachments
Medium:	Paper and electronic
Format:	Report

Title:	Environmental Assessment Screening - Trail Construction at Cape Jourimain National Wildlife Area. (Project # CJ 96-1)
Author:	Andrew Macfarlane
Publication Date:	July 12, 1996
No. Pages:	12 plus attachments
Medium:	Paper
Format:	Report

Title:	Environmental Assessment Screening - Trail Construction in Cape Jourimain National Wildlife Area (Project # CJ 97-1)
Author:	Andrew Macfarlane
Publication Date:	January 1, 1997
No. Pages:	11 plus attachments
Medium:	Paper
Format:	Report

Title:	Environmental Assessment Screening - Cape Jourimain Interchange
Author:	Stephen Barbour, Public Works and Government Service Canada
Publication Date:	January 25, 1999
No. Pages:	11 plus attachments
Medium:	Paper
Format:	Report

Title:	Federal Coordination Request - Cape Jourimain Nature Centre Project
Author:	C. Spicer, R. Gautreau, D. McDonald (Environment Canada)
Publication Date:	December 10, 1998
No. Pages:	9
Medium:	Paper
Format:	Correspondence

Title:	Responses to Federal Coordination Request, including comments from Department of Fisheries and Oceans (W. Landsburg)
Author:	Various
Publication Date:	December 1998
No. Pages:	8 (including e-mail print-out of DFO comments)
Medium:	Paper
Format:	Correspondence

Title:	Letter from SGE Group re: Feasibility of Zero Discharge Waste Water System
Author:	P. Stockton, P.Eng.
Publication Date:	February 15, 1999
No. Pages:	3 (including fax cover page)
Medium:	Paper
Format:	Correspondence

Appendix A
Guidelines for Use of Treated Lumber

CCA treated lumber can have significant adverse effects on fish and other aquatic organisms if misused or improperly applied. Copper is toxic to fish, and arsenic and chromium are both acutely toxic and are known to bioaccumulate in aquatic organisms. On a priority basis, alternative materials that are technically and economically feasible (e.g., untreated wood, concrete, plastic lumber for fenders) will be evaluated for possible use in the facility.

If treated lumber is used, the following measures will be considered in the preparation and implementation of an EPP as applicable to help ensure potential adverse impacts on the aquatic environment are avoided or minimized:

- pre-treated wood cut to pre-determined lengths should be utilized as much as possible (i.e., less waste, less sawdust, and no need for end treatments);
- any additional application of preservatives during construction or future maintenance activities, including the application of end-cut preservative which contains Tri-n-butyl-tin (TBT), should take place at a designated site away from the water;
- treated wood should not be placed in the aquatic environment until completely dried;
- creosote treated wood should be well aged (6 months minimum) before being placed in the aquatic environment;
- pentachlorophenol (PCP) treated poles should not be used in the aquatic environment;
- all waste wood and shavings should be contained within the upland construction site and disposed of in an approved manner;
- any material lost as a result of wave and storm action should be immediately recovered by the operator when safe to do so.

If pressure-treated wood is proposed for use in the aquatic environment, CCA treated wood is probably the safest. Creosote is not recommended, while PCP should not be used in aquatic environments.

Appendix B
Key Elements of an Erosion and Sedimentation Prevention and Control Strategy

- Construction activities are coordinated with seasonal constraints (e.g. time clearing, grubbing, and excavation activities to avoid periods of heavy precipitation; avoid sensitive periods for fish and wildlife; shut down and stabilize the work site in accordance with pre-established criteria in advance of the winter season) {before revegetation is no longer possible and before freeze-up};

- Measures are implemented, in advance of grubbing and excavation activities, that will allow surface drainage to be diverted around the work area;

- All perimeter control structures (e.g. silt fencing, sediment traps, settling ponds) are installed prior to any land disturbance;

- Vegetated buffer zones are maintained as appropriate to protect resources at risk;

- The exposed soil area is minimized (by limiting the area that is exposed at any one time and by limiting the amount of time that any area is exposed);

- Exposed soil is stabilized as soon as possible (e.g. dykes and berms should be stabilized with mulch, erosion control blankets or fast-growing, non-invasive, native vegetation);

- Sediment control structures are maintained (by repairing structural problems during and after storm events, removing accumulated sediment at regular intervals or at designated capacities, and by disposing of it at an approved site, given its unsuitability as structural fill material);

- Water retained by sediment control structures is sampled and analyzed to determine if further treatment is required prior to discharge. Suspended solids concentrations **within effluent** released from sedimentation control structures should not exceed 25 mg/L (monthly average) or 50 mg/L (grab sample). (These concentrations reflect permissible limits of suspended solids in effluents subject to industry-specific regulations under Section 36 of the *Fisheries Act)*;

- Freshwater receiving waters are monitored to ensure maintenance of the CCME "Canadian Water Quality Guidelines" (1987) for the protection of aquatic life (and other uses as appropriate) when considered in conjunction with existing ambient water quality and site-specific factors. The "Canadian Water Quality Guidelines"(1987) for the protection of aquatic life recommends that the concentration of suspended solids **within the receiving water** should: a) not increase by more than 10 mg/l if the background suspended solids concentration is equal to or less than 100 mg/l, or b) not increase more than 10% above the background concentration if the background concentration exceeds 100 mg/l);

- Suspended solids levels in marine receiving waters are monitored to ensure they are consistent with the CCME "Interim Marine and Estuarine Water Quality Guidelines for General Variables" (1996), which state that human activities should not cause suspended solids levels to increase by more than 10% of the natural conditions expected at the time;

- Further mitigative actions are taken as necessary based on monitoring results.

February 5, 1999