Fisheries and Oceans Canada
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Musquash Estuary

A Management Plan for the Marine Protected Area and Administered Intertidal Area

Canada

ACKNOWLEDGEMENTS

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ABBREVIATIONS

AIA	Administered Intertidal Area
ALERT	Atlantic Emergency Response Team
C&P	Conservation and Protection Branch
CAPP	New Brunswick Coastal Areas Protection Policy
CCG	Canadian Coast Guard
CCNB	Conservation Council of New Brunswick
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
FAM	Fisheries and Aquaculture Management Branch
FPP	Fisheries Protection Program
MAC	Musquash Estuary Marine Protected Area Advisory Committee
MPA	Marine Protected Area
MPA Regulations	Musquash Estuary Marine Protected Area Regulations
NEEC	National Environmental Emergencies Centre
OCMD	Oceans and Coastal Management Division
SAR	Search and Rescue
SJPA	Saint John Port Authority
TC	Transport Canada

DEFINITION OF BOUNDARIES

Marine Protected Area – those waters below the ordinary water mark at low tide in Musquash Estuary that are administered by Fisheries and Oceans Canada as a Marine Protected Area (MPA). The MPA includes Musquash River and the lower components of its West and East Branches, Musquash Harbour, Gooseberry Cove, and the mouth of Musquash Estuary between Western Head and Musquash Head. It also includes the seabed and subsoil to a depth of two metres.

Administered Intertidal Area – selected lands and waters bounded by the ordinary water mark at low tide and ordinary water mark at high tide in Musquash Estuary that are administered by Fisheries and Oceans Canada as an Administered Intertidal Area (AIA).

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EXECUTIVE SUMMARY

Musquash Estuary is located in the Bay of Fundy approximately 20 km southwest of Saint John, New Brunswick. It encompasses a productive estuary and salt marsh environment which provide habitat for many species of fish, invertebrates, and marine plants. The estuary is one of only a few that remains in the region that has not been significantly impacted by human development. In 1998, the Conservation Council of New Brunswick, with support from the Fundy North Fishermen's Association, proposed Musquash Estuary and the surrounding intertidal area, as a candidate Marine Protected Area (MPA) under the *Oceans Act*. An MPA is a coastal or marine area given special status to conserve and protect its natural habitat and marine life. On December 14, 2006, the proposed Musquash Estuary MPA and Administered Intertidal Area (AIA) received formal designation as a protected area.

As a result of this designation, the waters of the estuary below the ordinary water mark at low tide are now a federal MPA. Certain submerged Crown lands and waters between the ordinary water mark at low tide and ordinary water mark at high tide, referred to as the 'Administered Intertidal Area', have also been afforded conservation status through an agreement between the Government of New Brunswick and the Government of Canada. The Musquash Estuary MPA Regulations provide legal protection status to the MPA, while the New Brunswick Coastal Areas Protection Policy and New Brunswick *Trespass Act*, along with the *Fisheries Act*, are used to manage the AIA in a manner that is consistent with the MPA. Additionally, through the efforts of non-government groups and the Government of New Brunswick, areas around the estuary have been given conservation status, further contributing to the protection of the area.

The vision for the MPA and AIA is the conservation and protection of the marine ecosystem. Accompanying conservation objectives were developed that are aimed at protecting the biodiversity, productivity and habitats of the estuary. This document provides details on the relevant regulations and acts. It also outlines management priorities. Details are provided on the roles and responsibilities of the Musquash Advisory Committee and various government departments and agencies in the management of the MPA and AIA. This second version of the management plan includes updates and revisions based on experience gained and advice received since the designation of the MPA.

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1 INTRODUCTION

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Musquash Estuary is a unique coastal marine ecosystem located in the Bay of Fundy approximately 20 km southwest of Saint John, New Brunswick (Figure 1). It encompasses a productive estuary and salt marsh environment that provide habitat for many species of fish, invertebrates and marine plants. The estuary is one of only a few remaining in the region that has not been significantly impacted by human activities and development. In addition to its natural attributes, Musquash Estuary plays an important role in the heritage of the region. It is believed that Aboriginal groups established seasonal camp sites along the shores of the estuary. French settlers, followed by United Empire Loyalists, are thought to be associated with early settlement of the area. Today, the surrounding coastal communities continue to make use of the estuary for fishing and recreation.

In 1998 the Conservation Council of New Brunswick (CCNB), with support from the Fundy North Fishermen's Association, proposed Musquash Estuary and the surrounding intertidal area as a candidate Marine Protected Area (MPA) under the *Oceans Act*. On

Figure 1 Map of Musquash Estuary

December 14, 2006, the Musquash Estuary MPA and Administered Intertidal Area (AIA) were formally designated as a protected area. The estuary's protected status reflects the cooperative efforts of community and government. Fisheries and Oceans Canada (DFO), on behalf of the Government of Canada, is responsible for managing the MPA and AIA in collaboration with the Musquash Estuary MPA Advisory Committee (MAC). Members of the MAC represent government, non-government organizations, industry, First Nations and community groups that have an interest in the MPA and AIA. An overview of conservation initiatives that ultimately led to the designation of the Musquash Estuary MPA is provided in the previous version of this document (DFO 2008a). A timeline of events in the conservation history of the Musquash Estuary MPA is also available on the MPA website.[1]

The Musquash Estuary recently celebrated its 10th anniversary as an MPA. DFO co-hosted a reception with the Conservation Council of New Brunswick's (CCNB) Fundy Baykeeper and the Nature Conservancy of Canada (NCC) to commemorate the occasion. Events also included hikes guided by NCC and the CCNB's Annual Musquash Paddle. Participation at these events indicated strong ongoing community support of the MPA and continuing partnerships to protect the MPA and adjacent terrestrial lands.

[1] http://www.inter.dfo-mpo.gc.ca/Maritimes/Oceans/OCMD/Musquash/MPA-Designation

1.1 PURPOSE AND SCOPE

The purpose of this management plan is to outline DFO's plan to manage activities in the Musquash Estuary MPA and AIA. It pertains to those areas in Musquash Estuary that DFO has authority to manage. This document explains key requirements of the Musquash Estuary MPA Regulations (hereafter referred to as the MPA Regulations) and identifies management priorities. This second version of the management plan includes updates and revisions based on MPA management experience gained and advice received since the designation of the MPA.

This management plan is divided into four main sections: 1) Introduction; 2) Background; 3) Management Vision, Guiding Principles, and Conservation Objectives; and
4) Managing the Musquash Estuary MPA.
The management plan has been prepared in consultation with the MAC and the Government of New Brunswick, as well as many other partners.

Recommendations for enhancing Musquash MPA management performance resulting from a management effectiveness review conducted for the 2007-2012 period have also informed the current version of the management plan.

Other documents have been developed to provide further detail on management actions and priorities beyond that contained in this plan, and these are referenced throughout (e.g., monitoring plan in Section 4.3.4.1; progress report in Section 4.3.3.4).

1.2 LEGISLATIVE AUTHORITY IN THE MUSQUASH ESTUARY

The *Oceans Act* provides the Federal Government with the authority to designate an MPA in the marine environment up to the ordinary water level at low tide. A strong partnership with the Government of New Brunswick allows certain intertidal areas above the low water mark to also be protected.

On December 14, 2006, waters in Musquash Estuary, up to the ordinary water level at low tide, were designated an MPA through regulations pursuant to the *Oceans Act* (see Appendix 1 for MPA Regulations). The MPA is 7.4 km^2 and includes the seabed and subsoil to a depth of 2 metres. The legislative basis for designation of the Musquash Estuary MPA is the *Oceans Act*. Section 35(1) of the *Act* outlines the reasons for which a site can be designated an MPA under DFO's MPA Program (Box 1). In accordance with Section 35(1), MPAs can be established for one or more of five purposes. Musquash Estuary met three purposes for MPA designation pursuant to the *Act* (Table 1). The MPA Regulations made pursuant to the *Oceans Act* legally designate the MPA and afford authority and guidance regarding the management of human activities within the MPA boundary.

The *Oceans Act*, however, only has authority in the marine environment up to the ordinary water level at low tide; thus, the MPA Regulations do not have

BOX 1: *OCEANS ACT* AND MARINE PROTECTED AREAS

35. (1) A marine protected area is an area of the sea that forms part of the internal waters of Canada, the territorial sea of Canada or the exclusive economic zone of Canada and has been designated under this section for special protection for one or more of the following reasons:

(a) the conservation and protection of commercial and non-commercial fishery resources, including marine mammals, and their habitat;

(b) the conservation and protection of endangered or threatened marine species, and their habitat;

(c) the conservation and protection of unique habitat;

(d) the conservation and protection of marine areas of high biodiversity or biological productivity; and

(e) the conservation and protection of any other marine resource or habitat as is necessary to fulfil the mandate of the Minister.

(2) For the purposes of integrated management plans referred to in sections 31 and 32, the Minister will lead and coordinate the development and implementation of a national system of marine protected areas on behalf of the Government of Canada.

(3) The Governor in Council, on the recommendation of the Minister, may make regulations

(a) designating marine protected areas; and

(b) prescribing measures that may include but not be limited to

(i) the zoning of marine protected areas,

(ii) the prohibition of classes of activities in marine protected areas, and

(iii) any other matter consistent with the purpose of the designation.

TABLE 1: MUSQUASH ESTUARY MPA DESIGNATION PURSUANT TO SECTION 35 OF THE *OCEANS ACT*

REASONS FOR MPA DESIGNATION PURSUANT TO SECTION 35 (1) OF THE *OCEANS ACT*	MUSQUASH ESTUARY CHARACTERISTICS THAT SUPPORT THE DESIGNATION CRITERIA
a) conservation and protection of commercial and non-commercial fishery resources, including marine mammals and their habitat	• Approximately two-thirds of all commercially-harvested fishery resources rely on estuaries at some stage in their lives. • Several commercial and non-commercial fishery resources are found in Musquash Estuary. • Links between Musquash Estuary and critical life stages of commercial and non-commercial fishery resources are well documented (e.g. larval and juvenile stages).
(c) conservation and protection of unique habitat	• In the Bay of Fundy, more than 85% of the salt marsh ecosystems have been altered or destroyed by human activities over the past 300 years. • Musquash Estuary is unique due to its size, expansive salt marsh, diverse habitat types, and natural condition. • Musquash Estuary is the largest ecologically intact estuary in the Bay of Fundy that has not been significantly impacted by human activities.
(d) conservation and protection of marine areas of high biological diversity or biological productivity	• Musquash Estuary supports a diverse range of species, including large populations of invertebrates, marine plants, fish, and rare birds.

authority in the adjacent intertidal lands and waters in Musquash Estuary since they are above low water. In 2006, the Government of New Brunswick transferred the administration and control of submerged and certain intertidal provincial Crown lands in the estuary to the Government of Canada pursuant to the Government of New Brunswick Order in Council 2006-407 (later amended pursuant to the Government of New Brunswick Order in Council 2006-443) to support a federal MPA. The Government of Canada considers the transfer of administration and control of submerged provincial Crown lands and waters from the Government of New Brunswick to mean 'full federal authority and jurisdiction'.

A reversion clause outlined in the Order in Council ensures that the transferred lands and waters revert back to the administration and control of the Government of New Brunswick (managed by the New Brunswick Department of Energy and Resource Development) in the event that the Government of Canada does not conserve and protect the transferred lands as a protected area. The Government of

Canada will abide by all Government of New Brunswick laws, regulations and policies that apply to the transferred submerged provincial Crown lands. The Government of New Brunswick reserves the right to all coal, minerals, oils and natural gas, bituminous shale and mines in the transferred lands. However, the lands have been withdrawn from prospecting and staking pursuant to the Government of New Brunswick Order in Council 2008-54, and all pre-existng mineral claims have expired.

The Government of Canada committed to the Government of New Brunswick, in good faith under the transfer of administration and control agreement, to manage human activities in the transferred intertidal areas, covering 4.0 km^2, in a manner similar to the MPA. Thus these lands and waters between the ordinary water level at low tide and high tide are administered by DFO and referred to as the Administered Intertidal Area (AIA).

Since the MPA Regulations do not apply in the AIA, an alternative means is used to manage human activities in this area. In accordance with Section 18 of the *Federal Real Property and Federal Immovables Act*, a Minister of the Government of Canada has the authority to restrict and control human activities on lands and waters administered for the purposes of the department. With this authority, and as land owner of the AIA, DFO will manage activities in the AIA as they are described in the MPA Regulations and the Government of New Brunswick Coastal Areas Protection Policy (CAPP). In the circumstance where a condition described in the MPA Regulations and CAPP may not be in agreement, the condition described in the MPA Regulations shall take precedence. To enforce land owner rights pursuant to the *Federal Real Property and Federal Immovables Act*, DFO is limited to the application of civil action pursuant to the New Brunswick *Trespass Act*. In contrast, the *Fisheries Act* provides DFO the authority to manage fisheries, marine resource harvesting, and works and undertakings in both the MPA and AIA.

Pursuant to the *Fisheries Act*, DFO manages marine resource harvesting activities in accordance with various fishery regulations, and works and undertakings are managed in accordance with the Fisheries Protection Provisions (*Fisheries Act* [R.S.C., 1985, c. F-14, s. 36-42]). Violation of the *Fisheries Act* may carry significant fines and/or imprisonment upon conviction. Thus, the *Federal Real Property and Federal Immovables Act* gives DFO, as land owner, the authority to determine which human activities can be undertaken in the AIA, and the *Fisheries Act* and New Brunswick *Trespass Act* are the legal means by which DFO will ensure that the human activities are undertaken in a manner consistent with the objectives of the MPA and AIA.

1.3 RELATED REGIONAL AND NATIONAL PROGRAMS

MPAs are just one of many tools that can contribute to marine conservation efforts. Programs that assist or facilitate Musquash MPA management include:

Regional Oceans Plan
The Musquash Estuary MPA management plan is supported by the implementation of an integrated ocean management plan, the 'Regional Oceans Plan for the Scotian Shelf, Atlantic Coast and Bay of Fundy'. The Regional Oceans Plan is a multi-year, strategic-level plan that provides long-term direction for, and commitment to, integrated, ecosystem-based and adaptive management for the area (DFO 2014).

Bioregional MPA Network
Since 2004, DFO and its partners have made significant efforts to advance a network of MPAs for the Scotian Shelf Bioregion which includes the Bay of Fundy, and work continues under various initiatives to identify and designate areas. The Musquash Estuary MPA is an important component of this network and was identified as an ecologically and biologically significant area (Buzeta 2014).

2 BACKGROUND

2.1 THE MUSQUASH ESTUARY ECOSYSTEM

An estuary is a partially enclosed coastal body of water where freshwater from rivers and streams flows into the ocean and mixes with saltwater. Estuaries are considered one of the most productive ecosystems on earth and host several habitat types that support a diverse range of marine life. Estuaries are often surrounded by tidal flats and low-lying coastal grasslands called salt marshes. Tidal flats provide habitat for an abundance of salt marsh plants, fish species, and common and rare bird species. Salt marshes that fringe estuaries perform a variety of functions including the filtration of sediment and pollution, buffering of upland areas from storm surges and floods, and the protection of shorelines from erosion. More than 85% of the original salt marshes in the Bay of Fundy have been altered or destroyed by humans over the past 300 years (Percy 1996).

Musquash Estuary is a shallow tidal estuarine ecosystem with mid channel water depths of 1–6 m at low tide and a tidal range of 6–8 m. Water depths up to approximately 10 m occur in the area near Five Fathom Hole and increase at the mouth of the harbour (6–16 m).The estuary consists of a large embayment with a relatively narrow and deep entrance between the two rocky headlands of Western Head and Musquash Head. Musquash Harbour is highly turbid (muddy) due to the re-suspension of bottom sediment associated with strong tidal currents. Musquash River flows into the shallow

Musquash Harbour and drains the surrounding watershed. The estuary's size, expansive salt marshes and relatively undisturbed natural condition make it unique in the Bay of Fundy.

Its location, shape and oceanographic characteristics support nine distinct habitat types (Figure 2). The estuary consists of rocky shores at its seaward boundary, large tidal flats in the upper Musquash Harbour and an expansive salt marsh that surrounds Musquash River. The rocky areas provide habitat for many fish and some marine plants. A variety of fish species, including Atlantic silverside, winter flounder, Atlantic smelt, shorthorn sculpin and Atlantic tomcod, take shelter in areas where stands of marine plants protect them from the power of the waves and provide an abundant food source. Notable marine species that occupy the rocky shores of the estuary include periwinkle and rockweed. Although on the tidal flats most organisms live unseen within the sediment, these areas can be extremely productive. Relative to most other habitats elsewhere in the area, the tidal flats within the estuary are home to a large number of organisms. Notable marine species that occupy the tidal flats include soft-shell clams, periwinkle, rockweed and an abundance of worms and shrimp. Lastly, the expansive salt marsh supports several types of salt marsh plants and shorebirds that congregate in the estuary prior to their annual migration.

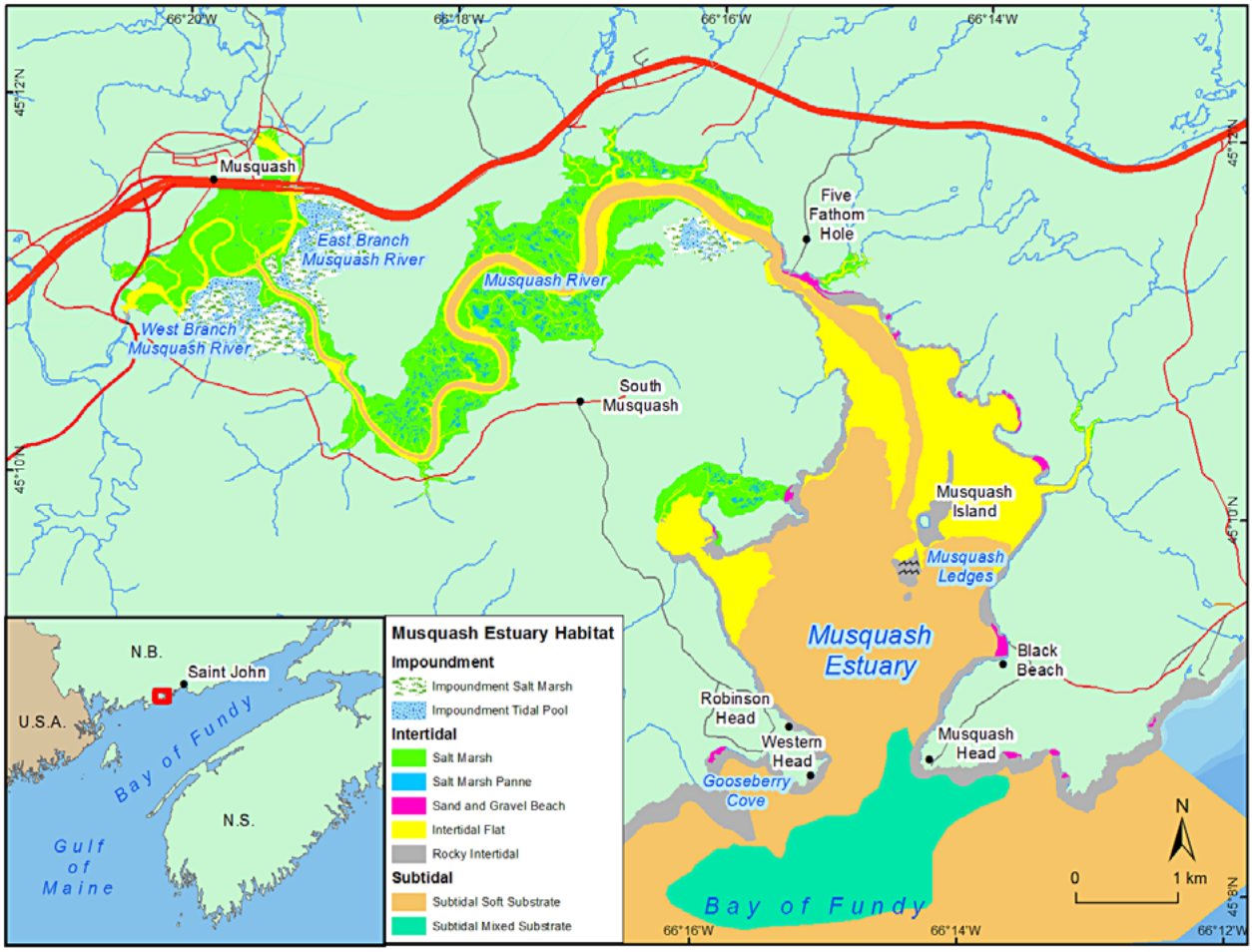

Figure 2. Spatial distribution of habitat types within the Musquash Estuary (from Greenlaw et al. 2014)

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2.2 COMMUNITY AND ECONOMIC VALUES

Musquash Estuary and the surrounding areas are used for commercial and recreational fishing, as well as for other human activities. A herring fishery had been carried out in the estuary since the area was first settled. The fishery was pursued by weirs, shut off seines and until the mid-1970s by purse seine during winter months. The herring fishery has declined since the early 1980s and no herring weirs have operated in the Musquash Estuary since 1987. Currently lobster is the main fishery in the area (typically April through June and mid-November to mid-January). A small scallop fishery occurs in the outer Musquash Estuary from mid-January through March. Scallops are not plentiful here and this fishery has been infrequent in the MPA in the last 10 years.

Limited recreational fishing occurs within the MPA. Previously, periwinkles (winkles), clams and dulse were harvested within the estuary both commercially and recreationally. Currently, periwinkle harvesting is prohibited and the estuary is closed to clam harvesting. Dulse harvesting occurs on an irregular basis. Hunting for particular bird and animal species also occurs throughout the marshes and woodlands surrounding the estuary. Note that migratory bird hunters must hold a valid Class 1, 2, 3 or 4 or Minor's New Brunswick Hunting Licence and a federal Migratory Game Bird Hunting Permit with a Canadian Wildlife Habitat Conservation Stamp.

The estuary is designated as a Rockweed (*Ascophyllum*) long-term study area. As a result, no harvesting of *Ascophyllum* is being conducted in the area and the rockweed industry has supported this area for protection.

There is moderate vessel activity in the area, mainly from local fishing vessels traveling to and from Five Fathom Hole wharf. Less than ten lobster vessels regularly use this facility during the fishing seasons and a few also have mid bay scallop licences. There is no public boat launch for small craft but there is limited small craft activity for recreational purposes.

Prior to designation, many academic and government institutions conducted scientific research on various aspects of Musquash Estuary. Since the designation there has been an increase in research by oceanographers, benthic ecologists and many other scientists.

Aboriginal fishing for food, social and ceremonial purposes is allowed throughout the MPA. At present Aboriginal activities are relatively limited, although there is evidence of historical use of the resources in the area, and of several seasonal camps. Sweet grass is collected in the area by Indigenous Peoples.

The undeveloped nature of the area and the largely intact ecosystem - with extensive salt marshes, mudflats, rocky and sandy beaches and subtidal habitats - provide visitors and residents with

relaxing and scenic views of the area. The Nature Conservancy of Canada's Five Fathom Hole and Black Beach coastal hiking trails provide stunning views of the estuary.

2.3 ADJACENT COASTAL AND WATERSHED CONSERVATION MEASURES

Musquash Estuary is supported by the conservation and protection of much of the land that surrounds it, which includes sensitive salt marshes (Figure 3). As of 2016, the Nature Conservancy of Canada (NCC) had successfully protected over 4800 acres of land surrounding the Musquash Estuary through land purchases and donations. As well, Ducks Unlimited Canada is a major landholder and has wetland areas in the upper reaches of the estuary. Approximately 12 acres of land around the lighthouse at the head of the estuary are owned by Musquash Head Light Station Incorporated (MHLSI), an organization committed to protecting the site. An additional 95 acres surrounding the 12-acre parcel is owned by the same organization and is being leased to NCC for 10 years. In 2019, the end of the 10 year period, the intent is for MHLSI to transfer ownership of those 95 acres to NCC. In total, 86% of the coastline around the Estuary is protected by conservation organizations

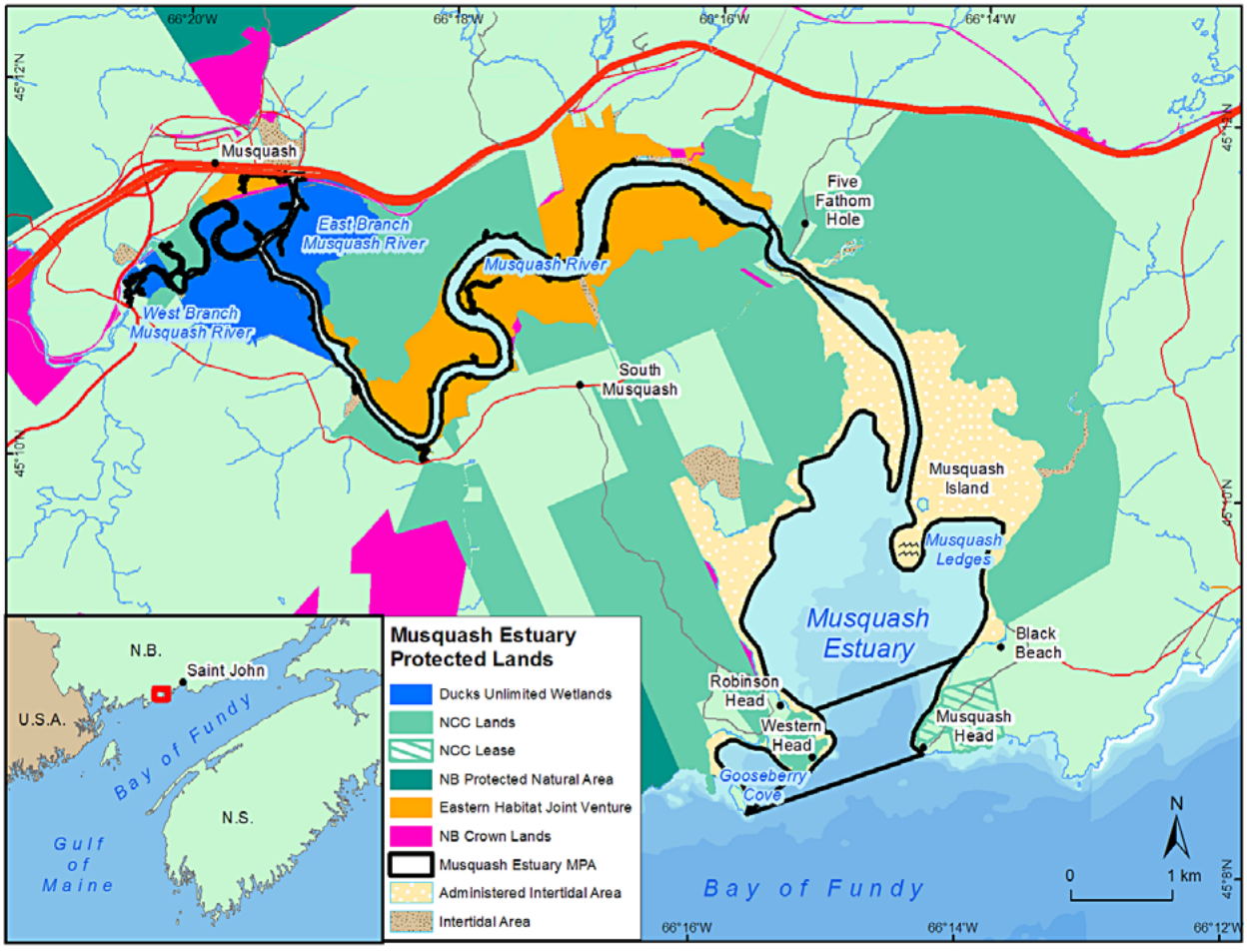

Figure 3. Complementary conservation efforts around the Musquash Estuary MPA (based on data from Ducks Unlimited Canada 2014, GeoNB 2014 and Nature Conservancy of Canada)

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and the Government of New Brunswick. This additional land protection can help reduce potential impacts of land-based activities on the estuary. The Conservation Council of New Brunswick also contributes to the conservation and protection of the Musquash Estuary through its Marine Conservation Program.

The Musquash watershed is a drainage area that is 470 km^2 in size and contains a network of dams and diversions that provide water to the City of Saint John. It is managed pursuant to the Watershed Protected Area Designation Order of the New Brunswick *Clean Water Act* to prevent contamination of the municipal drinking water supply. Under the Order, activities on various sectors of land and water in the watershed are controlled. The watershed includes the provincial Loch Alva Protected Area, and the East and West Musquash Subwatersheds (Figure 4). The Loch Alva Protected Area consists of approximately 220 km^2 of land that protects a network of lakes, rivers, wetlands and forests. It limits human use to low impact recreational activities such as hiking, canoeing, camping, fishing and hunting. The larger East and West Musquash Subwatersheds are relatively undeveloped. Agriculture, forestry, road construction, commercial and industrial development, mining, recreation, aquaculture and residential development are allowed to occur in the watershed outside of the Loch Alva Protected Area boundaries.

Despite the conservation and protection of lands that surround Musquash Estuary and in the Musquash watershed, the waters, seabed and intertidal area within the estuary remain vulnerable to human activities such as runoff and contamination. Due to the unique natural environment, and its place in the cultural fabric of the region, members from surrounding communities have worked with government and non-government organizations to conserve and protect the waters of Musquash Estuary.

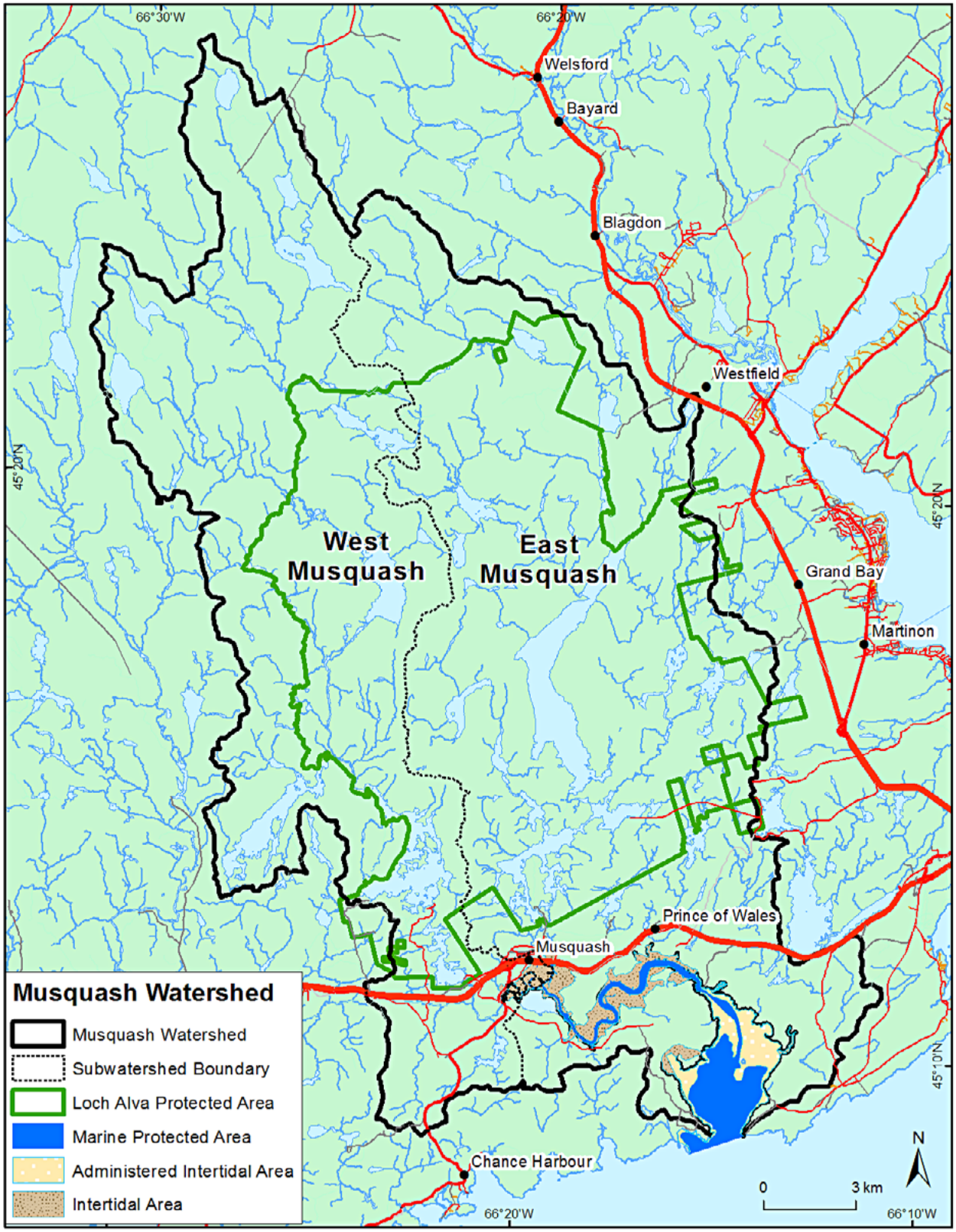


Figure 4. Musquash watershed

3 MANAGEMENT VISION, GUIDING PRINCIPLES, AND CONSERVATION OBJECTIVES

The following vision, guiding principles, and conservation objectives provide guidance for the management of human activities in the MPA and AIA.

3.1 VISION

The vision for the MPA and AIA is the conservation and protection of the marine ecosystem.

3.2 GUIDING PRINCIPLES

The Musquash MPA and AIA management plan and management actions are guided by the following principles adapted from the Regional Oceans Plan for Maritimes Region (DFO 2014) and the National Framework for Canada's Network of Marine Protected Areas (Government of Canada 2011).

Integrated Management: Integrated management is the planning and management of human activities in a comprehensive manner with consideration for the full range of interests and environmental, social, cultural, economic, and institutional objectives for the broader management area.

Ecosystem approach: The ecosystem approach involves the management of human activities so that ecosystem components, functions, and properties are restored and/or maintained at appropriate temporal and spatial scales. Objectives are identified and measurable indicators for monitoring and evaluation of the ecosystem are selected. As well, operational measures and actions are chosen to ensure that conditions are met and maintained.

Precautionary approach: The precautionary approach is an evaluation and decision-making process that errs on the side of caution and is used in the case of significant scientific uncertainty. Not all human activities are excluded from the Musquash Estuary MPA, but a precautionary approach will be applied in evaluating proposed activities. This will put the burden of proof on any individual, organization, or government agency conducting activities within or affecting the MPA to demonstrate that proposed activities will not adversely affect the marine ecosystem.

Knowledge-based decision making: Management actions will be based on the

best scientific information and traditional ecological knowledge available. Scientific studies of particular aspects of the ecosystem will be encouraged to improve upon and add to existing information.

Collaboration and stewardship: While DFO is the lead authority, the vision and objectives for the Musquash MPA can only be achieved through coordination, cooperation, and partnership among all interested parties. Management planning must be both inclusive and transparent, and supported, to the greatest extent possible, by all affected organizations and individuals. Stewardship refers to the wide range of actions that can be taken by individuals, groups, and communities to raise awareness of the MPA, and to monitor and conserve the Musquash ecosystem. DFO encourages and will actively pursue collaboration, partnership, and stewardship opportunities for the MPA.

Adaptive planning and management: Pressures on the Musquash ecosystem may change over time as a result of shifting social, environmental, and economic conditions. At the same time, knowledge of the Musquash ecosystem will continue to improve. Planning and management must be adaptive to respond to these changes. The design and management of the Musquash Estuary MPA will be evaluated and adapted as necessary to ensure the effectiveness of the MPA in meeting its objectives.

3.3 CONSERVATION OBJECTIVES

An ecological overview of Musquash Estuary highlighted the importance of the area to commercial and non-commercial fishes, its unique habitats, and the areas of high biological diversity and biological productivity. The information

contained in the ecological overview reinforced the reasons for the establishment of the MPA and AIA. Based on DFO's national objectives for ecosystem-based management, overarching ecosystem objectives were proposed for Musquash Estuary. These ecosystem objectives provide the foundation for the conservation objectives described below, which guide management of the MPA and AIA.

The conservation objectives are to ensure no unacceptable reduction or human-caused modification to:

A. Productivity so that each component (primary, community, population) is functioning in the ecosystem (e.g., by maintaining the abundance and health of harvested species);

B. Biodiversity by maintaining the diversity of individual species, communities, and populations within the different ecotypes;

C. Habitat in order to safeguard the physical and chemical properties of the ecosystem by maintaining water and sediment quality.

Section 4.3 identifies the management priorities and actions that will be undertaken in the lifetime of this management plan to help meet these conservation objectives.

4 MANAGING THE MUSQUASH ESTUARY MPA

This section describes in further detail the Musquash Estuary MPA Regulations and the AIA provisions (introduced in Section 1.2), the governance structure for the MPA and the management priorities. Each section of the MPA Regulations is described, including the management zones, general prohibitions, exceptions to the general prohibitions, activities allowed via activity plan applications, reporting of violations and accidents, and fines and imprisonment. Related provincial policies, such as the New Brunswick Coastal Areas Protection Policy (CAPP), and the involvement of partners and stakeholders, such as through the Musquash Advisory Committee (MAC), are also described.

4.1 OVERVIEW OF THE MPA REGULATIONS

Human activities allowed in the Musquash Estuary MPA and AIA are based on those described in the MPA Regulations (see Appendix 1) and provincial policy (described below). The MPA Regulations only have legal authority upon human activities within the MPA boundary. In contrast, the *Fisheries Act* and New Brunswick *Trespass Act* are the primary authoritative instruments that are used to regulate human activities within the AIA boundary. Prosecution, however, is not limited to these Acts and individuals undertaking activities in the MPA and AIA must abide by all other applicable federal and provincial legislation, regulations, and policies that may apply to the activity. Table 2 provides an overview of the human activities that are allowed to occur in the Musquash Estuary MPA and AIA.

4.1.1 MUSQUASH ESTUARY MANAGEMENT ZONES

Musquash Estuary is divided into distinct management zones that provide the foundation for managing human activities in the MPA and AIA (Figure 5). The level of conservation and protection in each management zone depends on the ecological sensitivity of the zone and the ability of the zone to accommodate human activities. The management zones are:

1. MPA Zone 1 consists of the upper region of Musquash River. This habitat is species-rich and surrounded by a sensitive salt marsh. Zone 1 is afforded the highest degree of protection and few activities are allowed;

2. MPA Zone 2 consists of the lower region of Musquash River, upper Musquash Harbour, and Gooseberry Cove. It is subdivided into two zones. MPA Zone 2A consists of the lower reach of Musquash River and upper Musquash Harbour, and is the largest

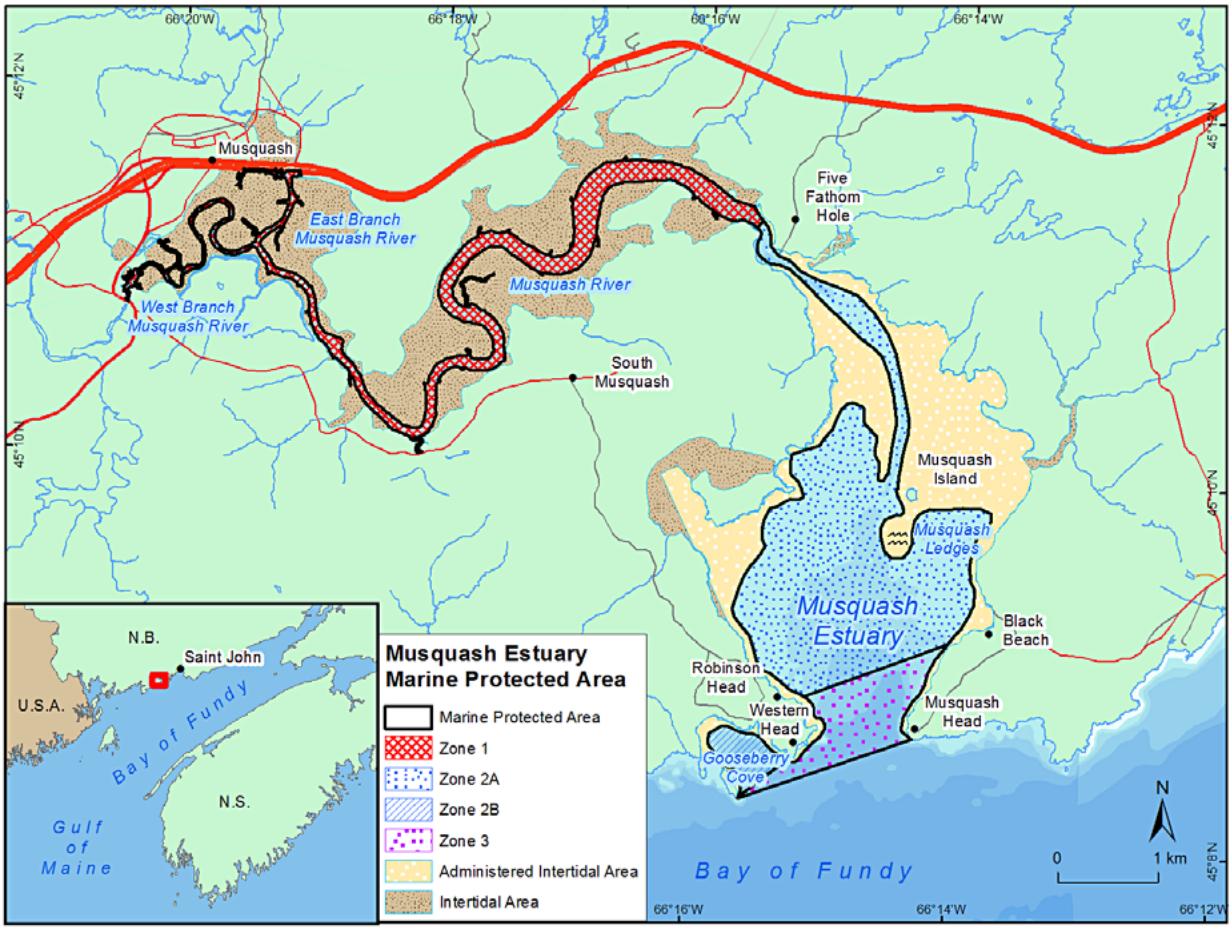


Figure 5. Musquash Estuary MPA management zones

zone in the MPA. It is characterized by a mix of soft bottom sediment and hard bottom substrate. MPA Zone 2B consists of Gooseberry Cove located at the mouth of the estuary, which is predominantly characterized by gravel substrate. A broader range of activities is allowed in Zones 2A and 2B compared to Zone 1;

3. MPA Zone 3 consists of the mouth of Musquash Estuary between Western Head and Musquash Head, and inward to Black Beach. Bottom sediment in the zone is continually mixed by natural processes associated with tides and waves. The largest range of activities is allowed in Zone 3; and

4. The AIA consists of the expansive intertidal area that is adjacent to MPA Zones 2A and 2B, and the rocky shores that are adjacent to MPA Zone 3. The intertidal areas and salt marsh adjacent to Zone 1 are not part of the lands administered by DFO. Activities within the AIA are managed in a manner consistent with the MPA and both provincial and federal regulations are applied to human activities in the AIA to achieve the management objectives.

Permanent boundary markers located on the shores of the estuary demarcate the division between MPA Zones 1 and 2A, and MPA Zones 2A and 3 (Figure 6). A permanent boundary marker was placed on the southern shore of Western Head, although it was not possible to place a permanent boundary marker on the shore of Gooseberry Island. As a result, there is no permanent boundary demarcation between MPA Zones 2B and 3.

Figure 6. Permanent boundary marker demarcating the division between MPA Zones 1 and 2A (photo courtesy of David Thompson)

4.1.2 GENERAL PROHIBITION

The general prohibition applies to all human activities in the MPA, and makes it illegal for any person to:

disturb, damage or destroy, or remove from the Area, any living marine organism or any part of its habitat; or

carry out any activity — including depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped — that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.

Exceptions to these prohibitions are provided in Section 4.1.3.

In addition, the Coastal Areas Protected Policy provides further guidance regarding the management of human activities in the AIA (NBDELG 2002). Within coastal areas covered by the Policy, intertidal areas such as the AIA are the most highly protected. Few development activities are allowed within intertidal areas and are largely limited to those for the public interest (e.g., boardwalks, access and interpretation for educational or research purposes, maintenance or enhancement of coastal features). Coastal salt marshes are also managed under this policy, and are considered provincially significant wetlands under the New Brunswick Wetlands Conservation Policy. Furthermore, DFO can use the *Fisheries Act* to manage activities in the AIA (see Section 1.2).

4.1.3 EXCEPTIONS TO THE GENERAL PROHIBITION

It is recognized that certain activities in the MPA and AIA may affect the natural environment but may still be allowed to occur provided they abide by other applicable legislation, regulations and policies. Human activities exempted from the general prohibition are listed below and summarized in Table 2.

Aboriginal fishing for food, social and ceremonial purposes carried out in accordance with the Aboriginal Communal Fishing Licences Regulations is allowed in all management zones.

Commercial fishing (including Aboriginal commercial communal) carried out in accordance with the *Fisheries Act* and its regulations for elvers or eels by means of a hand-deployed fyke net or dip net is allowed in Zone 1. Fishing for lobster by means of individual traps is allowed in Zones 2A, 2B, and 3, and for herring by means of a weir, beach seine, bar seine, or drag net is allowed in Zones 2A, 2B, 3 and the AIA. Fishing for scallops is allowed in Zone 3, and manually fishing for clams[2] is allowed in all management zones.

Recreational fishing carried out in accordance with the Atlantic Fishery Regulations 1985, or the Maritime Provinces Fishery Regulations, for scallops

and clams[2] by manual means, and recreational fishing for any other species by means of angling or a dip net is allowed in all management zones.

Recreational and commercial dulse harvesting by manual means is allowed in all management areas except Zone 1.

Operation of a marine vessel (any large vessel including ships, sail boats, and motorized personal watercraft) is allowed in Zones 2A and 2B at a maximum speed of 5 knots, and in Zone 3 at a maximum speed of 8 knots. Operation of a motorized marine vessel is prohibited in Zone 1 except with an approved activity plan (e.g., for scientific research) and for the purpose of public safety, national defence, national security, law enforcement, or environmental emergency response and clean up.

Boat launches, wharfs, or navigational channels may be constructed, repaired, removed, or maintained in Zone 2A, if an approval or authorization is not required under the *Navigable Waters Protection Act* or *Fisheries Act*, or when the work or activity is carried out in accordance with an approval or authorization pursuant to these *Acts*. This type of activity is only allowed in the AIA if it supports such an activity in Zone 2A.

Other exceptions to prohibitions in all management zones include activities carried out for the purpose of public safety, national defence, national security, law enforcement, or environmental emergency response and clean up.

Although there are no specific exceptions for non-commercial recreational activities, swimming, canoeing, kayaking, and scuba-diving are allowed in the MPA and AIA provided they do not contravene the general prohibition and CAPP or any other applicable legislation, regulations or policies. In contrast, all-terrain vehicles are prohibited in all management zones with the exception of their use to support activities carried out for the purpose of public safety, national defence, national security, law enforcement or environmental emergency response and clean up.

4.1.4 ALLOWED HUMAN ACTIVITIES PURSUANT TO ACTIVITY PLANS

Certain other human activities are also exempted from the general prohibitions but require an activity plan to be approved by DFO prior to being undertaken in the MPA and AIA. Activity plans can be approved for scientific monitoring and research, educational activities, archaeological studies, commercial tourism and habitat restoration projects. A habitat restoration project is considered any physical restoration project that contributes to the maintenance or improvement of the estuarine ecosystem. To undertake the above-mentioned activities in the MPA and AIA, proponents must submit an activity plan application form that provides information describing the proposed activity and its potential effects on the MPA and AIA ecosystem (refer to Section 4.3.3.1).

4.1.5 REPORTING VIOLATIONS AND ACCIDENTS

Every person involved in, or aware of, accidents, violations or environmental emergencies in the MPA and AIA must report them to the appropriate authorities. Marine accidents, spills, or environmental emergencies must be reported to the Canadian Coast Guard (CCG) immediately or as soon as reasonably possible within two hours of occurrence. In the event of marine accidents, spills or environmental emergencies, individuals are legally obligated to take reasonable measures to prevent a deposit or to remedy or mitigate any damages to minimize potential impacts of the accident or spill on the MPA and AIA ecosystem.

[2] Although the MPA regulations allow for the manual harvesting of clams for commercial and recreational purposes throughout the MPA, in accordance with Appendix IX of the Canadian Shellfish Sanitation Program - Manual of Operations, the entire MPA is closed to the harvesting of bivalve molluscs (excluding scallops) pursuant to subsection 3(1) of the *Management of Contaminated Fisheries Regulations*

TABLE 2: Human activities allowed in the Musquash Estuary Marine Protected Area (MPA) and Administered Intertidal Area (AIA) provided that they abide by applicable legislation, regulations, and policies (Check Mark, ✔ – Activity is allowed and/or activity plan is required, No Check Mark – Activity is prohibited, and C – Condition with which the activity may be allowed).

ACTIVITY	MANAGEMENT ZONE					ACTIVITY PLAN REQUIRED	NOTES
	1	2A	2B	3	AIA		
NATIONAL INTEREST							
a. Public safety (e.g. SAR)	√	√	√	√	√		
b. National defence	√	√	√	√	√		
c. National security	√	√	√	√	√		
d. Law enforcement	√	√	√	√	√		
e. Environmental response	√	√	√	√	√		
PERSONAL RECREATION (e.g. swimming, kayaking)	√	√	√	√	√		• Allowed provided it does not violate the General Prohibition, CAPP, or any other applicable legislation, regulations, or policies
ABORIGINAL FISHING	√	√	√	√	√		• Aboriginal fishing for food, social and ceremonial purposes is allowed throughout the MPA and AIA, pursuant to the Aboriginal Communal Fishing Licences Regulations.
COMMERCIAL FISHING (including Aboriginal commercial communal)							• Must be carried out in accordance with the *Fisheries Act* and its regulations
a. Scallops				√			
b. Clams							• Although the MPA Regulations allow for the commercial harvesting of clams by manual means throughout the MPA, in accordance with Appendix IX of the Canadian Shellfish Sanitation Program - Manual of Operations, the entire MPA is closed to the harvesting of bivalve molluscs (excluding scallops) pursuant to subsection 3(1) of the *Management of Contaminated Fisheries Regulations*.
c. Elvers or eels	√						• Allowed by means of a hand-deployed fyke net or dip net
d. Lobster		√	√	√			• Allowed by means of individual traps
e. Herring		√	√	√	√		• Allowed by means of a weir, beach seine, bar seine, or drag seine
RECREATIONAL FISHING							• Must be carried out in accordance with the *Fisheries Act* and its regulations
a. Scallops	√	√	√	√	√		• Allowed by manual means
b. Clams							• Although the MPA regulations allow for the recreational harvesting of clams by manual means throughout the MPA, in accordance with Appendix IX of the Canadian Sanitation Program - Manual of Operations, the entire MPA is closed to the harvesting of bivalve molluscs (excluding scallops) pursuant to subsection 3(1) of the *Management of Contaminated Fisheries Regulations.*
f. Any other species	√	√	√	√	√		• Allowed by means of angling or dip net

ACTIVITY	MANAGEMENT ZONE					ACTIVITY PLAN REQUIRED	NOTES
	1	2A	2B	3	AIA		
DULSE HARVESTING							
a. Recreational harvesting		√	√	√	√		• Allowed by manual means
b. Commercial harvesting		√	√	√	√		• Allowed by manual means
MARINE VESSELS AND ALL-TERRAIN VEHICLES							
a. Marine vessels	C	√	√	√	√		• Marine vessel refers to any large vessel including ships, sail boats and motorized personal water craft • Allowed in Zone 1 for purposes of national interest (e.g. public safety) or with approved activity plan (e.g., for scientific research). Allowed in Zones 2A and 2B (and adjacent AIA) at a maximum speed of 5 knots, and in Zone 3 (and adjacent AIA) at a maximum speed of 8 knots.
b. All-terrain vehicles					C		•Allowed for purposes of public safety, national defence, national security, law enforcement or environmental emergency response
PHYSICAL WORKS AND UNDERTAKINGS							
a. Boat launches, wharfs, or navigational channels		√			C		• Allowed when approval or authorization is not required pursuant to the *Navigable Waters Protection Act* or *Fisheries Act*, or is carried out in accordance with an approval or authorization pursuant to this legislation, in support of construction, repair, maintenance or removal • This type of activity is only allowed in the AIA portion adjacent to Zone 2A if it supports such an activity in Zone 2A.
OTHER							
a. Scientific research (including monitoring)	√	√	√	√	√	√	• Allowed pursuant to an approved activity plan and if consistent with any other applicable legislation regulations and policies
b. Educational activities	√	√	√	√	√	√	• Allowed pursuant to an approved activity plan and if consistent with any other applicable legislation, regulations and policies
c. Archaeological studies	√	√	√	√	√	√	• Allowed pursuant to an approved activity plan and if consistent with any other applicable legislation, regulations and policies
d. Commercial tourism	√	√	√	√	√	√	• Allowed pursuant to an approved activity plan and if consistent with any other applicable legislation, regulations and policies
e. Habitat restoration	√	√	√	√	√	√	• Allowed pursuant to an approved activity plan and if consistent with any other applicable legislation, regulations and policies

Marine Protected Area, Administered Intertidal Area and Fisheries Violations must be reported to:
Fisheries and Oceans Canada
Tel: 506-636-5051

Search and Rescue incidents must be reported to:
Joint Rescue Coordination Centre /
Search and Rescue
National Defence Canada
Tel: 800-565-1582

Marine accidents, spills or environmental emergencies must be reported immediately or as soon as reasonably possible within two hours of occurrence to:
Marine Accidents, Spills and Environmental Emergencies
Canadian Coast Guard
Tel: 800-565-1633

4.1.6 FINES AND IMPRISONMENT

Violation of the MPA Regulations carries penalties under the *Oceans Act* up to $100,000 for an offence punishable on summary of conviction and up to $500,000 for an indictable offence. Violation of the *Fisheries Act* may carry additional significant fines and/or imprisonment upon conviction. Conviction of a violation or accident may also result in additional fines and imprisonment pursuant to the New Brunswick *Trespass Act* or other applicable legislation, regulations and policies.

4.2 GOVERNANCE

The Musquash Estuary MPA and AIA are managed by the Oceans and Coastal Management Division (OCMD) within DFO, on behalf of the Government of Canada. Guidance for the management of the MPA and AIA is provided by the Musquash Advisory Committee (MAC). Several other federal and provincial government departments and agencies have regulatory roles and responsibilities in the Musquash Estuary (see Appendix 2 for roles and responsibilities).

4.2.1 ROLES AND RESPONSIBILITIES

4.2.1.1 FISHERIES AND OCEANS CANADA

Fisheries and Oceans Canada consists of several sectors that are responsible for different aspects of oceans governance pursuant to the *Oceans Act, Fisheries Act,* and *Species at Risk Act*. Through coordination by OCMD, the lead authority responsible for managing the MPA and AIA, DFO aligns its policies, programs, and management strategies related to the site. DFO will implement the management actions set out in this plan to ensure long-term conservation, protection, and sustainable use of the MPA and AIA.

In addition, OCMD, on behalf of the Ecosystem Management Branch, coordinates DFO's regional environmental response program. The MPA and AIA have been identified as priority areas in the case of an environmental incident in the area.

The Real Property, Safety and Security Branch hold the title to the Provincial Crown lands that were transferred from New Brunswick to DFO. The Science Branch contributes to scientific monitoring and research in the MPA and AIA, contingent on the availability of funds and resources.

The Fisheries and Aquaculture Management Branch (FAM) is responsible for regulating fisheries and marine plant harvesting activities in accordance with various regulations pursuant to the *Fisheries Act*. Harvesting activities are managed through license conditions, integrated fisheries management plans, and conservation harvesting plans. Within FAM, the Conservation and Protection Branch (C&P) is responsible for the enforcement of human activities in the MPA and AIA, pursuant to the *Oceans Act, Fisheries Act,* and *Species at Risk Act*.

Last, the Fisheries Protection Program (FPP) regulates works and undertakings pursuant to the Fisheries Protection Provisions of the *Fisheries Act*. Proposed activities, works and undertakings (e.g., habitat restoration) in the MPA and AIA and adjacent lands will be reviewed to determine if serious harm to fish is likely to occur, and if an Authorization should be issued pursuant to Subsection 35(2)(b) of the *Act*.

DFO's core responsibilities under the management plan are to:

1) implement and coordinate management activities in DFO, and with other federal and provincial government departments and non-government organizations that have jurisdiction in the MPA and AIA;
2) promote user awareness regarding allowed and prohibited human activities in the MPA and AIA, as well as awareness of the *Oceans Act* (and the MPA Regulations), *Fisheries Act, Species at Risk Act, Federal Real Property and Federal Immovables Act*, New Brunswick *Trespass Act*, CAPP, and other applicable legislation, regulations, and policies;
3) coordinate and conduct surveillance and enforcement in the MPA and AIA;
4) support and undertake monitoring and scientific research in the MPA and AIA, contingent on the availability of funds and resources;
5) facilitate public awareness and distribute educational materials to stakeholders and users of the MPA and AIA, contingent on the availability of funds and resources;
6) build capacity in support of stewardship initiatives; and
7) review actions and priorities in the MPA and AIA management plan to determine if the conservation objectives are being met.

4.2.1.2 Environment and Climate Change Canada

Environment and Climate Change Canada (ECCC) is responsible for enforcement of the Pollution Prevention Provisions of the *Fisheries Act*, certain sections of the *Species at Risk Act*, as well as the *Canadian Environmental Protection Act, Canada Wildlife Act, Migratory Birds Convention Act*, and *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*. ECCC will provide a lead enforcement role in the MPA and AIA in the event of a violation of the *Acts* that they enforce. A violation may be subject to prosecution pursuant to more than one *Act*, and DFO and ECCC will cooperate with enforcement when appropriate.

In the event of an environmental emergency, ECCC plays a lead role through its National Environmental Emergencies Centre (NEEC). In the case of a significant environmental incident, ECCC may convene an Emergency Science Table, comprised of representatives and experts from relevant levels of government, Aboriginal groups and other sectors, to provide consolidated advice to the lead agency. In most cases, the lead agency is the Canadian Coast Guard (CCG) for marine incidents and the New Brunswick Department of Environment and Local Government for land-based and freshwater incidents (On-Scene-Commander and/or Federal Monitoring Officer). In the Maritimes Region, DFO plays a large role in the Emergency Science Table due to its breadth of expertise regarding marine science and sensitivities. ECCC has included the MPA and AIA in its environmental response contingency planning for the area.

4.2.1.3 Canadian Coast Guard

The CCG is responsible for Search and Rescue on water, navigational aids maintenance and planning, and environmental response. The CCG has included the MPA and AIA in its regional environmental response contingency planning. In the event of an environmental incident in the estuary, the CCG will serve as either the lead agency On-Scene Commander or Federal Monitoring Officer (when another agency is the On-Scene Commander). See Figure 7 for the MPA incident reporting and response scheme. Information regarding the MPA Regulations, conservation measures, and specific guidance on the transit of vessels in Musquash Estuary has been published in the CCG's *Notice to Mariners*. The MPA has been flagged as a priority for the CCG, DFO, ECCC and the local Response (ALERT) Organization — Atlantic Environmental Response Team — for any incidents that may occur in the MPA that require environmental response. Note that ALERT maintains contracts

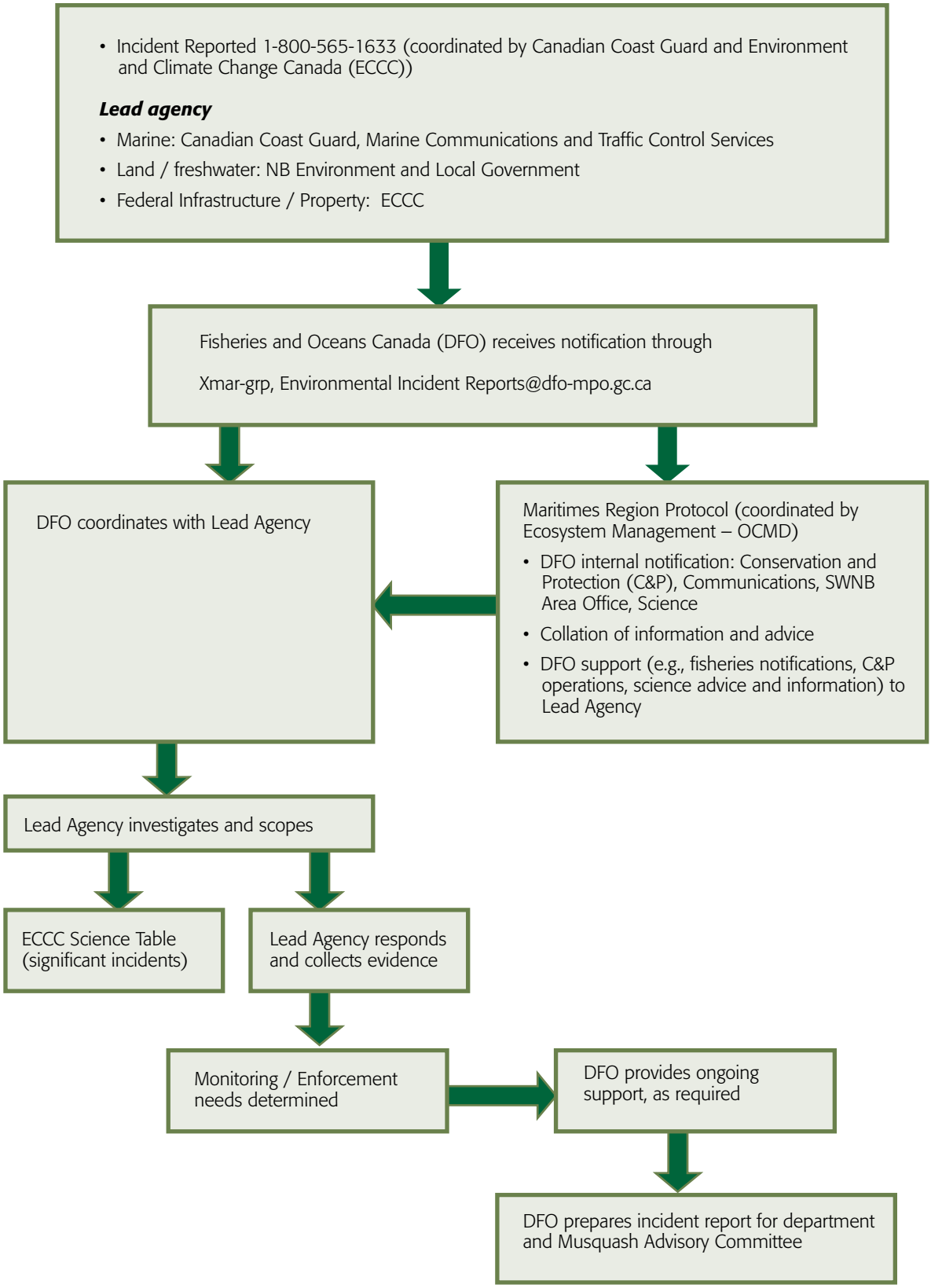


Figure 7. MPA incident reporting and response scheme

with all commercial tankers operating in the area to undertake spill response on their behalf.

4.2.1.4 Transport Canada (TC)

Transport Canada is responsible for matters related to marine safety and ship source pollution in Canadian waters. These responsibilities are exercised through various regulations pursuant to the *Canada Shipping Act* and Canada's international commitment to the International Maritime Organization. Transport Canada will provide a lead enforcement role in the MPA in the event that regulations pursuant to the *Canada Shipping Act* are violated. A violation may be subject to prosecution pursuant to more than one Act, and DFO and Transport Canada will cooperate with enforcement when appropriate.

4.2.1.5 Government of New Brunswick

The Government of New Brunswick is responsible for enforcing provincial laws. The Government of Canada will abide by all Government of New Brunswick laws, regulations, and policies that apply to the AIA, such as CAPP. DFO may rely on the Government of New Brunswick to enforce the provincial *Trespass Act*, in the event individuals contravene the allowed activities in the AIA. Last, DFO will coordinate with provincial departments to ensure that applications for works and undertakings in the AIA are referred to DFO's FPP.

4.2.1.6 Saint John Port Authority

Pursuant to the *Canada Marine Act* and Letters Patent, the Saint John Harbour Port Authority is responsible for maintaining safe and efficient navigation and protection of the environment in the waters of the Port. Jurisdiction under the Saint John Harbour Port Authority extends up to the ordinary water mark at high tide in Musquash Estuary, inward to Five Fathom Hole Wharf. The Port Authority

has enforcement jurisdiction related to specific vessel operations in much of MPA Zone 2A, throughout all of Zones 2B and 3, and in much of the AIA. Vessel activities in the estuary will continue to adhere to the practices and procedures established by the Port Authority, with the exception that vessels must adhere to the vessel speed limits outlined in the MPA Regulations and this management plan. The Port Authority is exempt from the *Navigable Waters Protection Act* for its own works, although DFO will collaborate on navigational projects proposed by the Port Authority that may affect the MPA and AIA.

4.2.1.7 Musquash Estuary MPA Advisory Committee

The MAC facilitates dialogue between DFO, other regulators, and stakeholders regarding implementation of the MPA and AIA management plan. MAC members represent government, non-government organizations, industry, First Nations, and community groups that have an interest in the MPA and AIA. It provides skills, local knowledge, and experience related to conservation, management, and general use of the estuary. As guided by the Terms of Reference, the MAC will continue to provide input on management issues for the MPA and AIA. However it does not replace the regulatory mandate or decision-making authority of any government department or agency that has legal jurisdiction in Musquash Estuary. Fisheries and Oceans Canada is committed to integrating advice from MAC in decisions regarding

the MPA and AIA, provided that the advice is consistent with legislation, regulations, and policies that guide management of the area.

On-going collaboration will continue to define the roles and responsibilities of MAC. The roles of MAC are to:

1) advise on the development and implementation of MPA and AIA plans, policies, protocols, conservation measures, management strategies, and operational procedures;
2) provide input on interpretation and application of the MPA Regulations;
3) assess the accuracy and quality of ecological and socio-economic information used by DFO for decision-making;
4) review activity plans submitted under the MPA Regulations and provide comments with respect to appropriateness and consistency with MPA conservation objectives;
5) endorse and recommend strategies and plans of management for DFO approval;
6) provide input on activities of other organizations mandated or involved in the protection of the Musquash Estuary;
7) discuss and recommend monitoring and research to address the needs of the MPA and AIA;
8) identify outreach opportunities and assist with the development and delivery of educational materials for the general public; and
9) participate in the review and evaluation of conservation objectives, management effectiveness and Committee contributions.

4.3 MANAGEMENT PRIORITIES AND ACTIONS

The management vision, guiding principles, and conservation objectives outlined in section 3, guide the management of the MPA and AIA. OCMD has identified management priorities and associated actions to be undertaken, as resources allow, during the lifetime of this management plan (Figure 8) and these are listed below and described in subsequent sections.

4.3.1 CONTINUE TO ENGAGE FEDERAL AND PROVINCIAL REGULATORS TO ENSURE THEY ARE AWARE OF THEIR ROLES AND RESPONSIBILITIES

As indicated in Section 4.2, the roles and responsibilities of various departments and agencies in the Musquash Estuary MPA arise out of their respective legislative authority. Nevertheless, OCMD will continue to regularly engage federal and provincial regulators to ensure the MPA is considered in their policies and programs, where applicable, and to update them with MPA management issues and requirements, as needed. Specific actions to be addressed in the lifetime of this management plan are listed below.

4.3.1.1 Develop an oil spill emergency response plan

In 2014, the Atlantic Environmental Response Team (ALERT), a marine oil spill response organization, conducted an operational exercise in the MPA. Equipment, such as protection booms and skimmers, was deployed in several areas of the harbour including at Five Fathom Hole and Black Beach. The exercise provided valuable information about how best to protect the MPA in the event of an oil spill. ALERT has committed to additional work in the MPA to further develop its area-specific response plan. OCMD is supportive of ALERT's efforts to develop a response plan with protection strategies and tactics for the MPA and will collaborate with them to ensure effective response strategies and measures are in place for the MPA. As part of this work, OCMD is collaborating with the local fishing industry to identify protection priorities based on their knowledge of the area.

VISION

Conservation and protection of the MPA and AIA marine ecosystem

GUIDING PRINCIPLES

- Integrated Management
- Ecosystem Approach
- Precautionary Approach
- Knowledge-based decision making
- Collaboration and stewardship
- Adaptive planning and management

CONSERVATION OBJECTIVES

Ensure no unacceptable reduction or human-caused modification in:

- Productivity so that each component (primary, community, population) is functioning in the ecosystem (e.g., by maintaining the abundance and health of harvested species);
- Biodiversity by maintaining the diversity of individual species, communities, and populations within the different ecotypes; and
- Habitat in order to safeguard the physical and chemical properties of the ecosystem by maintaining water and sediment quality.

MANAGEMENT PRIORITIES	KEY MANAGEMENT ACTIONS
Continue to engage federal and provincial regulators to ensure they are aware of their roles and responsibilities in management of the MPA and AIA	• Develop an oil spill emergency response plan for the MPA • Ensure appropriate planning, procedural, and communication mechanisms are in place to support surveillance, enforcement and compliance • Update relevant agencies with MPA management issues and requirements, as needed

Figure 8: Overview of the management approach (continued)

MANAGEMENT PRIORITIES	KEY MANAGEMENT ACTIONS
Foster public education, awareness and stewardship	• Inform estuary users of the allowed and prohibited activities in the MPA • Develop educational materials to raise awareness of the MPA • Support the efforts of Fundy Baykeeper of the Conservation Council of New Brunswick to contribute to the conservation of the Musquash Estuary by expanding upon its existing education, outreach and stewardship efforts for the MPA
Manage activities in the MPA	• Review proposed activity plan applications and ensure MAC is given the opportunity to provide recommendations prior to a decision • Manage liability and ensure safe practices within the MPA (e.g., ensure buoys mark the location of navigation hazards, maintain field signs at access points) • Work with other government agencies, land owners, community members and other stakeholders on the management of lands and coastal waters adjacent to the MPA in a manner that supports conservation and protection of the MPA (e.g., ensure that aquaculture development considers potential effects on the MPA) • Develop a progress report on the MPA • Investigate potential changes to the MPA Regulations to enhance the management of activities and the effectiveness of the MPA
Monitor and report on the health and management effectiveness of the MPA	• Implement the monitoring plan for the MPA • Review the monitoring plan and develop an ecosystem monitoring report • Support and encourage research in the MPA • Review governance aspects of MPA management effectiveness with input from the MAC and make recommendations for improving management performance • Review the management plan • Support the efforts of Eastern Charlotte Waterways to contribute to the conservation of Musquash Estuary through monitoring

Figure 8: Overview of the management approach

4.3.1.2 Ensure appropriate planning, procedural, and communication mechanisms are in place to support surveillance, enforcement and compliance

A coordinated approach to surveillance and enforcement is required in the MPA and AIA given the area's multiple users, many regulators, and potential interactions and impacts with adjacent areas. Fisheries and Oceans Canada is responsible for ensuring that the *Oceans Act*, *Fisheries Act,* and *Species at Risk Act* are enforced in the MPA and AIA. This is undertaken by DFO Fishery Officers, the primary authority regarding enforcement in the MPA and AIA, who conduct shellfish closure patrols, road patrols, and foot, air, and ATV patrols.

Other government departments and agencies, as outlined in Section 4.2, may also contribute to the surveillance, compliance monitoring, and enforcement of activities in the MPA and AIA. Fisheries and Oceans Canada coordinates inter-agency surveillance and enforcement activities, where appropriate. Transport Canada conducts pollution surveillance for the MPA via the National Aerial Surveillance Program. The MPA is considered in the flight plan for surveillance flights in the area and OCMD staff members receive these surveillance reports. The CCG publishes an annual Notice to Mariners which contains information on the MPA Regulations, and guidance on vessel traffic in the MPA provided by OCMD (Canadian Coast Guard 2013).

Enforcement and compliance promotion initiatives are carried out to ensure that activities in the area are consistent with MPA conservation objectives and regulations. DFO promotes compliance through public awareness, education programs, and stewardship initiatives. The intensity and nature of compliance promotion will be contingent on the availability of funds and resources. Marine users, coastal landowners, and local residents will be encouraged to participate in the surveillance, compliance monitoring, and reporting effort for the MPA and AIA via the Musquash Watch community surveillance initiative.

Surveillance and compliance monitoring information in the MPA and AIA will be reviewed to determine if users are complying with the allowed human activities. Effectiveness of inter-agency communication and planning regarding surveillance and enforcement will also be reviewed.

4.3.2 FOSTER PUBLIC EDUCATION, AWARENESS AND STEWARDSHIP

Public awareness and education are critical factors in ensuring the long term success of an MPA, especially those with coastal access like the Musquash Estuary MPA. Compliance with MPA Regulations is expected to be higher when community members, MPA users, and the general public are aware of objectives and management strategies of an MPA. Since designation of the MPA, several partners have been involved in educational and outreach activities. Education, awareness and stewardship initiatives will be encouraged and coordinated where possible with outreach programs that already exist in Musquash Estuary, such as those undertaken by the Fundy Baykeeper of the Conservation Council of New Brunswick (CCNB), Ducks Unlimited Canada, Nature Conservancy of Canada, and the Gulf of Maine Council.

Specific projects to be addressed in the lifetime of this management plan, contingent on the availability of funds and resources, are identified below.

4.3.2.1 Inform estuary users of the allowed and prohibited activities in the MPA

OCMD maintains relationships with federal and provincial regulators to ensure they are aware

of MPA regulatory requirements. Additionally OCMD communicates with, and distributes materials to marine users and the public who undertake activities in the MPA and AIA to inform them of activities that are allowed, prohibited, restricted, or need to be approved by DFO.

4.3.2.2 Develop educational materials to raise awareness of the MPA

OCMD will seek opportunities to develop and distribute educational materials about the MPA. In particular, OCMD will develop educational video products to highlight the ecological importance of the MPA. The videos will be placed online and potentially used in other public venues.

Funds have been identified to strengthen marine and coastal conservation with community partners to advance conservation efforts. For example, the CCNB's Fundy Baykeeper will expand upon its existing education, outreach and stewardship efforts for the MPA by 1) seeking out new education and outreach opportunities with local schools and tourism groups; 2) facilitating in class learning opportunities, field trips, and guided tours; 3) developing materials to support outreach, and helping promote the MPA via the media; and 4) contributing to ecosystem monitoring by collecting temperature, salinity and depth data during outreach/stewardship activities within the MPA.

4.3.3 MANAGE ACTIVITIES IN THE MPA

4.3.3.1 Review proposed activity plan applications

Proponents of scientific research and monitoring, educational activities, archaeological studies, commercial tourism, and habitat restoration projects must submit an activity plan application to DFO prior to undertaking such activities in the MPA and AIA. In the case of a habitat restoration project, the proposed activity can be allowed if it is to be carried out for the purpose of managing the MPA and AIA.

OCMD has developed an application form and guidelines for submission of activity plans for the above-mentioned proposed activities in the MPA and AIA. These documents are available from OCMD. DFO Fishery Officers are informed of activities that have been approved to be undertaken in the MPA and AIA.

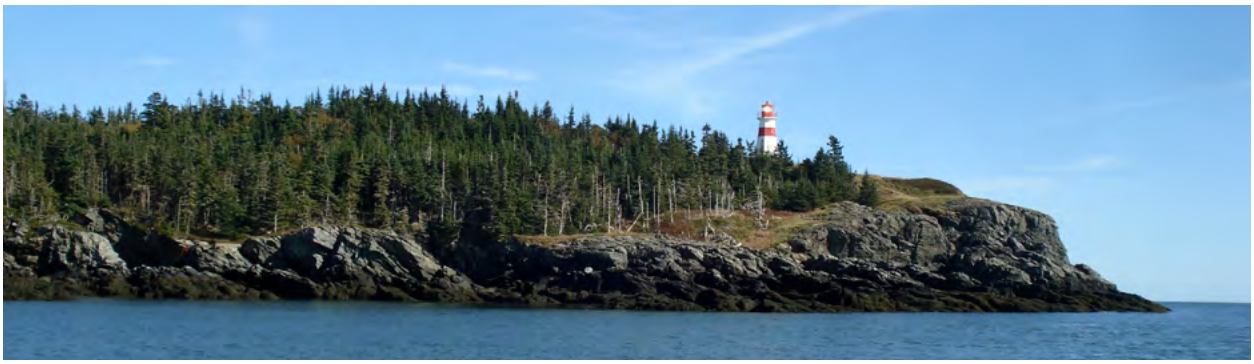
Information requirements of the activity plan application include:

1. Proponent contact information:
   (a) Name;
   (b) Address;
   (c) Telephone number;
   (d) Fax number; and
   (e) Email address.

2. Description of activity:
   (a) Purpose of activity;
   (b) Time period of activity;
   (c) Map identifying activity location;
   (d) Type of vessel used and its identity;
   (e) Type of equipment being used and how it is deployed/anchored;
   (f) Types of data to be collected;
   (g) List of other licences, permits, or authorizations that are required; and
   (h) List of substances that may be deposited, discharged, or dumped.

3. Description of potential effects of activity:
   (a) Assessment of likely effects of the activity on the environment.

An activity plan application must be submitted to DFO for review at least 60 days in advance of the proposed activity date. OCMD circulates the application to MAC for input prior to a decision on its approval. DFO will approve an activity within 30 days of receiving a completed submission



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if the activity or its associated cumulative effects are not likely to damage or destroy the habitat of a living marine organism in the MPA or AIA. Fisheries and Oceans Canada recognizes that activities may arise opportunistically and on short notice and, if reasonably possible, DFO will aim to review proposed activity plans in a shorter time period than that described above, particularly for proposed activities that strongly contribute to conservation and protection of the estuary (e.g. scientific monitoring activities).

An approved activity plan application is not considered approval of other licences, permits, or authorizations that may be required by the proponent to undertake an activity in the MPA or AIA. It is the responsibility of the proponent to ensure that other required licences, permits, or authorizations are acquired prior to undertaking an approved activity. Proponents of scientific research and monitoring, educational activities, archaeological studies, commercial tourism, and habitat restoration projects can contact DFO for guidance regarding the requirements of the submission and evaluation process at:

Musquash Estuary Marine Protected Area
Oceans and Coastal Management Division
Fisheries and Oceans Canada
1 Challenger Drive, PO Box 1006
Dartmouth, NS
Canada B2Y 4A2
Tel: 902-426-9919
Fax: 902-426-2331
Em. Musquash@dfo-mpo.gc.ca

OCMD has established and maintains a database of past activity plan applications, evaluations, and decisions.

4.3.3.2 Manage liability and ensure safe practices

Fisheries and Oceans Canada will undertake reasonable measures to inform the public of the unique physical conditions of the MPA and AIA. For this purpose, the OCMD has developed a brochure outlining issues and hazards to consider when planning and carrying out an activity. Musquash Estuary users should exercise caution when undertaking activities in the MPA and AIA. Factors that need to be considered when planning a safe and enjoyable activity include:
1) environmental conditions can rapidly change, including fog, rain, wind, waves, tides and surges/ swells;
2) rising tides are large and currents can be strong, rapidly flooding tributary channels and covering mudflats;
3) mudflats, marshlands and rocky shores can be slippery and may contain hidden mud patches, standing water and sensitive habitat;
4) shoals, debris and old marine vessels can float or be hidden below water during high tide;
5) old marine vessels, weir stakes and wharfs can be

unsteady and their historic significance should be enjoyed from a distance; and
6) fishing equipment and navigational aids may be located in the water ways. Musquash Estuary is used by many individuals and the activities and property of others should be respected.

OCMD will maintain field signs with information on the potential hazards of the MPA at six access points, buoys marking the location of navigation hazards that cannot be seen at high tide, and permanent land markers that delineate the zones for MPA users. OCMD will ensure proponents of approved activities are aware of potential hazards in the MPA.

4.3.3.3 Work with other government agencies, land owners, community members and other stakeholders on the management of lands and coastal waters adjacent to the MPA in a manner that supports conservation and protection of the MPA

The health of the MPA and AIA are linked to the surrounding Musquash watershed and Bay of Fundy ecosystems (Figure 4; see Section 2.3). Musquash Estuary is the end point for freshwater discharge from Musquash watershed, which makes its way through the MPA and AIA to the sea. More than 75% of the water in Musquash Estuary is renewed with each flood tide from the Bay of Fundy. The health of the marine ecosystem in the MPA and AIA is, therefore, dependent on the quality of freshwater from the Musquash watershed and the seawater of the Bay of Fundy. This creates a special management challenge for the MPA and AIA. Proximity to the population centre of the City of Saint John, New Brunswick, vulnerability to impacts of human activities in the watershed and adjacent coastal waters, and complex jurisdictional and management issues emphasize the need to coordinate the management of lands and waters adjacent to the MPA and AIA.

DFO will work with other government agencies, private land owners and other stakeholders to ensure activities on lands and in coastal waters adjacent to the MPA and AIA, including Musquash watershed and the Bay of Fundy, are conducted in a manner that supports conservation and protection of the estuary.

4.3.3.4 Develop a progress report on the MPA

The current management plan identifies conservation objectives and management priorities and actions for meeting those objectives. OCMD will develop a public report to provide an update on the progress that has been made toward meeting the various objectives and priorities that are described in the management plan. These periodic reports will also highlight special management issues, collaborative efforts and research activities that have occurred in the MPA. The first progress report was published in 2015 and covered the period of 2007-2013[3].

4.3.3.5 Investigate potential changes to the MPA Regulations to enhance the management of activities and the effectiveness of the MPA

Since the designation of the Musquash Estuary MPA, a number of regulatory issues have been identified that have resulted in modifications to the regulations in more recently established *Oceans Act* MPAs. Modifying the Musquash Estuary MPA Regulations is one means of addressing the needs of the MPA. For example, in 2011 the MPA Regulations were amended to address minor errors (e.g., inconsistencies between the French and English versions).

Over the life of this management plan, additional regulatory changes will be investigated to enhance the management and effectiveness of the MPA. Potential changes may include, but are not limited to:

- revisions to the activity plan application process to require additional information from activity proponents and to modify the timelines for activity approval; and

[3] http://waves-vagues.dfo-mpo.gc.ca/Library/40610081.pdf

- zoning changes such as modifying activities permitted in certain zones.

Changes to the Regulations would be published in the Canada Gazette, and any significant changes would be posted for public review and discussed in advance with MAC and other affected interested parties.

4.3.4 MONITOR AND REPORT ON THE HEALTH AND MANAGEMENT EFFECTIVENESS OF THE MPA

DFO will promote, and in many cases, fund and conduct scientific research and monitoring. Research and monitoring activities in the Musquash Estuary have focused to date on benthic diversity, physical oceanography, sedimentation rates, fish community assemblages, bird population surveys, and human threats (Cooper et al. 2014). Research and monitoring activities in the MPA may be conducted by DFO and other partners from government, industry, academia, and environmental/community groups. Monitoring and research activities will be conducted by DFO as capacity and resources allow.

4.3.4.1 Implement the monitoring plan

Twelve ecosystem indicators to monitor the health of the Musquash MPA have been identified through several Canadian Science Advisory Secretariat meetings and reports (Cooper et al. 2011, Cooper et al. 2014, DFO 2011, DFO 2013a, 2013b, 2013c). An ecosystem monitoring plan for Musquash Estuary MPA which describes these ecosystem indicators (8 ecological indicators and 4 pressures/threats indicators), protocols, and management priorities for monitoring for 2014-2019 has been developed and is being implemented (OCMD 2015). Outcomes of the monitoring plan will inform management in support of the conservation objectives for the MPA and AIA. Monitoring is central to informing management actions that are designed to minimize the effects of human activities on the ecosystem. Baseline information will provide a benchmark against which future evaluations of ecosystem health can be compared. Monitoring of the MPA and AIA will be coordinated between OCMD and DFO Science and will be implemented with various partners. The monitoring plan will be reviewed every five years to ensure monitoring activities are addressing management priorities.

Monitoring conducted by DFO will aim to complement programs that already exist in Musquash Estuary, such as those undertaken by the Conservation Council of New Brunswick, Ducks Unlimited Canada, Nature Conservancy of Canada, and ECCC. It will also aim to incorporate community participation.

In the event that negative ecosystem effects are observed in the MPA or AIA a range of actions may be undertaken. In the short-term, mitigation measures may be implemented through management actions to address the cause of negative effects (e.g. temporary fishery closure). In addition, more intensive monitoring may be undertaken to evaluate the effectiveness of management actions. Observed negative effects due to human activities may be grounds for increased enforcement and/or prosecution. The need for enforcement and prosecution will be determined on a case-by-case basis.

Opportunities for partners to become involved in conservation efforts have been strengthened through dedicated funding provided to DFO. For example, OCMD will support Eastern Charlotte Waterways in its efforts to contribute to the conservation of Musquash Estuary through monitoring water quality in the MPA over a five year period (2014-2019). The water quality monitoring will include environmental measurements of temperature, conductivity, dissolved oxygen, and Secchi depth; eutrophication indicators including total nitrogen, total phosphorous, and chlorophyll a; and faecal

coliform bacteria analysis. The monitoring will also include one eutrophication sampling event and five coliform sampling events per year.

4.3.4.2 Review the monitoring plan and develop an ecosystem monitoring report

A report summarizing ecosystem monitoring activities and results for the Musquash Estuary MPA and AIA will be published during the lifetime of this plan. There may, however, be instances where the results of a specific monitoring activity are especially interesting or show a need for management action. In such situations, those results will be reported as needed. The MAC will be a key venue through which to share and discuss monitoring results.

4.3.4.3 Research

Activities not captured in the ecosystem monitoring plan are considered research. Research in the MPA and AIA should improve understanding of the physical, chemical and biological processes that influence the health of the marine ecosystem. It should also support information needs identified by monitoring. OCMD will encourage ecological research as well as research that contributes to knowledge of human history and socio-economic importance in the MPA. Research should:

- Contribute to conservation and protection of biodiversity, productivity and habitat in the estuary;
- Address issues arising from human activities that are incompatible with the conservation objectives;
- Support multidisciplinary cooperation, partnerships and resource sharing; and
- Be conducted in an ecologically sensitive manner.

4.3.4.4 Review governance aspects of MPA management and make recommendations for improving management performance

Social and governance aspects of the MPA were not considered in the ecosystem monitoring plan. As such, an evaluation of these components of management effectiveness is needed. This assessment will be based on commitments made in this management plan and other *Oceans Act* guidance and policy documents. Results of the assessment will be used to guide work planning, inform the management plan review scheduled for 2020, and ultimately provide important recommendations for enhancing Musquash management performance. The first such evaluation of the MPA was conducted for the 2007-2012 period (DFO 2015[4]). OCMD will conduct reviews of management effectiveness regularly to help meet the MPA monitoring and evaluation objectives and to help inform the next management plan review.

4.3.4.5 Review the management plan

The management plan is intended to guide management of the MPA for approximately five years. Management actions in the plan will be reviewed every five years, or as deemed necessary by DFO and MAC. Fisheries and Oceans Canada will consult with MAC on a regular basis regarding management priorities and actions. Similar to the review described above, an effort to review progress towards meeting plan objectives will be conducted. The review will examine the conservation objectives of the MPA and AIA to determine if they remain appropriate, evaluate the success of management actions in achieving the conservation objectives, and identify emerging priorities for the next iteration of the plan. Over this period changes to legislation, regulations, priorities or commitments could necessitate an earlier review and update to the public on particular management issues. This could take the form of companion documents to this management plan.

[4] http://waves-vagues.dfo-mpo.gc.ca/Library/40610172.pdf

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APPENDIX 1: MUSQUASH ESTUARY MPA REGULATIONS

Musquash Estuary Marine Protected Area Regulations
SOR/2006-354

Registration December 14, 2006
OCEANS ACT
Musquash Estuary Marine Protected Area Regulations

Her Excellency the Governor General in Council, on the recommendation of the Minister of Fisheries and Oceans, pursuant to subsection 35(3) of the *Oceans Act*, hereby makes the annexed Musquash Estuary Marine Protected Area Regulations.a S.C. 1996, c. 31
Musquash Estuary Marine Protected Area Regulations

INTERPRETATION

1. (1) The following definitions apply in these Regulations.
"Area" means the Musquash Estuary Marine Protected Area designated under section 2. (zone)
"vessel" has the same meaning as in section 2 of the *Canada Shipping Act*. (bâtiment)
"waters" means, in addition to the waters, the seabed and subsoil below the waters to a depth of two metres. (eaux)
(2) In these Regulations, all geographical coordinates (latitude and longitude) are expressed in the North America Datum 1983 (NAD 83) geodetic reference system.
(3) In the schedule, the lines connecting the points are rhumb lines.

DESIGNATION

2. The areas of the sea in the Musquash Estuary comprised of the management zones described below – and depicted in the schedule – are together designated as the Musquash Estuary Marine Protected Area:
(a) Zone 1, consisting of waters lying generally northwest of a rhumb line connecting points at 45°11'19.63" N, 66°15'37.35" W and 45°11'23.96" N, 66°15'33.38" W, that are in an area bounded by the low-water line of the estuary and by
(i) the rhumb line to its points of intersection with the low-water line,
(ii) the northeasterly limit of Highway 790, where it crosses the southwestern arm of the West Branch Musquash River,
(iii) the southeasterly limit of the abandoned Canadian Pacific Railway right-of-way, where it crosses the northeastern arm of the West Branch Musquash River, and
(iv) the southerly limit of Route 1, where it crosses the East Branch Musquash River;
(b) Zone 2A, consisting of waters that are in an area bounded by the low-water line of the estuary and by the following rhumb lines to their respective points of intersection with the low-water line, namely,
(i) a line connecting points at 45°11'19.63" N, 66°15'37.35" W and 45°11'23.96" N, 66°15'33.38" W, and
(ii) a line connecting points at 45°08'47.00" N, 66°15'11.00" W and 45°09'08.91" N, 66°13'55.87" W;
(c) Zone 2B, consisting of waters that are in an area known as Gooseberry Cove and bounded by the low-water line of the cove and by a rhumb line, to its points of intersection with the low-water line, connecting points at 45°08'28.46" N, 66°15'12.23" W and 45°08'14.39" N, 66°15'35.50" W; and
(d) Zone 3, consisting of waters that are in an area bounded by the low-water line of the estuary and by the following rhumb lines to their respective points of intersection with the low-water line, namely,
(i) a line connecting points at 45°08'47.00" N, 66°15'11.00" W and 45°09'08.91" N, 66°13'55.87" W,
(ii) a line connecting points at 45°08'28.46" N, 66°15'12.23" W and 45°08'14.39" N, 66°15'35.50" W, and
(iii) a line connecting points at 45°08'14.39" N, 66°15'35.50" W and 45°08'35.60" N, 66°14'16.77" W.

PROHIBITED ACTIVITIES

3 (1) In the Area, no person shall

(a) disturb, damage or destroy, or remove from the Area, any living marine organism or any part of its habitat; or

(b) carry out any activity — including depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped — that is likely to result in the disturbance, damage, destruction or removal of a living marine organism or any part of its habitat.

(2) Despite subsection (1), a person may carry out any activity excepted under section 4 or any scientific, educational, archaeological, commercial tourism or habitat restoration activity for which a plan is approved under section 6.

EXCEPTIONS

4. The following activities may be carried out in the Area:

(a) the following fishing activities, namely,

(i) fishing that is carried out in accordance with the *Aboriginal Communal Fishing Licences Regulations*,

(ii) any of the following recreational fishing activities carried out in accordance with the *Atlantic Fishery Regulations*, 1985 or the Maritime Provinces Fishery Regulations, namely,

(A) manually fishing for scallops or clams, and

(B) fishing for any other species by means of angling or a dip net, and

(iii) any of the following commercial fishing activities carried out in accordance with the *Atlantic Fishery Regulations*, 1985 or the *Maritime Provinces Fishery Regulations*, namely,

(A) in Zone 1, fishing for elvers or eels by means of a hand-deployed fyke net or dip net,

(B) in Zone 2A, 2B or 3, fishing for lobster by means of individual traps and for herring by means of a weir, beach seine, bar seine or drag seine,

(C) in Zone 3, fishing for scallops, and

(D) in any Zone, manually fishing for clams;

(b) in Zone 2A, 2B or 3, the recreational or commercial harvesting of dulse manually;

(c) the operation of a vessel in Zone 2A or 2B at a speed no greater than five knots or in Zone 3 at a speed no greater than eight knots;

(d) in Zone 2A, the construction of a boat launch, the maintenance, repair or removal of a wharf or boat launch or the maintenance of a navigation channel, for which approval or authorization is not required under the *New Brunswick Clean Water Act*, S.N.B. 1989, c. C-6.1, the *Navigable Waters Protection Act* or the *Fisheries Act*, as the case may be, or that is carried out in accordance with an approval or authorization required under any of those Acts; and

(e) any activity that is carried out for the purpose of public safety, national defence, national security or law enforcement or in response to an emergency.

ACTIVITY PLAN

5. Every person who proposes to carry out a scientific, educational, archaeological, commercial tourism or habitat restoration activity in the Area shall submit to the Minister for approval, not less than 60 days before the day on which the activity is proposed to begin, a plan that contains the following information and documents:

(a) the name, address and telephone number and, if applicable, the facsimile number and electronic mail address of a person who can be contacted in respect of the plan;

(b) a detailed description of the proposed activity that sets out

(i) its purpose,

(ii) the period or periods during which it is to be carried out,

(iii) a map on which its location is identified,

(iv) the types of data that are to be collected, if any, and the sampling protocols or other techniques to be used to collect the data,

(v) the types of equipment, if any, that are to be used during the proposed activity, including those for gathering data and, if any of the equipment is to be anchored or moored in the Area, the methods by which the anchoring or mooring is to be conducted,

(vi) the type and identity of every vessel that is to be used to carry out the proposed

activity, and

(vii) every substance, if any, that is to be deposited, discharged or dumped in the Area during the proposed activity;

(c) an assessment of the environmental effects that are likely to occur in the Area as a result of the proposed activity; and

(d) a list of every licence, permit, authorization or consent obtained or applied for in respect of the proposed activity.

6. (1) The Minister shall, in 30 days after the day on which a plan that is submitted in accordance with section 5 is received, approve the plan if the proposed activity is not likely to damage or destroy the habitat of a living marine organism in the Area and, in the case of a habitat restoration activity, the proposed activity is to be carried out for the purpose of managing the Area.

(2) Despite subsection (1), the Minister shall not approve a plan if the cumulative environmental effects of the proposed activity, in combination with any other past and current activities carried out in the Area, are likely to damage or destroy the habitat of living marine organisms in the Area.

REPORTING OF ACCIDENTS

7. Every person involved in an accident that is likely to result in any prohibited activity shall, in two hours after its occurrence, report the accident to the Canadian Coast Guard.

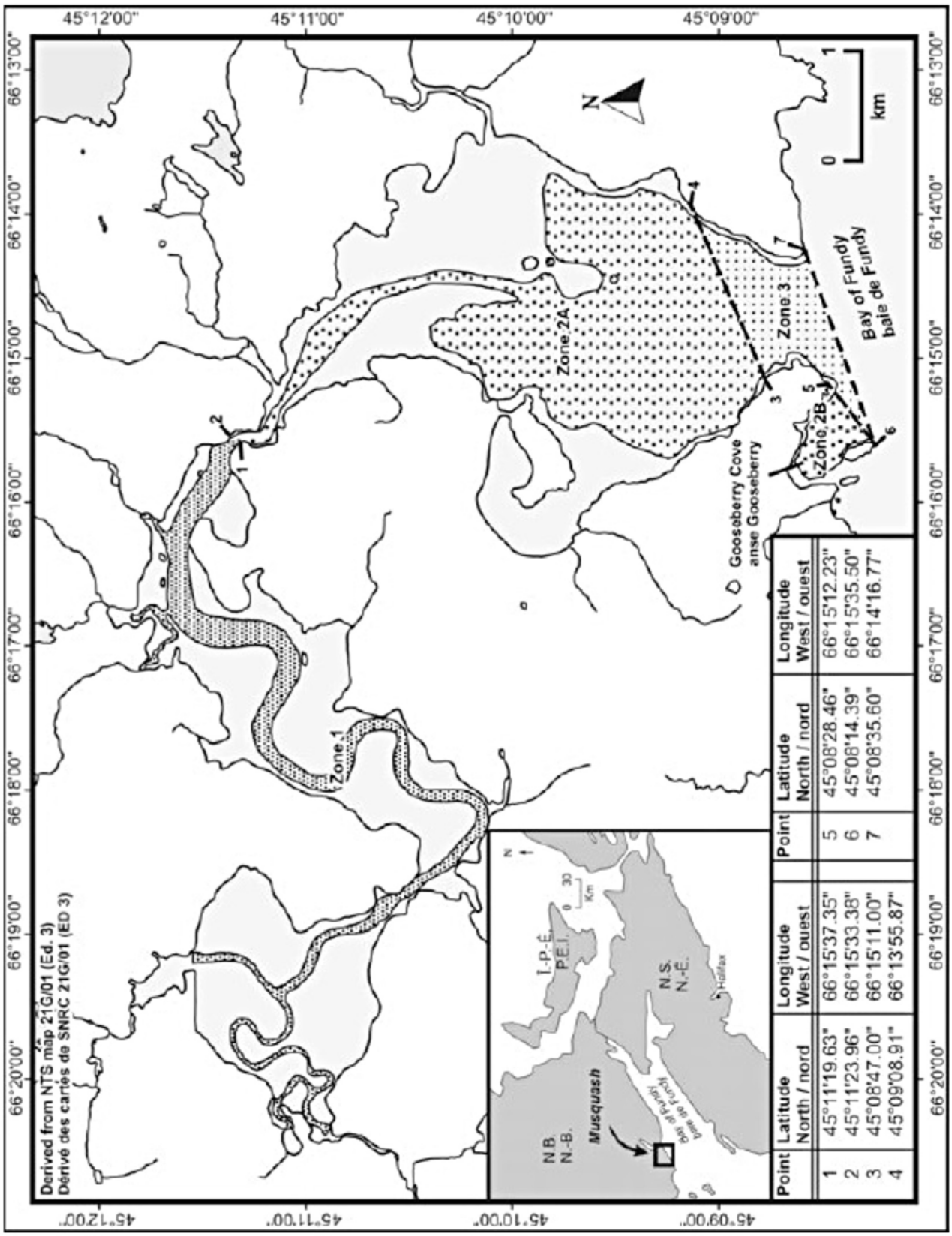
COMING INTO FORCE

8. These Regulations come into force on the day on which they are registered.

SCHEDULE/ANNEXE

(Subsection 1(3) and section 2/paragraphe 1(3) et article 2)

MUSQUASH ESTUARY MARINE PROTECTED AREA/ ZONE DE PROTECTION MARINE DE L'ESTUAIRE MUSQUASH



Point	Latitude North / nord	Longitude West / ouest
1	45°11'19.63"	66°15'37.35"
2	45°11'23.96"	66°15'33.38"
3	45°08'47.00"	66°15'11.00"
4	45°09'08.91"	66°13'55.87"
5	45°08'28.46"	66°15'12.23"
6	45°08'14.39"	66°15'35.50"
7	45°08'35.60"	66°14'16.77"

APPENDIX 2: ROLES AND RESPONSIBILITIES IN MANAGEMENT

Refer to abbreviations section at the beginning of the management plan for a description of acronyms used in this table.

REGULATORY OR ADVISORY BODY	REGULATORY AUTHORITY	ROLE AND RESPONSIBILITIES WITHIN THE MPA AND AIA
Canadian Coast Guard	• Responsible for maintenance of navigational aids, waterways management, icebreaking, marine communications and traffic services, search and rescue and environmental response • Conducts search and rescue and assists with fisheries patrols	• Assists environmental response strategies and planning, navigational aids maintenance and planning, and search and rescue
Canadian Environmental Assessment Agency	• Administers and promotes compliance with the federal environmental assessment process, assists in the process and promotes sound environmental practices	• Assists with environmental assessments carried out in and in the vicinity of the MPA and AIA
Department of National Defence (MARLANT)	• Responsible for national defence and national security • Conducts search and rescue and assists with fisheries patrols and ocean monitoring	• Ensures that defence activities are carried out in accordance with the MPA Regulations and other applicable legislation, regulations and policies
Environment Canada and Climate Change Canada	• Responsible for regulating pollution discharged into the marine environment and for managing disposal of waste at sea (*Fisheries Act, Canadian Environmental Protection Act*) • Manages environmental emergencies • Monitors and protects migratory birds (*Migratory Birds Convention Act*) • Key responsibilities for non-aquatic species at risk (*Species at Risk Act*) • Monitors water quality in shellfish growing areas (*Canadian Shellfish Sanitation Program and Shellfish Water Quality Protection Program*)	• Supports management and clean-up activities of an environmental emergency in the MPA and AIA • Enforces the pollution prevention provisions of the *Fisheries Act* • Undertakes water quality surveys to determine the suitability of waters for the harvesting of molluscs and shellfish • Conducts bird surveys as needed to support the MPA's ecological monitoring plan

REGULATORY OR ADVISORY BODY	REGULATORY AUTHORITY	ROLE AND RESPONSIBILITIES WITHIN THE MPA AND AIA
Fisheries and Oceans Canada	• Lead authority for managing Canada's oceans • Development of a network of Marine Protected Areas (*Oceans Act*) • Development and implementation of integrated management plans (*Oceans Act*) • Undertakes marine science research (*Oceans Act*) • Regulates fisheries (*Fisheries Act*) • Protects fish and fish habitat (*Fisheries Act*) • Protects critical habitat and develops recovery plans for aquatic species at risk (*Species at Risk Act*)	• Manager of the MPA and AIA • Enforces the *Oceans Act*, *Fisheries Act*, and *Species at Risk Act* (for aquatic species) • Coordinates management and implementation of the management plan • Chair of Musquash MPA Advisory Committee • Responsible for activity application process • Undertakes surveillance and enforcement of activities • Provides information about the MPA and AIA to industry, stakeholders and the public • Maintains Musquash MPA website • Undertakes monitoring and research • Responsible for the authorization of serious harm to fish pursuant to Subsection 35(2)(b) of the *Fisheries Act* • Responsible for fisheries and aquaculture management, including Aboriginal, commercial and recreational fisheries
Industry Canada	• Responsible for communications infrastructure, including licences for submarine cables (*Telecommunications Act*)	• Ensures submarine cable licensing proposals are in accordance with the MPA Regulations and other applicable legislation, regulations and policies
Musquash MPA Advisory Committee		• Provides advice to DFO on managing the MPA and AIA. Meetings of the committee provide a forum for communicating information and concerns with stakeholders
NB Department of Agriculture and Aquaculture	• Regulates the construction and operation of submarine cables and pipelines to transport oil, gas, or minerals (*Pipeline Act*)	• Ensures that pipeline licensing proposals are in accordance with the MPA Regulations and other applicable legislation, regulations and policies
NB Department of Fisheries	• Regulates fish processing • Provides advice on fisheries policy, planning and resource management	• Ensures that fisheries policy and planning will not impact the MPA and AIA

REGULATORY OR ADVISORY BODY	REGULATORY AUTHORITY	ROLE AND RESPONSIBILITIES WITHIN THE MPA AND AIA
NB Department of Energy	• Regulates the construction and operation of submarine cables and pipelines to transport oil, gas, or minerals (*Pipeline Act*)	• Ensures that pipeline licensing proposals are in accordance with the MPA Regulations and other applicable legislation, regulations and policies
NB Department of the Environment and Local Government	• Regulates land use activities that could impact aquatic habitat • Regulates wetlands under the *Clean Water Act*, Watercourse and Wetlands Alteration Regulations and the New Brunswick Wetlands Conservation Policy • Administers the *Clean Environment Act*, which aims to protect the environment • Administers the *Clean Water Act*, which monitors the cleanliness and contamination of water • Responsible for implementing New Brunswick's *Coastal Areas Protection Policy*, which provides direction to coastal development • Administers compliance with the provincial environmental impact assessment process and promotes sound environmental practices • Administers the *Clean Water Act, Clean Environment Act* and *Community Planning Act* • Supports environmental response in land-based and freshwater incidents	• Ensures that authorized works or construction in coastal areas will not impact the MPA and AIA • Assists with environmental assessments carried out in the vicinity of the MPA and AIA • Support environmental response in the MPA and AIA
NB Department of Energy and Resource Development	• Issues licences, leases, or easements for approved land use applications for proposed developments (e.g. erosion control measures, break waters, docks, marinas, intake/outfall pipes, ocean dumping, dredging and submerged logging) on submerged lands	• Ensures that mineral and hydrocarbon leases/licences and related activities will not impact the MPA and AIA

REGULATORY OR ADVISORY BODY	REGULATORY AUTHORITY	ROLE AND RESPONSIBILITIES WITHIN THE MPA AND AIA
	• Regulates wetlands under the New Brunswick Wetlands Conservation Policy • Regulates provincial fisheries and hunting (*Fish and Wildlife Act*) • Regulates exploration, development and production of the province's minerals and mines *(Mining Act)* and hydrocarbon resources (*Oil and Natural Gas Act)*	• Ensures that fishing and hunting permits/ licences are in accordance with the MPA Regulations and other applicable legislation, regulations and policies
NB Department of Wellness, Culture & Sport	• Manages the province's cultural resources, including archaeological heritage	• Ensures that archaeological and research licences are in line with the MPA Regulations and other applicable legislation, regulations and policies
Other organizations		• Other organizations (e.g. industry, user groups, university researchers, or non-government organizations) play a role by complying with the MPA Regulations, promoting awareness of the MPA and AIA and undertaking monitoring and research activities that contribute to improved understanding of the MPA and AIA
Saint John Harbour Authority	• Under the *Canada Marine Act* and Letters Patent, is responsible for enforcing navigation, safety, protection of the environment and good order in waters of the Port • Jurisdiction of the Port Authority is up to the ordinary high water mark in Musquash Estuary and extends up to Five Fathom Hole wharf	• Responsible for enforcing navigation, safety, protection of the environment and good order in waters of the Port in the MPA and AIA
Transport Canada	• Responsible for ship safety, ship source pollution prevention and surveillance for all commercial and fishing vessels (*Canada Shipping Act*) • Regulates ballast and bilge discharges	• Administers *Canada Shipping Act* in the MPA and has provision to work with other federal government departments to enforce the Act in the AIA • Conducts pollution surveillance for the MPA via the National Aerial Surveillance Program

Fisheries and Oceans Canada | Pêches et Océans Canada

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National Defence Canada
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