REPLACEMENT CLASS SCREENING REPORT

HARBOUR MAINTENANCE RE-DREDGING AND DISPOSAL AT SEA OF RE-DREDGED SEDIMENTS IN PRINCE EDWARD ISLAND

Prepared for:

Fisheries and Oceans Canada
Small Craft Harbours Branch
Charlottetown, PEI

and

Environment Canada
Environmental Stewardship Branch
Dartmouth, NS

Prepared by:

Environment Canada

With assistance from:

Public Works and Government Services Canada
Office of Greening Government Operations
Charlottetown, PEI

November 2010

Table of Contents

List of Acronyms

ACCDC	Atlantic Canada Conservation Data Centre
CEAA	*Canadian Environmental Assessment Act*
CEPA	*Canadian Environmental Protection Act*
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
DAS	Disposal at Sea
DFO SCH	Fisheries and Oceans, Small Craft Harbours Branch
EC	Environment Canada
ECC	Environmental Components of Concern
FA	Federal Authority
FCR	Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements
HADD	harmful alteration, destruction and disruption of fish habitat
MBCA	*Migratory Birds Convention Act*
m	metres
NWPA	*Navigable Waters Protection Act*
PEI	Prince Edward Island
PWGSC	Public Works and Government Services Canada
RA	Responsible Authority
RCS	Replacement Class Screening
SARA	*Species at Risk Act*
SCH	Small Craft Harbours
SPM	Suspended Particulate Matter
the Act	*Canadian Environmental Assessment Act*
the Agency	Canadian Environmental Assessment Agency
the Registry	Canadian Environmental Assessment Registry
VEC	Valued Environmental Component

1.0 INTRODUCTION

Fisheries and Oceans Canada, Small Craft Harbours (DFO SCH) Branch operates and maintains a national system of harbours that provide commercial fishers and recreational boaters with safe and accessible locations for boat launching, berthing and maintenance. DFO SCH operates under the authority of the *Fishing and Recreational Harbours Act* and the *Federal Real Property and Federal Immovables Act*.

There are numerous DFO SCH commercial harbours located along the coast of Prince Edward Island (PEI). To provide fishers with safe access to and from its harbours, DFO SCH must conduct periodic dredging of many of the channels and harbour basins. The resulting dredged material is frequently disposed of in the marine environment. The navigation channels leading to the harbours and the entrance areas of the harbour basins are exposed to the currents and waves of the Gulf of St. Lawrence and Northumberland Strait, subject to rapid infilling, and are therefore frequently dredged. It is these dredge areas and the associated marine disposal sites that are the focus of this replacement class screening (RCS) report.

DFO SCH approves its dredging projects following the conclusion of environmental assessments conducted pursuant to the *Canadian Environmental Assessment Act* (the Act). If the dredged material is disposed of in the marine environment, one of the other approvals required is a Disposal at Sea (DAS) permit, under the *Canadian Environmental Protection Act* (CEPA). Environment Canada (EC) is the federal department responsible for issuing DAS permits. EC and DFO SCH share environmental assessment responsibilities for DFO SCH projects involving disposal of dredged material at marine sites.

Due to the number of sites in PEI requiring dredging, and the frequency of dredging activities at many similar sites, DFO SCH and EC have evaluated options to streamline the environmental assessment process. It has been determined that a RCS is the most appropriate option for managing environmental assessment obligations for those DFO SCH projects where channels and entrance areas are dredged annually and the dredged material is subsequently disposed of in the marine environment.

A separate but similar RCS was completed in 2007 for dredging and land-based disposal activities at several of the same PEI DFO SCH locations (PWGSC, 2007). Where the two RCSs differ is in the selection of the disposal site; upland vs marine. Site selection is dependent upon a number of factors including physical/chemical characteristics of the dredged material (e.g. material that is primarily sand may meet a demand for construction or bedding material and thus be taken to land) and equipment (e.g. the required floating equipment may not be available or able to reach portions of the dredge area, making marine disposal no longer an option). Rather than a duplication of effort, these two RCSs are intended to be complementary. At some point in the future, they may be combined.

1.1 CLASS SCREENINGS AND THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT

CEAA and its regulations set out the legislative basis for federal environmental assessments. The legislation ensures that the environmental effects of projects involving the federal government are carefully considered early in project planning. The Act applies to projects which require a federal authority (FA) to make a decision or take an action, whether as a proponent, land administrator, source of funding or regulator (issuance of a permit or license). The FA then becomes a responsible authority (RA) and is required to ensure that an environmental assessment of the project is carried out prior to making its decision or taking action.

Most projects are assessed under a screening type of assessment. A screening systematically documents the anticipated environmental effects of a proposed project, and determines the need to modify the project plan or recommend further mitigation to eliminate adverse environmental effects or minimize the significance of these effects.

The screening of some repetitive projects may be streamlined through the use of a class screening report. This kind of report presents the accumulated knowledge of the environmental effects of a given type of project and identifies measures that are known to reduce or eliminate any significant adverse environmental effects. The Canadian Environmental Assessment Agency (the Agency) may declare such a report appropriate for use as a class screening after taking into account comments received during a period of public consultation.

A RCS consists of a single report that defines the class of projects and describes the associated environmental effects, design standards and mitigation measures for projects assessed within the report. It includes a determination regarding significance of environmental effects for all projects assessed by the RCS. Once the Agency declares an RCS report and where an RA is satisfied that a project falls within the class described in the RCSR, no further action is required under sections 18 or 20 of the Act with respect to the project, as long as the RA ensures that design standards and mitigation measures described in the RCS report are implemented.

1.2 DESCRIPTION OF PROJECTS SUBJECT TO THE CLASS SCREENING

The projects captured under this RCS involve the removal of sediments in navigational channels and entrance areas of PEI DFO SCH harbours and the marine disposal of associated dredged material. Dredging and disposal at sea occurs every 1-5 years for the majority of these projects. The term of application will be 5 years from the date of declaration.

The projects are located in areas where wave action and littoral (long-shore) tidal currents carry in large volumes of sediment. The channels and entrance areas require dredging, by way of sand by-passing. Sand by-passing is the removal of accumulated sediment from channels and harbour entrance areas and disposal of the sediment at a nearby location down gradient to the littoral drift. This disposal method is in keeping with *sustainable relocation*, a concept promoted by EC Atlantic Region's DAS Program whereby dredged material is re-introduced into the marine environment to maintain and/or supplement sediment supply. It is a means of sustaining natural processes. All but one disposal site (North Lake Harbour intertidal option – to be discussed later) are considered "Shallow Water High Energy", a classification used in EC's DAS program (Stewart *et al*. 1999). Disposal sites for these projects are within approximately 1 km of the dredging site.

Along coastal PEI, dredging and disposal activities are only possible after ice-out (generally April) and before freeze-up (generally December or January) and are most commonly conducted in the spring and fall during daylight hours. There are however some exceptions when a dredging project may extend into the night, generally in the spring when the need to dredge is considered urgent (e.g. the time available between ice-out and the opening of lobster season in the first week of May is very limited).

The frequency, types of dredging conducted and the volumes dredged vary from site to site according to funding requirements, equipment availability, channel sizes, charted depths, current direction and strength, and other factors. Both hydraulic and mechanical dredging will be assessed in this RCS. Hydraulically dredged material will be disposed of by pumping the material to an adjacent in-water disposal site. Mechanically dredged material will be disposed of by way of side-casting from a floating platform or from land.

Activities usually take from a few hours to less than one week to complete. All dredged material is composed of 80% sand or more. This sand is considered "clean sand", that is, sand that meets acceptable limits of contamination as set by EC. Volumes of dredged materials from each site are small by dredging standards; typically between 5,000 and 20,000 m^3.

Existing DFO SCH locations eligible for the RCS are listed in Figure 1 and Table 1. Additional location-specific information is provided in Appendix A. All DFO SCH locations captured by this RCS have been subject to project-specific environmental assessments and have been granted DAS permits in the past.

1.3 THE ADDITION OF NEW DFO SCH LOCATIONS TO THE CLASS SCREENING

DFO SCH and EC may add new PEI DFO SCH locations to the RCS following consideration of comments received on the appropriateness of each location from the following government departments and agencies: EC - Canadian Wildlife Service and Marine Water Quality Monitoring Program; Fisheries and Oceans Canada - Habitat Management; Transport Canada - Navigable Waters Program, Parks Canada Agency (when activities are located in proximity to the PEI National Park); and the PEI Department of Environment, Energy, and Forestry.

In addition, for new DFO SCH locations to be added to Table 1, the project must meet the following design standards:

- The material to be dredged must be sampled in accordance with EC's DAS guidelines and demonstrated to be 80% sand or more, with contaminant concentrations below DAS chemical screening criteria[1].
- The annual volume of material to be dredged must be no more than 20,000 m^3.
- The dredging and disposal activities must rely only on floating equipment.
- The dredge area must be limited to the navigation channel leading to the DFO SCH facility and/or the entrance area of a DFO SCH basin.
- The disposal site(s) must meet the definition of "shallow water high energy", and be located within approximately 1 km of the dredge area.
- The disposal site(s) must be distant from pollution sources.
- The dredge area and disposal site(s) must not require additional federal or provincial permits, authorizations or agreements such as those pursuant to Section 32 and 35 of the *Fisheries Act* (destruction of fish by means other than fishing, Harmful Alteration, Disruption or Destruction of fish habitat) or the *Species at Risk Act.*
- The project must have been previously subject to a project-specific environmental assessment and been granted a DAS permit.
- The project must incorporate the mitigation measures summarized in Section 3.4.

[1] The Lower Level of the National Action List of the Disposal at Sea Regulations are as follows: cadmium 0.6 mg/kg (dry weight), mercury 0.75 mg/kg (dry weight), total polycyclic aromatic compounds (PAH) 2.5 mg/kg (dry weight) and total polychlorinated biphenyls (PCB) 0.1 mg/kg (dry weight).

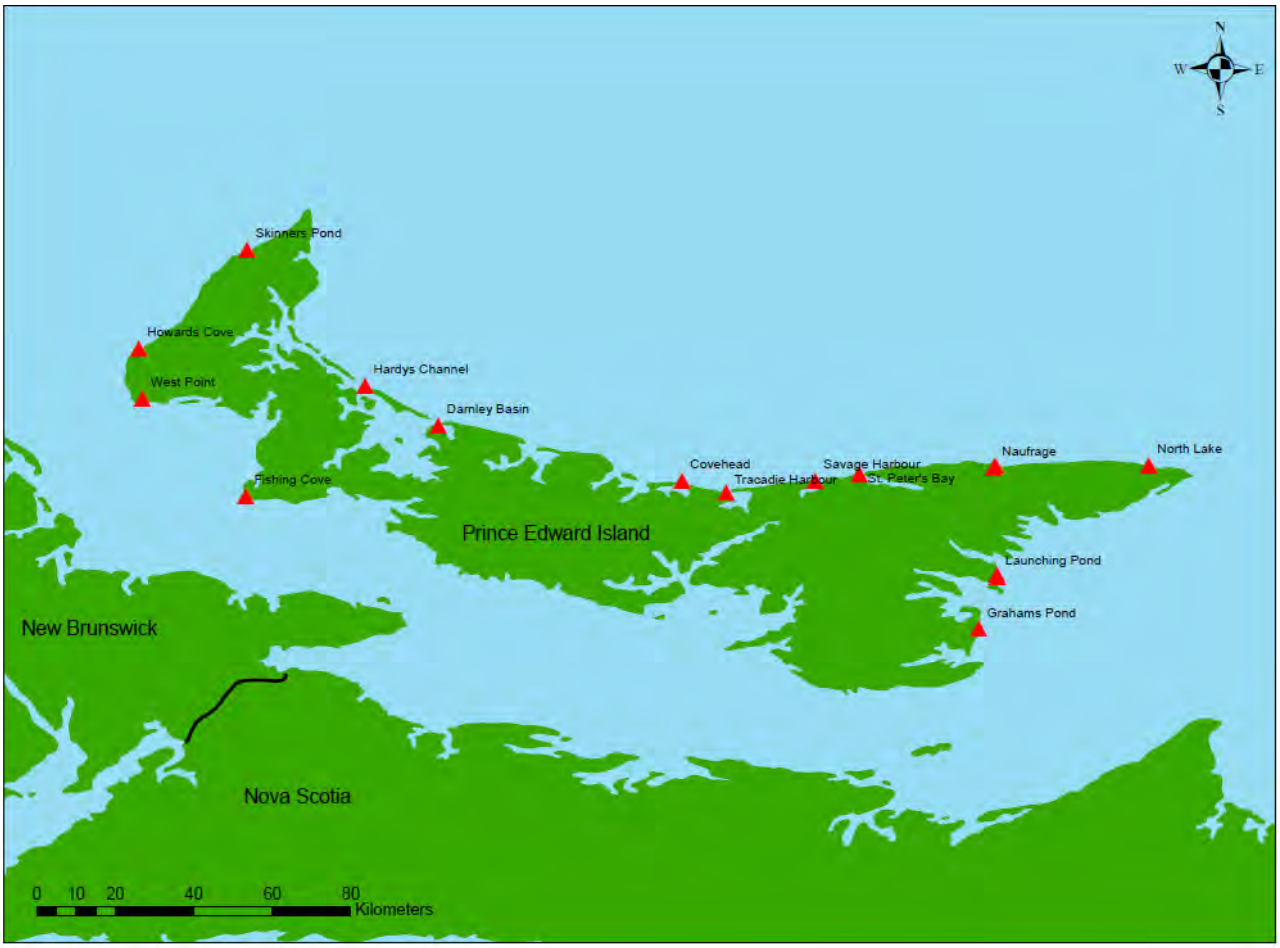


Figure 1: Existing DFO SCH Locations Eligible for the RCS

Table 1: Existing DFO SCH Locations Eligible for the RCS

DFO SCH location	Re-Dredging Location	Expected Volume (m^3) to be Removed	Sediment Quality		Expected Dredging Methodology	Approximate Disposal Site Locations Latitude / Longitude
			Date Collected	Results		
Covehead	Channel	10,000	January 2010	Acceptable for disposal at sea [2]	Hydraulic dredging with pipeline disposal, or mechanical excavation, side-casting	NAD 83 46º 25.94'N 63º 08.61'W or NAD 83 46º 25.87'N 63º 08.71'W
Darnley Basin	Channel	15,000	January 2010	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 33.70'N 63º 41.80'W
Fishing Cove	Channel Entrance	10,000	December 2006	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal or mechanical excavation, side-casting	NAD 83 46º 23.10'N 64º 07.95'W
Grahams Pond Harbour	Entrance Channel	10,000	February 2009	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 05.69' N; 62º 27.13'W
Hardys Channel	Channel	10,000	January 2008	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 39.09'N 63º 51.54'W
Howards Cove Harbour	Entrance Channel	10,000	December 2006	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 44.30'N 64º 22.80'W
Launching Pond	Entrance Channel	15,000	February 2009	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 13.13'N 62º 24.65'W
Naufrage	Entrance Channel	20,000	January 2008	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal or mechanical excavation, side-casting	NAD 83 46º 28.11' N 62º 24.85' W
North Lake Harbour	Entrance Channel	10,000	February 2009	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal or mechanical dredging from the wharf and loading material onto trucks, disposal in the inter-tidal zone and levelling by dozer	NAD 83 46º 28.13'N 62º 04.13'W NAD 83 46º 28.15'N 62º 03.70'W

DFO SCH location	Re-Dredging Location	Expected Volume (m3) to be Removed	Sediment Quality		Expected Re-Dredging Methodology	Approximate Disposal Locations Latitude / Longitude
			Date Collected	Results		
St. Peters Bay (Red Head)	Entrance Channel	10,000	January 2010	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal or mechanical excavation, sidecasting	NAD 83 46º 26.98'N 62º 43.58'W
Savage Harbour	Entrance Channel	10,000	April 2007	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46° 26.04' N 62° 49.62' W
Skinners Pond	Channel	10,000	February 2009	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 57.84'N 64º 07.78'W
Tracadie Harbour	Channel	17,000	January 2010	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 24.40' N 63º 01.34'W or NAD 83 46º 24.94' N 63º 02.02'W
West Point Harbour	Entrance Channel	10,000	December 2006	Acceptable for disposal at sea	Hydraulic dredging with pipeline disposal	NAD 83 46º 37.21'N 64º 22.23'W

[2] Results deemed acceptable for Disposal at Sea must be below Cadmium 0.6 mg/kg , Mercury 0.75 mg/kg, total polycyclic aromatic compounds (PAH) 2.5 mg/kg and total polychlorinated biphenyls (PCB) 0.1 mg/kg.

1.4 RATIONALE FOR RCS

Any proposed RCS must demonstrate that the projects covered meet several criteria. The suitability of a class screening approach to DFO SCH for dredging and marine disposal projects in PEI is based on application of the following criteria:

1. Well-defined Class of Projects: The proposed projects all involve the same proponent responsible for the same repetitive activities in similar locations. The dredged material has similar sediment characteristics. The activities are conducted over similar time periods with conventional equipment.

2. Well-understood Environmental Setting: DFO SCH has been responsible for dredging its navigation channels and harbour entrances on PEI for many years. Each of the existing sites selected for the RCS has been previously assessed at the screening level under CEAA. These past environmental assessments were used as resources for provision of the site-specific information provided in Appendix A.

In addition, each disposal site associated with the RCS has been previously disturbed and has been historically permitted for the disposal of marine sediments by EC. Disposal sites are located in areas of high wave energy where material disposed is quickly re-integrated back into the coastal sediment transport regime.

3. Unlikely to Cause Significant Adverse Environmental Effects, Taking into Account Mitigation Measures: Based on the RAs' experience with the same activities conducted previously and with many similar projects in New Brunswick, significant adverse environmental effects are unlikely to occur. Both standard and site-specific environmental mitigation measures have been identified to minimize interaction between the projects and the sensitive features in the respective environments (see Section 3.2).

Sediment sampling and analysis programs have been completed for all sites currently subject to the RCS. The results have consistently demonstrated that the dredged materials have appropriate physical characteristics and that contaminant levels are below DAS chemical screening criteria. The Disposal at Sea Regulations state that dredged material with contaminants below screening criteria "should be considered of little environmental concern in relation to disposal at sea". EC sampling guidelines for clean sand requires re-characterization every four years. The RCS will rely on the regulatory process to ensure that all dredged materials originating from the selected SCH sites have the required physical characteristics and have contaminant concentrations below Disposal at Sea Regulations screening criteria.

4. Project-Specific Follow-up Measures Not Required: Follow-up programs are not typically required for the dredging and disposal activities that meet the design standards of this RCS. In the past, DFO SCH inspections have been implemented for projects of similar scope within some of these harbours which have verified the accuracy of assessment predictions and determined the effectiveness of mitigation measures. The knowledge gained from those assessments and inspections has been applied to the RCS projects.

In addition, EC's Enforcement Branch verifies that loading and disposal activities are conducted in accordance with the terms and conditions of DAS permits and as such, has conducted inspections at select sites in the past.

5. Effective and Efficient Planning and Decision-making Process: All of the projects considered in this RCS involve activities that are straightforward and routine in nature, so planning is generally uncomplicated.

Previous environmental assessments were developed with advice provided from the Canadian Wildlife Service, Fisheries and Oceans Canada - Habitat Management, Parks Canada Agency, Transport Canada and the PEI Department of Environment, Energy, and Forestry. Both DFO SCH (the project proponent),

and EC (the regulator) have extensive experience managing the environmental effects associated with dredging and dredged material disposal.

6. Public Concerns Unlikely: For project-specific screenings, a "Notice of Commencement" must be posted on the Canadian Environmental Assessment Registry Internet site (the Internet site) for a 15-day period. The screening is finalized following the 15-day period, and a project Determination Decision is posted on the Internet site permitting the commencement of project activities (more information on the Canadian Environment Assessment Registry is provided in Section 1.6). In addition, the DAS permitting process requires publication in local newspapers of a notice of proposed disposal activities. The notifications are designed to advise the public of proposed activities and to provide instructions to obtain additional project information.

In the past number of years, there have been no public concerns raised in response to either the Internet site postings (Notice of Commencement) or DAS newspaper advertisements (Notice of Application for permit). The lack of public concern is likely due in part to the activities being designed to serve local interests and to the local communities understanding of the need for and nature of these activities.

1.5 ENGAGING OTHER GOVERNMENT DEPARTMENTS AND STAKEHOLDERS

During the development of this RCS report, DFO SCH and EC (with assistance from Public Works and Government Services Canada (PWGSC)) engaged Fisheries and Oceans Canada (DFO)- Habitat Management, Transport Canada, Parks Canada Agency, and the PEI Department of Environment, Energy and Forestry. EC expert programs (i.e. Canadian Wildlife Service and the Marine Water Quality program) were also consulted.

- Transport Canada determined they were not likely to be an RA and did not have expert advice to contribute to the development of this RCS report.

- Parks Canada Agency indicated they would participate as an FA and provided expert advice. Comments were also received from DFO - Habitat Management and the EC expert programs.

- No comments were received from the PEI Department of Environment, Energy and Forestry.

With respect to the fishing community, the RAs concluded that DFO SCH was acting in the interests of the fishing communities and, with the existing channels of communication between fishing interests and DFO SCH, direct consultation on the development of the RCS report was deemed unnecessary.

The Aboriginal engagement process is described in Section 3.2.8.

1.6 THE CANADIAN ENVIRONMENTAL ASSESSMENT REGISTRY

The purpose of the Canadian Environmental Assessment Registry (the Registry) is to facilitate public access to records relating to environmental assessments, and to provide notice in a timely manner. The Registry consists of two components – an Internet site and a project file.

The Registry project file must include a copy of the RCS report. The RA maintains the file, ensures convenient public access, and responds to information requests in a timely manner.

The Registry Internet site is administered by the Agency. The RA and the Agency are required to post specific records to the Internet site in relation to the RCS report.

Upon declaration of the RCS, the Act requires RAs to post on the Internet site of the Registry, at least every three months, statements of projects for which an RCS was used. Each statement should be in the form of a list of projects, and should include:

- the title of each project for which the RCSR was used;
- the location of each project;
- RA contact information (name, phone number, address, email); and
- the date when it was determined that the project falls within the class of projects covered by the report.

Note: The schedule for posting statements is:

- no later than July 15 (for projects assessed from April 1 to June 30)
- no later than October 15 (for projects assessed from July 1 to September 30)
- no later than January 15 (for projects assessed from October 1 to December 31)
- no later than April 15 (for projects assessed from January 1 to March 31)

As proponent of the dredging and disposal activities, DFO SCH will be responsible for maintaining the Registry.

2.0 ENVIRONMENTAL REVIEW METHODS

The purpose of this section is to detail the boundaries and environmental assessment methodology used to ensure the potential effects of dredging and activities are addressed in a consistent manner.

2.1 BOUNDARIES

An important aspect of the environmental assessment process is the determination of the environmental assessment boundaries. A boundary is a function of the extent and duration of potential interaction between the proposed undertaking and a valued ecosystem component (VEC)[2]. Generally, these boundaries are defined by the temporal and spatial characteristics encompassing those periods and areas, during and within which, the VECs are likely to interact with, or be influenced by, the project. The environmental assessment boundary for the projects subject to this RCS is defined by the spatial and temporal extent of potential disturbances to the physical and chemical characteristics of the habitat, such as water and sediment, and is based on the professional judgement and experience of DFO SCH and EC with similar projects of similar scope.

The following subsections outline, in a general manner, the boundaries that have been established for the project (for both ecological purposes and socioeconomic purposes). Following the identification of VECs in Section 3.0 (Environmental Assessment Analysis), each of the identified VECs has been specifically bounded in the subsections of Section 3.1.

2.1.1 Project Boundaries

Project boundaries refer to the spatial and temporal extent of project activities, and are dictated primarily by the project-specific characteristics at each DFO SCH location (dredge site, sediment characteristics,

[2] The Agency defines a VEC as 'the environmental element of an ecosystem that is identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance'.

sediment excavation methods and disposal site). Temporal project boundaries include mobilization (transporting equipment to the site), dredging and disposal, and demobilization phases that can occur any time from ice-out to freeze-up, but are typically concentrated in the spring months. The demobilization phase would be considered the cessation of any dredging and disposal activities, removal of any equipment from the DFO SCH location and the natural attenuation of these sites through the processes of sediment transport accretion and erosion. Spatial project boundaries are defined as the area of project activity, both dredging and disposal activities within and adjacent to the DFO SCH location.

2.1.1.1 Environmental Assessment

For the purpose of the assessment, the temporal boundary is considered the same as Section 2.1.1 (i.e. between ice-out and freeze-up, primarily in the spring) and the spatial boundary is the extent to which dredging and/or disposal activities could potentially influence nearby VECs such as marine water quality (i.e. maximum of 300 m)[3].

2.1.2 Ecological Boundaries

Ecological boundaries are determined by the temporal and spatial scales over which environmental components or populations function. The establishment of temporal ecological boundaries takes into consideration the potential variety of relevant characteristics of environmental components or populations including:

- magnitude, frequency and trends in the natural variation of a population or ecological component;
- the time required for a biological, physical and/or chemical response to an effect to become evident; and
- the time required for a population or ecological system to recover from an effect and return to its pre-impact state.

In dealing with temporal ecological boundaries for impact assessment, there is a need to consider intervals that are biologically meaningful with respect to the life cycle of the species being examined. The time scales that need to be considered in assessing potential environmental effects vary widely among species and environmental components. The degree of a potential impact on a particular species or environmental component is also influenced by other temporal characteristics including:

- the proportion of the year that the species or component remains in the proposed project area;
- the timing of sensitive life history periods (such as larval life phase or bird nesting periods) in relation to the schedule of proposed activities; and
- whether the project activity cycle includes a period of dormancy.

Spatial ecological boundaries are determined by the distribution, patterns of movement, and potential zones of interaction between an environmental component and the project. Direct project environment interactions are expected to be localized within the project boundary system and are unlikely to occur beyond this spatial extent. However, effects may also extend beyond the limits of direct potential interactions between the project and the VEC, particularly in the case of migratory species, and these are considered in the assessment.

2.2 SIGNIFICANCE CRITERIA

Under the Act, the significance of environmental effects must be considered. Definitions of potential significant adverse environmental effects for each VEC are provided in Section 3.2, taking into account

[3] Further explanation regarding the 300 m value is provided in Section 3.2.2, the analysis of potential impacts on marine water and sediment quality.

relevant scientific literature, environmental protection statutes or guidelines, social values and professional judgement.

This section outlines criteria that can be used in determining whether an adverse environmental effect could reach the defined significance threshold for a particular VEC, following the application of mitigation. Analysis of the significance of residual environmental effects can be based on several criteria outlined in the Agency guidance (CEAA, 1994) including magnitude, geographic extent, duration, frequency, and reversibility, and the ecological context of the effect (see Table 2), as well on professional judgement. The criteria below have been used as applicable in determining whether residual effects described in Section 3.2 would be significant.

Table 2: Rating System to Determine the Significance of Residual Environmental Effects

Criteria	Importance Level Rating		
	Negligible (1)	**Minor (2)**	**Major (3)**
Magnitude (M)	Negligible levels of disturbance and/or damage (i.e. within natural variation)	Minor levels of disturbance and /or damage (i.e. temporarily outside range of natural variation)	Major levels of disturbance and/or damage (i.e. outside range of natural variation)
Geographic Extent (GE)	Limited to project area within DFO SCH location.	Extends beyond project area but remains within the DFO SCH location.	Extends beyond the DFO SCH location and/or disposal site boundaries.
Duration of Effect (D)	2-3 days.	4 days to 4 weeks.	A month or longer.
Frequency of Effect (F)	Occurs less frequently than a monthly basis	Occurs on a monthly basis	Occurs more frequently than a monthly basis.
Reversibility (R)	Effects reversible over short term without active management.	Effects reversible over short term with active management.	Effects reversible over extended term with active management or effects are irreversible.

3.0 ENVIRONMENTAL ASSESSMENT ANALYSIS

This section describes the process used to identify VECs, the potential adverse environmental effects and the mitigation measures intended to eliminate or reduce those effects. A discussion is also presented regarding accidents and malfunctions, the effects of the environment on the project and potential cumulative effects. Lastly, conclusions are made regarding the significance of any residual adverse environmental effects.

3.1 IDENTIFICATION OF VECs

The selection of VECs for this assessment involved issues identification and pathway analysis - a process previously undertaken for each of the DFO SCH locations identified in Table 1.

The first step towards selecting VECs involved identifying Environmental Components of Concern (ECCs) (both biophysical and socio-economic) at the proposed dredging/disposal locations. This was based on concerns expressed previously by various stakeholders, non-government organizations, and government departments and agencies; consideration of available literature and reference materials; and previous assessment experience. Maintenance dredging projects are of a positive socio-economic nature as harbour infrastructure and safe and accessible waterways are of vital importance to the sustainability of coastal communities in PEI. The ECCs for the RCS are listed in the first column of Table 3.

The second step in selecting VECs involved examination of the ECCs and identifying the pathways (or linkages) by which the proposed activities may affect each ECC. This process focused the assessment on those ECCs where a clear linkage or pathway with project activities can be identified, and potential

significant adverse effects may be a concern. For a number of the ECCs, there are no pathways of concern, as they are avoided altogether through the design criteria and site selection process. These ECCs are therefore not identified as VECs and are excluded from further consideration in the assessment.

Table 3 summarizes the rationale for exclusion/inclusion of ECCs as VECs. Note that the term 'site' used in the following subsections and analysis refers to the areas of dredging/disposal activity at or near the DFO SCH locations listed in Table 1.

The VEC list has been condensed so that components which share common responses to activities can be assessed concurrently. Each definition was established in the context of a 'bounded area' within which project activities could potentially interact with each VEC.

Table 3: Issues Scoping/Effects Analysis Summary Matrix

Environmental Resources	Environmental Components of Concern (Biophysical and Socio-Economic)	Potential interaction		Project Phase			Pathways or Sources	VEC		Rational for inclusion or exclusion as a VEC
		Yes	No	Mobilization	Dredging/ disposal	De-mobilization		Yes	No	
Biophysical Environment	Ambient Air Quality	X		X	X	X	• Emissions from equipment. • Accidental release of hazardous materials	X		Concern identified.
	Ground Water		X						X	No likely pathway identified.
	Surface Water		X						X	No likely pathway identified.
	Soil		X						X	No likely pathway identified.
	Marine Water	X			X		• Changes in suspended particulate matter levels. • Accidental release of hazardous materials	X		Protected by legislation/concern identified.
	Marine Sediment	X			X		• Physical changes. • Contaminant mobilization • Accidental release of hazardous materials	X		Protected by legislation/concern identified.
	Physical Oceanographic Conditions	X			X		• Increased water depths at dredge sites		X	Dredging will restore channels to previous conditions.
	Aquatic Wetlands		X						X	No likely pathway identified.
	Terrestrial Vegetation/ Wildlife and Habitat		X						X	
	Marine/Coastal Birds and Habitat	X		X	X	X	• Disturbance to birds, their prey, their nests, and their habitats • Accidental release of hazardous materials	X		Protected by legislation/concern identified. Intertidal activities at North Lake are further addressed in the Bird and Bird Habitat Section.
	Species of Conservation Concern and Habitat	X		X	X	X	• Disturbance to shorebirds of conservation concern and/or their habitat. • Accidental release of hazardous materials	X		Protected by legislation/concern identified.
	Fish and Fish Habitat	X			X		• Introduction of invasive species. • Interference with spawning or migration • Benthic smothering • Accidental release of hazardous materials	X		Protected by legislation/concern identified.

Environmental Resources	Environmental Components of Concern (Biophysical and Socio-Economic)	Potential Interaction		Project Phase			Pathways or Sources	VEC		Rationale for inclusion or exclusion as a VEC
		Yes	No	Mobilization	Dredging/ Disposal	De-mobilization		Yes	No	
Socio-Economic Setting	Population and Labour Force	X					• Effect on local economy.		X	This project will have a beneficial effect (increased water depths will improve access to harbour facilities).
	Commercial Fisheries/ Aquaculture access, Transportation and Marine Navigation	X			X		• Short-term interference with vessel traffic during dredging and disposal. • Interference with accessing commercial fisheries/aquaculture sites	X		Concern identified.
	Aquaculture		X						X	The dredging/disposal sites are located sufficient distances from existing aquaculture leases. Further explanation provided in Appendix A.
	Cultural Resources		X						X	All harbour channels have been dredged previously and material to be removed is all recent infill. All disposal sites are located in high energy and dispersive environments. There will be no long-term physical changes and almost no likelihood of encountering heritage resources.
	Health and Safety	X			X		• Potential accidents during dredging and disposal activities (attracting swimmers to artificial sandbars).	X		Protected by legislation/concern identified.
	Current Use of Resources by Aboriginal People	X			X		• Interference with the use of marine resources.	X		Concern identified.
	Quality of Life/Amenities	X			X		• Potential effects on amenities (shoreline activities). • Noise/lighting	X		Concern identified.

3.2 ANALYSIS OF ENVIRONMENTAL EFFECTS ON SELECTED VECs

The following section includes a discussion of the potential adverse environmental effects associated with dredging and disposal activities, proposed mitigation measures to reduce those effects, and analyses of residual environmental effects (based on the criteria outlined in Section 2.2). Any location-specific environmental sensitivities identified in Appendix A have been taken into account in each analysis.

Please note that the VEC list has been condensed in the following subsections so that components which share common responses can be presented concurrently.

3.2.1 Ambient Air Quality

Definition of Significance

The bounded area within which activities could potentially interact with air quality is considered to be the local airsheds of the DFO SCH locations. A significant adverse effect on air quality is defined as an exceedance of provincial or national air quality criteria.

Potential Impacts

The primary air quality concern associated with the project is the effect of emissions from the motorized equipment on the local airshed. The potential effects will be influenced by the site and weather conditions (rain and wind direction) and by preventative measures implemented during project activities to minimize accidental emissions.

Dredging equipment produces emissions typical of diesel-fuelled vehicles. Generally, emissions may cause occasional nuisance problems on construction sites; however, they typically do not present problems outside the immediate project area and for projects of this nature, emissions would be short-term and localized. No specific mitigation is required for general operations.

In addition, hazardous materials may be released to the surrounding airshed as a result of accidental spillage of fuels, lubricant and hydraulic fluids used during project activities.

Mitigation Requirements

Adverse impacts resulting from the accidental release of hazardous materials will be minimized through application of pollution prevention and response measures outlined in Section 3.3.

Residual Adverse Effects

Following the application of the above mitigation measures, and considering the limited geographic extent of the projects (dredge/disposal sites), duration/frequency of the activities, and the fact that the work will be undertaken in functioning commercial harbours or established navigational channels where similar activities are common and acceptable to the local community, it has been determined that significant adverse environmental effects on this VEC are unlikely.

3.2.2 Marine Waters/ Marine Sediments

Definition of Significance

The bounded area within which project activities could potentially interact with marine waters and sediment was considered to be the near-shore environment of a DFO SCH location. A project activity affecting water quality through the deposit of a substance defined as deleterious under Subsection 36(3) of the *Fisheries Act* or harmful under Section 3.1 of the *Migratory Bird Convention Act* would be considered significant (e.g. a discharge stream or accidental release).

Potential Impacts

For projects of this nature, the potential effects of concern on local marine water and sediment quality are increased suspended solids load/turbidity (sedimentation), contaminant mobilization and accidental leakage/spillage of hazardous materials.

Sedimentation may result from dredging and disposal activities. Sedimentation is known to adversely affect the ecology of most aquatic systems with the severity of associated impacts generally decreasing with distance from the area of disturbance and with time after the project activity is completed.

Seakem (1990) found that although a dredging operation causes high concentration of suspended particulate matter (SPM) within 500 m of the dredge, concentrations can be expected to fall below maximum values naturally experienced at the site over time. This estimate is conservative when considering the design standards selected for the RCS (particularly that dredged material must be at least 80% sand). This design standard will limit dispersion of the dredged material, regardless of the manner of disposal, as coarse sand will immediately settle to the bottom of the disposal area and the vast majority of the remaining fines will also descend rapidly to the bottom. With coarse dredged material, any plumes will be short-lived. Therefore, after considering the nature of the material as well as experience with managing and regulating dredging and disposal activities at these locations in the past, the RAs have determined that 300 m is a more appropriate spatial boundary.

Degradation of marine water and sediment quality could occur through the dredging of contaminated sediment, however, the RAs have selected design standards that will minimize the potential of such an activity. In addition, the RCS will rely on the CEPA Disposal at Sea regulatory process to ensure that all dredged materials originating from the sites in Table 1 over the next five years, and any sites to be added to the list in future, are below applicable chemical screening criteria. Disposal sites subject to this RCS are previously disturbed and historically permitted for the disposal of marine sediment by EC.

Degradation of marine water and sediment quality may also occur through contamination from accidental releases of hazardous materials (i.e., leaks from project machinery and accidental spills of fuels and lubricants) down gradient of the project, which may then deposit, and affect aquatic resources. The severity of the potential effect of these substances on marine water and sediment/substrate quality would be both site-specific and incident-specific.

Mitigation Requirements

Sedimentation

Visual monitoring will be conducted at the dredge and disposal sites by inspectors hired by PWGSC Project Management. The purpose of this monitoring is to provide indications of significant changes in turbidity. If such changes occur, suggesting the dredging of fine-grained materials, the incident will be reported to PWGSC Environmental Services and the dredging operations will be modified to ensure water quality returns to conditions typical to the dredging and disposal of materials that are predominantly sand.

In addition, disposal activities will be monitored to ensure that the volumes approved in the DAS permits are not exceeded.

Adverse impacts resulting from the accidental release of hazardous materials will be minimized through application of pollution prevention and response measures outlined in Section 3.3.

Residual Adverse Effects

Following the application of the above mitigation measures, and considering the limited geographic extent of the project (dredge/disposal sites), duration/frequency of the activities, and the fact that the work is being undertaken in functioning commercial harbours or established navigational channels where similar levels of disturbance are common with normal operations at the site (i.e. reversibility of potential adverse effects), it has been determined that significant adverse environmental effects on this VEC are unlikely.

3.2.3 Birds and Bird Habitat

Definition of Significance

The bounded area within which project activities could potentially interact with birds is considered to be the habitat of birds and is identified as occurring within the vicinity of a DFO SCH location. In this context, a significant adverse effect on birds is defined as any effect resulting in a sustained suppression of fitness to maintain the population, or a decrease in density of the population below naturally occurring levels.

A significant adverse effect on birds may also be defined as one that results in a violation of the relevant sections of the *Migratory Bird Convention Act* (MBCA) and its regulations including: Section 5.1 (1) of the MBCA which describes prohibitions related to the deposit of substances harmful to migratory birds and Section 6(a) of the Migratory Birds Regulations which states that no person shall disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird.

Potential Impacts

The significance of any effect on migratory bird species or their habitat will depend in part on the permanence of that effect and the sensitivity of the particular species or habitat component affected. For projects taking place in the near-shore environment, it is appropriate to focus the effects analysis on shorebirds, waterfowl and seabirds (terns). Site-specific bird information is provided in Appendix A.

Regarding shorebirds it is important to take into account that Maritime Shorebird Survey trend data for the past three decades shows a decline in the numbers of most migrant species in Atlantic Canada and that the beaches and sandbars along the north shore of PEI are important migration habitats for a variety of shorebird species and their prey.

Regarding seabirds, it is important to consider that the PEI tern population has sustained a decline since a historic high in 1984 when they reached over 3300 pairs. Since the last tern survey in 2004, the number of nesting pairs in PEI has declined from 738 to 612 although the number of colonies has increased from 6 to 7. This decline persists despite a reduction in two of their predators, Great Black-backed and Herring Gulls. Arctic Terns are considered extremely rare in PEI and may be vulnerable to extirpation. Common Terns are considered uncommon or found only in a restricted range (Environment Canada, in prep(b)).

Potential adverse effects on shorebirds, seabirds and waterfowl in general include those project-bird interactions that result in adult or juvenile birds avoiding or being displaced from their feeding, breeding, resting or nesting habitat. These disturbances may be caused by noise and light from project vessels, equipment and any other associated human activities. The operation of any vehicles/equipment onland (e.g. beach) could result in loss or injury to nests, eggs, and or chicks, and poor waste management practices (i.e. garbage) could result in the attraction of predators or scavenger species to the site, thereby endangering or displacing more vulnerable species such as terns. Habitat alteration could potentially occur at North Lake in particular given that land-based equipment will be employed and dredged material placed in the intertidal zone. Lastly, birds and/or their habitat may be impacted by accidental leakage/spillage of hazardous materials or from loss of equipment (e.g. pipelines washing up on the beach).

Potential impacts on two bird species of conservation concern (the Piping Plover and Red Knot) are discussed in further detail in Section 3.2.4.

Mitigation Requirements

The following mitigation requirements will be employed in an effort to eliminate or minimize the potential adverse impacts on birds and their habitat described above:

- All equipment mufflers will operate efficiently during dredging activities. Other sounds such as whistle blasts and horns will be limited or replaced with radio communication;
- Concentrations of seabirds, waterfowl, or shorebirds will be avoided when anchoring equipment, accessing wharves, or ferrying supplies;
- Vessels will be restricted to main navigation channels, except when positioning pipelines from hydraulic dredges;
- Pipelines will be deployed and anchored at sea and will not be located on beaches or other important bird habitat. Beaching of pipelines will be avoided by ensuring moorings are secure and pipelines are moved to protected areas during periods of heavy seas;
- If an accident occurs and equipment is washed up on the beach (e.g. pipeline), it will be retrieved from the marine environment (i.e. from the vessel), rather than via the beach;
- With the exception of North Lake, dredge crews, their anchors, vehicles or equipment will not access beaches or other important bird habitat such as sandspits, dunes, intertidal flats/sandflats. Beaches will not be used as staging areas for equipment and measures will be taken to ensure that project staff and vehicles do not trample sensitive beach habitats.
- North Lake will use existing access roads to reach the dredging/disposal areas and will dispose dredged material in the lower half of the intertidal area. In addition, activities will be restricted to a small portion of the intertidal zone (situated between the breakwater and the adjacent access road).
- The dredging/disposal sites will be kept clear of any food, debris or litter.

In addition, please see Sections 3.2.2 and 3.3 for mitigation measures related to sedimentation and accidents and malfunctions respectively.

Residual Adverse Effects

During dredging, it can be expected that most bird species occupying the immediate vicinity of the site will initially be displaced. Nevertheless, following application of the above mitigation measures and considering the limited geographic extent of the project (dredge/disposal sites), duration/frequency of the activities, and the fact that the work is being undertaken in functioning commercial harbours or established navigational channels where similar levels of disturbance are common with normal operations at the site (i.e. reversibility of potential adverse effects), it has been determined that significant adverse environmental effects on this VEC are unlikely.

3.2.4 Species of Conservation Concern

The following discussion is restricted to shorebird species of conservation concern: the Piping Plover and the Red Knot.

Definition of Significance

The bounded area within which project activities could potentially interact with the above two species of conservation concern is considered to be the species and/or its habitat identified as occurring within the vicinity of a DFO SCH location. In this context, a significant adverse effect on these species is generally defined as any effect resulting in a sustained suppression of fitness to maintain the PEI population, or a decrease in density of the population below naturally occurring levels or any effect which precludes use of habitat.

For the Piping Plover, a species designated as Endangered under the *Species at Risk Act* (SARA), the loss of an individual would be considered a significant adverse effect. The loss of critical habitat and the destruction of its residence (individual nests) would also be considered to be significant adverse effects.

The Piping Plover

In eastern Canada, the Piping Plover breeds exclusively on seashore beaches. Adults normally arrive on PEI nesting grounds from the end of March to early May with most nests initiated during the first two weeks of May.[4] Re-nesting may extend the nesting period into July. Most young hatch in the period extending from late-May to early June. Migration back to the wintering grounds begins in July with the bulk of the population having left PEI by early September. The PEI population has fluctuated widely over recent years. The total number of plovers in the 2009 census was 94 (Stewart, unpublished).

Under SARA “critical habitat” means habitat necessary for the survival or recovery of a listed wildlife species. The draft recovery strategy for the Piping Plover describes critical habitat as the beaches and adjacent areas used by plovers for mating, nesting, and chick rearing. It begins at the low water mark extending landward to include the intertidal zone, sand or mud flats, and the upper beach. The upper beach includes dune vegetation (marram/beach grass or other vegetation) up to the crest or peak of the dune (Environment Canada, in prep(a)).

The draft recovery strategy identifies PEI Piping Plover beaches by their approximate centre point only. It does not delineate the boundaries associated with each beach. Recognizing the absence of precise delineation information, for the purposes of this assessment draft critical habitat was defined by using the draft recovery strategy centre points together with the maps depicting habitat found in the 2009 PEI Piping Plover atlas.

[4] http://www.sararegistry.gc.ca/document/dspText_e.cfm?ocid=1433

Following consultations with EC's Canadian Wildlife Service, the RAs determined 300 m to be an appropriate zone of influence when identifying potential interactions between dredging/disposal activities and the Piping Plover and its habitat. Based on this understanding, draft critical habitat was identified within 300 m of the following DFO SCH locations: Covehead Channel, Darnley Basin, Hardys Channel, Naufrage Channel, St. Peters Harbour Channel, Savage Harbour, and Tracadie Harbour Channel. Potential plover effects at these seven locations are considered further below.

Potential Effects

Human disturbance and habitat alteration are among the main threats to Piping Plovers, particularly during the period of mating, nesting, and chick rearing (Environment Canada, in prep(a)). Potential effects on plovers from project activities are the same as those described for shorebirds in general - in Section 3.2.3 (e.g., noise, lights, spills).

The likelihood however, of potential project-plover interactions is significantly reduced and, in some cases, eliminated, when taking into account the nature of the activities contemplated under the RCS: all SCH locations within 300 m of draft plover critical habitat rely on floating equipment and shallow water high energy disposal sites (i.e. no activities will take place on the beach itself including the intertidal zone). Past project monitoring provides further assurance that an in-water approach to dredging and disposal affords more protection to the plover and its habitat, compared to intertidal or land-based approaches. For example, PWGSC and Parks Canada Agency have worked collaboratively to monitor past dredging/disposal activities in Covehead, St. Peters and Tracadie harbours, and any influences they may have on plovers or other birds nesting on the adjacent National Park beaches. The objective of the monitoring has been to determine, through observation, if project activities required adjustment to reduce interactions with plovers (PWGSC, 2007b). PWGSC has confirmed that project activities have not required adjustments to date.

The likelihood of potential project-plover interactions is further reduced given the mitigation measures already in place for shorebirds as a whole in Section 3.2.3 (e.g. spill prevention and response). Furthermore, as a precautionary measure, PWGSC contacts the Island Nature Trust[5] annually to determine the presence or absence of plovers or their nests at DFO SCH locations where spring or summer dredging is proposed within 300 m of draft critical habitat. The information is kept on record and made available to contractors so that all parties are aware of plover presence in the event of a spill, however unlikely.

Based on the above information, and consultations with the Parks Canada Agency (E. Gregus, pers. comm., 2010) and Canadian Wildlife Service (A. Boyne et al and R. Gautreau et al, pers. comm., 2007-2010), the RAs have determined that potential adverse effects on the Piping Plover and its habitat are unlikely, and that additional mitigation measures are not required.

The Red Knot

The Red Knot (*Calidris canutus rufa*) was recently listed as endangered by COSEWIC and is pending public consultation for addition to Schedule 1 of SARA. This sub-species undergoes migrations between South America and the Arctic. The Red Knot breeds in the central parts of the Canadian Arctic, and during return (southern) migration, adult birds pass through the Maritime Provinces in late July or early

[5] The Island Nature Trust is a non-government organization dedicated to protection and management of natural areas on PEI. Among its interests is the protection of plovers and it annually collects and reports information on plover nesting, laying, hatching and fledging.

August with juveniles following from mid-August to roughly mid-September. During migration the Red Knot uses coastal sand or mud flats and feeds on bivalves and other invertebrates. It may also inhabit peat banks, salt marshes, brackish lagoons, and mussel beds (COSEWIC, 2007). COSEWIC identifies the north shore of PEI as an important area for return migrating Red Knot in Eastern Canada and birds have been recorded in the past at Covehead Harbour, most recently in 2003 (ACCDC, 2006).

The discussion below is limited to (return) migrating Red Knots (staging/feeding), and does not consider impacts to breeding, nesting birds.

Potential Effects

COSEWIC (2007) identifies a number of limiting factors and threats to Red Knot survival such as habitat degradation, disturbance, and oil pollution. While dredging projects could potentially contribute to some of these limiting factors through vehicle traffic, noise, lights etc., the likelihood is considered low when taking into account 1) the RCS design criteria (i.e. all but one project employs floating equipment and shallow water disposal sites, thereby avoiding the beaches - foraging/staging habitat), and 2) the timing of most dredging projects (i.e. completed by late July - before the fall migration period). Furthermore, the mitigation described in Section 3.2.3 for shorebirds in general is expected to further reduce any remaining likelihood of potential adverse effects (e.g. spill prevention and response measures).

With regards to North Lake in particular, which involves intertidal zone disposal, it is important to note that the disposal site is limited to a small area sandwiched between the breakwater and an access road. It is therefore unlikely that migrating Red Knots would be attracted to this area.

Based on the above information, and consultations with the Canadian Wildlife Service (A. Boyne et al and R. Gautreau et al, pers. comm., 2007-2010), the RAs have determined that potential adverse effects on the Red Knot are unlikely, and that additional mitigation measures are not required.

3.2.5 Fish and Fish Habitat

Definition of Significance

For reasons discussed previously in Section 3.2.2, the assessment boundary for potential physical effects at the dredge and disposal sites is 300 m.

In this context, a significant adverse effect on fish or fish habitat is defined as any effect resulting in a sustained suppression of fitness to maintain the population, or a decrease in density of the population below naturally occurring levels, or the need for management action (i.e. requirement for a *Fisheries Act* Section 32 or 35 authorization).

Potential Impacts

General

Dredging and disposal activities may adversely affect fish by way of habitat alteration. The physical removal and disposal of the marine sediment and associated turbidity from the disturbed areas will transport suspended solids to adjacent areas affecting aquatic life including spawning and migrating fish, as well as benthic communities. In addition, there is potential for the use of equipment or machinery from areas known to support invasive species. This equipment could introduce invasive species into the dredged/disposal areas.

Fish can move to avoid direct mortality and once dredging and disposal activities are finished and the area is re-stabilized, fish will return to the area provided that habitat quality is acceptable.

Spawning and Migration

The herring spawning areas in the vicinity of Howards Cove and Skinners Pond could be impacted by dredging/disposal activities. However, previous environmental assessments conducted at these DFO SCH locations have determined that the spawning areas are sufficiently distant from dredging and disposal activities to avoid adverse effects (PWGSC, 2002 and 2006). Furthermore, the project schedules will be set based on characteristics of the environmental setting of the site to avoid adverse interaction with sensitive fish and fish habitat features. Dredging will not be conducted during periods of fish migration through the proposed dredging area as activities will be largely confined to daylight hours. This will be verified with DFO SCH prior to project commencement.

Benthic Communities

Disposal of dredged material will impact benthic communities at the disposal site. Bolam and Rees (2003) found that in order to minimize alterations to the benthic community structure, dredged materials should be placed in a manner that enables resident organisms to migrate up through the deposited sediment. Recovery in such instances will be via vertical migration and relatively rapid compared to planktonic settlement. This is possible in cases where the volume of material is small and the disposal area is highly dispersive. The same authors quote Flemer et al. (1997) who concluded that if dredged material needs to be disposed into the marine environment, the most ecologically suitable place to dispose of it is where the system is already adapted to a high level of sediment movement. These descriptions apply to the RCS disposal sites. The dredging will be carried out in navigational channels where the benthic community is accustomed to disturbances from vessel traffic, and dredged materials will be disposed of in shallow water, highly dispersive sites that were selected because of low abundance of marine fauna and past use as disposal sites. Relatively small volumes of dredged material will be placed in highly dispersive areas which will enable vertical migration of organisms.

Invasive Species

Waters of Atlantic Canada are experiencing the effects of invasive aquatic plant and animal species from around the world. Once invasive species have established themselves in a new ecosystem (absent of their natural predators) they can harm native species, possibly causing entire ecosystems to be disrupted due to habitat destruction or food chain alteration (i.e., preying on native species, transmitting disease, etc.). They can result in negative impacts to the commercial fishing and aquaculture industries.

The principal invasive species in the Gulf of St. Lawrence include the Green Crab (*Carcinus maenas*), the branching green algae Oyster Thief (*Codium fragile tomentosoides*) and a number of tunicate species. According to DFO (2005), tunicates include the Clubbed tunicate (*Styela clava*), Violet tunicate (*Botrylloides violaceus),* and the Start tunicate (*Botryllus schlosseri).*

According to the Canadian Council of Fisheries and Aquaculture Ministers Aquatic Invasive Species Special Task Force (2007), invasive species may be unintentionally introduced into a marine environment by seven key pathways: shipping, recreational and commercial boating, the use of live bait, the aquarium/water garden trade, live food fish, unauthorized introductions and transfers, and canals and water diversions. Equipment used to conduct dredging and disposal activities falls under the ‘recreational and commercial boating’ category that may introduce invasive species by the following ways:

- Invasive organisms such as tunicates that attach to or become lodged on the hull, motor, trailer or equipment such as anchors, ropes or fishing gear
- Water that contains invasive organisms enters the watercraft during operation (bilge water, live wells, and engine cooling systems).

Mitigation Requirements

All equipment will be mobilized by road and will be pressure washed before being placed in the water.

Residual Adverse Effects

Following the application of the above mitigation measures, and considering the limited geographic extent of the project (dredge/disposal sites) and duration/frequency of the activities, it has been determined that significant adverse environmental effects on this VEC are unlikely.

3.2.6 Commercial Fisheries/Aquaculture Access, Transportation and Marine Navigation

Definition of Significance

The bounded area within which project activities could potentially interact with commercial fisheries or aquaculture operations is considered to be areas immediately within and adjacent to a project site. In this context, a significant adverse effect on fisheries/aquaculture is defined as an effect resulting in exclusion of the fishing/aquaculture sector from areas historically accessed or used.

The bounded area within which the proposed project could potentially interact with existing land use (i.e. tourism and recreation) is considered to be the environment immediately adjacent to a project site. In this context, a significant adverse effect on existing land use is considered to be interference/disruption of existing land use activities.

Potential Impacts

The potential interaction between project activities and commercial fisheries/aquaculture/transportation and marine navigation relate to interruption of facility access or use, additional vessel traffic and marine navigation restrictions within the project area.

Dredging projects should be considered a positive socio-economic impact as site infrastructure and safe and accessible waterways are of vital importance to the sustainability of coastal communities in the Maritimes. Safe and accessible DFO SCH harbours protect millions of dollars in user business assets, allow safe user operation, prevent coastal erosion and damage, provide local economic development and employment and offer refuge for mariners in distress. As well, the temporal scope of the projects is designed to work with the schedules of the marine resource users to ensure the least amount of disruption.

Mitigation Requirements

The proponent, DFO SCH, will coordinate with local Harbour Authorities prior to commencement of the project activities such that the schedule with the least possible conflicts will be implemented.

Floating equipment will be operated such that navigation in and out of harbours is maintained.

Residual Adverse Effects

Following the application of the above mitigation measures, and considering the duration/frequency of the activities, it has been determined that significant adverse environmental effects on this VEC are unlikely.

3.2.7 Health and Safety

Definition of Significance

The bounded area within which project activities could potentially interact with health and safety is considered to be a DFO SCH location. In this context, a significant adverse effect on health and safety is defined as an unsecured safety hazard.

Potential Impacts

General Health and Safety

The potential health and safety risks associated with the project are generally similar to other construction projects which involve heavy machinery, including worker injury or death, or loss to the marine environment, and risk of injury with increased traffic during transport of the workforce, the equipment, and/or re-dredged spoils. The training and safety/emergency procedures required by dredging and disposal crews are similar to those required for other construction projects which involve heavy machinery as per municipal, provincial and federal regulations and appropriate project-specific safety plans. A review of the emergency service capabilities in the DFO SCH locations subject to this RCS indicate that these communities have adequate services to respond to an emergency. Contractors must also have the capabilities to deal with medical emergencies.

There is a potential safety risk in relation to the disposal sites and swimmers. In the past, swimmers have at times been attracted to artificial sandbars created through disposal at sea activities which became a major safety concern.

Mitigation Requirements

To avoid creating an attraction to swimmers, dredged material will be distributed in such a manner as to avoid the creation of an artificial sand bar.

See also mitigation described in Sections 3.3.

Residual Adverse Effects

Following the application of the above mitigation measures, and considering the duration/frequency of the activities, it has been determined that significant adverse environmental effects on this VEC are unlikely.

3.2.8 Current Use of Resources by Aboriginal People

Definition of Significance

The bounded area within which project activities could potentially interact with asserted or established Aboriginal or treaty rights (e.g. commercial or food, social and ceremonial fisheries) is considered to be the area immediately within and adjacent to a DFO SCH location. In this context, a significant adverse effect is defined as an effect resulting in exclusion of an Aboriginal or treaty right.

Potential Impacts

Aboriginal fishing activity is conducted at Grahams Pond and Hardys Channel. However, when considering the history and nature of these activities (small spatial and temporal footprints, dredging of clean sand only), DFO SCH and EC believe significant adverse effects on Aboriginal or treaty rights to be unlikely.

Nonetheless, while there may be no need for formal consultation, DFO SCH and EC believe some engagement of Aboriginal organizations is warranted.

Engagement Process

Letters were sent to the PEI Native Council on February 9, 2010, and Lennox Island First Nation and Abeqweit First Nation on January 15, 2010. These groups were asked to indicate what, if any, changes the projects may cause to the environment that could in turn affect the current use of lands and/or resources for traditional purposed and/or cultural use. There was no negative response received.

The working relationship to date with these Aboriginal groups is such that if they have issues with a DFO-SCH project or activity, they contact DFO-SCH and PWGSC in response. These projects have previously been discussed with the Aboriginal groups listed above and at that time they did not raise issues or concerns.

3.2.9 Quality of Life/Amenities

Potential Impacts

Noise and lights could potentially impact the quality of life of individuals living nearby the dredge/disposal sites. Also, project activities in general could potentially interrupt/limit shoreline recreational activities such as kayaking, beach use, swimming, boating etc., particularly for those harbours in proximity to National or Provincial parks (e.g. Covehead). Lastly, accidental spills of hazardous materials could potentially impact use of the shoreline and DFO SCH facilities by local residents and fishermen.

The opportunity for impacts on/interruption of shoreline and facilities use is expected to be minimal, given the overall duration (typically 1 week to complete) and timing of activities (activities are most common outside of peak use periods). Furthermore, the dredge sites are located in the main navigational channels, the disposal sites are located beyond the low tide mark and the pipeline routes are marked with buoys. All equipment is well muffled, and the dredged material is restricted to clean sand that is quickly reintegrated into the littoral system. These activities have occurred annually for many years and fishermen and recreational users have not raised concerns to date.

Lastly, these activities are necessary to provide boats with sustainable, safe, and secure access to harbours. The temporal scope of the projects is designed to work with the schedules of the marine resource users to ensure the least amount of disruption.

Mitigation Requirements

Adverse impacts resulting from the accidental release of hazardous materials will be minimized through application of pollution prevention and responses measures outlined in Section 3.3.

Residual Adverse Effects

Significant adverse environmental effects on this VEC are therefore considered to be unlikely.

3.3 ACCIDENTS AND MALFUNCTIONS

Potential Impacts

Accidents and malfunctions were considered relative to each identified VEC. With the nature of the projects to be captured in this RCS, the potential environmental effects resulting from an accident/malfunction include:

- Potential fuel/oil spills and or hydraulic oil spills which could impact air/marine water/sediment/fish habitat quality, as well as birds, species of conservation concern, and their habitats.

Mitigation Requirements

Handling of Hazardous Materials

The handling of hazardous materials will comply with all applicable provincial and federal legislation.

General Pollution Prevention and Emergency Response

Basic petroleum spill clean-up equipment, including a 250 L oil spill clean-up kit, will be maintained on site during the duration of the project. In order to ensure contaminant releases do not occur, machinery will be regularly inspected for leakage of lubricants or fuel. This will include ensuring that all hydraulic hoses, oil and fuel lines are in good condition with no leaks.

In the event of an accidental spill, the Canadian Coast Guard will be notified at 1-800-565-1633 (24 hour reporting line) for all SCH locations and Parks Canada Agency will be notified at 1-877-852-3100 (24 hour Jasper Dispatch) for Covehead, St. Peter's, Tracadie and Savage Harbours. The source of the spill will be identified and stopped, with any released material contained immediately. Work will be halted and spill containment and clean up will begin with the spill kit on hand.

Should a small leak or drip be identified, they will be contained by using drip pans or other appropriate means until the equipment is properly repaired. Routine maintenance will be conducted offsite.

Residual Adverse Effects

Significant adverse environmental effects are unlikely to occur provided the above spill prevention and responses measures are applied.

3.4 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

Potential Impacts

Under CEAA, an environmental assessment must also consider the potential effects the environment may have on the project. Within the scope of this RCS, potential effects of the environment on the project consist of:

- weather and ice – storm events and ice movements can affect the sediment shift patterns and rates within the DFO SCH locations; and
- climate change – sea level rise may implicate operations within the DFO SCH locations through changing water levels and water quality, weather patterns.

Potential pathways and effects of the environment on the project include permanent damage and/or loss of project equipment at the site for the duration of the project.

Mitigation Requirements

The following measures will be implemented to mitigate these potential effects:

- only proven methodologies for dredging and disposal will be used; and
- project activities will be implemented during favourable weather and sea-state conditions to minimize potential for accidents (i.e. EC's local forecast {http://weatheroffice.ec.gc.ca} and storm surge advisory and warning bulletins will be consulted prior to project commencement).

In addition, DAS permits are issued with a one-year term in recognition of both the unpredictable nature of channel infilling and the need for a flexible project schedule. The flexibility allows schedules to be adjusted to avoid severe weather and sea-state conditions.

Generally, these issues are considered mitigable through the above project design, harbour maintenance procedures, and temporal scope. Furthermore, in the event of an accident, response measures would be implemented as outlined in Section 3.3.

Residual Adverse Effects

No significant adverse effects on the project resulting from the existing environment are likely with proper implementation of the identified mitigation measures.

3.5 CUMULATIVE EFFECTS

The Act requires that the assessment of potential environmental effects also consider the potential for cumulative environmental effects. It defines cumulative environmental effects as "environmental effects that are likely to result from a project in combination with the environmental effects of other past, existing and future projects or activities". Cumulative effects can occur when environmental effects take place so frequently in time or so densely in space that the effects of individual impacts cannot be assimilated. For example, an impact considered minor within the framework of a project might become more significant if the analysis of the other activities indicates that the VEC is already affected, or could be affected, in different ways. They can also occur when the effects of one activity combine with those of another in a cumulative or synergistic manner.

Potential Sources/Impacts and Mitigation

While it is difficult to confidently predict what, if any coastal developments may take place in close proximity to these sites in future, it is reasonable to assume that, based on the findings in EC (2006), impacts due to human-induced climate change (e.g., sea-level rise and associated storm impacts such as erosion, flooding, and infrastructure damage) could result in increased need for maintenance dredging and/or infrastructure repair at DFO SCH locations in PEI. Cumulative environmental effects could

therefore potentially occur if the impacts on VECs described in Section 3.2 begin working in concert with similar effects from future coastal and marine activities in the vicinity of the DFO SCH locations. Cumulative environmental effects could also occur if the effects from dredging/disposal activities work in concert with other anthropogenic sources of pollutants existing in the vicinity of the DFO SCH locations which could degrade water quality and habitat and/or affect local flora and fauna (*i.e.*, nutrient loading from agricultural run-off).

It is important to note however that all DFO SCH locations in this RCS report are long-established, functioning harbours which have been subjected to maintenance dredging (and individual environmental assessments) year after year. As described in Section 1.3, certain criteria must be met up front for a particular project type to be deemed suitable for a RCS, including the fact that significant adverse environmental effects are unlikely (with applied mitigation) and that follow-up is not required. Using this criteria, potential effects associated with maintenance dredging activities generally are limited to the duration of the work (a few hours to < 1 week), localized (within 300 m of dredge/disposal sites), and reversible (intermittent nature of activities allows for natural recovery). Consequently, the ability of any effects, to act in a cumulative manner is expected to be minimal. In terms of effects from pollutants in particular, it is important to note that material must be "clean" if permitted for ocean disposal. As well, the measures described in Section 3.3 will minimize if not eliminate the possibility of accidental releases.

With respect to potential cumulative impacts to the fisheries for the area as a whole, the dredging projects subject to this RCS are small, involving the relocation of uncontaminated coarse materials very short distances and are implemented in order to serve the need of local fishing communities. For these reasons, the RAs predict it is unlikely that these projects would contribute in any measureable decline in the productivity of the regional marine environment. Nonetheless, the RAs acknowledge that a number of recommendations for action were put forth in 2007 by the Northumberland Strait Initiative Working Group to address stakeholders' concerns[6]. The results and findings of future work conducted under this initiative will be important to the RCS and the RAs commit to revisiting and updating the RCS report conclusions and mitigation measures as new information becomes available.

Residual Impacts

With the implementation of the identified mitigation measures, and the additional reasons described above, significant, adverse cumulative environmental effects are not likely to occur.

Predictions made regarding cumulative environmental effects will be confirmed on a yearly basis to the Agency as part of the conditions for declaration set by the Agency's President.

3.5.1 Complimentary Initiatives

In addition to the Northumberland Strait Ecosystem Initiative described above, an integrated management plan for Malpeque (Darnley Basin) is also underway. Again, relevant aspects of this plan will be incorporated in the RCS when it becomes available.

[6] Multistakeholder consultations conducted as part of the Northumberland Strait Ecosystem Initiative revealed a number of factors perceived to be contributing to the overall decline in fisheries productivity. Dredging and disposal at sea were identified as a potential source of impact on water quality.

4.0 ROLES AND RESPONSIBILITIES

Responsible Authorities

The RCS will be applied, where appropriate, by DFO SCH and EC until such time as the Agency declares the RCS not to be a class screening report or the declaration period expires.

It will be the responsibility of DFO SCH to:

- ensure that projects are properly identified as class-applicable;
- ensure that applicable mitigation is implemented;
- place a regular statement on the Registry Internet site describing the extent to which the RCS report has been used, as identified in Section 1.7;
- maintain the Registry project file, ensure convenient public access, and respond to information requests in a timely manner; and
- provide annual confirmation of the continuing validity of cumulative effects assessment conditions to the Agency.

A separate document will be developed prior to the first application of this RCS outlining the roles and responsibilities of DFO SCH and EC in terms of compliance monitoring, audits and any other items.

4.1 SUMMARY OF MITIGATION AND OTHER COMMITMENTS

Turbidity and Sedimentation

- Visual monitoring will be conducted at the dredge and disposal sites by inspectors hired by PWGSC Project Management. If such changes occur, suggesting the dredging of fine-grained materials, the incident will be reported to PWGSC Environmental Services and the dredging operations will be modified to ensure water quality returns to conditions typical to the dredging and disposal of materials that are predominantly sand.

- Disposal activities will be monitored to ensure that volumes approved in DAS permits are not exceeded.

Birds and Bird Habitat

- All equipment mufflers will operate efficiently during dredging activities. Other sounds such as whistle blasts and horns will be limited or replaced with radio communication;

- Concentrations of seabirds, waterfowl, or shorebirds will be avoided when anchoring equipment, accessing wharves, or ferrying supplies;

- Vessels will be restricted to main navigation channels, except when positioning pipelines from hydraulic dredges;

- Pipelines will be deployed and anchored at sea and will not be located on beaches or other important bird habitat. Beaching of pipelines will be avoided by ensuring moorings are secure and pipelines are moved to protected areas during periods of heavy seas;

- If an accident occurs and equipment is washed up on the beach (e.g. pipeline), it will be retrieved from the marine environment (i.e. from the vessel), rather than via the beach;

- With the exception of North Lake, dredge crews, their anchors, vehicles or equipment will not access beaches or other important bird habitat such as sandspits, dunes, intertidal flats/sandflats. Beaches will not be used as staging areas for equipment and measures will be taken to ensure that project staff and vehicles do not trample sensitive beach habitats.

- North Lake will use existing access roads to reach the dredging/disposal areas and will dispose dredged material in the lower half of the intertidal area. In addition, activities will be restricted to a small portion of the intertidal zone (situated between the breakwater and the adjacent access road).

- The dredging/disposal sites will be kept clear of any food, debris or litter.

Species of Conservation Concern and their Habitat

Piping Plover

- PWGSC will contact the Island Nature Trust[7] annually to determine the presence or absence of plovers or their nests at DFO SCH locations where spring or summer dredging is proposed within 300 m of draft plover critical habitat. The information will be kept on record and made available to contractors so that all parties are aware of plover presence in the event of a spill. If recent data are not available for a particular DFO SCH location, PWGSC may provide funds to Island Nature Trust to gather site-specific information at the time when it is needed.

Measures for Covehead, St. Peters (Greenwich) and Tracadie (Blooming Pt)

- DFO SCH/PWGSC and Parks Canada Agency will continue to work collaboratively to monitor dredging activities, and any related effects on Piping Plovers and other birds, in order to adjust dredging activities, if required.

Fish and Fish Habitat

Invasive Species

- All equipment will be mobilized by road and will be pressure washed before being placed in the water.

Commercial Fisheries, Aquaculture/Transportation and Marine Navigation

- The proponent, DFO SCH will coordinate with local Harbour Authorities prior to commencement of the project activities such that the schedule with the least possible conflicts will be implemented.

- Floating equipment will be operated such that navigation in and out of harbours is maintained.

[7] The Island Nature Trust is a non-government organization dedicated to protection and management of natural areas on PEI. Among its interests is the protection of plovers and it annually collects and reports information on plover nesting, laying, hatching and fledging.

Health and Safety

- To avoid creating an attraction to swimmers, dredged material will be distributed in such a manner as to avoid the creation of an artificial sand bar.

Accidents and Malfunctions

Hazardous Materials

- The handling of hazardous materials will comply with all applicable provincial and federal legislation.

General Pollution Prevention and Emergency Response

- Basic petroleum spill clean-up equipment, including a 250 L oil spill clean-up kit, will be maintained on site during the duration of the project. Machinery will be regularly inspected for leakage of lubricants or fuel. This will include ensuring that all hydraulic hoses, oil and fuel lines are in good condition with no leaks.

- In the event of an accidental spill, the Canadian Coast Guard will be notified at 1-800-565-1633 (24 hour reporting line) for all SCH locations and Parks Canada Agency will be notified at 1-877-852-3100 (24 hour Jasper Dispatch) for Covehead, St. Peter's, Tracadie and Savage Harbours. The source of the spill will be identified and stopped, with any released material contained immediately. Work will be halted and spill containment and clean up will begin with the spill kit on hand.

- Should a small leak or drip be identified, they will be contained by using drip pans or other appropriate means until the equipment is properly repaired. Routine maintenance will be conducted offsite.

Effects of the Environment on the Project

- Only proven methodologies for dredging and/or DAS will be used.

- The project will be implemented during benign weather conditions to minimize potential for accidents (i.e. EC's local forecast {http://weatheroffice.ec.gc.ca} and storm surge advisory and warning bulletins will be consulted prior to project commencement).

5.0 PROCEDURES FOR REVISING THE RCS REPORT

The RAs will notify the Agency in writing of their interest to revise the RCS report as per the terms and conditions of the declaration. They will discuss the proposed revisions with the Agency and affected federal government departments and may invite comment from stakeholders on the proposed changes. For a re-declaration of the RCS report, a public consultation period will be required. The RAs will then submit the proposed revisions to the Agency, along with a statement providing a rationale for each revision proposed, as well as a request that the Agency amend or re-declare the RCS report.

5.1 AMENDMENTS

The purpose of an amendment is to allow for minor modifications to the RCS after experience has been gained with its operation. Amendments do not require public consultation and do not allow for changes to the term of application. In general, amendments to the RCS can be made if the Agency is satisfied that the changes:

- represent editorial changes intended to clarify or improve the document and procedures screening process;
- streamline or modify the planning process; and/or
- do not materially alter either the scope of the projects subject to the RCS or the factors to be considered in the assessment required for these projects.

5.2 RE-DECLARATION

The purpose of a re-declaration is to allow substantial changes to the RCS after experience has been gained with its operation. Re-declarations require a public consultation period. A re-declaration of an RCS report may be undertaken for the remaining balance of the original declaration period or for a new declaration period if the changes:

- extend the application of the RCS to projects or environmental settings that were not previously included, but are similar or related to projects included in the class definition;
- represent modifications to the scope of the projects subject to the RCS or the factors to be considered in the assessment required for these projects;
- reflect new or changed regulatory requirements, policies or standards;
- introduce new design standards and mitigation measures;
- modify the federal coordination notification procedures;
- extend the application of the RCS to RA(s) who are(were) not previously declared users of the report;
- remove projects that are no longer suitable for the class; and/or
- extend the term of application of the RCS.

6.0 TERM OF APPLICATION

This report will be in effect for 5 years from its date of declaration. Near the end of the RCS report declaration period, and at other times as necessary, DFO SCH and EC will review content and usage to allow for report updates and the preparation for potential re-declaration.

7.0 REFERENCES

Barnard, W. 1978. Prediction and Control of Dredged Material Dispersion Around Dredging and Open-Water Pipeline Disposal Operations. Technical Report DS-78-13. Vicksburg, MS, U. S. Army Engineer Waterways Experiment Station Environmental Laboratory.

Bolam, S. G. and H. L. Rees. 2003. Minimizing impacts of maintenance dredged material disposal in the coastal environment: a habitat approach. Environmental Management 32.2 (2003): 171-88.

Canadian Council of Fisheries and Aquaculture Ministers Aquatic Invasive Species Special Task Force. 2007. A Canadian Action Plan to Address the Threat of Aquatic Invasive Species. URL: http://www.dfo-mpo.gc.ca/Science/enviro/ais-eae/plan/plan-eng.htm

Canadian Environmental Assessment Agency (the Agency). Canadian Environmental Assessment Registry (as of January 2008). URL: http://www.ceaa-acee.gc.ca/050/index_e.cfm

Canadian Environmental Assessment Agency (the Agency). 1999. Cumulative Effects Assessment Practitioners Guide. URL: http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=DACB19EE-1

Canadian Environmental Assessment Agency (the Agency). 1994. Responsible Authorities Guide. URL: http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=DACB19EE-1

Canadian Environmental Assessment Agency (the Agency). 1994. Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects. URL: http://www.ceaa-acee.gc.ca/default.asp?lang=En&n=DACB19EE-1

COSEWIC. 2007. COSEWIC assessment and status report of the Red Knot *Calidris canutus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. Vii + 58 pp. URL: http://www.sararegistry.gc.ca/virtual_sara/files/cosewic/as_calidris_canutus_e.pdf .

Environment Canada. In prep(a). Recovery Strategy for Piping Plovers (Charadrius melodus melodus) in Canada {Proposed}. *In* Species at Risk Act Recovery Strategy Series. Ottawa: Environment Canada 40pp.

Environment Canada. In prep(b). Census of Terns and Gulls in Prince Edward Island – 2009. Technical Report Series No. XX. Canadian Wildlife Service, Atlantic Region. p. 5.

Environment Canada. 2006. Impact of Sea-Level Rise and Climate Change on the Coastal Zone of Southeastern New Brunswick. URL: http://www.adaptation.nrcan.gc.ca/projdb/pdf/20061113_full_report_e.pdf .

Fisheries and Oceans Canada. 2005. Tunicates Project In PEI – Rapid Response For AIS. URL: http://www.dfo-mpo.gc.ca/media/back-fiche/2005/hq-ac83a-eng.htm

Flemer, D.A., B.F. Ruth, C.M. Bundrick, G.R. Gaston. 1997. Macrobenthic community colonisation and community development in dredged material disposal habitats off coastal Louisiana. Environmental Pollution 96: 141-154.

Indest, K. J. 2003. Interim guidance on assessing the risk posed by pathogens associated with dredged material. 2003.

Lee, C.M., T.Y. Lin, C.C. Lin, G.A. Kohbodi, A. Bhatt, R. Lee, and J. A. Jay. 2006. Persistence of fecal indicator bacteria in Santa Monica Bay beach sediments. Water Research 40: 2593-2602.

Northumberland Strait Ecosystem Initiative. March 15, 2007. Working Group Report: Habitat and Resource Protection. 19 pp.

Public Works and Government Services Canada. 2007(a). Replacement Class Screening Report for Harbour Maintenance Re-dredging and Land-based Disposal of Re-dredged Sediments in Prince Edward Island. Prepared for Small Craft Harbour Authorities and Department of Fisheries and Oceans. URL: http://www.ceaa-acee.gc.ca/050/CS_Listing_e.cfm

Public Works and Government Services Canada. 2007(b). Environmental Screening Report Channel and Harbour Entrance Dredging and Disposal of Clean Dredged Material 2007-2009 Small Craft Harbours, Prince Edward Island, February 2007. Prepared for Small Craft Harbour Authorities and Department of Fisheries and Oceans.

Public Works and Government Services Canada. 2006. Environmental Screening Channel Dredge and ocean Disposal Skinners Pond Prince County, PEI, February 2006. Prepared for Department of Fisheries and Oceans.

Public Works and Government Services Canada. 2002. Multi-Site Ocean Disposal Application for Dredged Sand from Howard's Cove Channel, Fishing Cove Channel, West Point Channel, and Graham's Pond Channel. Prepared for Small Craft Harbour Authorities and Department of Fisheries and Oceans.

Seakem Oceanography Limited. 1990. Assessment of the Effects of Suspended Dredge Material on Aquaculture Organisms. Report prepared for: Environment Canada, Environmental Protection Conservation and Protection, Atlantic Region.

Stewart, J. 2009. Annual Eastern Canada Piping Plover Population Data 2009 (unpublished). Canadian Wildlife Service, Atlantic Region.

Vestal, B., A. Rieser, M. Ludwig, J. Kurland, C. Collins and J. Ortiz. 1995. Methodologies and Mechanisms for Management of Cumulative Coastal Environmental Impacts. Part I - Synthesis with Annotated Bibliography. Part II - Development and Application of a Cumulative Impacts Protocol, NOAA Coastal Ocean Program Decision Analysis Series No. 6.

Contact List:

Andrew Boyne, Head, Species at Risk Recovery Unit, Canadian Wildlife Service, Atlantic Region

Christopher Craig, Senior Program Advisor, Water Quality Monitoring program, Environment Canada, Atlantic Region

Rachel Gautreau, Environmental Assessment Biologist, Program & Planning Coordination, Canadian Wildlife Service, Atlantic Region

Emily Gregus, Environmental Assessment Scientist, Atlantic Service Centre, Parks Canada Agency

Kevin LeBlanc, Environmental Officer, Environmental Affairs, Transport Canada, Atlantic Region

Janet Fisher, Environmental Officer, Environmental Services, Public Works and Government Services, Atlantic Region

Jean-Francois Mallet, OHM Biologist, Habitat Protection and Sustainable Development, Fisheries and Oceans Canada, Gulf Region

Dale Thompson, Supervisor, Watercourse/Wetland Alteration Program, PEI Department of Environment, Energy and Forestry

APPENDIX A: DFO SCH LOCATION-SPECIFIC INFORMATION

SITE SPECIFIC INFORMATION
FOR MULTISITE EA– Covehead Harbour

Site Name:	Covehead Harbour
Dredging Timeline:	Anytime after ice-out and before freeze-up but is most common in the spring and fall
Dredging Site Location:	channel
Approximate Locations of Disposal Site:	NAD 83 46º 25.94'N 63º 08.61'W or NAD 83 46º 25.87"N 63º 08.71"W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal or mechanical excavation, side-casting
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in January 2010 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the North coast of PEI. Grain size material to be removed is predominantly sand (98%).
Benthic Habitat:	The benthic habitat at the disposal site (adjacent to the dredge area) is a mix of medium sand and rocky bottom. Fauna is dominated by amphipods, blue mussels, and polychaetes. Abundance, number of species, and diversity is low to moderate. Conditions at the adjacent dredge site and the near-shore disposal site are assumed to be similar.
Fish and Fish Habitat:	Covehead Harbour supports a large number of fish species. Dominant fish species in the area include: lobster (*Homarus americanus*), hake (*Merluccius bilinearis*), cod (*Gadus morhua*), herring (*Clupea harengus*), and mackerel (*Scomber scombrus*).
Wildlife/Migratory Birds:	Harbour seals (*Phoca vitulina*) rarely occur in the harbour area. The beaches adjacent to Covehead Channel provide important habitat to a variety of wildlife species including Piping Plovers, Arctic Terns (*Sterna paradisaea*) and Common Terns (*Sterna hirundo)*, Willets (*Catoptrophorus semipalmatus)*, Great Blue Herons (*Ardea herodias)*, as well as a variety of staging and migratory shorebirds. See next section for further details on plovers and terns. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For this area of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 7.5 to 22.49 waterfowl/km for April to June and 2.00 to 4.99 waterfowl/km for July to September.
Species at Risk/Species of Conservation Concern:	A 2008 search of the ACCDC database yielded 105 records of 65 rare vascular flora, 2 records of 2 rare nonvascular flora, 609 records of 14 rare vertebrate, and 199 records of 27 rare invertebrate fauna within 5 km of the project area. Of those records, the following species have

	habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Red-breasted Merganzer (*Mergus serrator*) – listed as S2B,S5M by the ACCDC • American Golden-Plover (*Pluvialis dominica*) – listed as S3N by the ACCDC • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA • Whimbrel (*Numenius phaeopus*) – listed as S3N by the ACCDC • Hudsonian Godwit (*Limosa haemastica)*- listed as S2N by the ACCDC • Red Knot (*Calidris canutus)* – listed as Endangered by COSEWIC • White-rumped Sandpiper (*Calidris fuscicollis)* - listed as S3S4N by the ACCDC • Pectoral Sandpiper (*Calidris melanotos)* – listed as S2N by the ACCDC • Common Tern (*Sterna Hirundo*) – listed as S3B by the ACCDC • Arctic Tern (*Sterna paradisaea*) – listed as S1?B by the ACCDC • Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum)* – listed as Threatened on Schedule 1 of SARA • Sea-Side Dock (*Rumex maritimus)* – listed as Special Concern by COSEWIC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the species listed above. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. However, as a precautionary measure, the Red Knot and Piping Plover, and terns are examined more closely below and/or in Section 5 of the EA report. Covehead Beach (west side of the harbour) is an important breeding area for Piping Plover and is regularly the location of a breeding colony of Artic and Common Terns. Plovers were recorded as recently as 2009 (CWS, 2009) and nesting sites are monitored on a daily basis by the Parks Canada Agency. Covehead Beach has also been identified as critical habitat in the draft Piping Plover Recovery Strategy.
Environmentally Significant Areas:	The ACCDC database scan identified 3 Managed Areas with some degree of protected status, in the vicinity of the study area: Covehead and Marshalls Ducks Unlimited Areas, and PEI National Park. The Marshalls Ducks Unlimited Area is within 5 km of the project area, but is too far away to be directly affected by project activities.
Transportation and Navigation:	The harbour is usually open to navigation from April 15 to December

SITE SPECIFIC INFORMATION
FOR MULTISITE EA– Covehead Harbour

	15 and experiences the highest boating activity during mid April to the second week in September.
Harbour Uses:	The harbour has been developed to serve the general fishing industry and includes storage sheds for equipment associated with the fishing industry. Covehead Harbour serves recreational users, as well as users from the National Park. Tourism is one of the main activities at the harbour. There are 6 boats used in the harbour for chartered tours.
Commercial Fishing and Aquaculture	Herring are known to use the near-shore areas on both sides of the navigation channel. The herring fishery opens on August 15 each year and closes when quotas are reached. American lobster and rock crab are found in the project area. The commercial fishing seasons for these species are August 9 to October 10 (Rock crab [*Cancer irroratus*]) and April 30 to June 30 (lobster). The nearest aquaculture site, located inside Covehead Bay, is almost 2 km away so it is unlikely to be directly affected by project activities.

COVEHEAD HARBOUR
Queens County, PEI

AERIAL PHOTO

Covehead Harbour Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Darnley Basin

Site Name:	Darnley Basin
Dredging Timeline:	Most common in the spring and fall
Dredging Site Location:	channel
Approx. Location of Disposal Site:	NAD 83 46º 33.70'N 63º 41.80'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	15,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in January 2010 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the north western coast of PEI. Grain size material to be removed is predominantly sand (97%).
Benthic Habitat:	The benthic habitat at the disposal site is predominantly fine sand, with some medium to coarse sand and occasional rocks and shells. Fauna is dominated by young surf clams, polychaetes, and tanaids. Abundance is moderate, and similar conditions are assumed to be present at the nearby dredge location.
Fish and Fish Habitat:	There are no known fish or fish habitat present in the project area.
Wildlife/Migratory Birds:	The DFO Traditional Fishery Mapping did not reveal any marine mammals at this location. The area surrounding the dredge/disposal site is also within a Ramsar site that provides important habitat for a range of wildlife species including, but not limited to sea ducks, waterfowl, Great Blue Herons (*Ardea herodias*), terns and shorebirds. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For the north west coast of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 7.5 to 22.4 waterfowl/km for April to June, 0.50 to 1.994 waterfowl/km for July to September and 7.00 to 13.99 waterfowl/km for October to December.
Species at Risk/Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 38 records of 23 rare vascular flora, 18 records of 9 rare vertebrate fauna, and 1 record of a rare invertebrate fauna species within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Wood Duck (*Aix sponsa*) – listed as S3S4B,S5N by the ACCDC • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA • Hudsonian Godwit (*Limosa haemastica)*- listed as S2N by the ACCDC • Common Tern (*Sterna Hirundo*) – listed as S3B by the ACCDC • Angelica (*Angelica lucida*) – listed as S1 by the ACCDC • Sea-Chickweed (*Honckenya peploides ssp. robusta*) – listed as S2S3 by

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Darnley Basin

	• Purple Sandspurry (*Spergularia salina*) – listed as S3? by the ACCDC • Pit-Seed Goosefoot (*Chenopodium berlandiere var. macrocalycium*) – listed as S1? by the ACCDC • American Sea-Blite (*Suaeda calceoliformis*) – listed as S1? by the ACCDC • Sand-Heather (*Hudsonia tomentosa*) – listed as S3 by the ACCDC • Beach Pinweed (*Lechea maritima var. subcylindrica*) – listed as Special Concern by COSEWIC • Bearberry (*Arctostaphylos uva-uris*) – listed as S3 by the ACCDC • American Germander (*Teucrium canadense)* – listed as S1S2 by the ACCDC • Sea-Side Dock (*Rumex maritimus)* – listed as Special Concern by COSEWIC • Small Eyebright (*Euphrasia randii*) – listed as S1? by the ACCDC • Dwarf Juniper (*Juniperus communis var. depressa*) – listed as S3? by the ACCDC • Emmons Sedge (*Carex albicans var. emmonsii*) – listed as S3S4 by the ACCDC • Shaved Sedge *(Carex tonsa*) – listed as S2S3 by the ACCDC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the plant species listed above. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. Impacts to seabirds, shorebirds and waterfowl in general are further assessed in the EA report. As a precautionary measure, the endangered Piping Plover are examined more closely below and in the EA report: The Piping Plover uses the beaches of Cabot Provincial Park (west side of the channel) and Darnley Point (east side of the channel) as a breeding area. Piping Plovers have been recorded at Darnley Point as recently as 2009 (CWS, 2009). Darnley Point has also been identified as critical habitat in the draft Piping Plover Recovery Strategy.
Environmentally Significant Areas:	Three managed areas with some degree of protected status occur in the vicinity of the project area: Malpeque Bay Ramsar site, Cabot Beach and Cabot Park Natural Area.
Harbour Uses:	The primary activities that occur in this region include fishing, aquaculture and tourism. Darnley Basin Channel borders along Cabot Provincial Park and Darnley Point beaches. Cabot Provincial Park is a heavily used area and important for tourism. Darnley Point is also well used although mostly frequented by north shore cottagers.
Commercial Fishing and Aquaculture	Lobsters (*Homarus americanus*) are found in the fishing grounds immediately outside the harbour entrance. Hake (*Merluccius bilinearis*), cod (*Gadus morhua*), herring (*Clupea harengus*) and mackerel (*Scomber scombrus*) are fished exclusively offshore.

	Shellfish leases are located 250 m southeast of the channel entrance. This disposal site however has been successfully used over the past few years with little concern from the aquaculture industry. It can be assumed that dredged material settles rapidly and does not migrate to the aquaculture sites.

DARNLEY BASIN
(MALPEQUE HARBOUR)
Prince County, PEI

AERIAL PHOTO

Darnley Basin Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Fishing Cove Harbour

Site Name:	Fishing Cove Harbour
Dredging Timeline:	Most common in the spring and fall
Dredging Site Location:	channel entrance
Approx. Location of Disposal Site:	NAD 83 46º 23.10'N 64º 07.95'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal or mechanical excavation, side-casting
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in December 2006 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the west coast of PEI. Grain size material to be removed is predominantly sand (97%).
Benthic Habitat:	The benthic habitat at the disposal site is a mix of sand and gravel. Fauna is dominated by gastropods, bivalves and bryozoan colonies. Abundance is rated as moderate for the number of species and moderate to high for diversity and evenness. Marine worms and shellfish are the dominant fauna and eel grass is present on the finer substrate.
Fish and Fish Habitat:	Fishing Cove area supports a large number of fish species. Dominant fish species in the area include: lobster (*Homarus americanus*), winter flounder (*Pseudopleuronectes americanus*), rock crab (*Cancer irroratus*), cod (*Gadus morhua*), scallop (*Placopecten magellanicus*), herring (*Clupea harengus*), and mackerel (*Scomber scombrus*).
Wildlife/Migratory Birds:	Harbour Seals (*Phoca vitulina*) rarely occur in the harbour area. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For this area of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.3 to 2.49 waterfowl/km for April to June and 2.00 to 4.99 waterfowl/km for July to September.
Species at Risk/ Species of Conservation Concern:	A 2008 search of the ACCDC database yielded 5 records of 1 rare vertebrate and 2 records of 2 rare invertebrate fauna within 5 km of the project area. Of those records, only the Piping Plover [(*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA] has habitat requirements that may potentially overlap with coastal activity such as maintenance dredging. Plover presence however has only been recorded at the Maximeville Beach area which is > 2km from Fishing Cove Harbour and is therefore not considered further in the EA report.
Environmentally Significant	There are no designated environmentally significant areas within

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Fishing Cove Harbour

Areas:	Fishing Cove Harbour.
Transportation and Navigation:	The harbour is usually open to navigation from April 15 to December 15 and experiences the highest boating activity during late April to the end of May.
Harbour Uses:	There are no known activities other than commercial fishing and boating that occur in the assessment area.
Commercial Fishing and Aquaculture	In the immediately adjacent waters of Egmont Bay, there are lobster and winter flounder fishing grounds. Rock crab, cod, scallop, herring and mackerel fishing grounds are located 5 km from the project area and are therefore not anticipated to be impacted by activities. There are no shellfish leases in the adjacent waters of Fishing Cove.

FISHING COVE HARBOUR
Prince County, PEI

AERIAL PHOTO

Fishing Cove Harbour Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Grahams Pond

Site Name:	Grahams Pond Harbour
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	entrance channel
Approx. Location of Disposal Site:	NAD 83 46º 05.69'N 62º 27.13'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in February 2009 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the southeast coast of PEI. Grain size material to be removed is predominantly sand (98%).
Benthic Habitat:	Sediment samples taken in 2001 indicate that the benthic habitat at the disposal site is predominantly sand (98%). Fauna was dominated by bivalves and gastropods. Compared to typical values for biological community measures of marine infauna surveys presented in Stewart et al. (1999), the sites would be rated low to moderate for abundance and moderate for diversity and evenness. The bivalves were predominantly represented by clams and mussels. Polychaetes, crustaceans and bryozoans were also found.
Fish and Fish Habitat:	Grahams Pond Harbour area supports a large number of fish species. Dominant fish species in the area include: lobster (*Homarus americanus*), rock crab (*Cancer irroratus*), and herring (*Clupea harengus*).
Wildlife/Migratory Birds:	The DFO Traditional Fishery Mapping did not reveal any marine mammals in the vicinity of the harbour. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For the east coast of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.03 to 2.49 waterfowl/km for April to June, 2.00 to 4.99 waterfowl/km for July to September and 3.50 to 6.99 waterfowl/km for October to December.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 11 records of 10 rare vascular flora, 4 records of 4 rare vertebrate, and 2 records of 2 rare invertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Red-breasted Merganzer (*Mergus serrator*) – listed as S2B,S5M by the ACCDC • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA • Cockle Bur (*Xanthium strumarium var. canadense*) – listed as

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Grahams Pond

	• Seaside American-Aster [*Symphyotrichum subulatum* (Bathurst population)] – listed as S1 by the ACCDC • Purple Sandspurry (*Spergularia salina*) – listed as S3? by the ACCDC • Tropical Saltbush (*Atriplex littoralis*) – listed as S2S3SE by the ACCDC • Sea-Side Dock (*Rumex maritimus)* – listed as Special Concern by COSEWIC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the species listed above. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. Piping Plovers in particular (as well as terns) have been recorded in the area at Poverty Beach, however this is approximately 4 km away from the project site, and thus not considered further in the EA report.
Environmentally Significant Areas:	In addition to the Poverty Beach Natural Area (PID 251561), Panmure Island Provincial Park is located within 5 km of the project area.
Transportation and Navigation:	Grahams Pond harbour is free of ice from approximately April 15 to December 15 and experiences the highest boating activity during the months of May and June.
Harbour Uses:	Grahams Pond is a very active harbour, with fish processing facilities that support approximately 100 fishing vessels. Both commercial fishing and recreational boating activities occur in the general area.
Commercial Fishing and Aquaculture	The waters directly adjacent to the project area at Grahams Pond do not contain any aquaculture or fishing areas. Further offshore (1 km) there are lobster and rock crab fishing grounds and areas associated with herring migration.

GRAHAMS POND HARBOUR
Kings County, PEI

AERIAL PHOTO

Grahams Pond Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Hardys Channel

Site Name:	Hardys Channel
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	channel
Approx. Location of Disposal Site:	NAD 83 46º 39.09'N 63º 51.54'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in January 2008 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the north west coast of PEI. Grain size material to be removed is predominantly sand (99%).
Benthic Habitat:	Benthic conditions have been described as predominantly sand with lesser amounts of clay and silt. Gravel has not been detected in samples collected for the area. Ratings developed by Stewart et al. (1999) classified species density and biomass as low to moderate. Number of species and species diversity were also low to moderate.
Fish and Fish Habitat:	Fishing grounds for lobster (*Homarus americanus*), rock crab (*Cancer irroratus*), and herring (*Clupea harengus*) are located immediately adjacent to Hardys Channel in the Gulf of St. Lawrence. Several different species are fished in the offshore waters including: • toad crab (*Hyas araneus*), • hake (*Merluccius bilinearis*) • cod (*Gadus morhua*) • winter flounder (*Pseudopleuronectes americanus*) • mackerel (*Scomber scombrus*)
Wildlife/Migratory Birds:	The DFO Traditional Fishery Mapping did not reveal any marine mammal records for this location. The project area is located within and adjacent to a Ramsar site that is extremely important to many wildlife species including, but not limited to, seaducks, waterfowl, Great Blue Herons (*Ardea herodias)*, terns, and shorebirds. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For the north west coast of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 7.5 to 22.4 waterfowl/km for April to June, 0.50 to 1.994 waterfowl/km for July to September and 7.00 to 13.99 waterfowl/km for October to December.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 28 records of 24 rare vascular flora, 4 records of 3 rare vertebrate fauna and 1 record of 1

	rare invertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Red-breasted Merganzer (*Mergus serrator*) – listed as S2B,S5M by the ACCDC • Common Tern (*Sterna hirundo*) – listed as S3B by the ACCDC • Purple Sandspurry (*Spergularia salina*) – listed as S3? by the ACCDC • Frankton's Saltbush (*Atriplex franktonii*) – listed as S1S2 by the ACCDC • Sand-heather (*Hudsonia tomentosa*) - listed as S3 by the ACCDC • Beach Pinweed (*Lechea maritima var. subcylindrica*) – listed as Special Concern by COSEWIC • Rock Crowberry (*Empetrum eamesii*) – listed as S2? by the ACCDC • Bearberry (*Arctostaphylos uva-ursi*) – listed as S3 by the ACCDC • Seaside Spurge (*Chamaesyce polygonifolia*) – listed as S2 by the ACCDC • American Groundnut (*Apios americana*) – listed as S1 by the ACCDC • American Germander (*Teucrium canadense)* – listed as S1S2 by the ACCDC • Seabeach Dock (*Rumex pallidus*) - listed as S1? by the ACCDC • Creeping Juniper (*Juniperus horizontalis*) – listed as S3S4 by the ACCDC • Shaved Sedge (*Carex tonsa*) – listed as S2S3 by the ACCDC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the species listed above. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. Impacts to waterfowl and seabirds in general are addressed in the EA report. Terns are discussed further below. Hog Island, Conway Sand Hills, and Cascumpec Sand Hills are used as breeding and nesting grounds for the endangered Piping Plover, and have been identified as critical habitat in the draft Piping Plover Recovery Strategy. In addition, terns were historically known to use these islands, and could continue to do so if habitat conditions are still appropriate. Terns and the Piping Plover are discussed further in the EA Report.
Environmentally Significant Areas:	The GIS scan (ACCDC database) identified one Managed Area (Malpeque Bay Ramsar site) with some degree of protected status, in the vicinity of the study area.
Harbour Uses:	Fishing and tourism are the only two known human activities at the project site.

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Hardys Channel

Commercial Fishing and Aquaculture	Fishing grounds for lobster, rock crab, and herring are located immediately adjacent to Hardys Channel in the Gulf of St. Lawrence. Several different species are fished in the offshore waters including toad crab, hake, cod, winter flounder and mackerel. Bar clams are harvested near the harbour and outside of Hardys Channel. The nearest shellfish leases are located to the north, within the Conway Narrows, a few km from both the dredge and disposal sites.

Hardys Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Howards Cove

Site Name:	Howards Cove Harbour
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	entrance channel
Approx. Location of Disposal Site:	NAD 83 46º 44.30'N 64º 22.80'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in December 2006 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the west coast of PEI, and empties into the Northumberland Strait. Grain size material to be removed is predominantly sand (98%).
Benthic Habitat:	Stewart et al. (1999) described the benthic habitat at the disposal site as coarse to medium sand and cobble, with occasional shells and algal debris. The fauna was dominated by amphipods and polychaetes, but no single species was abundant. Abundance, number of species and diversity were low to moderate.
Fish and Fish Habitat:	Howards Cove harbour supports a large number of fish species. Dominant fish species in the area include: • lobster (*Homarus americanus*) • rock crab (*Cancer irroratus*) • herring (*Clupea harengus*)
Migratory Birds:	Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For the West coast of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.03 to 2.49 waterfowl/km for April to June, 0.01 to 0.49 waterfowl/km for July to September and 0.01 to 3.49 for October to December.
Species at Risk/ Species of Conservation Concern:	A 2008 search of the ACCDC database yielded 63 records of 24 rare vascular flora, and 9 records of 4 rare vertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Shaved Sedge (*Carex tonsa*) – listed as S2S3 by the ACCDC • Knotted Rush (*Juncus nodosus*) – listed as S3S4 by the ACCDC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the species listed above. Any

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Howards Cove

	land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes.
Environmentally Significant Areas:	The Cedar Dunes Provincial Park and Natural Area (PIDs 85266 and 45617) are located within 5 km of Howards Cove Harbour and considered significant for reasons of ecosystem values. The ACCDC has identified the Haliburton Ironwood Natural Area within 5 km of the proposed project.
Transportation and Navigation:	Howards Cove harbour is free of ice from approximately April 20 to December 20 and experiences the highest boating activity during April to June and August to the second week in October.
Harbour Uses:	Howards Cove is a very active harbour supporting ~ 45 fishing vessels and fish processing facilities. Both commercial fishing and recreational boating activities occur in the assessment area.
Commercial Fishing and Aquaculture	In the adjacent waters of the Northumberland Strait (1 to 2.5 km offshore), there are lobster and rock crab fishing grounds. Herring spawning areas are located 500 m from Howards Cove, and spawning occurs from mid-April to mid-May. There are no shellfish leases in the adjacent waters of Howards Cove.

HOWARDS COVE HARBOUR
Prince County, PEI

AERIAL PHOTO

Howards Cove Entrance Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Launching Pond[1]

Site Name:	Launching Pond Harbour
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	entrance channel
Approx. Location of Disposal Site:	NAD 83 46º 13.13'N 62º 24.65'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	15,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in October 2006 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the eastern shore of PEI along Boughton Bay, exiting into the Gulf of St. Lawrence. Grain size material to be removed is 99% sand.
Benthic Habitat:	The benthic conditions were described by Stewart et al. (1999) as hard-packed red sand containing occasional rocks and pebbles. Abundance, number of species, diversity, and biomass were low. This is likely attributed to sediment instability due to wave exposure (Stewart et al., 1999).
Fish and Fish Habitat:	Launching Pond harbour supports a large number of fish species. Dominant fish species in the area include: • lobster (*Homarus americanus*) • herring (*Clupea harengus*) • scallop (*Placopecten magellanicus*) • hake (*Merluccius bilinearis*) • winter flounder (*Pseudopleuronectes americanus*) • rock crab (*Cancer irroratus*) • mackerel (*Scomber scombrus*) • American plaice (*Hippoglossoides platessoides*), • Cod (*Gadus morhua*) • Bluefin Tuna (*Thunnus thynnus*)
Wildlife/Migratory Birds:	Harbour Seals (*Phoca vitulina*) have been identified rarely occurring in the harbour area Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly.

[1] This information is taken from the February 2007 report entitled: *Harbour Channel Re-Dredging and Disposal of Clean Dredged Material at Sea – Launching Pond Harbour SCH, King's County, Gulf Region PEI*

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Launching Pond[1]

	For this area of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.3 to 2.49 waterfowl/km for April to June, 0.50 to 1.99 waterfowl/km for July to September and 3.50 to 6.99 waterfowl/km for October to December.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 2 records of 2 rare vascular flora, and 12 records of 10 rare vertebrate, 6 records of 5 rare invertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Great Cormorant (*Phalacrocorax carbo*) – listed as S3B by the ACCDC • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA • Whimbrel (*Numenius phaeopus*) – listed as S3N by the ACCDC • Common Tern (*Sterna Hirundo*) – listed as S3B by the ACCDC • Black Guillemot (*Cepphus grille*) – listed as S2B by the ACCDC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the species listed above, with the exception of the Black Guillemot. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. In terms of the Black Guillemot, this particular record is fairly dated, however impacts to seabirds in general are considered further in the EA report
Environmentally Significant Areas:	The Boughton Island Natural Area is considered significant for reasons of ecosystem values and is listed as critical habitat in the proposed Piping Plover Recovery Strategy. It is however 5km from the project and considered unlikely to interact. The ACCDC has identified the Black Creek Ducks Unlimited Area within 5 km of the proposed project.
Transportation and Navigation:	Launching Pond harbour is free of ice from approximately March 1 to December 31 and experiences the highest boating activity during mid April to mid July.
Harbour Uses:	The harbour serves mainly commercial fishing and some recreational users. There are no fish processing plants at the harbour, however there is one lobster holding facility and facilities used for fishing gear storage and fish hauling
Commercial Fishing and Aquaculture	There are approximately 53 commercial fishing vessels operating out of the harbour with minimal recreational use. Fisheries at this harbour include: • lobster (May and June) • herring (end of August until mid-September) • scallops (November 1 until December 15)

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Launching Pond[1]

	• tuna (July 15 until mid-October) There are mussel boats (four vessels) that use Launching Pond Harbour and the aquaculture lease sites are located approximately 6-8 km from the wharf.

LAUNCHING POND HARBOUR
Kings County, PEI

AERIAL PHOTO

Launching Pond Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Naufrage[2]

Site Name:	Naufrage
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	entrance channel
Approx. Location of Disposal Site:	NAD 83 46º 28.11'N 62º 24.85'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal or mechanical excavation, side-casting
Quantity of Dredged Material:	20,000 m^3
Quality of Dredged Material:	Analytical sampling was conducted in January 2008 and indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the north shore of PEI. Grain size material to be removed in Naufrage is predominantly sand (98%).
Fish and Fish Habitat:	In the immediate adjacent waters of the Gulf of St. Lawrence there are lobster (*Homarus americanus*) and rock crab (*Cancer irroratus*) fishing grounds. Toad crab (*Hyas araneus*) fishing grounds are located between 5 and 10 km offshore Naufrage and winter flounder (*Pseudopleuronectes americanus*) fishing grounds are 10 km offshore. Areas associated with herring (*Clupea harengus*) and mackerel (*Scomber scombrus*) are located 1 and 5 km offshore respectively.
Migratory Birds:	Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For this area of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.01 to 0.49 waterfowl/km for July to September and 0.01 to 3.49 waterfowl/km for October to December.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 3 records of 3 rare vascular flora, and 7 records of 7 rare vertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Wood Duck (*Aix sponsa*) – listed as S3S4B,S5N by the ACCDC • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA According to CWS (2009) Piping Plovers were last observed in the area in 2003.

[2] This information is taken from the September 2006 report entitled: *Environmental Screening Report, Harbour Entrance Re-Dredging (3-Year Period) – Naufrage Harbour SCH, King's County, PEI*

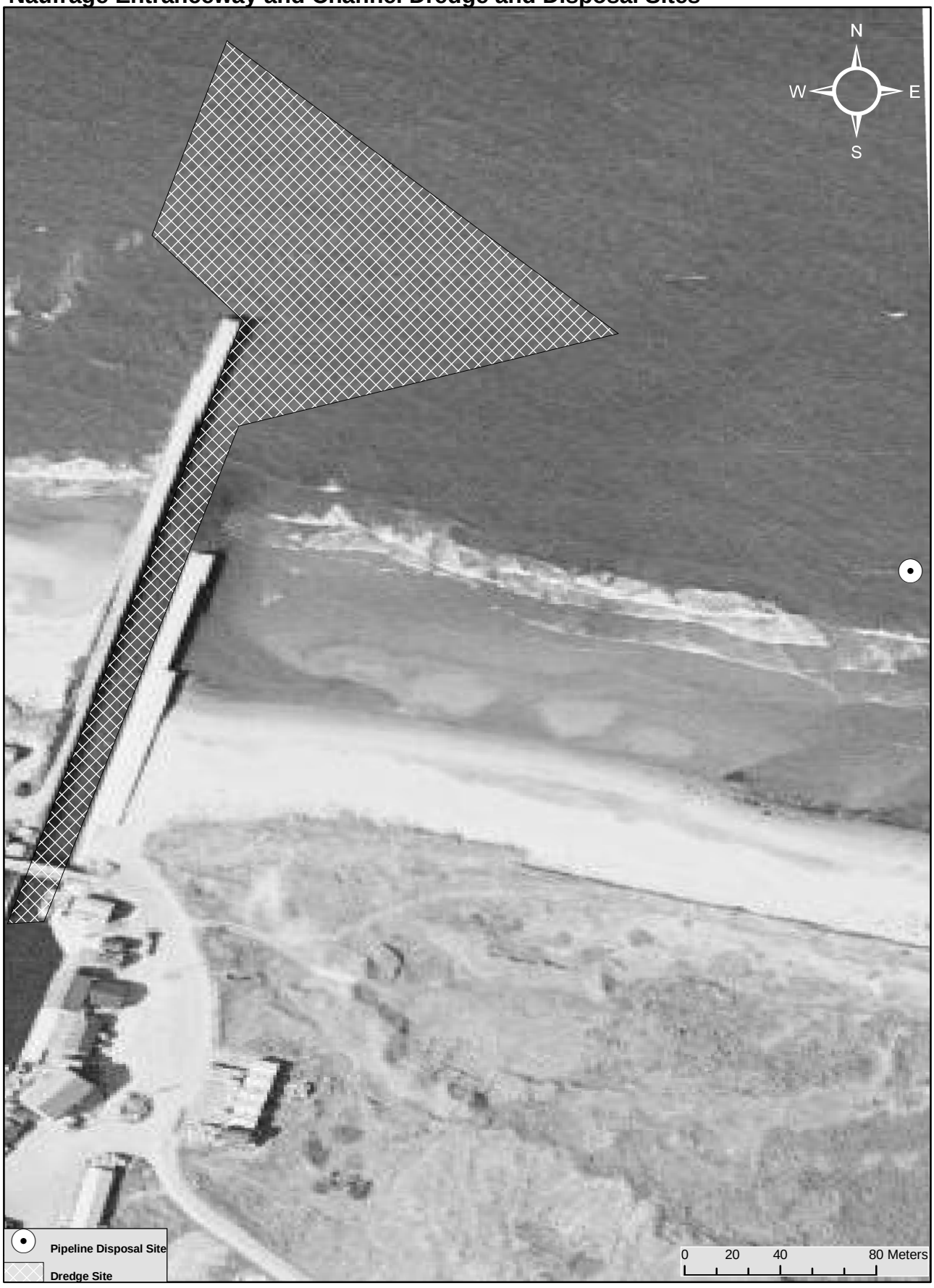
SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Naufrage[2]

	The shoreline at Naufrage has also been identified as critical habitat in the draft Piping Plover Recovery Strategy. The Piping Plover and waterfowl in general are addressed further in the EA report.
Environmentally Significant Areas:	The GIS scan (ACCDC database) identified 2 Managed Areas with some degree of protected status, in the vicinity of the study area: Clearsprings Ducks Unlimited Area and the Naufrage River Natural Area.
Harbour Uses:	The harbour serves mainly commercial fishing and some recreational users. There are no fish processing plants, aquaculture operations or aquaculture leased sites at or near the harbour, however there are facilities used for fishing gear storage and fish hauling.
Commercial Fishing and Aquaculture	There are approximately 100 commercial fishing vessels operating out of the harbour with minimal recreational use. Fisheries at this harbour include: • lobster (May and June) • tuna (August until early fall). There is also herring and mackerel fishing at this harbour location.

NAUFRAGE HARBOUR
Kings County, PEI

AERIAL PHOTO

Naufrage Entranceway and Channel Dredge and Disposal Sites



SITE SPECIFIC INFORMATION
FOR MULTISITE EA – North Lake

Site Name:	North Lake Harbour
Dredging Timeline:	Spring to early summer and if required, during the late summer/fall due to the dynamic nature of the shorelines and the frequency and severity of storms in the area.
Dredging Site Location:	entrance channel
Approx. Location of Disposal Sites:	NAD 83 46º 28.15'N 62º 03.70'W & 46º 28.10'N 62º 03.73' W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal or mechanical dredging, loading to trucks, and dumping in the inter-tidal zone
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in 2009 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the north eastern coast of PEI. Grain size material to be removed in North Lake Harbour is predominantly sand (98%).
Benthic Habitat:	The benthic conditions were described by Stewart et al. (1999) as fine, hard-packed sand containing occasional rocks and organic debris. There were no dominant or regularly present species. A total of twelve species occurred between the stations. Low abundance, number of species, diversity, and biomass were attributed to sediment instability due to wave exposure.
Fish and Fish Habitat:	North Lake Harbour supports a large number of fish species, crustaceans, molluscs and marine plants. Dominant fish species in the area include: • herring (*Clupea harengus*) • cod (*Gadus morhua*) • winter flounder (*Pseudopleuronectes americanus*) • hake (*Merluccius bilinearis*) • mackerel (*Scomber scombrus*) Crustaceans and shellfish in the area include: • lobster (*Homarus americanus*) • rock crab (*Cancer irroratus*) • toad crab (*Hyas araneus*)
Wildlife/Migratory Birds:	The DFO Traditional Fishery Mapping did not reveal any records of marine wildlife in the vicinity of the harbour. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [(*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For this area of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.03 to 2.49 waterfowl/km for April to June, 2.00 to 4.99 waterfowl/km for July to September, and 0.01 to 3.49 waterfowl/km for October to December.

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – North Lake

Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 62 records of 45 rare vascular flora and 5 records of 5 rare vertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Great Cormorant (*Phalacrocorax carbo*) – listed as S3B by the ACCDC • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA • Pondshore Knotweed (*Polygonum raii*) – listed as S1? by the ACCDC • Sea-side Dock (*Rumex maritimus*) – listed as S2S3 by the ACCDC • Mudwort (*Limosella australis*) – listed as S3 by the ACCDC • Dwarf Juniper (*Juniperus communis var. depressa*) – listed as S3? by the ACCDC There are two alternatives for dredging and disposal at North Lake. The first relies on floating equipment and shallow water disposal, therefore presenting no opportunity for interaction with the plant species listed above. The second option involves mechanical dredging from the existing breakwater structure, and loading the material onto trucks to be dumped in the intertidal zone. The trucks will use an existing access point just adjacent to the breakwater and will dispose dredged material in a small part of the intertidal zone located between the breakwater and the access point. Given the routing and spatial restrictions imposed, it is unlikely that these activities would interact with the plant species listed above and this issue will not be considered further in the assessment. The Piping Plover records in the ACCDC database are from East Lake. East Lake has been identified as critical habitat in the draft Piping Plover Recovery Strategy; however it is approximately 4 km away from the dredge/disposal sites and is therefore not considered further in the assessment. Seabirds in general however are discussed in more detail in the EA report.
Environmentally Significant Areas:	Designated areas near North Lake Harbour are East Lake, including Dunes PID 111351, 110783, 110791, 433490, and 813428. The ACCDC has identified the East Lake Natural Area, North Lake Natural Area, North Lake Ducks Unlimited Area and South Lake Sand Dunes Natural Area within 5 km of the proposed project.
Transportation and Navigation:	According to the Atlas of Canada, the harbour is usually open to navigation from April 1 to January 15.
Harbour Uses:	Fishing and tourism comprise the only two known human activities that take place at this location.
Commercial Fishing and Aquaculture	Fishing grounds for lobster and rock crab are located immediately adjacent to North Lake Harbour in the Gulf of St. Lawrence. Toad crab, hake, plaice (*Hippoglossoides platessoides*), cod, winter

	flounder, herring and mackerel are fished in the offshore waters of the area. There are no fish or fish habitat in the dredging area. Fisheries at this harbour include: • lobster (May to July) • tuna (July to September) • rock crab (July to October) • toad crab (July to September) • herring (spring and fall) • mackerel (July and late October)

NORTH LAKE HARBOUR
Kings County, PEI

AERIAL PHOTO

North Lake Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Savage Harbour[3]

Site Name:	Savage Harbour
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	entrance Channel
Approx. Location of Disposal Site:	NAD 83 46º26.04'N 62º49.62'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in April 2007 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the northern coast of PEI. Grain size of material to be removed is predominantly sand (98%).
Benthic Habitat:	The proposed disposal site is shallow (1-2 m) over rippled hard sand bottom which contains medium sand shell debris, and occasional rocks and pebbles. The fauna is dominated by the polychaete *Paraonis fulgens* and the cumacean *Mancocuma stellifera*. Abundance, a number of species, diversity, and biomass was determined to be low and uniform (Stewart et. al., 1999).
Fish and Fish Habitat:	Discussions with DFO-Oceans and Habitat on January 31, 2007 did not reveal fish habitat concerns with this redredging and ocean disposal operation.
Widlife/Migratory Birds:	The DFO Traditional Fishery Mapping did not reveal any records of marine mammals at this location. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For this area of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.03 to 2.49 waterfowl/km for April to June, 0.50 to 1.99 waterfowl/km for July to September, and 0.01 to 3.49 waterfowl/km for October to December.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 11 records of 10 rare vascular flora, and 12 records of 7 rare vertebrate fauna, 1 record of 1 rare invertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA • Common Tern (*Sterna hirundo)* – listed as S3B by the ACCDC

[3] This information is taken from the April 2007 report entitled: *Environmental Screening Report, Harbour Entrance Channel Redredging and Disposal of Clean Dredged Material at Sea, Savage Harbour, Kings County, PEI DFO SCH*

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Savage Harbour[3]

	According to CWS (2009), plovers have nested at Pigot's Pond to the west of the entrance as recently as 2009 and Pigot's Pond is listed as critical habitat in the draft Piping Plover Recovery Strategy. The Piping Plover and terns in general are addressed further in the EA report.
Environmentally Significant Areas:	Crowbush Ducks Unlimited Area, Mt. Stewart Marsh Eastern Habitat Joint Venture (EHJV), Pisquid River EHJV and Savage Harbour Natural Area were identified by the ACCDC (2007).
Harbour Uses:	Commercial fishing/shellfish aquaculture and recreational boating activities occur in the assessment area. The seasonal lobster and crab fisheries play an important role in the economy for this small fishing community.
Commercial Fishing and Aquaculture	At the entrance to Savage Harbour (approximately 2 km from the work site) there are fishing grounds for lobster (*Homarus americanus*) and rock crab (*Cancer irroratus*). Mackerel (*Scombler scombrus*) and cod (*Gadus morhua*) fishing grounds can be found at 5 km and at 2 km from savage harbour there are herring (*Clupea harengus*) fishing grounds. The lobster fishery operates from May to June whereas tuna fisheries operate from August to September. Herring fisheries operate in the summer and mackerel fisheries operate in the summer/fall. There is a small groundfish fishery managed by DFO operating outside of the harbour. Mussel and oyster leases are also common in Savage Harbour with the closest lease located approximately 825 m from the dredge/disposal area.

SAVAGE HARBOUR
Queens County, PEI

AERIAL PHOTO

Savage Harbour Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Skinners Pond

Site Name:	Skinners Pond Harbour
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	channel
Approx. Location of Disposal Site:	NAD 83 46º 57.84'N 64º 07.78'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in 2009 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the west coast of PEI. Grain size of material to be removed is predominantly sand (97%).
Benthic Habitat:	In the project area, surrounding sediments are typically reworked sand and gravel. The marine sediment consists of sand with small amounts of silt and clay. The disposal site for Skinners Pond Harbour is located in a shallow-water, high-energy, sandy environment, as confirmed by the sediment sampling results, in the predominant direction of sediment transport. The disposed dredge material is typically reformed by the summer tidal events and reshaped by the natural transport of marine sediment along the shoreline.
Fish and Fish Habitat:	Skinner's Pond Harbour supports a large number of fish species, crustaceans, mollusks and marine plants. Dominant fish species in the area include: • cod (*Gadus morhua*) • herring (*Clupea harengus*) • plaice (*Hippoglossoides platessoides*) • winter flounder (*Pseudopleuronectes americanus*) • hake (*Merluccius bilinearis*) • gaspereau (*Alosa pseudoharengus*) • mackerel (*Scomber scombrus*) Crustaceans and shellfish in the area include: • lobster (*Homarus americanus*) • rock crab (*Cancer irroratus*) • scallops (*Placopectin magellanicus*)
Wildlife/Migratory Birds:	The DFO Traditional Fishery Mapping did not reveal any marine wildlife in the vicinity of the harbour Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For the West coast of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.03 to 2.49 waterfowl/km for April to June, 0.01 to 0.49 waterfowl/km for July to September and 0.01 to 3.49 for October to December.

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Skinners Pond

Species at Risk/ Species of Conservation Concern:	A 2008 search of the ACCDC database yielded 39 records of 31 rare vascular flora, and 6 records of 5 rare vertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Piping Plover (*Charadrius melodus*) – listed as Endangered on Schedule 1 of SARA • Canada Sand-Spurry (*Spergularia canadensis*) – listed as S3? by the ACCDC • Seaside Spurge (*Chamaesyce polygonifolia*) – listed as S2 by the ACCDC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the plant species listed above. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. In terms of the Piping Plover specifically, the record above is from 1986. Since then, sightings have only been recorded at Nail Pond, which is located 6 km from the SCH site and is therefore not a concern.
Environmentally Significant Areas:	The ACCDC has identified the Nail Pond Natural Area in the vicinity of the study area.
Transportation and Navigation:	According to the Atlas of Canada, the harbour is usually open to navigation from April 1 to January 15.
Harbour Uses:	There are no known activities other than those related to commercial fishing and boating that occur in the assessment area at Skinners Pond.
Commercial Fishing and Aquaculture	In the adjacent waters of the Northumberland Strait (1 to 2.5 km offshore), there are lobster and rock crab fishing grounds. Further offshore, there are areas associated with scallops, herring, mackerel, and groundfish. Herring spawning areas are located between 1and 5 km from Skinners Pond, and spawning occurs from mid-April to mid-May. There are no shellfish leases in the adjacent waters of Skinners Pond. Irish moss grows and is harvested in the waters near Skinners Pond Harbour, however no conflict with dredging and disposal activity has been reported to date.

SKINNERS POND HARBOUR
Prince County, PEI

AERIAL PHOTO

Skinners Pond Entrance Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – St. Peter's Bay[4]

Site Name:	St. Peter's Bay
Dredging Timeline:	Most common in the spring and fall
Dredging Site Location:	Entrance channel
Approx. Location of Disposal Site:	NAD 83 46º 26.983'N 62º 43.579'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal or mechanical excavation, side-casting
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in 2009 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the north eastern coast of PEI. Grain size material to be removed is predominantly sand (97 %).
Benthic Habitat:	Benthic conditions were described as predominantly sand. Polychaetes and copepods were the dominant species found at the different stations. Abundance was low to moderate, with the total number of species classified as low (ratings developed by Stewart et al. 1999). Species diversity was uniformly low between stations.
Fish and Fish Habitat:	There are no known fish or fish habitat at the dredge location.
Wildlife/Migratory Birds:	The DFO Traditional Fishery Mapping did not reveal any records of marine mammal species at this location. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For this area, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 2.5 to 7.49 waterfowl/km for April to June, 2.00 to 4.99 waterfowl/km for July to September and 3.50 to 6.99 waterfowl/km for October to December.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database yielded 103 records of 85 rare vascular flora, 12 records of 6 rare vertebrate fauna and 15 records of 14 rare invertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Piping Plover (*Charadrius melodus*) – listed as Endangered on

[4] This information is taken from the March 2004 report entitled: *Environmental Screening Report, Channel and Harbour Entrance Dredging and Disposal of Clean Dredged Material, 2004-2006, Small Craft Harbours, Prince Edward Island*

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – St. Peter's Bay[4]

	• Whimbrel (*Numenius phaeopus*) – listed as S3N by the ACCDC • Hudsonian Godwit (*Limosa haemastica)*- listed as S2N by the ACCDC • White-rumped Sandpiper (*Calidris fuscicollis)* - listed as S3S4N by the ACCDC • Pectoral Sandpiper (*Calidris melanotos*) – listed as S2N by the ACCDC • Common Tern (*Sterna hirundo*) – listed as S3B by the ACCDC • Frankton's Saltbush (*Atriplex franktonii*) – listed as S1S2 by the ACCDC • Tropical Saltbush (*Atriplex littoralis*) – listed as S2S3SE by the ACCDC • Pit-Seed Goosefoot (*Chenopodium berlandieri var. macrocalycium*) – listed as S1? by the ACCDC • Sand-Heather (*Hudsonia tomentosa*) – listed as S3 by the ACCDC • Seaside Spurge (*Chamaesyce polygonifolia*) – listed as S2 by the ACCDC • Sea-Side Dock (*Rumex maritimus)* – listed as Special Concern by COSEWIC • Carolina Rose (*Rosa carolina*) – listed as S2S3 by the ACCDC • Mudwort (*Limosella australis*) – listed as S3 by the ACCDC • Creeping Juniper (*Juniperus horizontalis*) – listed as S3S4 by the ACCDC • Golden-Fruited Sedge (*Carex aurea*) – listed as S2S3 by the ACCDC • Shaved Sedge (*Carex tonsa*) – listed as S2S3 by the ACCDC • Little Green Sedge (*Carex viridula*) – listed as S3S4 by the ACCDC • Emmons Sedge (*Carex albicans var. emmonsii*) – listed as S3S4 by the ACCDC • Beach-Head Iris (*Iris setosa var. Canadensis*) – listed as S2S3 by the ACCDC • Hooded Ladies'-Tresses (*Spiranthes romanzoffiana*) – listed as S3 by the ACCDC • Starved Witchgrass (*Dichanthelium depauperatum*) – listed as S1S2 by the ACCDC When considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the plant species listed above. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. However, as a precautionary measure, the endangered Piping Plover, shorebirds and tern identified above are examined more closely below and/or in the EA report.

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – St. Peter's Bay[4]

	A barrier dune system that lies within PEI National Park is located to the east of the dredging and disposal. This is known as the Greenwich area and is home to a variety of wildlife including the Piping Plover. Piping Plover nests have also been found to the west of the site, on St Peter's Harbour Beach. Both of these beaches have been identified as critical habitat in the draft Piping Plover Recovery Strategy.
Environmentally Significant Areas:	The ACCDC identified 6 Managed Areas in the vicinity of the study area: Greenwich Project Area, Morell River (Nature Conservancy of Canada), Cable Head Provincial Park, Bristol Creek Natural Area, Greenwich National Park, and Greenwich Natural Area.
Harbour Uses:	Fishing, aquaculture and tourism are the main activities at this location.
Commercial Fishing and Aquaculture	Lobster (*Homarus americanus*), rock crab *Cancer irroratus*), and mackerel (*Scomber scombrus*) are fished in the waters immediately adjacent to the entrance to St. Peter's Bay, in the Gulf of St. Lawrence. Herring (*Clupea harengus*), hake (*Merluccius bilinearis*), and winter flounder (*Pseudopleuronectes americanus*) are fished in the offshore waters. Shellfish aquaculture leases are located in St. Peter's Bay. The nearest mussel farms are located 1 km from the dredging site and is therefore not a concern.

ST PETER'S BAY
Kings County, PEI

AERIAL PHOTO

St. Peter's Bay Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Tracadie

Site Name:	Tracadie Harbour
Dredging Timeline:	most common in the spring and fall
Dredging Site Location:	channel
Approximate Location of Disposal Site:	NAD 46° 24.40' N 63° 01.34'W or NAD 46° 24.94' N 63° 02.02'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal or mechanical excavation and side-casting
Quantity of Dredged Material:	17,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in 2010 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the north eastern coast of PEI. Grain size material to be removed is predominantly sand (99%).
Benthic Habitat:	Stewart et al. (1999) described the benthic habitat at the disposal site as packed fine sand that contains clam and mussel shells, worm tubes, and eelgrass. Dominant fauna varied slightly between stations, but included gastropods, periwinkles, mud snails, polychaetes, and bivalves. Abundance and biomass were found to be moderate, with moderate diversity and number of species.
Fish and Fish Habitat:	There are no fish or fish habitat on the substrate of the project area.
Wildlife/Migratory Birds:	Tracadie Bay is part of a barrier dune system that is located within the PEI National Park. The bay is a primary stopping point during the coastal migration of waterfowl, and is used during the fall by Canada Geese (*Branta canadensis*), Greater Scaup (*Aythya marila*), goldeneyes, mergansers, black ducks and loons. Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For this area of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 7.5 to 22.49 waterfowl/km for April to June and 2.00 to 4.99 waterfowl/km for July to September.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database revealed 84 records of 60 rare vascular flora, 28 records of 14 rare vertebrate fauna, and 44 records of 25 rare invertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Wood Duck (*Aix sponsa*) – listed as S3S4B,S5N by the ACCDC • Piping Plover (*Charadrius melodus*) – listed as Endangered on

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Tracadie

	• American Golden-Plover (*Pluvialis dominica*) – listed as S3N by the ACCDC • Whimbrel (*Numenius phaeopus*) – listed as S3N by the ACCDC • Hudsonian Godwit (*Limosa haemastica)*- listed as S2N by the ACCDC • White-rumped Sandpiper (*Calidris fuscicollis)* - listed as S3S4N by the ACCDC • Pectoral Sandpiper (*Calidris melanotos)* – listed as S2N by the ACCDC • Common Tern (*Sterna Hirundo*) – listed as S3B by the ACCDC • Arctic Tern (*Sterna paradisaea*) – listed as S1?B by the ACCDC • Gulf of St. Lawrence Aster (*Symphyotrichum laurentianum)* – listed as Threatened on Schedule 1 of SARA • Tropical Saltbush (*Atriplex littoralis*) – listed as S2S3SE by the ACCDC • Sand-Heather (*Hudsonia tomentosa*) – listed as S3 by the ACCDC • Seaside Spurge (*Chamaesyce polygonifolia*) – listed as S2 by the ACCDC • Beach Pinweed (*Lechea martima*) – listed as – listed as Special Concern by COSEWIC • Broom Crowberry (*Corema conradii*) – listed as S2 by the ACCDC • Rock Crowberry (*Empetrum eamesii*) – listed as S2? by the ACCDC • Purple Crowberry (*Empetrum eamesii ssp. atropurpureum*) – listed as S2? by the ACCDC • Bearberry (*Arctostaphylos uva-ursi*) – listed as S3 by the ACCDC • Ground Juniper (Juniperus communis) – listed as S3S4 by the ACCDC There are two alternatives for dredging and disposal at Tracadie. Both rely on floating equipment and shallow water disposal, which present no opportunity for interaction with the plant species above. For these reasons, impacts to the plant species listed above are not considered further in the assessment. The endangered Piping Plover and shorebirds/terns in general however, are examined more closely below and in the EA report. Blooming Point, a sandpit within the National Park, is extremely important to a variety of wildlife including the Piping Plover. Plover nests have been found at Blooming Pt as well as Tracadie Sandbar as recently as 2009 (CWS, 2009) . Both locations have been identified as critical habitat in the draft Piping Plover Recovery Strategy.
Environmentally Significant	The GIS scan (ACCDC database) identified 1 Managed Area (Prince

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – Tracadie

Areas:	Edward Island National Park) with some degree of protected status, in the vicinity of the study area. Tracadie Bay is part of a barrier dune system that is located within PEI National Park.
Harbour Uses:	The main activities for the harbour are fishing, aquaculture, and tourism.
Commercial Fishing and Aquaculture	Fishing grounds for lobster (*Homarus americanus*)and rock crab (*Cancer irroratus*) can be found at the entrance to Tracadie Bay. Mackerel (*Scomber scombrus*), herring (*Clupea harengus*), and cod (*Gadus morhua*) are fished offshore, beyond the influence of project activities. Shellfish aquaculture is common in Tracadie Bay but is not a concern given that the nearest shellfish lease for mussels is located 600m to the south.

TRACADIE HARBOUR
Queens County, PEI

AERIAL PHOTO

Tracadie Harbour Channel Dredge and Disposal Sites

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – West Point

Site Name:	West Point Harbour
Dredging Timeline:	Most common in the spring and fall
Dredging Site Location:	channel entrance
Approx. Location of Disposal Site:	NAD 83 46º37.21'N 64º 22.23'W
Dredge/Disposal Method:	hydraulic dredging with pipeline disposal
Quantity of Dredged Material:	10,000 m^3
Quality of Dredged Material:	Analytical sampling conducted in December 2006 indicated that sediments to be dredged meet all disposal at sea criteria.
Shoreline:	Developed harbour located on the south western coast of PEI. Grain size material to be removed is predominantly sand (96 %).
Benthic Habitat:	Sediment samples taken in 2001 indicate that the benthic habitat at the disposal site is predominantly sand (98%). Bivalves, polychaetes and nemertean worms were found at the site, along with amphipods and phyllocarid shrimp. The bivalves were predominantly represented by clams. Compared to typical values for biological community measures (Stewart et al. 1999), the site is rated low to moderate for abundance and moderate for diversity and evenness.
Fish and Fish Habitat:	In the adjacent waters off the Northumberland Strait there are lobster (*Homarus americanus*), rock crab (*Cancer irroatus*) and deep-sea scallops (*Placopecten magellanicus*). Herring spawning areas, which occur from mid-April to mid-May, are also found in the waters off the Northumberland Strait.
Migratory Birds:	Maritime Shorebird Survey (MSS) data indicates that the beaches and marshes of PEI support a wide variety of shorebird species during migration, as well as providing breeding habitat for the endangered Piping Plover (*Charadrius melodus)*. Morrison and Hicklin (2001) compared MSS data from the 1990s to the 1970s, and concluded that counts for adults of 6 species in particular (Red Knot [*Calidris canutus*], Least Sandpiper [*Calidris minutilla*], Short-billed Dowitcher [*Limnodromus griseus*], Semipalmated Sandpiper [*Calidris pusilla*], Dunlin [*Calidris alpine*], and Spotted Sandpiper [*Actitis macularia*]) have declined significantly. For the south west coast of PEI, Lock et al (1994) (figures 6.5, 6.9, 6.15), reported the abundance of coastal waterfowl to be: 0.03 to 2.49 waterfowl/km for April to June, 2.00 to 4.99 waterfowl/km for July to September.
Species at Risk/ Species of Conservation Concern:	A 2007 search of the ACCDC database revealed 54 records of 46 rare vascular flora, 5 records of 5 rare vertebrate fauna and 2 records of 2 rare invertebrate fauna within 5 km of the project area. Of those records, the following species have habitat requirements that may potentially overlap with coastal activity such as maintenance dredging: • Great Cormorant (*Phalacrocorax carbo*) – listed as S3B by the ACCDC • Northern Shoveler (*Anas clypeata*) – listed as S3B by the ACCDC • Red-breasted Merganser (*Mergus serrator*) – listed as S2B,S5M by the ACCDC • Tropical Saltbush (*Atriplex littoralis*) – listed as S2S3SE by the ACCDC

SITE SPECIFIC INFORMATION
FOR MULTISITE EA – West Point

	• Bearberry (*Arctostaphylos uva-ursi*) – listed as S3 by the ACCDC • Creeping Juniper (*Juniperus horizontalis*) – listed as S3S4 by the ACCDC • Umbel-Like Sedge (*Carex tonsa var. rugosperma*) – listed as S2S3 by the ACCDC • Little Green Sedge (*Carex viridula*) – listed as S3S4 by the ACCDC • Knotted Rush (*Juncus nodosus*) – listed as S3S4 by the ACCDC However, when considering that dredging and disposal activities will be conducted at this site with floating equipment only, below the low low water mark, there is little potential for overlap between the project and the habitat requirements for the plant species listed above. Any land-based equipment required to mobilize the floating equipment will use existing infrastructure (roads, parking areas, wharves) and will not access the coastal habitats of the species above such as beaches and dunes. Waterfowl and seabirds in general are assessed in more detail in the EA report.
Environmentally Significant Areas:	The GIS scan (ACCDC database) identified 2 Managed Areas with some degree of protected status (Livingstons Pond Ducks Unlimited Area, Cedar Dunes Natural Area), in the vicinity of the study area. There is a significant sand dune-beach complex, Northern White Cedar located at Cedar Dunes Natural Area and a freshwater marsh at Livingstons Pond Ducks Unlimited site.
Harbour Uses:	West Point is a very active harbour that supports approximately 25 fishing vessels. Both commercial fishing and recreational boating activities occur in the assessment area. In addition, there is a restaurant, gift shop and recreational vessel docking at West Point Harbour.
Commercial Fishing and Aquaculture	In the adjacent waters of the Northumberland Strait (1 km offshore), there are lobster (*Homarus americanus*) and rock crab (*Cancer irroratus*) fishing grounds. There are no shellfish leases in the waters of West Point Harbour.

WEST POINT HARBOUR
Prince County, PEI

AERIAL PHOTO

West Point Harbour Dredge and Disposal Sites

Atlantic Canada Conservation Data Centre ranking system

RANK	DEFINITION
S1	Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.
S2	Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.
S3	Uncommon throughout its range in the province, or found only in a restricted range, even if abundant at some locations. (21 to 100 occurrences).
S4	Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the species is of long-term concern.
S5	Common throughout its range in the province, secure with no indication of short or long-term
S#S#	Numeric range rank: A range between two consecutive numeric ranks. Denotes uncertainty about the exact rarity of the species (*e.g.*, S1S2)
?	Qualifier to denote inexact or uncertain (the "?" qualifies the character immediately preceding it in the S-rank)

References

Atlantic Canada Conservation Data Centre (ACCDC). 2007 data response for Darnley Basin, Hardys Channel, St. Peter's Bay, Tracadie, West Point, and Savage Harbour.

ACCDC 2006. ACCDC data response for Covehead Harbour, Fishing Cove Harbour, Graham's Pond Harbour, Howards Cove, Launching Pond Harbour, North Lake Harbour, Skinners Pond Harbour, Prince Edward Island. S. Gerriets, Senior Data Manager

Canadian Wildlife Service (CWS). 2009. Results from the Piping Plover database search.

Fisheries and Oceans Canada. 2006 Tides, Current and Water Levels. URL: http://www.lau.chs-shc.gc.ca/.

Fisheries and Oceans Canada. 2004. Traditional Fisheries Knowledge Internet Mapping Application – Inshore and Nearshore Database Searches for Prince Edward Island. URL: http://glfgeo.dfo-mpo.gc.ca/tfk-ctp/.

Lock, A.R., R.G.B. Brown, S.H. Gerriets. 1994. Gazetteer of Marine Birds in Atlantic Canada, An Atlas of Seabird Vulnerability to Oil Pollution. Canadian Wildlife Service, Atlantic Region.

Morrison, R.I.G, P. Hicklin. Winter 2001. Bird Trends. No. 8: 16-19. URL: http://www.cws-scf.ec.gc.ca/publications/btnews/pdf/bt8_e.pdf.

Island Nature Trust (INT). 2007. Prince Edward Island Piping Plover Atlas (2007 Edition).

PWGSC. 2009. Environmental Screening, Wharf Repairs, West Point, Prince County, Prince Edward Island.

PWGSC. 2008. Environmental Screening Report, Harbour Entrance Re-Dredging (3-Year Period) – Naufrage Harbour, PEI.

PWGSC. 2007. Environmental Screening Report, Harbour Entrance Channel Re-dredging and Disposal of Clean Dredged Material at Sea, Launching Pond Harbour, Kings County, Gulf Region, PEI DFO SCH.

PWGSC. 2007. Environmental Screening Report, Harbour Entrance Channel Re-dredging and Disposal of Clean Dredged Material at Sea, Savage Harbour, Kings County, PEI DFO SCH.

PWGSC. 2007. Replacement Class Screening Report, Harbour Maintenance Re-dredging and Land-based Disposal of Redredged Sediments in Prince Edward Island.

PWGSC. 2007. Environmental Screening Report, Channel and Harbour Entrance Dredging and Disposal of Clean Dredged Material 2007-2009, DFO SCH, PEI.

PWGSC. 2004. Environmental Screening Report, Channel and Harbour Entrance Dredging and Disposal of Clean Dredged Material, 2004-2006, Small Craft Harbours, Prince Edward Island.

Stewart, P.L., P. Pocklington, V. A. Partridge, P.A Kendrick. 1999. An Overview of Biological Community Data in the Ocean Disposal Permit Review Process, Atlantic Region: Current Practice, Statistical Validity, and Biological Communities.