Fisheries and Oceans Canada
Pêches et Océans Canada

The Gully

Marine Protected Area Management Plan

Oceans and Coastal Management Division
Second Edition, 2017

Canada

CONTACT INFORMATION

General Information
Oceans and Coastal Management Division
Fisheries and Oceans Canada
1 Challenger Drive, PO Box 1006
Dartmouth, NS
Canada
B2Y 4A2
Tel: 902-426-9919
Email: gully@dfo-mpo.gc.ca

Conservation and Protection Enforcement
Fisheries and Oceans Canada
Tel: 800-565-1633

Joint Rescue Coordination Centre / Search and Rescue
National Defence Canada
Tel: 800-565-1582

Marine Accidents, Spills and Environmental Emergencies
Canadian Coast Guard/ Environment and Climate Change Canada
Tel: 800-565-1633

Published by:
Oceans and Coastal Management Division
Fisheries and Oceans Canada
Dartmouth, Nova Scotia
B2Y 4A2

DFO/2017-1998
Catalogue number: Fs23-513/2017E
ISBN for print: 978-0-660-09508-0
Catalogue number for PDF: Fs23-513/2017E-PDF
ISBN for PDF : 978-0-660-09506-6

CONTENTS

1 PURPOSE AND BACKGROUND

1.1 INTRODUCTION

The Gully, found off the coast of Nova Scotia near Sable Island (Figure 1), is the largest submarine canyon in the Northwest Atlantic Ocean. With its abundant and diverse wildlife the Gully is an exceptional marine environment in Canada, protected as a Marine Protected Area under the *Oceans Act* for over a decade.

Since the 1990s the ecology of the Gully has attracted attention, requiring special protection and management. Fisheries and Oceans Canada (DFO) designated the area a Whale Sanctuary in 1994 in an effort to reduce ship collisions and limit noise disturbance for the resident population of northern bottlenose whales. Since the late 1990s, the oil and gas industry and its regulator have put measures in place to reduce impacts from petroleum exploration and development in surrounding waters. An overview of previous conservation initiatives and the steps leading to the establishment of the Marine Protected Area (MPA) are provided in the previous version of this document (DFO 2008). A timeline of events in the conservation history of the Gully is also available on the Gully MPA website[1].

In May 2004, Canada's Minister of Fisheries and Oceans designated the Gully MPA through Regulations passed under the *Oceans Act*, and published in the *Canada Gazette*[2]. That legal declaration provided comprehensive long-term protection for one of Canada's most diverse and exceptional marine ecosystems.

The Gully MPA Management Plan, hereafter called the Plan, supports the MPA Regulations and provides guidance to DFO, other regulators, various marine users, and the public on the protection of this important ecosystem. The Plan includes an overall vision, objectives, and priorities for management. It also includes a description of the Regulations, boundaries and zones, and specific actions to protect the Gully ecosystem. This second version of the Plan includes updates and revisions based on new environmental knowledge, experience gained in MPA management, and advice received since 2008.

The Plan is divided into five chapters:

Purpose and Background provides background on the ecology of the Gully, its environmental and economic values, and a short overview of MPA boundaries and the Regulations.

Vision, Guiding Principles, Goals, and Objectives describes the vision and objectives for the MPA including the key conservation priorities.

[1] www.dfo-mpo.gc.ca/oceans/mpa-zpm/gully-eng.html

[2] Legal instruments and their electronic sources are listed in Appendix 5.

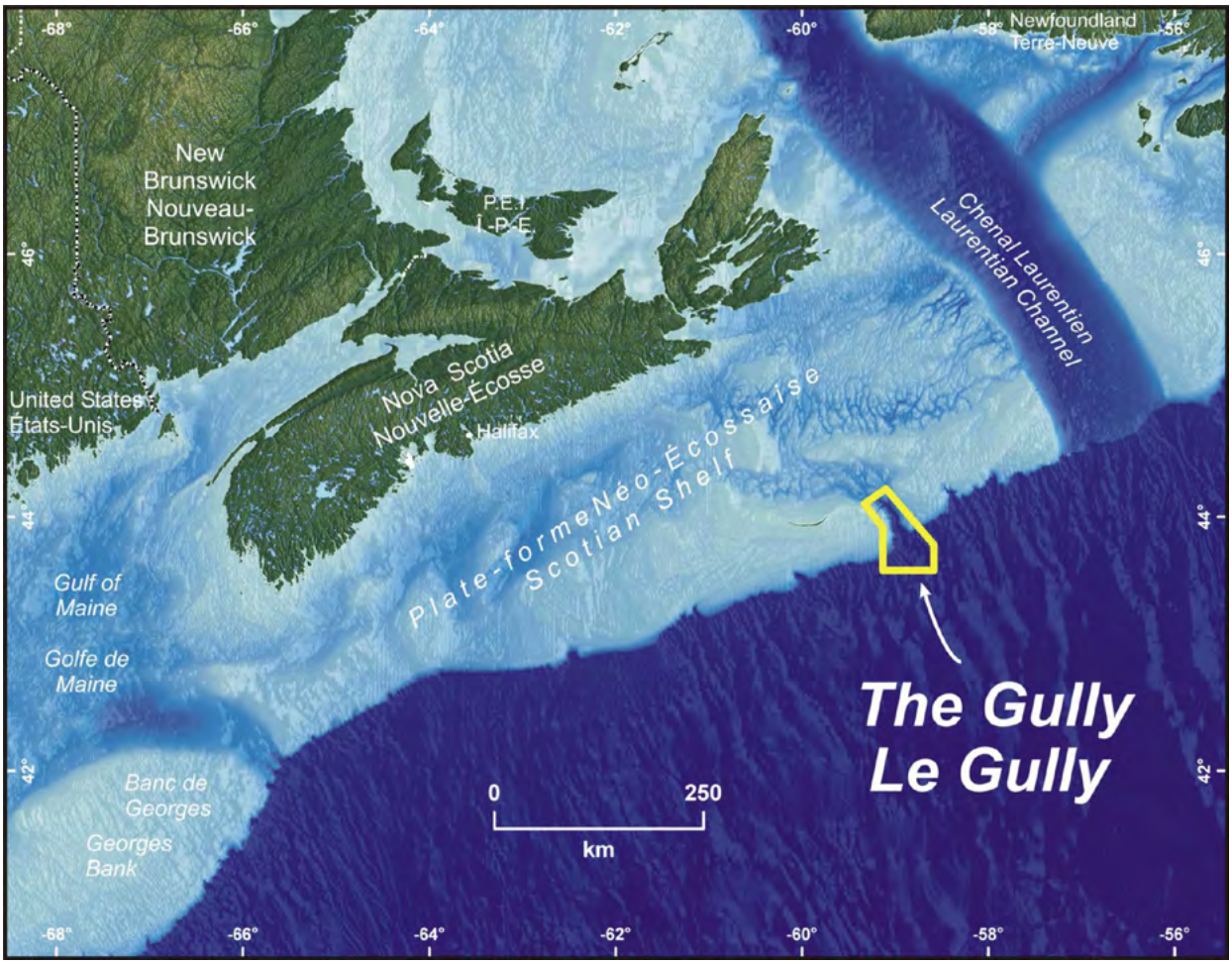


Figure 1. Location of the Gully MPA

Regulatory Management Framework explains the MPA Regulations and summarizes other laws, policies and programs that contribute to the overall management framework.

Managing the Gully provides guidance for current and future users of the area. The chapter offers sector-specific interpretations, explaining how the MPA Regulations are made operational in concert with other legal instruments and non-regulatory measures.

Administration of the MPA outlines decision-making responsibilities, site governance, education, and evaluation. It also describes the multi-agency partnerships in place for: managing activities, surveillance, and MPA compliance and enforcement.

Several companion documents have been developed to provide detail and progress reports on management priorities beyond those contained in the Plan, and these are referenced throughout. For example, documents required under the *Species at Risk Act* provide the strategic direction and detailed measures to recover and conserve several whale species that occur in the Gully. Additional documents specific to addressing MPA management include:

- ***Gully MPA Ecosystem Monitoring Plan:*** This document outlines a multi-year program to monitor indicators related to priority ecological components and human pressures faced by the Gully MPA (Oceans and Coastal Management Division, forthcoming). Its development was guided by advice

received from DFO's Canadian Science Advisory Secretariat (Allard et al. 2015; DFO 2010a; Kenchington 2010).

- ***The Gully Marine Protected Area:*** 10 Years of Progress: This document provides a ten year review of key activities and events between 2004 and 2014 (DFO 2014a). Similar reviews and documents are proposed during the life of this Plan to showcase progress towards meeting MPA objectives and priorities.

1.2 LEGISLATIVE BASIS FOR THE MARINE PROTECTED AREA

The legislative basis for the establishment of the Gully MPA is drawn from Canada's *Oceans Act*. Several sections under Part II of the Act (Oceans Management Strategy) support the development of MPAs (Box 1). Section 35 states the reasons for MPA designation and prescribes the regulation making authority for MPAs while Section 37 outlines penalties.

The Gully was designated because it meets all of the requirements identified in section 35 (1) of the *Oceans Act*. For example, the Gully is a unique canyon environment that is an important habitat for the endangered northern bottlenose whale and other marine mammals including the special concern population of Sowerby's beaked whales. Other species or assemblages of species with limited distributions in Atlantic Canada can also be found in the Gully such as cold-water corals and sea pens. It is known to be an important area for commercial fish as well as a variety of non-commercial species.

Overview of the Gully Marine Protected Area Regulations

The Gully MPA Regulations, as published in the Canada Gazette, are provided in Appendix 1. They establish the MPA boundary and three internal management zones (see Chapter 3 for elaboration). The MPA is 2364 km^2 in size.

There are general prohibitions for the MPA that apply to all marine organisms and their habitats within the boundaries. Activities that disturb, damage or destroy habitats, or remove living marine organisms are prohibited. The MPA Regulations also prohibit depositing, discharging, or dumping substances within the MPA and in areas in the vicinity of the MPA. The Regulations apply within the MPA boundary, and under certain circumstances they also apply beyond the boundary, reflecting the connection of the Gully to the wider marine ecosystem. Activities occurring in the vicinity of the MPA must not result in effects inside the MPA that contravene the Regulations. Where possible, existing processes will be used to review activities proposed for the area surrounding the MPA.

The Regulations identify certain activities that are allowed in the MPA provided they are conducted in compliance with relevant laws:

- commercial hook-and-line fishing for halibut, tuna, shark and swordfish in Zones 2 and 3;

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 habitats;

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

(c) the conservation and protection of unique habitats;

(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 fulfill 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,

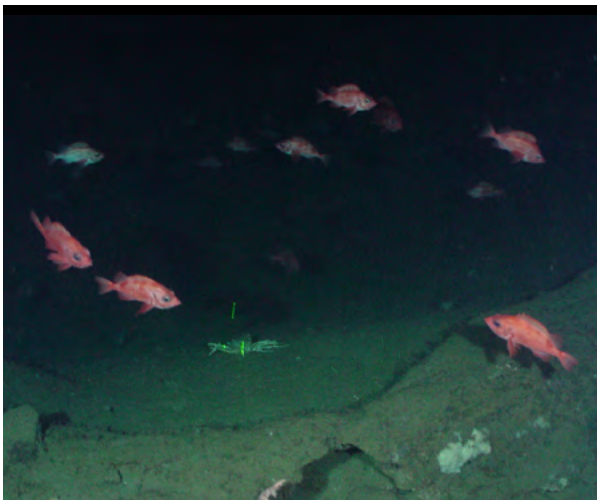
(ii) the prohibition of classes of activities within marine protected areas, and

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

37. Every person who contravenes a regulation made under paragraph 35(3)(b) or an order made under subsection 36(1) in the exercise of a power under that paragraph

(a) is guilty of an offence punishable on summary conviction and liable to a fine not exceeding $100,000; or

(b) is guilty of an indictable offence and liable to a fine not exceeding $500,000.



- vessel transit (in compliance with the *Canada Shipping Act*);
- search and rescue, environmental emergency response and clean up; and
- activities related to national security, sovereignty, and public safety.

Activities not specifically identified in the Regulations are generally excluded from the MPA. However, certain activities, including research and monitoring and tourism, may be allowed through a plan submission and approval procedure outlined in the Regulations and in this Plan.

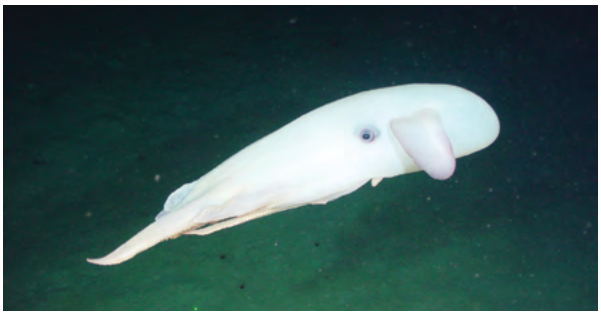
1.3 THE GULLY ECOSYSTEM AND ACTIVITIES IN AND AROUND THE GULLY

The Gully is the largest submarine canyon in the Northwest Atlantic and one of the deepest: approximately 40 km long, up to 16 km wide and more than 3000 m deep. The canyon extends from the Scotian Slope to the middle shelf, cutting through the largest outer banks of the Scotian Shelf. Because of its location, shape, size, and physical oceanography, the Gully is a unique area in eastern Canada.

Major offshore currents and oceanographic processes influence, and are influenced by the canyon itself. With

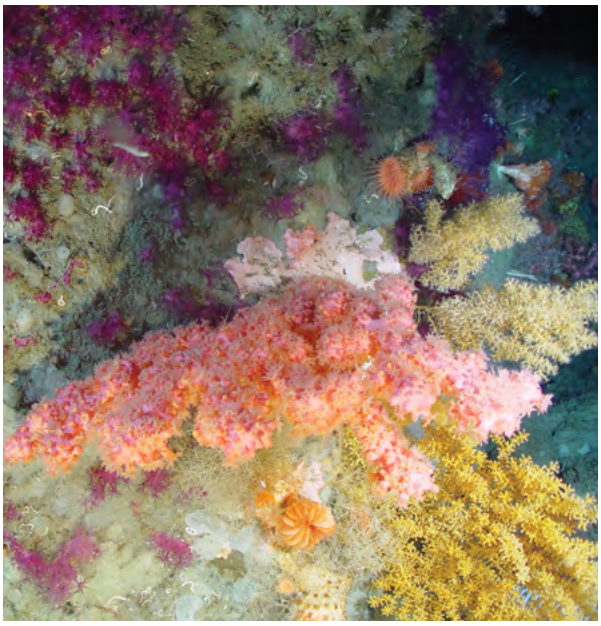
such varied depths, water masses and bottom sediment types it contains a number of distinct but interconnected habitats that support a wide variety of species and ecological communities. Within the MPA are endangered deep-diving squid-eating whales; seabirds; filter-feeding corals and sea pens; numerous varieties of pelagic and benthic fishes; and rare molluscs. Some of these species, like the northern bottlenose and other beaked whales, travel from surface waters to the deepest parts of the Gully for food. Others, such as the long-lived deep sea corals and sea pens, spend their adult lives attached to the sea floor, providing important habitats to many other species. Owing to its location, the Gully functions as a crossroads for many species, with many animals found in the canyon that are migratory and only present for a defined period each year. One of the primary objectives of the MPA is to continue learning more about the richness of the Gully ecosystem to ensure the Plan is effective in protecting the area's full biodiversity.

The features and ecology of the Gully have been described in numerous publications since it was announced as a site of conservation interest, with the first compilation of available information described in Harrison and Fenton (1998). More recent efforts over the last decade or so to describe the Gully ecosystem include Rutherford and Breeze (2002); DFO (2008),



Kenchington (2010), and DFO (2014a). A description of particular species of interest, habitats, and potential impacts are provided in the Chapter 2 discussion of Conservation Priorities for the Gully MPA.

Although the Gully is an offshore site far from Nova Scotia's coast, the resources of this area have been used for decades. Fishing has occurred in the Gully area for more than a century (Breeze 2002), and as noted above, select fishing activities continue within the MPA. Near the canyon, petroleum activity continues on Sable Island Bank, with ongoing interest in additional petroleum development. The canyon is



situated along one of the major commercial shipping routes of the North Atlantic. The Gully is well known as a focal area for whale research for more than three decades, and many other scientific explorations are ongoing. A general description of the various human activities that have taken place in and around the Gully ecosystem and the efforts to monitor their impacts are included in DFO (2014a). Further information on indicators and available data for monitoring specific activities, including overall trends in human use of the canyon, are provided in Allard et al. (2015).

Since MPA designation, the extent and nature of activities in and around the Gully have changed and new activities have arrived (e.g., hagfish effort near the MPA). Those fluctuations are monitored to determine their influence on this vulnerable ecosystem and management measures are implemented when necessary. For example, at the time of designation, tourism was largely non-existent due to the MPA's offshore location on the edge of the Scotian Shelf. However, in recent years, tourism companies have been operating vessel-based tours to Sable Island, which is now a National Park Reserve. These tours sometimes include wildlife observation in the Gully as part of their itineraries. Tourism policies were developed in response to this new activity, and the resulting measures are included in this second edition of the Plan.

2 VISION, GUIDING PRINCIPLES, GOALS, OBJECTIVES AND PRIORITIES

2.1 THE VISION FOR THE GULLY MPA

To protect the marine ecosystem of the Gully MPA for future generations by providing effective programs for management, conservation, research, monitoring, and stewardship.

2.2 GUIDING PRINCIPLES

The Gully MPA Management Plan and management actions are guided by the following principles adapted from *Regional Oceans Plan for Maritimes Region* (DFO 2014b) and the National Framework for Canada's Network of Marine Protected Areas (GOC 2011).

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. Ecosystem objectives are used to identify measurable indicators for monitoring and evaluation, and operational measures and actions to ensure that conditions are met and maintained.

Collaboration and Stewardship: While DFO has the lead jurisdictional responsibility, the vision and objectives for the Gully can only be achieved through coordination, cooperation, and partnership among all organizations and interests. 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 Gully, and to monitor and conserve the Gully ecosystem. DFO encourages and will actively pursue collaboration, partnership, and stewardship opportunities for the Gully.

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 will be excluded from the Gully, 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 Gully to demonstrate that proposed activities will not damage the marine ecosystem.

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.

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.

Adaptive Planning and Management: Pressures on the Gully ecosystem may change over time as a result of shifting social, environmental, and economic conditions. At the same time, knowledge of the Gully ecosystem will continue to improve. Planning and management must be adaptive to respond to these changes. The design, management, and effectiveness of the Gully MPA will be monitored and conservation measures adapted as necessary to ensure the objectives for the site are being met.

2.3 GOALS

The Gully MPA was designated to protect the ecological integrity of the Gully, which includes the natural biodiversity, productivity, and ecosystem components, functions, and properties. The overarching goal and associated sub-goals for the Gully MPA are:

- Protect the health and integrity of the Gully ecosystem
    - Protect the natural biodiversity of the Gully.
    - Protect the physical structure of the Gully and its physical and chemical properties.
    - Maintain the productivity of the Gully ecosystem.

2.4 OBJECTIVES

CONSERVATION OBJECTIVES

The conservation objectives for the Gully MPA were developed to address conservation priorities for the site. These were identified through science reviews and discussions with stakeholders prior to, and since Gully MPA establishment. The conservation objectives for the Gully MPA are:

- Minimize harmful impacts from human activities on cetacean populations and their habitats.
- Minimize the disturbance of seafloor habitat and associated benthic communities caused by human activities.
- Maintain and monitor the quality of water and sediments of the Gully.
- Manage human activities to minimize impacts on other commercial and non-commercial living resources.

Each of these objectives and associated management priorities are described in more detail in the next section.

MANAGEMENT AND STEWARDSHIP OBJECTIVES

Management and stewardship objectives are aimed at ensuring effective management by promoting and facilitating collaboration among agencies, users, and others with an

interest in the Gully. This includes promoting compliance with the MPA Regulations and advancing management priorities and actions. Fostering a greater understanding of the Gully among users and the general public is an important part of managing the MPA. The management and stewardship objectives for the Gully MPA are:

- Ensure that human activities within the MPA are consistent with Regulations and the conservation objectives.
- Engage users, regulators, Aboriginal groups, researchers, and other interested parties in the management of the MPA.
- Establish and maintain cooperative arrangements with responsible regulatory authorities to meet objectives for the MPA.
- Increase understanding and awareness of the Gully MPA and its ecosystem among user groups, regulators, Aboriginal groups, researchers, and the public.
- Monitor and evaluate the design, management, and effectiveness of the MPA on a regular basis to ensure it is meeting defined objectives.

Specific approaches for reaching these objectives are elaborated in Chapter 4 while general site governance arrangements are described in Chapter 5.

RESEARCH AND MONITORING OBJECTIVES

The following objectives aim to develop a better understanding of the Gully ecosystem through research and monitoring of natural processes and the effects of human activities:

- Increase our understanding of the Gully and the potential for human impacts on this ecosystem.
- Provide managers with accurate and timely information on the state of the Gully ecosystem and potential threats to conservation objectives.

Details on how these objectives will be met are described in companion documents such as the Gully MPA Ecosystem Monitoring Plan.

2.5 CONSERVATION OBJECTIVES FOR THE GULLY MPA: OVERVIEW AND MANAGEMENT PRIORITIES

This part of the chapter provides an overview of the conservation objectives identified above, providing additional background, management considerations, and related priorities. Some of these are described in greater detail in Chapter 4 with respect to specific activities and user groups.

2.5.1 MINIMIZE HARMFUL IMPACTS FROM HUMAN ACTIVITIES ON CETACEAN POPULATIONS AND THEIR HABITATS

Importance of the Gully for Whales

The Gully-Sable Island area has been identified as one of the most important habitats for all marine mammals on the Scotian Shelf (Harrison and Fenton 1998; Moors-Murphy 2014). It is a particularly critical habitat for the endangered Scotian Shelf population of the northern bottlenose whale. This species has been given particular attention in the Plan given the high use of the deep canyon area by much of its population and the presence of these whales on a year-round basis. There are an estimated 143 individuals in the population (O'Brien and Whitehead 2013). While Zone 1 of the Gully is the most important area for these whales, members of this population are also found regularly in nearby Haldimand and Shortland Canyons. As the only areas on the Scotian Shelf and Slope that the whales are known to use regularly, Zone 1 of the Gully as well as Shortland and Haldimand Canyons have been identified as critical habitat for this population under the *Species at Risk Act* (SARA). This measure and other relevant discussion points related to SARA implementation are provided in Chapter 3.

In addition to northern bottlenose whales, the area is used by many other species of whales and dolphins, with 16 cetacean species observed in the MPA since regular surveys began in the area. Changes have occurred over that period, with the number of Sowerby's beaked whale sightings in the Gully increasing at a rate of 21% per year (Whitehead 2013). Blue whales have also been

observed in higher numbers in recent years.

Each whale species that uses the Gully has particular habitat preferences, with distributions determined mainly by prey abundance, temperature, and underwater topography. Considering the habitat needs and known distributions of these species in the Gully, waters deeper than 200 m have been identified as a general area of importance to most cetaceans. Beaked whales, such as the northern bottlenose whale, are mainly found in areas of the Gully where waters are deeper than 800 m.

Because of the importance of the Gully for cetaceans, initiatives to protect them are often a focal point of management. Addressing whale conservation means determining short-term or acute impacts as well as cumulative or chronic impacts. Many whales have a broad distribution, so Gully MPA management must also be coordinated with other efforts, such as those under SARA, to ensure the health of cetaceans in the broader context of the Scotian Shelf and Northwest Atlantic. Relevant SARA recovery documents include the Northern Bottlenose Whale (Scotian Shelf Population) Recovery Strategy (DFO 2016) and Action Plan (DFO 2017a), the Sowerby's Beaked Whale Management Plan (DFO 2017bc), and the Blue Whale Recovery Strategy (DFO 2010b).

Whales and Human Activities

Human activities affect cetaceans in many different ways. In particular, the following characteristics of cetaceans tend to increase their vulnerability to human activity:

- most are long-lived species and reach sexual maturity at a late age;
- the rate of reproduction is slow in many species (one calf and several years between births);
- many species are highly mobile and migratory during their full life cycle;
- many are highly social, utilizing complex communication methods and some form of social organization; and
- populations of many species have been reduced by whaling (pre-1970s).

Human activities may kill or injure whales, or influence their behaviour such that their overall health is adversely affected. Threats to whales presented by human activities

include vessel collisions, fishing gear entanglements, noise, contaminants, harassment, and loss of prey species. Each of these will be described briefly below as they relate to the Gully, and further details are provided in documents such as Harris et al. (2013) and DFO (2011, 2016, 2017b).

Vessel collisions:
Cetaceans are struck when they fail to detect or are unable to avoid an oncoming vessel. The level of impact on cetaceans from a vessel strike is dependent on the size, type, and speed of the vessel. The risks associated with vessel collisions are generally increased in areas of cetacean concentration, such as the Gully. Ongoing analyses of ship traffic patterns in the Gully are helping to understand this risk (e.g., Koropatnick et al. 2012). Although species susceptible to vessel strikes, such as the endangered North Atlantic right whale, may occasionally use the area, there has not been a documented vessel strike in the Gully to date. The susceptibility of northern bottlenose whales to vessel strikes is not known, but is expected to be lower than other cetacean species.

Fishing gear entanglements:
Cetaceans that become entangled in gear may drown or become injured and unable to perform important functions including feeding. Data and information on the incidence of this problem in the Canadian offshore is generally lacking. However, scars and other marks observed on northern bottlenose whales and other whales found in the Gully suggest that the whales are being harmed by fishing gear more often than has been observed (Allard et al. 2015). Since MPA establishment, one humpback whale, one northern bottlenose whale, and two Sowerby's beaked whales have been found entangled in fishing gear in the deep canyon portion of the Gully (Allard et al. 2015; Narazaki 2013). It is not known where these whales initially encountered the gear though it is unlikely the animals were entangled in the deep canyon: surveillance efforts indicate high compliance with the complete prohibition on fishing activities in Zone 1.

Noise:
Human-generated sound in waters of the Scotian Shelf results from petroleum exploration and production, commercial shipping and other vessel movements, scientific research, aircraft, and naval activities. Sound can travel vast distances in the ocean along thermal channels. Reflection off bottom in complex topographical features such as submarine canyons makes it difficult to predict levels of noise and associated impacts.

Many whale species use sound to navigate and locate prey since sight is of little use in the dark depths beyond the surface layers. The hearing abilities of whales differ widely among the species that use the Gully. Similarly, the various types and sources of sounds themselves vary, both in terms of intensity, duration, and frequency. The related level of impact of sound on whales is dependent on these factors. Sound may affect whales directly by causing hearing loss or other physiological effects, or indirectly by creating background noise that prevents them from finding prey, disturbs mating behavior, causes them to avoid the area, or harms or displaces their prey. The potential impacts of sound on northern bottlenose whales are described in several publications including DFO 2016, 2015, and 2011.

Contaminants:
Whales are known to accumulate high levels of contaminants. For example, beluga whales in the St. Lawrence River have higher levels of certain persistent organic contaminants than those in the surrounding environment. Northern bottlenose whales from the Gully have been found to have higher concentrations of PCB (polychlorinated biphenyl), DDT (dichlorodiphenyltrichloroethane), and certain other organochlorine compounds than whales of the same species sampled off northern Labrador (Hooker et al. 2008). As well, concentrations of two of these compounds were found to be increasing over time in blubber samples from Gully residents. Additional sampling and research will be conducted during the life of this Plan.

Disturbances and direct interactions:
In Canada, the harassment of marine mammals is a violation under the *Fisheries Act*. Prolonged or repeated human disturbance may cause harmful effects or change whale behaviors such as mating or feeding. In the Gully, the most likely sources of disturbance include vessel traffic (from shipping and fishing activities), research

(e.g., prolonged presence and biological sampling) and more recently, whale watching associated with the growing offshore tourism industry. For more information on how these activities are managed in the MPA, see Chapter 4.

Loss of prey species:
Cetaceans consume large amounts of a wide variety of species in the Gully. The toothed whales and dolphins of the Gully feed on abundant squid and fishes. Baleen whales, like the blue whale, feed on krill. Reduced prey through natural or human causes may impact whale health.

Management Priorities
Management priorities for cetaceans include the following efforts, which should be used in combination with relevant SARA documents, such as DFO 2016 and 2017b:

- Monitor activities and minimize or eliminate any that are found highly likely to harm, disturb, or kill whales or damage or destroy their habitats within the Gully MPA.
- Provide guidance and set restrictions where possible for activities that could potentially impact whales or their habitats.
- Carry out research on human activities where impacts on whales are uncertain, particularly regarding the impacts of different types of noise, and effects of research or tourism activities.
- Monitor the status and health of cetacean populations in the Gully.
- Distribute whale ID guides and incident response sheets to mariners.

2.5.2 MINIMIZE THE DISTURBANCE OF SEAFLOOR HABITAT AND ASSOCIATED BENTHIC COMMUNITIES CAUSED BY HUMAN ACTIVITIES

Benthic animals are an important component of the Gully ecosystem. The variety of life-supporting bottom types and ocean current systems contribute to the diversity of habitats within the canyon. The high diversity of benthic habitats contributes to the wide variety of benthic life that can be found in the Gully. This management plan sets out measures to protect the diversity of benthic habitats, with a particular focus on protecting sensitive species and areas from disturbance.

Shallower portions less than 500 m deep were the focus of research efforts prior to MPA designation. There has been less research conducted in the deeper waters of the Gully, however several dedicated benthic deep water surveys have occurred since designation (Cogswell et al. 2009 and Kenchington et al. 2013). Interest in the Gully's benthic communities has focused on cold-water corals, many of which are long-lived and provide habitat for other species. The feeder canyons and bedrock outcrops in the main canyon have aggregations of corals, including an area identified by fishers as Hell's Kitchen. The Gully has the highest known diversity of corals in Atlantic Canada (over 30 species); however, the full extent of their distribution is not well known, particularly in deeper parts of the canyon. The current understanding of the distribution, abundance, and diversity of corals in the Gully is described in Cogswell et al. 2009.

There is general concern over the impact of human

activities on benthic communities. Physical disturbance, removal or alterations of benthic habitat resulting from activities such as fishing can seriously affect the viability of communities, particularly those that are long-lived or with specialized environmental preferences. Physical removal of benthic organisms or their habitat is a direct source of mortality. Altered habitats may be slow to recover and once damaged may never return to the pre-existing community structure. Global scientific results suggest that stable and complex benthic habitats and communities rarely subjected to natural disturbances are the most sensitive to impacts, such as contact by fishing gear (DFO 2006 and 2010c). For the Gully, bottom longline fishing in Zones 2 and 3 and scientific research are activities having the potential to damage sensitive benthic life; both activities are managed to avoid negative seabed interactions and monitored to minimize cumulative impacts.

Management Priorities

- Carry out research to map and characterize benthic communities within the Gully and to identify the most sensitive and important areas.
- Provide guidance for human activities that could potentially impact benthic habitat and benthic animals.
- Minimize and monitor activities that are known or likely to harm sensitive benthic habitat within the Gully MPA.
- Monitor the health and condition of the Gully's benthic communities to identify impacts, either from natural or human-induced changes.

2.5.3 MAINTAIN AND MONITOR THE QUALITY OF WATER AND SEDIMENTS OF THE GULLY

High levels of contaminants in water and sediments can negatively affects the health of marine life. Greater than normal levels may contribute to increased mortality and disease or lower rates of reproduction.

The environmental quality of the Gully is closely linked to that of the surrounding area. Large scale currents and smaller scale water movements carry suspended particles, including contaminants, into the canyon. Surficial sediments are also thought to transport substances of concern. Oceanographic processes within undersea canyons may make them more likely to have higher levels of pollutants than the surrounding area. A 2009 review of available information on contaminants in the Gully reported levels of dissolved metals that were similar to other areas of the Scotian Shelf; the level of contaminants of concern in available sediment samples was considered low (DFO 2009). However, this remains a key concern and additional sampling and characterization is required.

In addition to contaminants, the retention properties of the Gully may make it more likely to accumulate marine debris than nearby areas. In one study being replicated as of 2015 by Dalhousie University, higher densities of marine debris were collected in the Gully as compared with other areas of the Scotian Shelf (Dufault and Whitehead 1994).

Potential sources of contaminants for the Gully include dry and wet atmospheric precipitation and river-borne contaminants transported from the Gulf of St. Lawrence

(Yeats et al. 2009). As well, contaminants may be introduced by marine shipping (e.g., from ballast water, bilge water, sewage, or garbage) and offshore oil and gas activities (e.g., accidental spills) on nearby Sable Bank. There are no known shipwrecks in the Gully and no known disposal sites in the vicinity that might be contaminating the MPA.

Human activities that could introduce contaminants to the Gully MPA are subject to a variety of regulations and operational guidelines, most of which are described in Chapter 4.

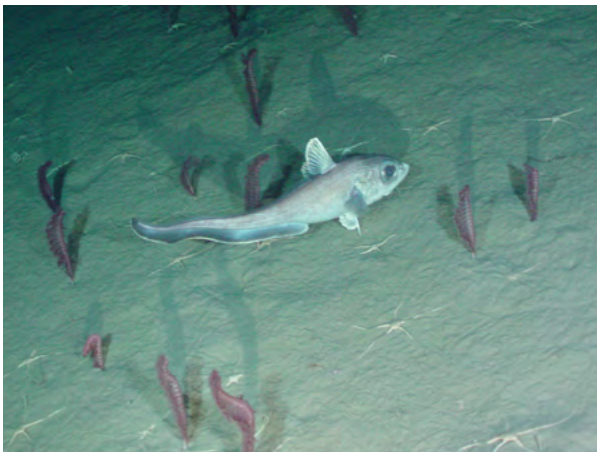
Management Priorities

- Where appropriate, establish sector specific guidance for activities in and around the Gully to reduce or eliminate sources of contamination.
- Monitor human activities in and near the MPA to ensure operators comply with relevant regulations and operational standards.
- Monitor contaminant levels in northern bottlenose whales and other indicator species to ensure environmental quality is maintained.
- Design and conduct broad surveys to establish baseline monitoring conditions for contaminants and marine debris.

2.5.4 MANAGE HUMAN ACTIVITIES TO MINIMIZE IMPACTS ON OTHER COMMERCIAL AND NON-COMMERCIAL LIVING RESOURCES

Maintenance of food chain links in the Gully is key to maintaining overall biodiversity and productivity in the canyon. For example, the presence of high numbers of whales in the canyon is the result of a productive ecosystem that produces sufficient prey for feeding. Where feasible, MPA management efforts will be put in place to address relevant human activities and reduce associated pressures (see Chapter 4).

Achieving this on a practical level is inherently



challenging, requiring a level of information and monitoring that is difficult to obtain and maintain over time. Given a variety of region-wide and even global scale pressures, a completely natural state of biodiversity and ecosystem function is impossible to achieve. However, over time, it is expected that establishing areas with the aim of minimal human disruption can have a positive effect on natural processes and biodiversity. In general, benthic organisms and habitats, along with resident species and communities, are most likely to benefit when applying this strategy.

The eastern Scotian Shelf has undergone a number of major changes in recent decades, and the populations of several key commercial species are currently in a depressed state. Amongst these depleted species, redfish, cusk, and cod populate the Gully in high relative abundance. As a result, management effort will be directed at monitoring the commercial and non-commercial species removed from the MPA to ensure bycatch of these species remains sustainable.

Management Priorities

- Conduct research and monitoring activities to further the understanding of the use of the canyon by a variety of species at different trophic levels, and connections to surrounding areas.
- Monitor allowed activities and take management action when shown to have an adverse effect on conservation objectives (particularly depleted species, food webs, or ecosystem function and integrity).

3 REGULATORY MANAGEMENT FRAMEWORK

3.1 MANAGEMENT APPROACH

The Oceans and Coastal Management Division (OCMD) is the lead organization within DFO for the management of the Gully MPA. Offshore MPAs have unique management challenges. The distance from shore, the lack of information about deep-sea ecosystems, and the complex jurisdictional and management responsibilities all influence implementation of this Plan. A collaborative approach to managing activities in the MPA is a necessity. Many different sectors of DFO, other government departments and agencies, MPA users, and other individuals with an interest in the area play important roles in meeting the objectives for the MPA.

Although the MPA Regulations provide the primary tool for protecting the MPA, the provisions of other legislation, regulations, and policies also play important supporting roles. Access to the MPA is controlled and the types of activities allowed are managed through the relevant provisions of several laws (identified in Appendices 2 and 5). Non-regulatory activities such as codes of conduct are also identified; these measures contribute to meeting the objectives for the MPA. Additional agreements and other arrangements may be put in place to allow users to play a greater role in stewardship. Outreach activities will raise awareness of the MPA among user groups and the general public, while research and monitoring activities will broaden our understanding of the Gully ecosystem.

3.2 RELATED REGIONAL PROGRAMS AND LEGISLATION

MPAs are one tool that can be used in marine conservation efforts. There are many other programs, policies and forms of legislation that can be used to contribute to marine conservation. The main management efforts falling under DFO's jurisdiction that help facilitate or provide overarching context for Gully MPA management are described below. Chapter 4 provides additional information on government programs and federal legislation specific to particular uses and sectors.

REGIONAL OCEANS PLAN

The Gully MPA Management Plan is linked closely with the implementation of an integrated ocean management plan (the Regional Oceans Plan) for the Scotian Shelf Bioregion. This 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 entire Scotian Shelf and Bay of Fundy (DFO 2014b).

BIOREGIONAL MPA NETWORK

Since 2004, DFO and its partners have made significant effort to advance a network of MPAs for the Scotian Shelf Bioregion, and work continues under various initiatives to identify and designate areas.

The Gully MPA is recognized as an important contributor to the network being put in place in this Bioregion.

SPECIES AT RISK ACT

The *Species at Risk Act* (SARA) was passed to prevent the extirpation and extinction of wildlife species in Canada and to provide for their recovery. Species assessed as endangered or threatened that are added to the List of Wildlife Species at Risk (Schedule 1) are protected by prohibitions under SARA. These include automatic prohibitions against harming, harassing, capturing, taking, or killing an individual of an endangered or threatened species, or destroying its residence. As well, the Critical Habitat of endangered and threatened species must be identified and protected.

The Gully MPA provides an important ongoing regulatory and management tool to protect several marine species at risk. The deep water portion of the Gully MPA (Zone 1) has been identified as critical habitat under SARA (Canada Gazette 2010). In addition to being subject to the applicable prohibitions under the Gully MPA Regulations, Zone 1 of the MPA is also subject to the SARA subsection 58(1) prohibition against the destruction of critical habitat.

DFO will coordinate efforts to meet the requirements under both pieces of legislation. The management activities described in this Plan are linked with SARA recovery strategies and action plans developed for at-risk species found in the area. In many cases, those documents and efforts provide a more up to date reference on the requirements and expectations around the protection of those species. Obtaining the necessary permits and approvals under SARA and the *Oceans Act* to conduct research on species at risk in the Gully is another area of coordination (see the Chapter 4 discussion of Scientific Research and Monitoring requirements).

Research and monitoring activities carried out as part of SARA action plans will also help to increase understanding of the Gully ecosystem. Conversely, research and surveillance activities carried out to manage the MPA may also be beneficial for assessing compliance with SARA and promoting the recovery of particular at-risk species.

FISHERIES ACT

The *Fisheries Act* is used to manage threats to the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries and their habitats. As well, all marine mammals are protected by section 7 of the Marine Mammal Regulations under the *Fisheries Act*. These Regulations do not allow disturbance of marine mammals, except when fishing under the authority of these Regulations (such as for some seal populations). Proposed amendments to the Marine

Mammal Regulations would provide a more detailed definition of disturbance which would be applicable to specific activities such as whale watching. Research permits required under the *Fisheries Act* are discussed in the science and monitoring portion of Chapter 4.

3.3 THE GULLY MARINE PROTECTED AREA REGULATIONS

The Gully MPA Regulations, reproduced in Appendix 1, are designed to protect the biota and habitat of the canyon ecosystem by imposing general prohibitions on potentially harmful activities within the MPA. They also allow for certain activities, with specific exceptions identified for low-risk undertakings identified as compatible with the conservation objectives when the MPA was being designed. Another section makes provision for case by case approvals of some additional activities. The Regulations apply within the boundary and in certain circumstances they apply beyond the boundary, reflecting the Gully's connection to the broader environment. This part of the chapter provides an overview of the Regulations; further explanation of what the Regulations mean for specific sectors is found in the chapter that follows.

MPA BOUNDARY AND MANAGEMENT ZONES

The Regulations establish the MPA boundary and its management zones. The 2364 km^2 MPA is divided into three management zones to address the complexity of conservation concerns and management issues in the site (Figure 2). The zoning scheme provides the foundation for managing activities within the MPA. Different geographic areas within the MPA were classified according to their general ecosystem characteristics and protection requirements. Protection levels vary from zone to zone according to the ecological features of the zone, its importance in meeting the overall objectives for the MPA, and its capacity to accommodate human activities.

The management zoning scheme reflects the conservation priorities described earlier (coordinates shown in Appendix 1). The dimensions, ecological characteristics, conservation priorities, and general management purpose for each zone are described below.

Zone 1, the Comprehensive Protection Zone is the deep water core area of the MPA. It includes the waters and habitats from the 600 m isobath (depth contour) and deeper to the southern and eastern boundaries of the 1994 DFO whale sanctuary. Zone 1 has an area of approximately 475 km^2.

This zone encompasses the deep canyon environment and includes the entire water column and ocean floor within the zone. It has been designed to protect the deep water retention area, which is a key habitat for many deep water and shelf edge species. There is still much to learn about this area. We have a partial list of the species found in the canyon, but more work is needed to better understand the food web and physical habitat dynamics. Based on ecological theory and habitat models for the species known to be present, this management zone is very sensitive to human impacts and has been given the highest level of protection.

Zone 1 contains habitat for deep diving whales, including the endangered Scotian Shelf population of northern bottlenose whales. Many other whales also frequent this zone, including sperm whales, blue whales, Sowerby's beaked whales, long-finned pilot whales, striped dolphins, common dolphins, and white sided dolphins. Lanternfish and other mesopelagic fishes are abundant, as are a variety of deep sea corals.

Zone 2, a Comprehensive Protection Zone with Limited Activity is an area of varied habitats. Zone 2 contains three distinct types of areas within one zone:

- along the canyon walls, between depths of 300 to 600 m;
- the head of the canyon with a variety of depths and habitat types, including the trough and upper feeder canyons; and
- the deep water area of the continental slope.

Owing to the complexity of the topography, this area contains a high diversity of marine life. Zone 2 has an area of approximately 1430 km^2.

This large and ecologically complex zone includes a number

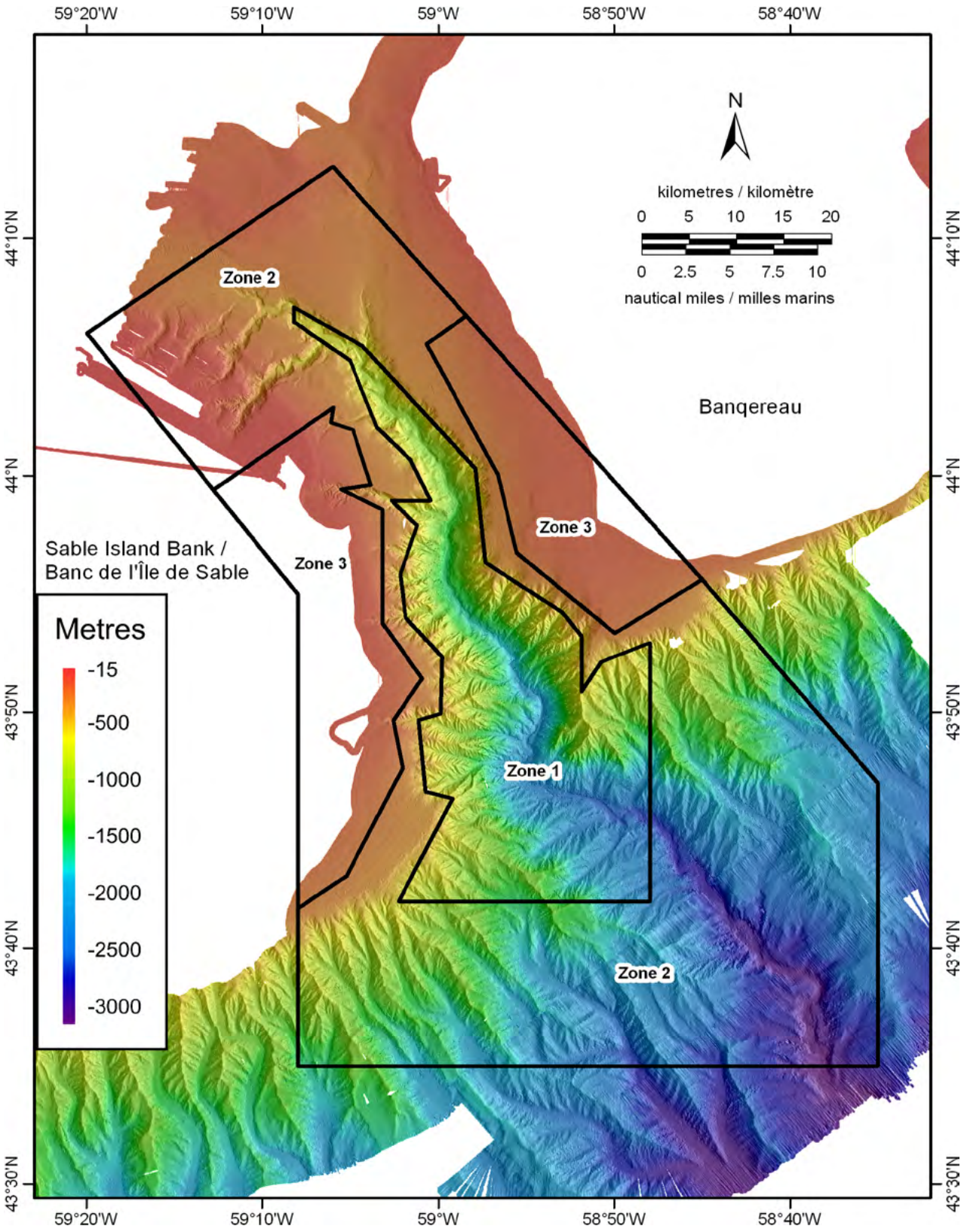


Figure 2. The Gully MPA boundary and zones. The bathymetry of the area is shown in colour. Coordinates for the boundary and zones can be found in Appendix 1.

of features that require special attention, including cold-water corals and their habitats and many of the whale species. The benthic habitats of the shallower parts of this area are similar to adjacent areas of the shelf. Below 300 metres the high diversity of deep sea corals has been documented. Bottom currents flowing through the feeder canyons in this zone carry sediments and organic matter from Sable Island Bank into the deep parts of the Gully. This management zone offers a high level of protection where only a limited number of activities are permitted.

Zone 3 is an MPA Transition Zone covering the remainder of the MPA. It is bounded by the outer MPA boundary and in general corresponds to waters shallower than 300 m. Zone 3 has an area of approximately 460 km^2.

This zone covers shallow, primarily sandy banks on either side of the canyon. Owing to the relatively shallow depths, this area is subject to highly dynamic oceanographic processes and regular natural disturbances, such as storms. The ecosystem here is generally made up of species that recover relatively quickly from disturbance of their habitats. The habitats themselves are relatively tolerant of change. This gives flexibility to allow activities that result in short-term disturbance, but do not damage or destroy the species assemblages or their habitats. The natural variability of the ecosystem, which is expected to be much greater than in the other two zones, is a key consideration in the management of this area.

Some of the primary production from this area is carried into the Gully and supports the canyon ecosystem, while fish and other mobile species travel from the banks to other parts of the MPA. Groundfish are known to overwinter in Zone 3, mainly on the slope of Banquereau in the eastern part of the MPA. Management of this zone will protect its key features and prevent impacts on the adjacent zones.

PROHIBITIONS, EXCEPTIONS AND ACTIVITY APPROVALS

General Prohibitions (Section 4 of the Regulations)

Section 4(a) of the MPA Regulations makes it an offence for any person to:

> *disturb, damage or destroy in the Gully Marine Protected Area, or remove from it, any living marine organism or any part of its habitat.*

Section 4(b) extends these general prohibitions to the seabed and subsoil to a depth of 15 m for the protection of benthic organisms and habitats. The application of the prohibitions is broad and includes all marine organisms and habitats within the boundary of the MPA and all human activities unless specifically excepted from the general prohibition by regulation. See Box 2 for further guidance on terms used.

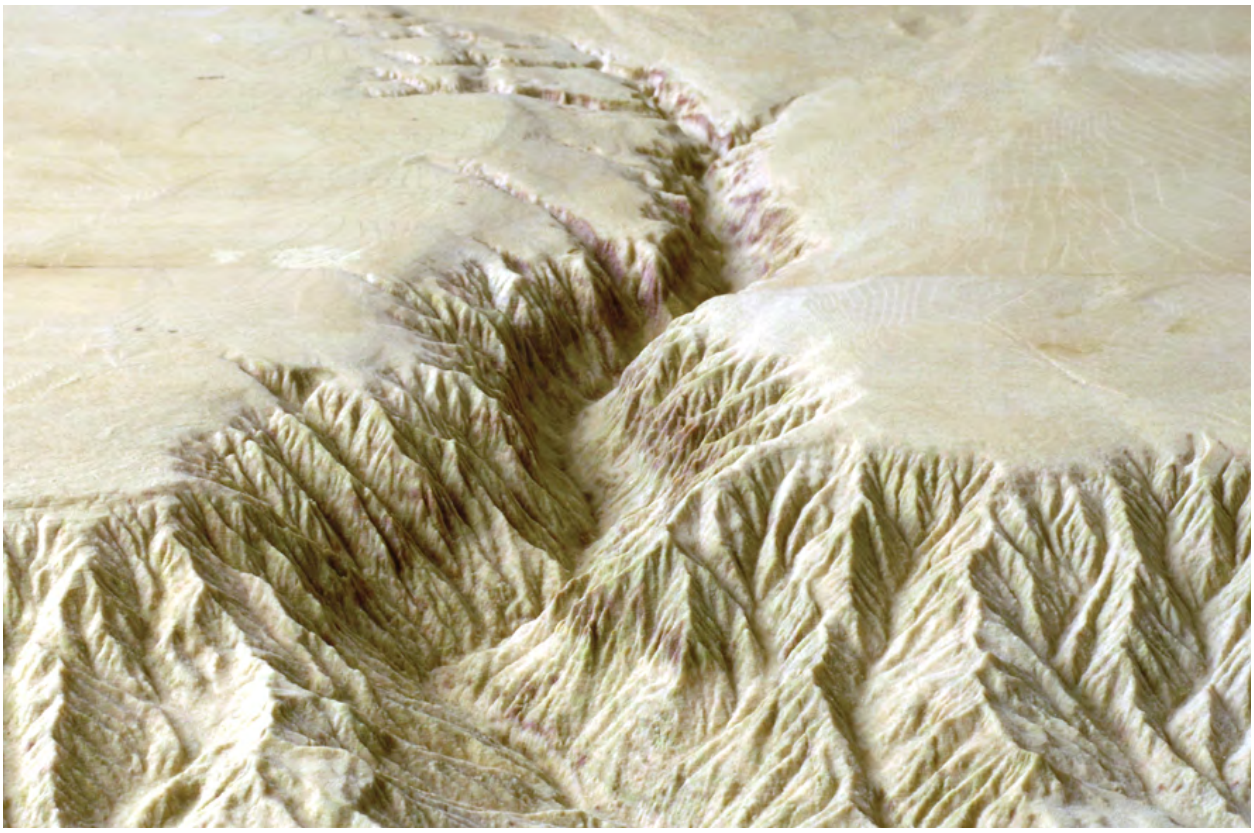
Activities in the Vicinity of the MPA

The Gully MPA has ecological connections with the broader Scotian Shelf ecosystem via currents and the movement of marine organisms. In recognition of transboundary pressures, section 4(c) of the Regulations prohibits activities outside the MPA that result in the disturbance, damage, destruction or removal of

BOX 2. TERMS: DISTURB, DAMAGE, DESTROY, REMOVE[3]

The terms disturb, damage, destroy, and remove are not defined in the MPA Regulations. Each term reflects different types of impacts that may occur. For example, the term disturb typically reflects non-lethal impacts on individuals (e.g., behavioural effects on organisms or short-term effects on habitat). By contrast, the term destroy typically reflects a lethal impact on organisms and a permanent or long-term effect on habitat. The term damage encompasses both recoverable and irrecoverable impacts. The term remove includes the lethal and sub-lethal capture or taking of any organism or habitat. The threshold for disturbance and damage varies among marine organisms and habitats. What disturbs a cetacean will be different from what disturbs benthic organisms and often has to be assessed on a case by case basis.

[3]Plain language descriptions of these impacts are offered to enhance general understanding of the concepts; they are not intended to serve as legal interpretations. The descriptions are also uniquely derived for the Gully MPA and should not be extended or applied to other *Oceans Act* MPAs.



organisms or habitats within the MPA.

The potential impact from each type of human activity in the region will have a different zone of influence. In other words, one activity may affect a large area, while another may only have ecological effects in a very small area. Of particular concern are the impacts resulting from the transmission of acoustic noise and the introduction of contaminants from activities in the area.

In general, the closer the activity is to the MPA boundary, the more likely an effect related to the prohibitions is to occur. A definition of 'in the vicinity' for the MPA is not provided in the Plan given the variety of current or future activities that would need to be captured. In most instances, 'vicinity' will be determined on a case by case basis, taking into consideration a number of factors including, but not limited to: specific sources, the type of receiving environment, and species. The area surrounding the MPA will be closely monitored and reviews of specific projects within the general area will be expected to directly address effects on the environment within the MPA. More discussion on vicinity as it relates to specific sectors is provided in Chapter 4 .

Exceptions

Sections 5 to 11 recognize that certain activities may be allowed to occur within the MPA without compromising the conservation objectives.

Exceptions to the general prohibitions: Sections 8 to 11 identify activities that are allowed in the MPA provided they operate under the conditions specified by other legislation.

Several activities are allowed in the MPA provided they are carried out in compliance with their associated enabling legislation (see Appendix 2). Chapter 4 gives further detail on statutory provisions that govern the following:

- Activities carried out by the Canadian Government, usually by the Canadian Coast Guard and the

BOX 3. NATURAL VARIATION

Natural variation is an ecological concept related to the ecosystem resilience and is a key component of ecosystem-based management efforts undertaken by DFO. Natural variation of the ecosystem is considered to include all components of the ecosystem: abiotic and biotic components and species, population, and community levels.

This approach recognizes that there are fluctuations within the ecosystem that must be taken into account when evaluating activities and their effects on the Gully ecosystem. For example, approval would only be issued for a disruptive non-scientific seabed activity if it could be demonstrated that intentional benthic disturbance was going to fall within the natural range of disturbance experienced by the depths and habitats in question.

Department of Defence or under their direction and supervision for:

» national security;

» public security, safety, and law enforcement; and

» environmental emergency response and clean up.

- Fishing activity in compliance with the *Fisheries Act* and licence conditions under the following circumstances:

  » by holders of commercial fishing licences for halibut, swordfish, tuna, or shark in Zones 2 and 3; and

  » other fishing activity that meets the conditions of section 8(c) of the Regulations.

- Passage of ships (vessels must still operate in compliance with the *Canada Shipping Act*).

- Marine scientific investigations carried out or sponsored by a foreign government under the terms of an MPA-compliant research consent issued by the Minister of Global Affairs Canada.

Plan Submission

Activities not identified as exceptions to the general prohibitions may require proponents to submit an activity plan for the approval of the Minister of Fisheries and Oceans. Section 5 details the submission requirements while section 6 stipulates conditions that must be met before an approval can be issued (see Appendix 1). The types of activities and the conditions for approval are defined by zone.

Plans must be submitted at least 60 days in advance of the proposed activity. The Minister will approve a plan within 30 days of receiving the submission if the activity meets the conditions set out in Section 6. Further detail on approvals for research, monitoring, tourism or other activities can be found in the next chapter under the relevant sector. It is important to note that to receive approval from the Minister, the proposed activity, in combination with other activities in or near the MPA, must not result in significant cumulative impacts. Activities in Zone 3 have a separate condition for approval that centers on the impacts (damage and destruction) from the activity needing to be within "natural variation" (see Box 3).

ACCIDENTS

Section 7 stipulates that all accidents, including those resulting from excepted or approved activities, must be reported to the Canadian Coast Guard within two hours of occurrence. Such accidents include collisions with marine mammals, entanglement of turtles or marine mammals, unintended damage to seabed habitat, spills or accidental discharges. These should be reported to the Canadian Coast Guard Regional Operations Centre (1-800-565-1633 or VHF channel 16).

FINES

Violations of the Regulations carry penalties under section 37 of the *Oceans Act.* Contraventions of activity approvals can also result in charges under the *Fisheries Act* and other applicable legislation, such as the Canada Shipping Act and SARA. Convictions can result in fines and imprisonment under these Acts.

FUTURE AMENDMENTS TO THE GULLY REGULATIONS

As only the second MPA designated in Canada, the Gully helped set the basis for the regulatory approach and legal language used in subsequent MPAs. However, since designation, a number of regulatory issues have been identified that have resulted in modifications to regulations in more recently established *Oceans Act* MPAs.

Modifying the Gully MPA Regulations is one means of addressing the needs of the Gully. For example, in 2008 the Gully Regulations were amended to address minor errors and new legal and program advice around the description of boundaries and the activity application requirements.

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:

- zone revisions to address research findings concerning sensitive benthic areas;
- revisions to the activity application requirements particularly for foreign researchers and tourism related activities; and
- reference to activities conducted under *Fisheries Act* instruments including the Fishery (General) Regulations and the Aboriginal Communal Fishing Licences Regulations.

Changes to the MPA Regulations would be published in the Canada Gazette and any significant changes would be discussed in advance with the Gully Advisory Committee (GAC) and other affected interested parties.

4 MANAGING THE MPA - REQUIREMENTS FOR USER GROUPS

This chapter seeks to answer the question: "What does the MPA mean for me?" All human activities carried out in and around the Gully MPA must comply with the Regulations. DFO has committed to working with partner regulators and industry to provide clear guidance on the application of the MPA Regulations, and concise instructions with respect to MPA management measures. The chapter also outlines legal requirements beyond the MPA regulations, non-regulatory measures, and future actions pertaining to each sector. Detailed treatment is included for the sectors most active in and around the MPA, namely: commercial fisheries, oil and gas, scientific research, shipping, military, and tourism.

4.1 COMMERCIAL FISHERIES

4.1.1 OVERVIEW OF ACTIVITY

Commercial fisheries have a long history in the Gully and surrounding area, with many changes over that period. A select few fisheries are currently allowed to operate in Zones 2 and 3 of the MPA: directing for halibut with bottom longline, and for swordfish, shark, and tuna by pelagic longline. Several other fisheries are conducted in close proximity to the MPA. These include snow crab trap fisheries in the trough of the Gully, hagfish trap fisheries along the slope edge, and dredge fisheries for surf clam and scallop on Banquereau. Ecological interactions vary from fishery to fishery though removal of target and bycatch species is universal. MPA catch profiles and trends are presented in Allard et al. (2015). Bottom contacting gear may cause benthic disturbance and there are observations of harm being caused to mammals as a result of entanglement.

4.1.2 REGULATORY REQUIREMENTS

Section 8 of the MPA Regulations provides limited MPA access for the select hook-and-line fisheries described above. Vessel operators fishing in the Gully MPA must hold a valid commercial fishing licence issued pursuant to the *Fisheries Act*. Crews are expected to conduct their activities according to applicable integrated fisheries management plans and as required by relevant conservation harvesting plans. No commercial fishing of any type is allowed in Zone 1 of the MPA. *Fisheries Act* licence conditions reinforce this complete prohibition by listing the Zone 1 boundary as a closed area for those fisheries allowed access to Zones 2 and 3. The entire MPA remains closed to fisheries that have not been given an explicit regulatory exception for access to Zones 2 and 3. No recreational fishing is allowed anywhere in the MPA.

Section 8(c) recognizes the possibility for future fisheries in Zones 2 and 3. This provision requires that all fisheries – other than those given a regulatory exception – be reviewed by the Department

and approved by the Minister prior to being granted access. No formal proposals have been submitted to DFO since the MPA was designated so the future fisheries provision has not been triggered and tested. Conceptually, future fisheries could involve: 1) new fisheries that are developing across the region, 2) the expansion of nearby fisheries into the Gully, and 3) fisheries like cod and haddock that traditionally operated in the MPA but are under moratorium due to low abundance. These and any other types of future fisheries are restricted from the Gully until it can be demonstrated that their MPA impacts fall within limits prescribed by the Regulations.

Future fisheries in Zones 2 and 3 remain subject to stringent regulatory conditions that forbid any damage, destruction or removals exceeding natural variability. Proposals for additional fisheries were discouraged in the first Gully MPA Management Plan owing to the reduced state of historically fished stocks, availability of other areas for developing fisheries, scientific knowledge gaps and technical assessment challenges posed by the section 8(c) conditions (DFO 2008, p. 39). Those factors and challenges carry over to this second version of the Plan. The burden-of-proof remains with fisheries proponents as before. DFO remains aware of the need to develop an assessment framework and review procedures for evaluating future fishery proposals. The elaboration of specific scientific and administrative requirements is anticipated during the life of this Plan in concert with other DFO MPAs subject to future fishery provisions, and in context of the broader MPA Network being implemented by Canada.

4.1.3 ADDITIONAL REQUIREMENTS TO MEET MANAGEMENT PLAN OBJECTIVES

Chapter 5 details the surveillance, enforcement, and compliance monitoring activities that apply to fisheries

and other activities. DFO will continue to monitor fishing activity to ensure compliance and to assess the impacts on biodiversity in the canyon in a manner similar to what is described in Allard et al. (2015). Based on current knowledge and ongoing analyses, the focus of fisheries management and stewardship efforts for the life of this Plan will be on reducing negative interactions with corals and other bycatch in Zone 2, and with cetaceans throughout the MPA. Efforts will be made to increase reporting of interactions and leverage expertise and existing training programs for species identification and disentanglement. Finally, fishers will be engaged to discuss MPA concerns and operational matters such as enhanced reporting and gear drift.

4.2 OIL AND GAS

4.2.1 OVERVIEW OF ACTIVITY

The offshore oil and gas industry is regulated by the joint federal-provincial agency, the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB). This authority is exercised under the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* (the *Accord Act*). Under the *Accord Act*, any activity related to the exploration or development of oil and gas requires approval from the CNSOPB. This approval includes a review of the environmental effects of the proposed activity. Conditions are placed on activity authorizations to address environmental matters deemed appropriate by the CNSOPB.

Some activities undertaken by oil and gas proponents may require permits, consents or authorizations from other regulatory authorities. For example, activities that pose serious harm to fish that are part of commercial, recreational, or Aboriginal fisheries may require a *Fisheries Act* authorization from DFO, though in practice, no such authorizations have been triggered by hydrocarbon activities in or immediately adjacent to the Gully.

Although the interactions and environmental pathways are not fully understood, or lack studies specific to this region, it is generally believed that oil and gas activities have the potential to negatively affect species and habitats within the MPA. To date, research and management measures related to potential interactions have focused on acoustic disturbance of whales and the potential contamination of water, sediment and biota.

Activity in the Gully

The Scotian Shelf and slope are important areas for oil and gas exploration and development. The area within the MPA was subject to oil and gas exploration during the 1960s and 1970s. As a result of those early exploration activities, a significant accumulation of natural gas and oil was detected in the seabed below the shallow water on the Sable Island side of the canyon. Subsequently named Primrose, the field is recognized under the *Accord Act* as a Significant Discovery. The rights to develop this particular field have not been exercised. Although little exploration has taken place in the Gully since the initial pulse of activity in the 1970s, and no exploration has taken place since MPA designation, the bank and slope geology indicate some probability that reserves exist in addition to the Primrose field. A recent description is available in Smith et al. (2014). However, the topography of the Gully makes it difficult or impossible to place a drill rig for the purposes of development activity.

Activity around the Gully
Natural gas and condensate are being produced near Sable Island, approximately 30 km west of the MPA as part of the Sable Offshore Energy Project (SOEP) in operation since 1998, and 55 km further west for the Deep Panuke Project in operation since 2013. SOEP is expected to be decommissioned in the coming years. The environmental effects monitoring program for SOEP has included sampling sites in and near the Gully. Interest in exploration in both the shallow and deeper areas adjacent to the MPA continues through the Call for Bids process administered by the CNSOPB. Through this process, lands are nominated for petroleum exploration. A history of parcel nominations and lands management activities and procedures is available on the CNSOPB website (CNSOPB 2015a). Strategic Environmental Assessments (SEAs) support this process, examining the potential environmental effects that may be associated with the potential issuance of future exploration rights granted by the CNSOPB. There are several SEAs that are relevant for the Gully and available on the CNSOPB website (e.g. Stantec 2013a, 2013b, 2012a, 2012b).

4.2.2 REGULATORY REQUIREMENTS

The MPA Regulations prohibit activities occurring in or in the vicinity of the MPA that may damage, disturb, or destroy marine organisms and their habitats within the MPA. Each of these cases – activities in or near the MPA – is explored further below.

Activities within the MPA:
The MPA Regulations do not remove existing sub-surface rights to petroleum within the MPA boundary (i.e., Primrose Significant Discovery Licence), neither do they identify oil and gas activities as an explicit prohibition or prevent the issuance of future petroleum rights. However, the CNSOPB has prohibited exploration within any part of the MPA since 1998 when the Gully was first identified as an Area of Interest for MPA designation (CNSOPB 2015b).This prohibition on exploration using current technologies is expected to remain in place given the sensitivities associated with ecological features of the MPA. Under Section 6 (c) of the MPA Regulations, other activities currently not provided an exception in the Regulations may apply to DFO for approval within Zone 3 the MPA only. Approvals of these activities under this provision cannot result in disturbance, damage or destruction to Zones 1 and 2.

Activities outside the MPA:
The Gully MPA Regulations require that any activity carried out in the vicinity of the MPA must not contravene the MPA prohibitions. This includes all petroleum exploration and development activities. The determination of what constitutes 'vicinity' in the application of the general prohibitions to activities outside of the MPA boundary depends on the nature of the activity, the area it affects, and the sensitivities involved.

Petroleum activities in the vicinity of the MPA are assessed within existing review processes and approval mechanisms, such as the environmental assessment processes conducted under the *Canadian Environmental Assessment Act*, 2012 and the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act*. As described in more detail below, these processes help to ensure that the MPA Regulations and conservation objectives are met.

Other Legislation
In addition to the MPA Regulations, the oil and gas industry must comply with other legislation, regulations, and policies. The discussion here focuses on important legislation in relation to the MPA. The review is not intended to provide a complete description of all the regulatory requirements pertaining to the offshore oil and gas industry; for comprehensive treatment, readers are directed to the CNSOPB.

Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act:
As part of the CNSOPB's responsibility as the regulator of offshore oil and gas activities, the Board requires that environmental assessments be conducted for exploration activities, and any other offshore petroleum projects that do not require assessment under the CEAA, 2012, such as seismic surveys, prior to the issuance of required authorizations under the *Accord Act*. Environmental assessments conducted under the *Accord Act* use a process that is consistent with assessments conducted under the CEAA.

Canadian Environmental Assessment Act, 2012:
The *Regulations Designating Physical Activities* lists activities that require an environmental assessment under the CEAA. For the oil and gas sector, these include:

- the drilling, testing, and abandonment of offshore exploratory wells in the first drilling program within an area set out in one or more exploration licences;
- the construction, installation, and operation of a new offshore floating or fixed platform;
- the decommissioning and abandonment of an existing offshore floating or fixed platform, vessel or artificial island used for the production of oil or gas that is proposed to be disposed of or abandoned offshore or converted to another role; and
- the construction, operation, decommissioning, and abandonment of a new offshore oil and gas pipeline that is not a flow line.

Marine seismic surveys are not identified in the activities list and thus do not require an environmental assessment under the CEAA 2012. However, the CNSOPB requires that an environmental assessment be conducted for all petroleum exploration and development projects that require authorization under the *Accord Act*. Thus, environmental assessments must still be conducted for activities such as seismic surveys.

Environmental assessments for oil and gas activities conducted under the CEAA may proceed as an assessment by the Responsible Authority (i.e., the Canadian Environmental Assessment Agency) or as an assessment by a review panel. In either case, environmental assessments of projects adjacent to the Gully must evaluate impacts to the MPA to ensure that activities will not disturb, damage, or destroy the Gully ecosystem.

The CNSOPB is the Federal Authority for offshore oil and gas activities in the vicinity of the Gully MPA and thus provides important information and advice for environmental assessments under CEAA 2012. Other government regulators also review and contribute advice as part of the environmental assessment process

in relation to their areas of expertise and regulatory responsibilities. The primary vehicle for evaluating potential impacts associated with exploration activities is a project specific environmental assessment. Environmental assessments must consider a variety of factors, including cumulative effects, mitigation measures, and environmental effects monitoring programs, which may include specific monitoring for the MPA. Conditions may be placed on project activities as part of the environmental assessment process. For example, approval of the SOEP was conditional on the development and implementation of an environmental effects monitoring program and code of practice for Sable Island and the Gully.

DFO involvement with the CNSOPB occurs at many stages and includes combined input by the Oceans & Coastal Management Division, the Fisheries Protection Program, Species at Risk Management Division and Science Branch. The advice from DFO on both environmental assessments and Strategic Environmental Assessments is posted in the Public Registry maintained on the CNSOPB website. Specific to the Gully, DFO letters of advice identify requirements and recommend best-practice mitigation measures to reduce potential impacts including ramp up procedures, sound modelling and verification of predictions, effects monitoring programs such as from passive acoustic monitoring systems, and collaborative research opportunities. Current science advice, such as DFO (2015), helps to guide these recommendations.

Fisheries Act:
Like other activities in the marine environment, oil and gas activities are subject to the fish and fish habitat provisions of the *Fisheries Act*. Section 35 prohibits activities that pose serious harm to fish that are part of commercial, recreational, or Aboriginal fisheries, or to fish that support these fisheries, without authorization from DFO. Potential effects on fish and fish habitat are considered during environmental assessments.

***Species at Risk Act* (SARA):**
Proponents of activities near the Gully must ensure they are in compliance with SARA. Environmental Impact Statements for activities in this area are expected to explicitly evaluate and state whether or not the project will affect species at risk. In particular, section 79(2) of SARA requires that for each listed species and its critical habitat, all potential adverse effects of the project be identified; measures to avoid or lessen those adverse effects be identified; and a program to monitor all adverse effects be designed and implemented. Guidance is often species specific, and is provided in relevant SARA documents and in advice from DFO as noted above.

Canada Shipping Act:
Industry vessels are expected to comply with all relevant legislation and shipping best practices. More details can be found in the marine navigation portions of the chapter that follows.

Canadian Environmental Protection Act:
The industry is required to meet the requirements of the *Canadian Environmental Protection Act*. Division 3 of the Act concerns the disposal of materials and substances at sea. Contravening this legislation may also result in penalties under the *Oceans Act*.

4.2.3 ADDITIONAL REQUIREMENTS TO MEET MANAGEMENT PLAN OBJECTIVES

Memorandum of Understanding (MOU) with the Canada-Nova Scotia Offshore Petroleum Board

In the 2016 work plan associated with this MOU, DFO will continue to work through the environmental assessment process (i.e., Call for Bids, Strategic Environmental Assessments, and Environmental Assessments) to ensure enhanced mitigation and monitoring are in place to protect Gully inhabitants from the impacts of nearby seismic programs and to ensure compliance with MPA Regulations and SARA (CNSOPB 2017).

The Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment
For seismic exploration in the vicinity of the Gully MPA, the Statement of Canadian Practice provides minimum standards for mitigation measures that must be adopted for seismic surveys in Canadian waters. Standard measures include the requirement to plan seismic surveys to avoid significant adverse effects on

SARA-listed marine mammals. As well, the Statement allows for the addition of enhanced measures to meet requirements for SARA-listed species or other species of concern that may be exposed to seismic sound. Enhanced mitigation measures that may help maximize the detection of SARA-listed whales have been proposed (DFO 2015).

Measures taken to mitigate the effects of seismic sound are given effect using existing regulatory instruments. For example, the CNSOPB requires a commitment to mitigation measures outlined in the Statement as part of environmental assessments required during the activity authorization process under the *Accord Act.*

Voluntary measures

Non-regulatory actions form an integral part of the conservation and management of the MPA, particularly when dealing with activities in the vicinity of the MPA. Voluntary codes of conduct and practice can reduce operational impacts on the Gully ecosystem. Codes stressing voluntary avoidance of the Gully have been drafted and adopted by several offshore operators including ExxonMobil, which operates the SOEP Project and EnCana, which operates the Deep Panuke field. These codes direct personnel to avoid industry-related vessel and aircraft transits in the Gully.

Future Directions and Actions

Management

- DFO will continue to work through the environmental assessment process at all stages of exploration, development and decommissioning (i.e., Call for Bids, Strategic Environmental Assessments, and Environmental Assessments led by CNSOPB or the Canadian Environmental Assessment Agency) to consider the MPA and ensure enhanced mitigation and monitoring is in place for nearby oil and gas activities.

- Companies operating near the Gully will be encouraged to adopt codes of practice similar to those used by existing operators.

- Future oil or gas pipelines on the eastern Scotian Shelf will be routed to avoid the MPA.

Research and Monitoring

- Continue studies to better understand both the acoustic environment of the canyon and the risks posed by seismic sound on vulnerable species (see DFO 2015).

- Studies are also needed to evaluate the effectiveness of existing mitigation measures for reducing the impacts of seismic sound on susceptible species.

- Building on existing studies, periodic monitoring for contaminants, including those linked to petroleum development, will be encouraged as part of ongoing ecosystem monitoring in the MPA.

4.3 SCIENTIFIC RESEARCH AND MONITORING

4.3.1 OVERVIEW OF ACTIVITY

Research and monitoring are essential activities that support MPA management. A wide variety of research and monitoring are expected as described in Box 4. DFO will promote, and in many cases, fund and conduct scientific research and monitoring. The Gully MPA Ecosystem Monitoring Plan, based on DFO Science advice (DFO 2010a; Allard et al. 2015), provides an overview of the indicators selected for ecosystem and stressor monitoring, and identifies monitoring priorities for the MPA.

Prior to being conducted, the Regulations require these types of activities to be granted approval by Minister of Fisheries and Oceans. Ecological interactions of research and monitoring activities within the Gully MPA will vary by activity type but may include:

- removal of organisms;

- samples and biopsies from living organisms;

- benthic disturbance; and

- noise and lights (attraction or disturbance of marine mammals, fish, and birds).

An overview of regulatory requirements is presented here; details on the application and approval process are provided in Chapter 5. For researchers based outside of Canada, marine scientific consent is issued through the Foreign Vessel Clearance Request process coordinated by the Minister of Global Affairs Canada. DFO reviews these requests as they relate to living marine resources.

Activity in the Gully

Research has been conducted in the Gully for decades. In the 1960s and 70s, research focused on geology and geological processes. In the 1980s, work was done on sediment transport and circulation. In 1988, scientists at Dalhousie University began to study whale and dolphin populations in the Gully. In the 1990s and 2000s, research expanded to include broader ecosystem concerns. Research and data collections in the Gully since designation are described in DFO (2014a) and Allard et al. (2015). These include:

- ecosystem (groundfish) and snow crab trawl surveys;
- research on cetaceans, including surveys, biopsies and acoustic studies;
- water sampling and zooplankton tows through the Atlantic Zone Monitoring Program;
- multibeam hydrographic surveys
- studies of currents and movements of water masses;
- benthic and mesopelagic surveys; and
- studies related to seismic and other anthropogenic noise.

The Gully MPA Ecosystem Monitoring Plan builds on these past efforts to provide a description of priorities and anticipated monitoring efforts for the MPA.

Activity around the Gully

Much of the research and monitoring conducted within the Gully is conducted as part of broader, often shelf-wide programs; e.g. ecosystem trawl surveys by DFO. Thus, these activities also occur in close proximity to the Gully. Other research activities near the MPA include monitoring of the SOEP near the production platforms, and studies on and around Sable Island (seals, birds, sharks, etc.).

BOX 4: MONITORING

The term "monitoring" is used in a variety of ways in the Plan. Monitoring in the Gully includes:

- Monitoring the health of organisms found in the Gully (baseline and trends);
- Monitoring pressures (i.e., human activities occurring within or adjacent to the MPA);
- Monitoring human activities to ensure they are in compliance with the Regulations; and
- Monitoring effectiveness of management measures against MPA objectives

The first two bullets are addressed by the forthcoming Gully Ecosystem Monitoring Plan. Compliance and effectiveness monitoring are described in Chapter 5.

4.3.2 REGULATORY REQUIREMENTS

Research activities conducted within the boundaries of the MPA, including any biological sampling, hydrographic surveys, or geological studies must be approved by DFO as a requirement of the Regulations (sections 5 and 6).

Individuals, organizations, and government agencies wishing to conduct research or monitoring within the Gully MPA are required to submit an activity plan for approval at least 60 days prior to the proposed start date. The submission must provide detailed information on planned scientific activities, including the consideration of potential impacts to the Gully environment and its inhabitants. An application form with associated guidance is available online[4] to help applicants through the approval process (also see procedural steps outlined in Chapter 5.).

[4] Available under the "Activity Applications" menu tab: www.dfo-mpo.gc.ca/oceans/mpa-zpm/gully-eng.html

In each zone, research is allowed for the purpose of: managing the MPA or monitoring the effectiveness of the conservation measures being implemented or investigating incidents that may have an environmental impact on the MPA. Table 1 summarizes the research and monitoring that will be allowed in each zone of the MPA if carried out for a purpose other than the ones listed above (as described in subsections 6.1.a.ii and 6.1.b.ii).

The Minister will approve a plan within 30 days of receiving the submission if the activity does not contravene the protection requirements of the MPA (conditions described in section 6 of the Regulations). Multi-year approvals can be granted for activities that are expected on a yearly basis and are consistent in methods and predicted impacts. Once an activity is approved, researchers are required to conduct their research as described in their application. A change to the research plan while at sea may mean that the research is no longer in compliance with the MPA Regulations. For example, if sampling gear changes or if back-up stations and sampling locations are needed to ensure the successful deployment of equipment, this information must be included in the application.

Other Legislation

An approved activity plan is not considered a surrogate or substitute for other licences, permits, or authorizations that may be required by the proponent to undertake an activity in the MPA. It is the responsibility of the proponent to ensure that other required licences, permits, or authorizations are acquired prior to undertaking an approved activity. In order to determine the potential for other regulatory requirements, those wishing to conduct research or monitoring within the Gully MPA should contact OCMD as early as possible. Some examples of other regulatory requirements are described below. Given the multiple regulatory requirements for some research activities, such as on endangered cetaceans, OCMD works closely with other parts of DFO to ensure a streamlined and coordinated response.

Fisheries Act:

Section 51 of the Fishery (General) Regulations states that "No person shall fish for experimental, scientific, educational or public display purposes unless authorized to do so under a licence." Section 52 enables the Minister of Fisheries and Oceans to issue a licence for these purposes if it would be in keeping with the proper management and control of fisheries. Conditions of a scientific collection and transfer licence vary, but this licence must be present on the vessel conducting this type of research. Compliance with the Marine Mammal Regulations is also relevant for many research activities; e.g., cetacean monitoring.

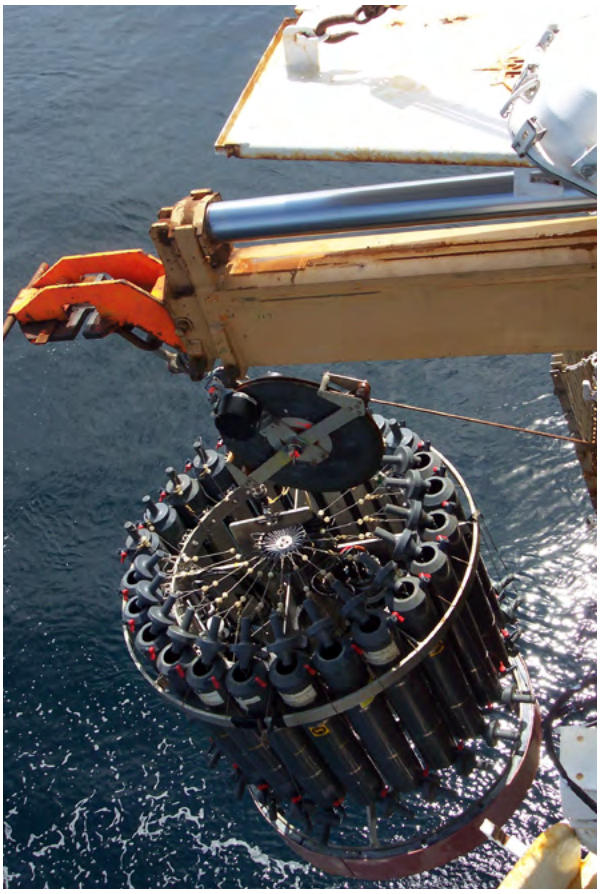
***Species at Risk Act* (SARA):**

Several species listed on Schedule 1 of SARA make regular use of the Gully MPA. Research activities in or near the Gully must be in compliance with SARA.

SARA places strict restrictions on human interaction with

TABLE 1: Research allowed in each zone of the Gully MPA (applies to activities other than those carried out for managing the MPA or monitoring the effectiveness of the conservation measures).

RESEARCH IN ZONE 1	RESEARCH IN ZONE 2	RESEARCH IN ZONE 3
Will not result in any damage or destruction (as referred to in section 4 of the Regulations) in zones 1 and 2	Will not result in any damage or destruction in zones 1 and 2	Will not result in damage, or destruction in zones 1 or 2
Scientifically-justified disturbance and removals permitted	Scientifically-justified disturbance and removals permitted	Must not result in disturbance, damage or destruction beyond the natural variability of the Zone 3 ecosystem
		Removals permitted



listed species, their residences, and critical habitat (sections 32 and 58). However, section 73 of the SARA states that the competent Minister may issue a permit to conduct scientific research relating to the conservation of a listed species, any part of its critical habitat, or the residences of individuals to a qualified person as long as:

(a) all reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted;

(b) all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals; and

(c) the activity will not jeopardize the survival or recovery of the species.

DFO's Aquatic Species at Risk website has information on how to apply for a SARA permit.

Foreign Research Requirements:
Foreign researchers interested in conducting marine scientific research within waters under Canadian jurisdiction must request diplomatic consent by writing directly to Global Affairs Canada. The request is then evaluated for approval under Canada's Foreign Vessel Clearance Request process. DFO reviews incoming research requests as they relate to Departmental mandates for marine science, resource management, and conservation. OCMD examines foreign research applications involving the Gully. Additional information is sought from proponents if necessary to demonstrate compliance with the environmental protection and management requirements of the current MPA Regulations.[5] DFO may advise the Minister of Global Affairs Canada to attach terms and conditions when warranted; for example, when consents allow invasive sampling methods. Lastly, section 44 of the *Oceans Act* enables the Minister of Fisheries and Oceans to request conditions requiring a foreign or non-duty paid ship to supply the results of marine scientific research conducted by that ship in Canadian waters.

4.3.3 ADDITIONAL REQUIREMENTS TO MEET MANAGEMENT PLAN OBJECTIVES

Collaboration
OCMD will encourage priority research and monitoring activities in the MPA, while at the same time addressing the regulatory requirements for the MPA. Researchers are encouraged to collaborate with OCMD early on in the application process to ensure requirements are met and the work has the best possible benefit for the MPA.

Cumulative impacts
To minimize the potential for cumulative impacts, OCMD will work with proponents so that, where feasible, no more than one approved activity is conducted in the MPA at a given time, and consecutive activities (especially of a similar nature) are not conducted in rapid succession.

[5] Proposed regulatory amendments would bring the Gully into alignment with newer *Oceans Act* MPAs where site regulations now require foreign proponents to submit a full Activity Plan as for domestic research.

Activity reports
Those allowed to conduct activities in the Gully MPA are asked to communicate the outcomes of their activities using a standardized report form. The activity report form and associated guidance are provided to successful applicants along with the MPA activity approval. Information provided in the report should include whether or not proposed activities were carried out successfully, the identification of sampling locations, and a description of data and/or samples collected. Researchers are also asked to watch for turtles, marine mammals, rare seabirds and marine debris during daylight hours and report sightings information to OCMD for inclusion in relevant databases.

Future Directions and Actions

Development of generic assessments for selected research activities
To streamline the application process for proponents and reviewers of repetitive and low-impact research activities, DFO will develop generic environmental assessment statements for selected research and monitoring activities. These will provide an advanced assessment of the potential for disturbance, damage, destruction or removal and outline accepted mitigation measures that research proponents can then incorporate by reference into their activity proposals. Research and monitoring activities that would qualify for a generic assessment include those that have been ongoing since MPA designation without causing any significant environmental effects. Candidates for these assessments include: seabed moorings with ballast anchors; benthic optical sampling (video and photographs); cetacean photo-identification studies; depth sounders; water column sampling and measurements, and research trawl surveys.

4.4 MARINE NAVIGATION

4.4.1 OVERVIEW OF ACTIVITY

The level of vessel traffic in the Gully MPA is low as compared with traffic levels in many other parts of the region. The primary types of vessels operating in the MPA for any duration are fishing, scientific research, and federal government vessels. Commercial vessels may also transit through the MPA while en route to ports in Canada, the USA and Europe. A recent study of offshore vessel traffic showed several predominant trans-Atlantic shipping paths, known as Great Circle Routes, which pass to the north and south of the Gully MPA and Sable Island, though a portion of the route that follows the shelf break appears to pass through the MPA (Koropatnick et al. 2012). The key shipping patterns in the area include traffic between Canada and ports in the Caribbean, the eastern seaboard of the United States, Europe, the Mediterranean Sea, and Africa. Commercial vessel traffic through this area includes container vessels, tankers, and bulk carriers.

In addition to commercial shipping, the area is traversed by various government vessels (e.g., Canadian and foreign naval vessels, the Canadian Coast Guard), research vessels, cruise ships, smaller recreational vessels, and fishing vessels. Ship movements associated with the oil and gas sector are limited in the MPA though resupply and occasional seismic surveys do take place in the vicinity.

Regulators
Several departments and agencies have roles in regulating marine transportation and navigation. Transport Canada has responsibilities for aspects of the *Canada Shipping Act* related to ship safety and ship-source pollution prevention. Transport Canada also has the lead responsibility for administering various standards and requirements of the International Maritime Organization. The Canadian Coast Guard has a regulatory role in pollution prevention and response. In addition, it provides marine communications and traffic services, marine aids to navigation, and search and rescue services for the entire sector.

Ecological Interactions
The primary ecological interactions related to marine navigation are the potential release of ship-source pollutants and discharges including oil, ballast water, sewage and garbage, noise, and vessel interactions with marine life, particularly cetaceans. All marine mammal species are protected in the MPA. The main species of concern are northern bottlenose, blue, Sowerby's, and North Atlantic right whales. For these species, the key

threats associated with shipping are acoustic disturbances and collisions.

4.4.2 REGULATORY REQUIREMENTS

Gully MPA Regulations

The MPA Regulations permit the year-round exercise of international navigational rights. Operators are exempted from the section 5 activity plan submission requirements. Section 7 instructs seafarers to report accidents to the Canadian Coast Guard within two hours of occurrence or detection. Any vessel operator in non-compliance with these provisions contravenes the MPA Regulations and is subject to penalties under the *Oceans Act*.

Other legislation

Canada Shipping Act

Vessel operators must comply with the provisions of the *Canada Shipping Act* and its Regulations. These address matters relating to safety of navigation and pollution prevention. For example, operational discharges of bilge water, sewage, and garbage are regulated under the Vessel Pollution and Dangerous Chemicals Regulations. The Ballast Water Control and Management Regulations and associated guidance prescribe acceptable ballast water management practices and prohibit the exchange and discharge of ballast water outside of prescribed alternative ballast water exchange zones, including in the Gully MPA.

Fisheries Act (Marine Mammal Regulations)

Vessel operators must comply with all relevant provisions of the Marine Mammal Regulations under the *Fisheries Act*. These Regulations prohibit any form of harassment of marine mammals. Specific guidance for navigation in MPAs and important mammal areas is provided in the Canadian Coast Guard's *Annual Notices to Mariners* 1 to 46, A.2 Section 5 and 5A.[6]

4.4.3 ADDITIONAL REQUIREMENTS TO MEET MANAGEMENT PLAN OBJECTIVES

Currently in Place

Vessel traffic monitoring and analysis

Transport Canada's Marine Safety Office monitors vessel traffic in Canadian waters in near-real time, and may advise

[6] https://www.notmar.gc.ca

vessel operators of operational restrictions and guidance for the Gully MPA if required. OCMD also regularly accesses satellite-based vessel traffic data from Long Range Identification and Tracking (LRIT) and Automatic Identification Systems (AIS) to create maps characterizing vessel traffic intensity and patterns of use for offshore waters under Canadian jurisdiction, including the Gully MPA. Near-real time vessel monitoring is also available to OCMD and is used for tracking known vessels of interest such as tourism charters and research platforms.

Ballast water exchange monitoring and analysis
OCMD works closely with Transport Canada's Marine Safety Office to ensure ballast water exchange activities conducted in the vicinity of the Gully MPA are in compliance with the Ballast Water Control and Management Regulations. OCMD also generates yearly maps of ballast water exchanges in Atlantic Canadian waters to characterize activity patterns and intensities.

An operational circulation model for the Scotian Shelf has been developed (Brickman and Drozdowski, 2012) and is used to help with predictive modeling for managing potential inputs, including ballast or contaminated water discharges.

Information for mariners
Canadian Hydrographic Service (CHS) charts and electronic products include the MPA boundaries. Operational guidance for mariners navigating in and around the Gully MPA is provided in the Canadian Coast Guard's *Annual Notices to Mariners* 1 to 46, A.2 Section 5A.

Future Directions and Actions
Mariner awareness and education
The dissemination of relevant information to mariners and the marine transportation sector is an important tool to increase awareness and promote compliance with the requirements of the MPA. This may include updates to the Notices to Mariners, the provision of information associated with electronic navigational equipment, and targeted outreach to provide information to vessels that regularly transit through the area. For example, an on-board placard was developed to raise awareness among ocean users about the need for information on encounters with dead, entangled, or injured whales.[7] One of the anticipated outcomes of this campaign is an increased likelihood of dead or injured whales being reported.

Research and Monitoring
Studies are ongoing to better understand the acoustic environment of the canyon and the risks posed by vessel traffic noise on vulnerable species.

Marine Traffic Monitoring and Assessment
Ongoing efforts to monitor vessel traffic activity in the MPA will be used to assess risks to the inhabitants of the Gully and to assess the need for additional management measures. If further restrictions are determined to be warranted, OCMD would work with Transport Canada to explore the use of instruments under the International Maritime Organization, such as an Area to be Avoided or a Particularly Sensitive Sea Area designation.

4.5 MILITARY OPERATIONS

4.5.1 OVERVIEW OF ACTIVITY

Canada's Maritime Forces Atlantic (MARLANT) engage in a range of operations and activities in the region, including maritime surveillance, sovereignty patrols, training and combat readiness exercises, search and rescue, and support to other government departments for law enforcement and fisheries and environmental protection. As part of the Department of National Defence, MARLANT uses a variety of platforms, including patrol frigates, coastal defence vessels, destroyers, submarines, ship-borne helicopters and long-range patrol aircraft. The main types of ecological interactions related to military operations are potential noise inputs (including sonar), ship-source pollutants and discharges, and contamination from weapons and equipment. Species at Risk documents, such as DFO 2016 and 2017b, provide some additional guidance on these issues as they relate to endangered cetaceans.

Military training exercises are restricted to designated exercise areas off Nova Scotia. Each exercise area is zoned for specific types of activities involving surface, sub-surface and air training operations. Foreign military vessels

[7] http://www.dfo-mpo.gc.ca/fm-gp/mammals-mammiferes/entangled-enchevetres-eng.html

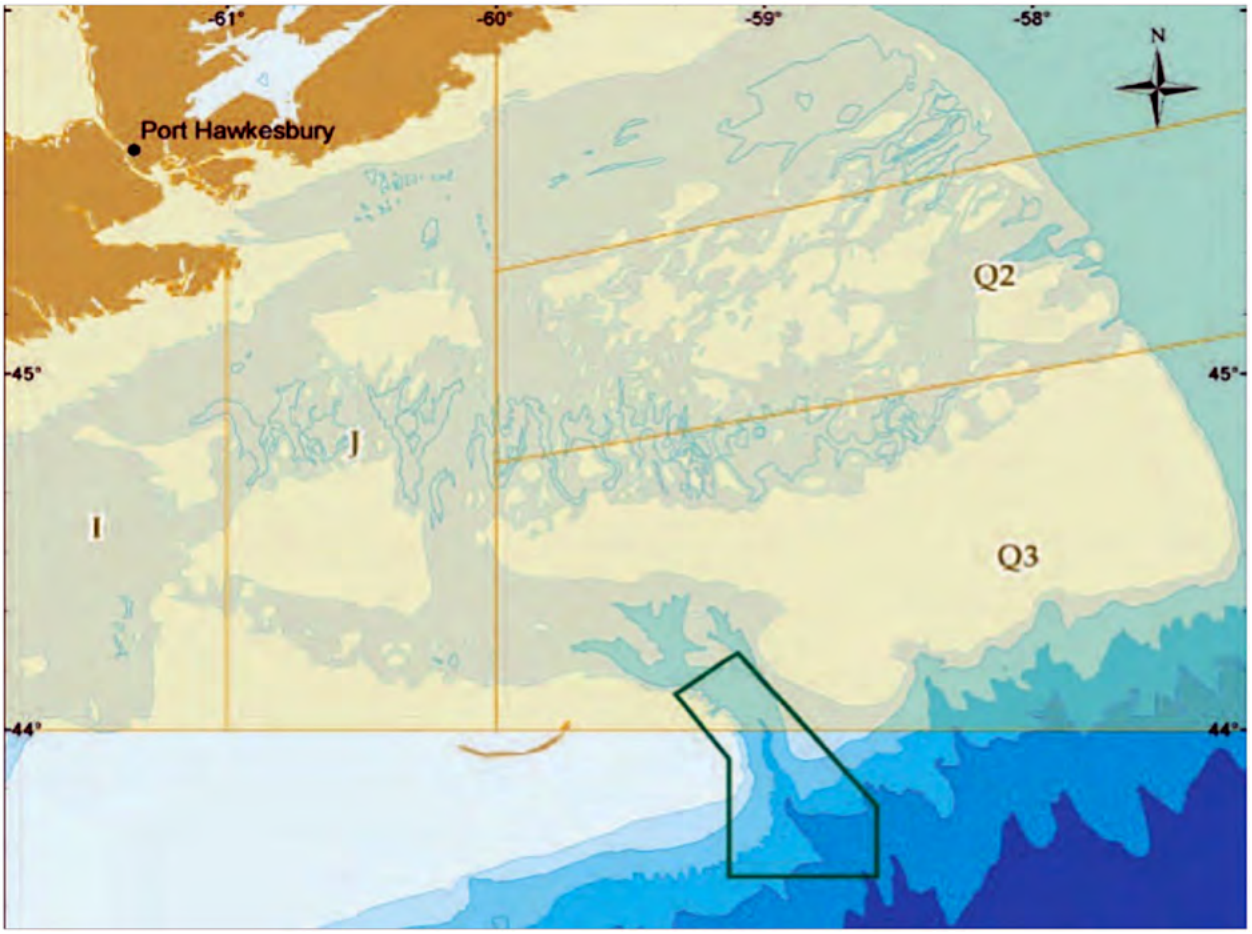


Figure 3. Military exercise areas (shaded yellow) in the vicinity of the Gully MPA (outlined in green).

may also operate in the regional exercise areas with the permission of the Canadian Forces. The upper portion of the Gully MPA is located in the military exercise area known as Quebec 3 (Q3, see Figure 3). This exercise area is designated for sub-surface training activities, and excludes live fire operations. MARLANT has also developed an environmental management plan for the regional exercise areas. This MPA Management Plan provides additional information and mitigation measures for military activities in particular exercise areas. As a matter of practice, Canadian and foreign military exercises undertaken in the Q3 area do not occur in the MPA.

Military transits may occur in the vicinity of the MPA on a year round basis. MARLANT does not undertake other activities in the Gully MPA unless at the request of DFO (e.g., Chapter 5 provides an overview of military activities as they pertain to MPA surveillance). The Maritime Forces have issued a standard operating procedure to govern activities of military vessels and aircraft in MPAs. The procedure is designed to safeguard MPAs through controls and restrictions on certain types of activity. Standard prohibitions are in place for the deployment of active sonar and towed arrays and the depositing of any substance, including expendable bathythermographs, in MPAs. A command order (DND 2008) outlines specific procedures to protect marine mammals from vessel operations.

4.5.2 REGULATORY REQUIREMENTS

The Gully MPA Regulations provide an exception to the general prohibitions and requirements for activity plans for Canadian military vessels and aircraft if their activities are for the purpose of public safety, law enforcement, or national security and sovereignty (section 10a) or

emergency response (section 10b). Foreign military vessels and aircraft are in compliance with the Regulations if they are operating for these same purposes in cooperation with or under the command of the Canadian Forces.

Activities not mentioned above and carried out by Canadian military vessels, such as training, must adhere to the activity submission and approval provisions found in the Regulations (sections 5 and 6). Foreign military vessels involved in activities with the permission of the Canadian Forces must also adhere to the plan submission and approval provisions. Canadian and foreign military vessels and aircraft are required to report all accidents and incidents in the MPA (section 7).

4.5.3 ADDITIONAL REQUIREMENTS TO MEET MANAGEMENT PLAN OBJECTIVES

Currently in Place
When transiting the MPA, Canadian and foreign military vessels should follow the operational guidance and procedures for vessel passage contained in the Canadian Coast Guard's Annual Notices to Mariners 1 to 46, A.2, section 5A, General Guidelines for Marine Protected Areas, and as described above more generally for Marine Navigation in the MPA.

Future Directions and Actions
Scientific research
International research, guidance and recommendations related to the use of sonar in beaked whale habitats will be reviewed to help update mitigation requirements for this area.

Foreign Military Activities
DFO and the Department of National Defence will continue to work together to ensure foreign military activities do not contravene the MPA Regulations. For example, the Canadian government will provide information to the United States government related to sensitive areas such as the Gully.

4.6 TOURISM, RECREATION AND AT-SEA EDUCATION

4.6.1 OVERVIEW OF ACTIVITY

Activity in and around the Gully
Until recently, the distance from the coast to the Gully has limited tourism and recreation. However, with the designation of Sable Island as a National Park Reserve, tourism companies have started offering vessel-based tours to Sable Island. These trips often include a visit to the Gully for marine mammal and seabird watching. Three tours to Sable Island and the Gully were conducted between 2011 and 2013, two trips occurred in the summer of 2014, and one trip was registered in 2016. Interest at this level or higher is expected to continue. Aerial tourism is not known to have occurred in the MPA and the potential for this activity is expected to remain low.

In addition to tourism, cruises have been conducted for the purpose of at-sea education. For example, the Sea Education Association has sailed its floating classroom, the tall ship Corwith Cramer, from New England to the Gully. Trips of this nature may become more frequent with the added draw of the Sable Island National Park Reserve.

Interest in developing multi-media products related to the Gully has been expressed by film, television, magazines, museums, and aquaria. In fact, all of these outlets have produced Gully content over the years. Requests are expected to continue, particularly for the collection of video footage at-sea in the MPA. Capturing the Gully on film for public broadcast is supported in principle to meet research, education and awareness objectives. DFO will encourage productions that meet high scientific and educational standards.

Ecological Interactions

The potential for growing numbers of wildlife observers and recreational boaters to impact species that use the Gully is unknown. Increased vessel traffic, noise, and human presence may result in behavioral changes and other potentially negative impacts.

Regulators

Activities associated with tourism and educational trips to the Gully are regulated by DFO under the marine research provisions of the MPA Regulations. Transport Canada regulates commercial vessels, including vessels that carry passengers such as cruise ships and whale watching operations. Requirements for pleasure craft are also regulated by Transport Canada with support from the Canadian Coast Guard.

4.6.2 REGULATORY REQUIREMENTS

Gully MPA Regulations

Tourism, recreation, and educational activities conducted in the MPA require approval from DFO. Zone 1 and the canyon portions of Zone 2 are understood to be the most desirable area of the MPA for tourism ventures, educational programming, and whale observation. However, the Gully MPA Regulations stipulate that activities other than scientific research and monitoring must be limited to Zone 3. Therefore, to be considered for approval in Zones 1 and 2, tour operators must include a satisfactory research or monitoring component to their expeditions. Appendix 4, developed in collaboration with the Gully Advisory Committee, provides some examples of research

and monitoring activities that may be incorporated as part of an application for tourism in the Gully. Once settled on a program of research, applicants develop an activity plan and proceed with the submission and approval process as described earlier for scientific undertakings in the MPA.

Other Legislation

Fisheries Act (Marine Mammal Regulations)

Tour operators must comply with all relevant provisions of the Marine Mammal Regulations under the *Fisheries Act*. These Regulations prohibit any form of harassment of marine mammals.

***Species at Risk Act* (SARA)**

It is illegal to kill, harm, harass, capture or take endangered or threatened species protected under SARA. Several species on the List of Wildlife Species at Risk in Canada make regular use of the Gully MPA. Tour operators must ensure they are in compliance with SARA while conducting activities within the MPA.

Canada Shipping Act

Vessels operating within the MPA must comply with relevant provisions of the *Canada Shipping Act* and related Regulations. As discussed above for shipping activities, these clauses address matters relating to safety of navigation and vessel-sourced discharges, such as sewage and garbage disposal at sea.

Migratory Birds Convention Act

Tour operators must comply with the provisions of the *Migratory Birds Convention Act* for the protection of migratory birds in Canada's Exclusive Economic Zone. Contraventions of the *Migratory Birds Convention Act* in the MPA may also result in penalties under the *Oceans Act*.

4.6.3 ADDITIONAL REQUIREMENTS TO MEET MANAGEMENT PLAN OBJECTIVES

Currently in Place

Notices to Mariners

Specific guidance to mariners for vessel operation in the Gully and around marine mammals is provided in the Annual Notices to Mariners 1 to 46, A.2 Section 5 and 5A.

Collaboration

Applicants are encouraged to work closely with OCMD when preparing their MPA activity plan for submission to ensure that regulatory requirements are met. Proponents taking on research in Zones 1 and 2 are encouraged to collaborate with researchers at DFO, universities or other academic institutions. As illustrated by the research and monitoring suggestions provided in Appendix 4, the aim is to encourage high quality data collection that contributes to ongoing Gully research or monitoring programs. Where possible, OCMD will help facilitate this collaboration.

Acceptable activities

Seabird and whale watching, and at-sea educational activities conducted in accordance with DFO guidelines and industry best practices will be considered for approval by the Minister. Applications that include activities such as water sports (e.g., swimming, snorkeling), recreational fishing, or the deployment of smaller vessels (e.g., zodiacs or jet skis) from the main vessel will not be approved.

Whale watching guidelines

OCMD has developed whale watching guidelines for commercial operators to follow while observing whales in the Gully MPA. These guidelines include guidance on minimum approach distance, speed, and method of approach. They also provide specific guidance on how to operate around "friendly" whales, such as the resident population of northern bottlenose whales that are known to approach stationary and slow-moving vessels.

OCMD provides the guidelines to all tour operators and encourages incorporation by reference in plan submissions. DFO expects full compliance with these guidelines while in the MPA. Applicants who receive Ministerial approval to visit the MPA are asked to post the guidelines in a highly visible location for viewing by guests.

Cumulative impacts

The impacts of vessel presence on whales that use the Gully are unknown so a precautionary approach is advised. As such, increases in vessel traffic are generally discouraged. To minimize the potential for cumulative impacts, OCMD will work with proponents to coordinate the timing of approved activities. All efforts will be made to schedule tourism trips and scientific voyages so that no more than one vessel occupies the MPA at any given time. Similar

steps will be taken to avoid having consecutive activities conducted in rapid succession.

Activity reports

Those allowed to conduct activities in the Gully MPA are asked to communicate the outcomes of their activities using a standardized report form. Information provided in the report should include whether or not proposed activities were carried out successfully, the identification of sampling locations, and a description of data and/or samples collected. Tour operators are also asked to watch for turtles, marine mammals, rare seabirds and marine debris during daylight hours and report sightings information to OCMD. The activity report form and associated guidance are provided to successful applicants along with the MPA activity approval.

Educational Programming

Tour operators are encouraged to build educational elements into their voyage plans as well. OCMD offers information packages and welcomes the opportunity to work with operators to help facilitate interpretive programming and natural history learning.

Visitor surveys

Cautious and controlled growth of the sector remains a management priority for the MPA. Tour operators may be requested to provide guests with a short anonymous survey so that OCMD can monitor and assess the industry as it develops. Survey questions have been designed in collaboration with Parks Canada to gather information and visitor impressions from trips to the Gully and Sable Island. The surveys are expected to help OCMD assess public awareness and knowledge levels, general perceptions of the Gully, and the overall site experience from a visitor's point of view.

Future Directions and Actions

Outreach

Relevant tourism industry associations and companies known to operate in the region will be provided with information on the ecological sensitivities of the Gully, the regulatory requirements, guidance for operating within the MPA, and instructions for submitting an application for approval.

Other forms of tourism

OCMD will continue to monitor all forms of tourism-related interest in the Gully MPA and will work with the appropriate regulators to develop guidance as required.

Regulatory changes

Under the current Regulations, non-exempted activities in Zone 1 and 2 can only be approved by the Minister if they qualify as scientific research or monitoring. An amendment to the current Regulations would be required to make explicit allowance for tourism-focused activities in the canyon core. Such an amendment could be useful to provide further clarity on activities that could be considered for Zones 1 and 2 under an activity approval process. Regulatory amendments will be examined; however, the overall change to current decision-making would be negligible because a robust research, monitoring or educational component would still be required for a tour operator to visit Zones 1 and 2.

Evaluation of Gully tourism policy

The approach adopted here for tourism management has been developed based on experience with only a few such trips. The effectiveness of this guidance will be tested continually and revised if required during the next management plan review in context of monitoring and stewardship objectives but also with reference to the education and outreach efforts described in the next chapter. Whale watching guidelines may also require revisions to ensure they align with any changes made to the Marine Mammal Regulations.

5 ADMINISTRATION OF THE MPA

This chapter provides an overview of the activities related to the administration of the MPA and identifies roles and responsibilities of DFO, other government departments, and the Gully Advisory Committee (GAC). The management of the Gully MPA is an ongoing commitment of the Government of Canada. Administrative activities include environmental assessments and activity approvals, information management, surveillance, monitoring, enforcement, emergency response, public consultation, education, and stewardship.

5.1 ROLES AND RESPONSIBILITIES

Government and non-government organizations play a role in managing the Gully MPA and ensuring it is protected for future generations (Figure 4). However, others with an interest in the MPA play a role by providing advice for management, carrying out research, undertaking outreach, or participating in stewardship activities in the MPA. Appendix 2 provides an overview of the key responsibilities of government departments and non-government bodies as they relate to the MPA.

GOVERNMENT ROLES AND RESPONSIBILITIES

Fisheries and Oceans Canada (DFO)
DFO has the lead responsibility for oceans management in Canada and coordinates federal programs, policies, and management strategies related to the Gully. As the lead authority for the MPA, DFO has the primary responsibility for its protection and management. The Department invested significant program resources into planning, consultation, and the designation process. DFO will continue investing in long term protection of the MPA.

DFO will implement this Plan and a range of supporting programs and functions according to resource allocations and conservation priorities, both of which are revisited and reviewed annually. Core responsibilities for DFO include:

- implement and coordinate activities related to the Management Plan;
- promote compliance with Regulations among all user groups and other government regulators;
- monitor allowed activities within the MPA;
- coordinate and carry-out surveillance of the MPA and enforcement of the Regulations;
- manage and share information related to the MPA;

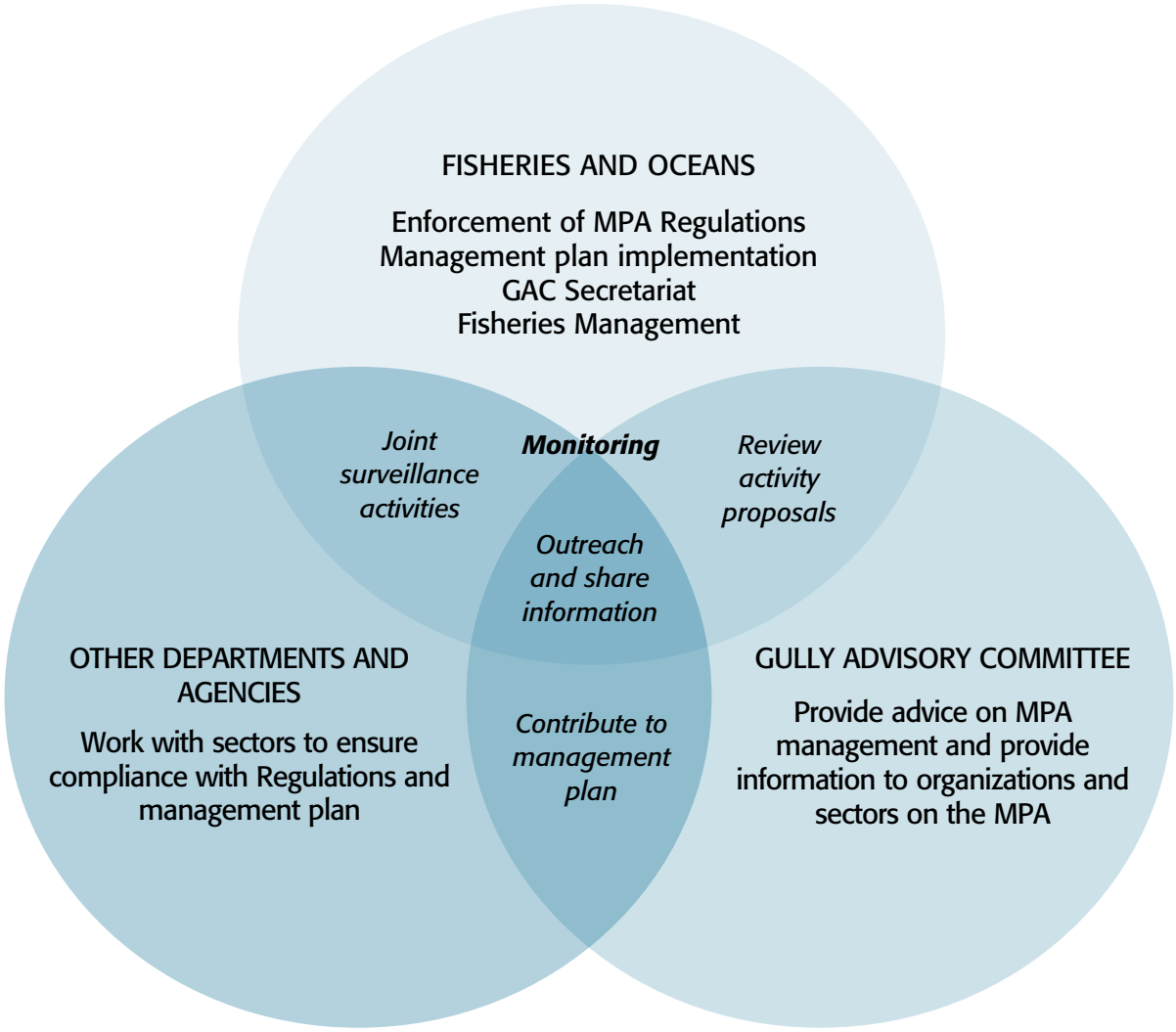


Figure 4. Key roles and responsibilities related to the Gully MPA.

- leverage outreach opportunities and provide educational materials;
- support and conduct research, ecosystem and pressures monitoring in the MPA; and
- evaluate management of the MPA to ensure objectives are met.

OCMD provides an overall facilitation and coordination function for the MPA. This role requires ongoing dialogue with regulators and various stakeholders and interests. OCMD provides advice to those considering activities in the Gully and surrounding areas, and coordinates the review of activity plans received through the plan submission process.

Other Government Departments

Although DFO has the overall responsibility for managing and administrating the MPA, several other departments and agencies also play a significant role in managing activities in and around the MPA (see Appendix 2 for a summary of responsibilities by department). Although each regulatory body has different responsibilities and interacts with different sectors, they have a common goal of promoting compliance with the Gully MPA Regulations. Core responsibilities for these departments as they relate to the Gully include:

- ensuring awareness of the MPA and minimizing impacts from human activities and ensuring compliance of any authorized activities with the Regulations;

- assisting DFO with surveillance and enforcement activities;

- conducting or supporting research activities

Existing planning and regulatory approval mechanisms used to manage ocean activities will be used to facilitate compliance with the Regulations and communication of the Plan objectives. Chapter 4 of this Plan describes some of the existing processes as related to each user group.

In addition to their regulatory responsibilities, many government agencies have representatives on the GAC (see below). As well, the Regional Committee on Coastal and Ocean Management (RCCOM) provides a regular and ongoing forum for DFO and many key government agencies involved in oceans management in the region. This provides a venue to address the ongoing requirements for the Gully MPA and to provide an update on management issues or concerns.

GULLY ADVISORY COMMITTEE

The ongoing participation and involvement of a variety of federal and provincial government bodies, industry, and public interests is essential to the protection of the Gully ecosystem. To facilitate ongoing dialogue and implementation of the Management Plan, DFO formed the GAC in 2003. GAC members represent government and non-government interests in the Gully and have skills, knowledge, and experience related to the ecology, management, conservation, and use of the area.

While the committee is recognized as a key mechanism for collaboration, it does not have decision making authority related to the Regulations or any other Act of Parliament. Moreover, it does not replace the regulatory mandate or decision-making authority of existing bodies or processes. The GAC provides advice to DFO and other regulators who make decisions related to the Gully and its management.

The GAC was involved with the MPA assessment requirements and establishment process, and continues to play an important role in ongoing management of the MPA. The following are the primary activities of the GAC:

- provides a regular forum to exchange information and views amongst a core group of government and non-government organizations with interests in the Gully;

- reviews the development of management plan components, regulatory proposals, and associated materials;

- provides advice to DFO on proposals for activities within the MPA boundary; and

- provides input into the activities of other organizations or bodies involved in the research, protection, and management of the Gully.

The GAC consists of individuals from federal and provincial governments, First Nations, the petroleum industry, fishing organizations, environmental organizations, and universities (Appendix 3). A representative from OCMD serves as chair of the GAC, and OCMD staff members perform all administrative functions related to the committee. The terms of reference for the GAC are available by request from OCMD (see last part of the chapter for contact information).

5.2 ONGOING ADMINISTRATIVE ACTIVITIES

5.2.1 ACTIVITY PLAN ASSESSMENTS

As described in the preceding chapter, those interested in conducting fisheries, research or tourism activity in the MPA that has not been given a specific exception to the general prohibitions, must submit an application for ministerial approval. The Regulations (sections 5 and 6) stipulate that an approval may be obtained for scientific research and monitoring throughout the MPA. Approval may be available for non-science undertakings but only in Zone 3. In practice, and as described in Chapter 4,

whale and seabird tours through Zone 1 are approved under the research provisions: operators are expected to conduct a robust program of science or monitoring. Activities related to media production have not been proposed to DFO but similar requirements would be imposed on film and television crews wishing to access Zone 1 under the terms of a research approval.

The activity plan application must be submitted to OCMD at least 60 days prior to the start of the planned activity. The application form and associated guidance are available from OCMD or online. If possible, proponents should discuss the activity with OCMD prior to formal submission of the plan so that OCMD can provide relevant reference materials, help with regulatory interpretation, suggest appropriate mitigation for proposed activities, assist in site-level planning, and/or provide general guidance on addressing the requirements to obtain an approval. OCMD will also advise the proponent if other permits or licences are required by DFO for conducting the activity. Although scientific research carried out or sponsored by a foreign government is exempted from the Gully MPA application requirement, proponents must demonstrate compliance with the MPA Regulations—as required of domestic applicants—and be granted approval in principle.

Once OCMD has accepted the submission of a complete application, the application is circulated to the GAC and other subject matter experts as required for advice and feedback. OCMD must then assess the proposal against the regulatory requirements and make a recommendation to the Minister regarding approval or denial. Regulatory factors and various policy considerations examined during assessment include:

- Does the activity support Gully MPA management?
- What will be the impact on the ecology/species of the Gully from the activity?
- What cumulative environmental effects might be expected from the activity in combination with other past and current activities?
- Will the work be conducted or supervised by an individual qualified in the field?

- In cases of environmental monitoring, does the proposal address recognized indicators?
- For primary research and characterization studies does the activity have scientific merit?
- Does the activity contribute to meeting the management and conservation objectives of the Gully?

The Minister will approve a plan within 30 days of receiving the completed submission if the activity does not contravene the protection requirements of the MPA. Approvals are provided in writing.

5.2.2 INFORMATION MANAGEMENT

As the lead department responsible for the management and administration of the MPA, DFO serves as the primary custodian of data and information about the site, including research findings, monitoring data, regulatory approvals, etc. As the Gully MPA information manager, DFO is working to ensure data, data products, and other information sources are properly archived and made accessible to managers, scientists and where possible to the general public.

The Gully MPA website[8] provides an overview of the MPA and links to the Regulations, management

[8] www.dfo-mpo.gc.ca/oceans/mpa-zpm/gully-eng.html

plan and to various scientific research and monitoring documents related to the area. Digital map files of the Gully boundary and zones are readily available as part of a national MPA layer hosted on the Government of Canada's Open Data Portal (http://open.canada.ca/) or by request to OCMD. Additional scientific data and spatial information relevant to the Gully will be made available publicly via online databases and web-mapping applications as they are developed.

5.2.3 EDUCATION AND OUTREACH

Due to its remote location, the Gully offers few hands-on educational opportunities as compared with coastal MPAs. However, the MPA provides an excellent opportunity to raise awareness among the general public on deep ocean environments and the role of MPAs in general.

To meet the management and stewardship objectives described in Chapter 2, a dedicated effort to provide information to a variety of Canadians is required. For the MPA to be successfully managed, it is important that the general public, and affected user groups in particular, are aware of the MPA designation and Regulations. For that reason, education and outreach is an important focus for MPA management.

Education and outreach activities are carried out largely by DFO, and many efforts in this regard were made between 2004 and 2014 (DFO 2014a). Other regulatory agencies, such as the CNSOPB, Parks Canada, and Transport Canada may also support efforts to broadly communicate regulatory information about the MPA to their relevant user groups. In addition, members of the GAC and other stakeholders are encouraged to contribute to education and outreach efforts for the MPA.

Education and Outreach Activities: Since designation DFO has developed specific education and outreach materials that target a variety of audiences. Although a dedicated "education and outreach strategy" document will not be developed, OCMD has sufficient experience and awareness of successful approaches and key opportunities to reach the public. Ongoing efforts will build on existing programs and partnerships, providing information on the ecology and management of the Gully to the public and to key sectors that operate in or near the MPA.

Curriculum materials: In support of education specialists, information on the Gully is encouraged in public school programs and other institutions dedicated to marine education.

Materials for the general public: Printed materials, video and online materials produced by DFO and others provide knowledge of the Gully ecosystem and MPA to a broad audience. As well, tour guides provide and interpret Gully material for visitors to the Bedford Institute of Oceanography, Dartmouth, Nova Scotia. DFO is working with the Natural History Museum of Nova Scotia to develop a permanent display on the Gully MPA. Other permanent or temporary exhibits in Nova Scotia or beyond are encouraged.

National and international awareness: Participation in national and international forums serves to raise global awareness of the Gully MPA and provides an opportunity for MPA managers, researchers and others to share their experience and knowledge.

Gully website: Information about the Gully is available online to meet basic inquiries from the general public. The website will be continually enhanced to include additional information on the ecology and management of the Gully MPA.

5.2.4 SURVEILLANCE, COMPLIANCE MONITORING, AND ENFORCEMENT

A coordinated and integrated approach to surveillance and enforcement is required for the MPA given its remote offshore location, and the variety of ocean uses, management jurisdictions, and potential interactions and impacts in the area. What follows is a description of DFO's surveillance and enforcement role and the supporting roles of several other government authorities. Compliance promotion efforts conducted in support of the MPA are also described.

DFO

As the lead federal authority for the MPA, DFO has overall responsibility for ensuring that the regulations and conservation measures are respected and enforced. This is undertaken through the Department's legislated enforcement mandate and responsibilities under the *Oceans Act*, the *Fisheries Act*, the SARA, and other federal legislation covering fisheries conservation, environmental protection, habitat protection, and marine safety. DFO also provides a leadership and coordination role for broader inter-agency surveillance, monitoring, and enforcement activities in support of the MPA. Under this coordinated approach, DFO plays a support role for enforcement matters falling under the jurisdiction of other government authorities.

DFO Conservation and Protection:

The primary means of surveillance and enforcement in the MPA is through DFO's fisheries Conservation and Protection (C&P) program. C&P conducts regular aerial fisheries surveillance patrols of the eastern Scotian Shelf region, and the MPA is often included in the flight plan. During these patrols, fishing and other types of vessel activities in and around the MPA are investigated and reported through the DFO's surveillance information system. Owing to the remote offshore location and the seasonal nature of fishing activities being monitored, dedicated and year-round coverage of the MPA is not achieved solely through the aerial surveillance program. Additional monitoring and information sources include fisheries observer reports, vessel logbooks, and automated vessel monitoring system (VMS) reports. Integrated computer programs have been developed to collect and analyze multiple sources of information to provide an operational picture of fishing activity in the MPA year-round, and to provide automatic notification when a catch has been reported within a closure (e.g., Zone 1) or VMS data indicate a fishing vessel has crossed into the MPA. MPA practitioners provide additional surveillance support by monitoring these reports and alerting C&P if potential infractions are detected.

As part of its general MPA enforcement mandate, C&P is responsible for fisheries enforcement matters within and adjacent to the Gully. Intelligence analysts and Fisheries Officers oversee the MPA exclusions and enforce the access conditions: fleets allowed to fish in Zones 2 and 3 are watched for potential Zone 1 infractions; all other fleets are watched for MPA boundary incursions. Fisheries access and conservation measures related to the MPA have been incorporated into DFO's resource management program through the use of licence conditions, variation orders and closures, and fleet-level conservation harvest plans. Fisheries violations can result in charges under both the *Fisheries Act* and the *Oceans Act*. Fishery Officers are designated as enforcement officers under both pieces of legislation.

The enforcement provisions of the SARA may also be used in support of the MPA when dealing with listed species, such as the northern bottlenose whale. Fishery Officers are designated as enforcement officers for the SARA and may lay charges under this legislation, as appropriate.

Canadian Coast Guard:

The Canadian Coast Guard provides support to MPA monitoring through its emergency response and vessel traffic management and vessel monitoring programs. The Coast Guard must be notified of accidents when they occur (as required under section 7 of the MPA Regulations) and serves as the coordinating body for

government responses as required. The Coast Guard has included the MPA in its regional environmental response plan and would provide a leadership and operational role in the event of an environmental emergency.

The Coast Guard's Annual Notices to Mariners provides information on MPA conservation measures as well as regulatory requirements and voluntary guidance for vessels operating in the area.

Supporting Roles: Other Agencies

In addition to DFO, other government authorities involved in the surveillance, monitoring and enforcement of activities in the MPA are Canada's Maritime Forces (Department of National Defence), the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB), Transport Canada, and Environment and Climate Change Canada. Wherever possible, MPA-related tasks are incorporated into existing agency enforcement and compliance programs. Under this coordinated, inter-agency system, each government authority operates according to its enforcement mandate and capabilities through existing cooperative arrangements or through new arrangements as required. Inter-agency coordination and planning is aimed at the efficient, cost-effective use of enforcement assets and capabilities. It also serves to demonstrate government interest, presence, and capabilities to enforce the conservation and management measures for the MPA. For activities requiring involvement by multiple agencies, existing interdepartmental arrangements and Memoranda of Understanding (MOUs) are used to incorporate MPA surveillance and enforcement considerations, where applicable.

Maritime Forces Atlantic:

Canada's Maritime Forces Atlantic (MARLANT) provides an important support role for the surveillance and monitoring and presence in the MPA. MARLANT carries out surveillance patrols at the request of DFO using either long-range patrol aircraft or patrol frigates. MPA coverage occurs while en route to patrol areas or during surveillance operations in the surrounding area. The cooperation between DFO and MARLANT is supported by a long-standing MOU for assistance in

fisheries surveillance and protection.

Canada-Nova Scotia Offshore Petroleum Board:
Oil and gas exploration, development, and production activities with the potential to effect the MPA are regulated by the CNSOPB under federal-provincial accord legislation. The CNSOPB is responsible for ensuring industry compliance with MPA Regulations and management provisions through its compliance assurance practices comprising monitoring, audits and sanctions.[9] The CNSOPB has a range of inter-agency arrangements in place for matters relating to environmental assessment, approvals, monitoring, and enforcement, including MOUs with DFO and Environment and Climate Change Canada. Enforcement actions may occur jointly with these authorities for matters affecting their jurisdiction, such as pollution, ocean dumping, habitat protection and marine safety.

Transport Canada:
Transport Canada is responsible for matters related to marine safety and the prevention of ship-source pollution in Canadian waters. These responsibilities are exercised through various regulations under the *Canada Shipping Act*, such as the Ballast Water Control and Management Regulations, and Canada's international commitments through the International Maritime Organization (IMO). In the case of a violation of the *Canada Shipping Act* or its regulations, Transport Canada will provide a lead enforcement role. However, Transport Canada and DFO will cooperate in the enforcement of violations under federal shipping legislation in or affecting the MPA as these may also be subject to penalties under the *Oceans Act* or the *Fisheries Act*.

Transport Canada's National Aerial Surveillance Program (NASP) provides Canada's primary surveillance mechanism for detecting oil pollution at sea. The NASP fleet includes one plane based in Moncton, New Brunswick that is used to conduct aerial surveillance for Atlantic Canadian waters and the Great Lakes. The program takes advantage of a wide array of remote sensing equipment, including satellite-based oil-like anomaly detection equipment available through Environment and Climate Change Canada's Integrated Satellite Tracking of Pollution (ISTOP) program. This technology helps to efficiently detect, investigate, and characterize oil spills despite the large territory covered by the single plane. NASP surveillance flights are planned and conducted regularly and the Gully MPA is included in the flight plans whenever feasible.

Environment and Climate Change Canada:
Environment and Climate Change Canada works in partnership with Transport Canada for the surveillance of sea-based activities, including pollution (i.e., NASP and ISTOP) and ice surveillance activities. Environment and Climate Change Canada is responsible for the enforcement of the pollution and wildlife protection provisions of the *Canadian Environmental Protection Act*, the *Fisheries Act*, the *Migratory Birds Convention Act*, and the SARA, as well as the various regulations enacted under these pieces of legislation. In the case of environmental emergencies, Environment and Climate Change Canada plays a lead role through the inter-agency Environmental Emergencies Science Table, which is charged with assessing environmental incidents and advising on appropriate responses. As violations of federal environmental legislation that occur in or affect the MPA may also be subject to penalties under the *Oceans Act*, DFO and Environment and Climate Change Canada will cooperate in the enforcement process.

Compliance Promotion
In addition to government surveillance and enforcement programs, management activities actively seek to promote compliance with the MPA Regulations. Compliance promotion can be achieved through the use of best practice guidelines for various activities, the recognition and adoption of industry codes of practice, and promotion and development of stewardship initiatives. Marine user groups operating in the MPA (e.g., fishers, researchers, tourism operators, transiting vessels) or near the area (e.g., oil and gas companies) are encouraged to contribute to the surveillance, monitoring, and reporting effort.

Education and outreach exercises are important to inform current and potential user groups of the MPA objectives, Regulations, and management provisions. The GAC provides ongoing opportunities for communication

[9] Regulator practices available online: https://www.cnsopb.ns.ca/environment/compliance-and-enforcement

with many users and other interest groups. As well, targeted outreach efforts, such as the distribution of information packages, or engagement in meetings or one-on-one discussions, may be employed as needed to educate and encourage compliance amongst specific users or user groups.

5.3 EVALUATION AND REPORTING

Regular MPA management evaluations can help prioritize management activities, highlight successes, identify gaps and challenges, capture staff knowledge, encourage appropriate resource allocation, and inform adaptive management and planning. Repeated evaluations provide an opportunity to collect information in a regular, structured way to allow for the tracking of progress. Reporting on the results of such evaluations can help stakeholders understand the challenges and constraints faced by MPA practitioners, and can help build cooperation and support for MPAs by improving accountability. For more information on the theory and practice of MPA effectiveness, refer to guidance such as Pomeroy et al. (2004).

As one of the five management and stewardship objectives for the MPA (Chapter 2), this management plan commits to the monitoring and evaluation of the design, management, and effectiveness of the MPA on a regular basis to ensure it is meeting defined objectives. Adaptive planning and management, which includes monitoring and evaluation of MPA effectiveness, and regulatory amendments when appropriate, has also been identified as a guiding principle for Gully MPA management (Chapter 2).

EVALUATION OF MANAGEMENT EFFECTIVENESS

A comprehensive evaluation of MPA effectiveness requires consideration for the biophysical, social, and governance aspects of the site. The Gully MPA Ecosystem Monitoring Plan will be used for evaluating the biophysical aspects of the MPA. The social and governance aspects of the site have been reviewed using a suite of 50 indicators designed to address the following 6 categories of management effectiveness: 1) stakeholder interactions, 2) education, stewardship and outreach efforts, 3) research, monitoring, and other allowed activities, 4) management planning, 5) human and financial resource capacity, and 6) surveillance and enforcement. The review was conducted by DFO with input from the GAC for a period covering 3 fiscal years, from April 1, 2007 to March 31, 2010. The evaluation helped to identify the strengths and weaknesses of Gully MPA management, and highlighted priority issues to be addressed to improve management performance. The

findings were shared with the GAC and used to guide the review of the 2008 management plan. Reviews of management effectiveness will be conducted regularly to help meet the MPA monitoring and evaluation objectives and to help inform the next management plan review.

MANAGEMENT PLAN REVIEW

The management plan is intended to guide management of the MPA for approximately five years. Similar to the review described above, an effort to review progress towards meeting plan objectives will be conducted, anticipated in 2021-2022. Over this period, changes to legislation or regulations and priorities and 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 Plan.

REPORTING

Progress reports are produced to document accomplishments as they relate to the objectives and priorities identified in the Plan. The first such report, covering the first 10 years of Gully MPA establishment, was released in 2014 (DFO, 2014a) and a similar report is expected to be released over the life of this Plan. In addition, reports that provide the findings of ecosystem monitoring programs and management effectiveness (see above) will also be published as they are completed.

5.4 CONTACT INFORMATION

Oceans and Coastal Management Division
Fisheries and Oceans Canada (Maritimes Region)
Bedford Institute of Oceanography
PO Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

Phone: (902) 426-9919

Fax: (902) 426-2331

E-mail: Gully@dfo-mpo.gc.ca

Gully website:
www.dfo-mpo.gc.ca/oceans/mpa-zpm/gully-eng.html

APPENDIX 1: GULLY MARINE PROTECTED AREA REGULATIONS

The MPA was legally designated under subsection 35(3) of the *Oceans Act* in May 2004 (http://laws-lois.justice.gc.ca/eng/regulations/SOR-2004-112/index.html). Minor technical amendments were passed in 2008. The Gully MPA Regulations are reproduced here in consolidated form to facilitate convenient reference. For any matters requiring legal certainty, readers are referred to Canada Gazette (2004) or the Department of Justice webpage.

GULLY MARINE PROTECTED AREA REGULATIONS (SOR/2004-112)

INTERPRETATION

1. (1) In these Regulations, all geographical coordinates (latitude and longitude) are expressed in the North America Datum 1983 (NAD83) geodetic reference system.
   (2) In Schedules 1 and 2, the lines connecting the points are rhumb lines.

DESIGNATION

2. The area of the Atlantic Ocean depicted in Schedule 1 — consisting of the seabed, the subsoil to a depth of 15 m and the water column above the seabed — that is bounded by a rhumb line drawn from a point 44°13'N, 59°06'W to a point 43°47'N, 58°35'W, then to a point 43°35'N, 58°35'W, then to a point 43°35'N, 59°08'W, then to a point 43°55'N, 59°08'W, then to a point 44°06'N, 59°20'W (which points are shown as points 1 to 6, respectively, in Schedule 1), and back to the point of origin, is hereby designated as a marine protected area to be known as the Gully Marine Protected Area.

MANAGEMENT ZONES

3. The Gully Marine Protected Area consists of the following management zones:
   (a) Zone 1, as depicted in Schedule 2;
   (b) Zone 2, as depicted in Schedule 2, consisting of the area surrounding Zone 1,
   (c) Zone 3, as depicted in Schedule 2, consisting of the Gully Marine Protected Area, other than Zones 1 and 2

PROHIBITED ACTIVITIES

4. Subject to sections 8 to 10, no person shall
   (a) disturb, damage or destroy in the Gully Marine Protected Area, or remove from it, any living marine organism or any part of its habitat;
   (b) disturb, damage or destroy in the Gully Marine Protected Area, or remove from it, any part of the seabed, including the subsoil to a depth of 15 m of the seabed; or
   (c) carry out any activity — including depositing, discharging or dumping any substance, or causing any substance to be deposited, discharged or dumped — in the Gully Marine Protected Area or in the vicinity of that Area that is likely to result in the disturbance, damage, destruction or removal of anything referred to in paragraph (a) or (b).

PLAN TO BE SUBMITTED

5. Subject to sections 10 and 11, every person who proposes to carry out an activity in the Gully Marine Protected Area must submit to the Minister for approval, not less than 60 days before beginning the proposed activity, a plan that indicates the management zone in which the activity is proposed to be carried out and includes
   (a) a statement of the purpose of the activity;
   (b) a detailed description of the activity;
   (c) the identity of every ship and aircraft proposed to be used during or in connection with the activity;
   (d) the proposed period or periods during which the activity will take place;
   (e) the location of the activity, expressed in latitude and longitude;
   (f) two copies of all plans and specifications relating to the activity;
   (g) two copies of a report assessing the environmental impact of the activity on the Gully Marine Protected Area, including a consideration of any cumulative environmental effects that are likely to result from the activity in combination with any other past and current activities undertaken in or affecting that Area and any other anticipated activities that may be undertaken in or may affect that Area;
   (h) a list of every licence, permit, authorization or consent obtained or applied for in respect of the activity; and
   (i) the name, address and telephone number and, if applicable, the facsimile number and electronic mail address of the contact person.

6. (1) Subject to subsection (2), the Minister shall, within 30 days after receiving a plan submitted in accordance with section 5, approve the plan, subject to the following conditions, as applicable:
   (a) in the case of scientific research or monitoring activities in Zone 1, the activities
      (i) are to be carried out for the purpose of
         (A) managing the Gully Marine Protected Area or monitoring the effectiveness of the conservation measures being implemented in that Area, or
         (B) investigating incidents that may have an environmental impact on the Gully Marine Protected Area, or
      (ii) are to be carried out for a purpose other than the purposes referred to in subparagraph (i) and will not result in any damage or destruction referred to in section 4 in Zone 1 or 2;
   (b) in the case of scientific research or monitoring activities in Zone 2 or 3, the activities
      (i) are to be carried out for the purpose of
         (A) managing the Gully Marine Protected Area or monitoring the effectiveness of the conservation measures being implemented in that Area, or
         (B) investigating incidents that may have an environmental impact on the Gully Marine Protected Area, or

(ii) are to be carried out for a purpose other than the purposes referred to in subparagraph (i) and
(A) will not result in any damage or destruction referred to in section 4 in Zone 1 or 2, and
(B) will not result in any damage or destruction referred to in section 4 in Zone 3 or will only result in damage or destruction referred to in section 4 in Zone 3 that is within the natural variation of the ecosystem in which that Zone is located; and

(c) in the case of any other activity in the Gully Marine Protected Area, the activity
(i) will be limited to Zone 3,
(ii) will not result in any disturbance, damage, destruction or removal referred to in section 4 in Zone 1 or 2, and
(iii) will not result in any disturbance, damage, destruction or removal referred to in section 4 in Zone 3 or will only result in disturbance, damage, destruction or removal referred to in section 4 in Zone 3 that is within the natural variation of the ecosystem in which that Zone is located.

(2) The Minister shall not approve the plan referred to in sub section (1) if the cumulative environmental effects of the proposed activity, in combination with any other past and current activities undertaken in or affecting the Gully Marine Protected Area and any other anticipated activities that may be undertaken in or may affect that Area, are likely to result in disturbance, damage, destruction or removal that exceeds the parameters described in the conditions set out in paragraph (1)(a), (b) or (c), as applicable.

ACCIDENTS TO BE REPORTED

7. Any person involved in an accident that is likely to result in any disturbance, damage, destruction or removal prohibited under section 4 shall, within two hours after its occurrence, report the accident to the Canadian Coast Guard.

EXCEPTIONS

8. Living marine organisms may be removed from Zone 2 or 3 if they are removed by the holder of a valid commercial fishing licence issued under subsection 7(1) of the *Fisheries Act* in the following circumstances:
(a) the licence is for swordfish, tuna or shark and the holder of the licence, when fishing for a species of fish authorized by the licence, complies with the terms and conditions of the licence;
(b) the licence is for groundfish and the holder of the licence, when fishing for halibut, complies with the terms and conditions of the licence; or
(c) the licence is a valid commercial fishing licence, other than a licence referred to in paragraph (a) or (b), and the holder of the licence, when fishing for a species of fish authorized by the licence,
(i) complies with the terms and conditions of the licence,
(ii) does not cause any damage or destruction referred to in section 4 in Zone 2,
(iii) causes only damage or destruction referred to in section 4 in Zone 3 that is within the natural variation of the ecosystem in which that Zone is located, and
(iv) removes living marine organisms from Zone 2 or 3 only to an extent that is within the natural variation of the ecosystem in which Zone 2 or 3, as the case may be, is located.

9. Paragraph 4(c) does not apply in respect of an activity carried out in the vicinity of the Gully Marine Protected Area if the disturbance, damage, destruction or removal referred to in that paragraph
(a) is limited to Zone 3; and
(b) is within the natural variation of the ecosystem in which Zone 3 is located.

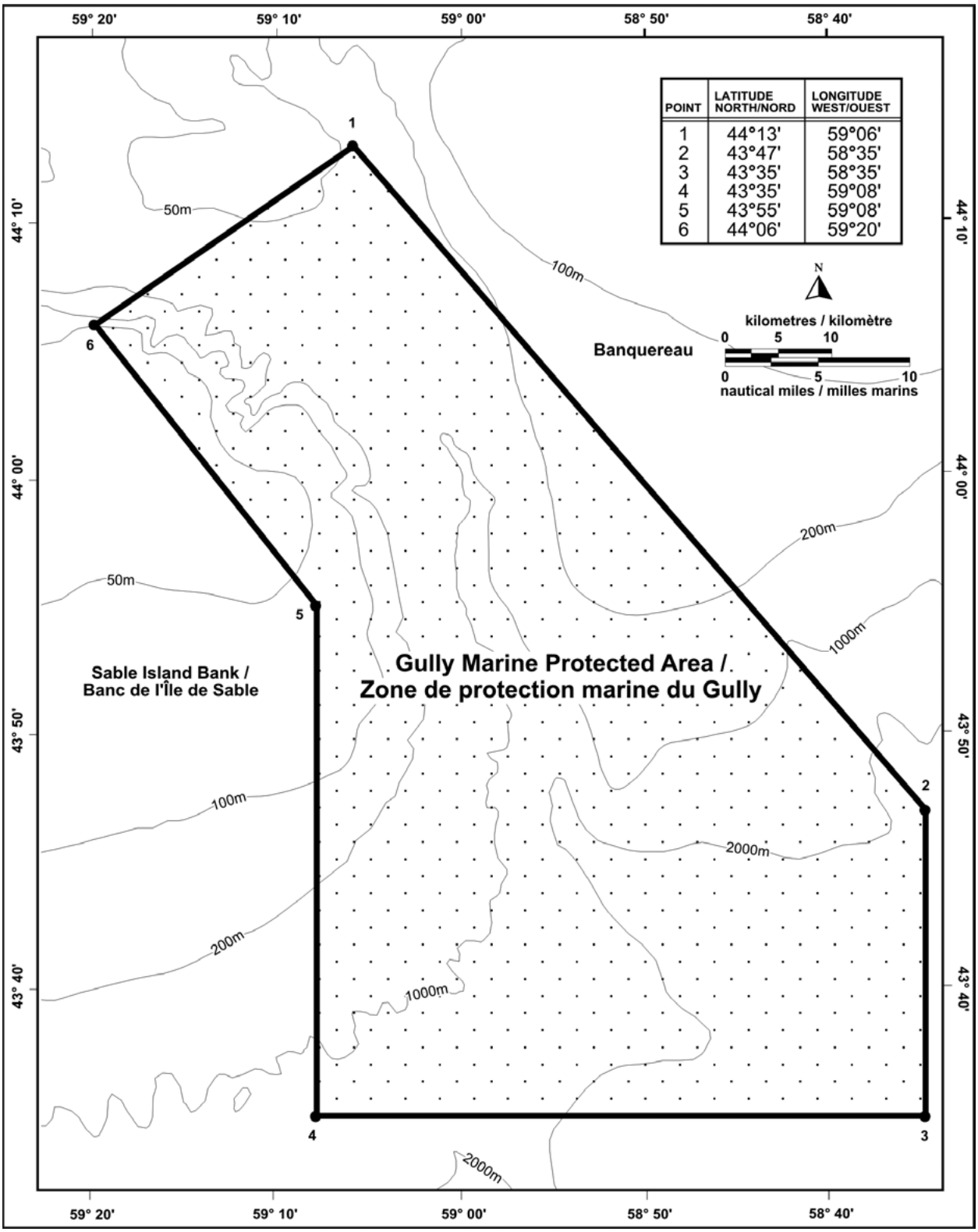
10. Sections 4 and 5 do not apply in respect of any movement or other activity of a ship, submarine or aircraft if the movement or other activity is carried out for the purpose of public safety, law enforcement or national security or for the exercise of Canadian sovereignty and
(a) the ship, submarine or aircraft is owned or operated by or on behalf of Her Majesty or by a foreign military force acting in cooperation with, or under the command or control of, the Canadian Forces; or
(b) the movement or other activity is carried out for the purpose of an emergency response under the direction, command or control of the Canadian Coast Guard.

11. Section 5 does not apply in respect of
(a) fishing activities carried out in Zone 2 or 3 by the holder of a valid commercial fishing licence, issued under sub section 7(1) of the *Fisheries Act*, if the activities are carried out in a manner that complies with the terms and conditions of the licence;
(b) marine scientific research activities that are carried out or sponsored by a foreign government in the Gully Marine Protected Area and in respect of which that government has received the consent of the Minister of Foreign Affairs under paragraph 3(2)(c) of the *Coasting Trade Act*, if the activities are carried out in a manner that complies with the terms and conditions of the consent; or
(c) the activities of a ship that is exercising international navigational rights in the Gully Marine Protected Area and is not contravening the *Canada Shipping Act* or any requirements of the International Maritime Organization.

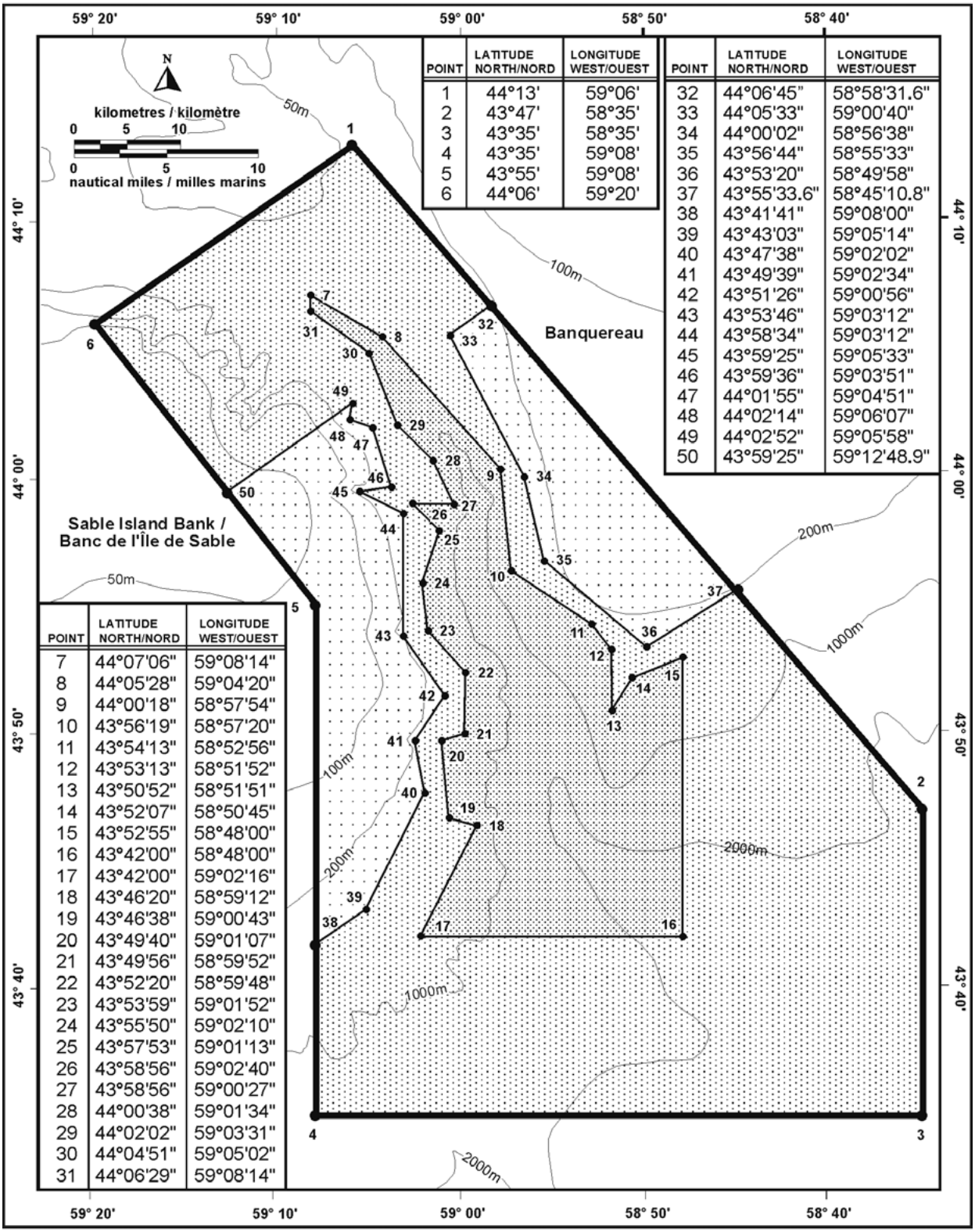
COMING INTO FORCE

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

SCHEDULE 1 CANADA GAZETTE - GULLY MARINE PROTECTED AREA



SCHEDULE 2 CANADA GAZETTE - MANAGEMENT ZONES



POINT	LATITUDE NORTH/NORD	LONGITUDE WEST/OUEST
1	44°13'	59°06'
2	43°47'	58°35'
3	43°35'	58°35'
4	43°35'	59°08'
5	43°55'	59°08'
6	44°06'	59°20'

POINT	LATITUDE NORTH/NORD	LONGITUDE WEST/OUEST
32	44°06'45"	58°58'31.6"
33	44°05'33"	59°00'40"
34	44°00'02"	58°56'38"
35	43°56'44"	58°55'33"
36	43°53'20"	58°49'58"
37	43°55'33.6"	58°45'10.8"
38	43°41'41"	59°08'00"
39	43°43'03"	59°05'14"
40	43°47'38"	59°02'02"
41	43°49'39"	59°02'34"
42	43°51'26"	59°00'56"
43	43°53'46"	59°03'12"
44	43°58'34"	59°03'12"
45	43°59'25"	59°05'33"
46	43°59'36"	59°03'51"
47	44°01'55"	59°04'51"
48	44°02'14"	59°06'07"
49	44°02'52"	59°05'58"
50	43°59'25"	59°12'48.9"

POINT	LATITUDE NORTH/NORD	LONGITUDE WEST/OUEST
7	44°07'06"	59°08'14"
8	44°05'28"	59°04'20"
9	44°00'18"	58°57'54"
10	43°56'19"	58°57'20"
11	43°54'13"	58°52'56"
12	43°53'13"	58°51'52"
13	43°50'52"	58°51'51"
14	43°52'07"	58°50'45"
15	43°52'55"	58°48'00"
16	43°42'00"	58°48'00"
17	43°42'00"	59°02'16"
18	43°46'20"	58°59'12"
19	43°46'38"	59°00'43"
20	43°49'40"	59°01'07"
21	43°49'56"	58°59'52"
22	43°52'20"	58°59'48"
23	43°53'59"	59°01'52"
24	43°55'50"	59°02'10"
25	43°57'53"	59°01'13"
26	43°58'56"	59°02'40"
27	43°58'56"	59°00'27"
28	44°00'38"	59°01'34"
29	44°02'02"	59°03'31"
30	44°04'51"	59°05'02"
31	44°06'29"	59°08'14"

APPENDIX 2: ROLES AND RESPONSIBILITIES

KEY ROLES AND REGULATORY RESPONSIBILITIES FOR MANAGING MARINE ACTIVITIES[10]

REGULATORY OR ADVISORY BODY	REGULATORY RESPONSIBILITIES	ROLE AND RESPONSIBILITIES RELATED TO THE GULLY MPA
Fisheries and Oceans Canada (DFO)	Lead responsibility for Canada's oceans. Develops network of MPAs and administers MPA Regulations (*Oceans Act*). Leads and facilitates the development and implementation of integrated management plans (*Oceans Act*). Carries out marine science (*Oceans Act*). Regulates fisheries (*Fisheries Act*). Protects fish habitat (*Fisheries Act*). Protects critical habitat and develops recovery plans for aquatic species at risk (*Species at Risk Act*). Responsible for marine safety and security (*Canadian Coast Guard*).	Lead role with respect to the MPA. Coordinates management of the Gully and implementation of the management plan. Chair of Gully Advisory Committee. Responsible for activity approvals. Carries out surveillance of activities. Provides information to industry (in cooperation with their regulators) and the public on the MPA. Maintains the Gully MPA website. Carries out research in the MPA.
Canada-Nova Scotia Offshore Petroleum Board	Lead regulatory agency for petroleum activities and resources in the Nova Scotia offshore area (*Canada-Nova Scotia Offshore Petroleum Resource Implementation Accord Act*). Responsible for safe working conditions, promotion of environmental protection during offshore petroleum exploration and development, management and conservation of offshore petroleum resources, and ensuring compliance with accords and regulations.	Ensures petroleum activities are done in accordance with the Regulations and the management plan. Provides DFO with information on activities in the vicinity of the MPA.

[10] This is a brief overview of the primary responsibilities in oceans management and is not meant to list all roles and responsibilities for each agency in relation to the marine environment. More than 30 government agencies have some role in ocean policy and governance in Canada.

REGULATORY OR ADVISORY BODY	REGULATORY RESPONSIBILITIES	ROLE AND RESPONSIBILITIES RELATED TO THE GULLY MPA
Environment and Climate Change Canada	Responsible for limiting pollution and discharges into the marine environment and 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 species at risk (*Species at Risk Act*).	Ensures ocean disposal sites and other authorized disposal of waste at sea will not impact the MPA. Coordinates management and clean-up activities if an environmental emergency were to occur in the Gully or surrounding area. Assists DFO with SARA responsibilities.
Canadian Environmental Assessment Agency	Administers and promotes compliance with the federal environmental assessment process, assists in the process, and promotes sound environmental practices.	Where needed, assists with environmental assessments carried out in the vicinity of the Gully.
Transport Canada	Responsible for ship safety and ship source pollution prevention for all commercial and fishing vessels (*Canada Shipping Act*). Regulates ballast water discharges.	Administers Ballast Water Control and Management Regulations.
Industry Canada	Responsible for telecommunications, including licences for submarine cables (*Telecommunications Act*).	Ensures submarine cable licensing proposals are in accordance with the Regulations and management plan.
Department of National Defence	Responsibility for matters relating to national defence (*National Defence Act*). Conducts search and rescue missions. Assists other government departments in fisheries patrols and monitoring the ocean environment.	Assists with surveillance and enforcement of MPA Regulations through patrols. Ensures their activities are carried out in accordance with the MPA Regulations and management plan.
Natural Resources Canada	Responsible for administration of nonfuel offshore mineral interests. Carries out marine geoscience research.	Carries out research to support understanding of ecosystems Federal oversight of petroleum regulation and administration in the Nova Scotia offshore

REGULATORY OR ADVISORY BODY	REGULATORY RESPONSIBILITIES	ROLE AND RESPONSIBILITIES RELATED TO THE GULLY MPA
Global Affairs Canada	Administers consent process for marine scientific research when foreign investigators request access to Canadian waters.	Receives foreign research applications for the Gully area and sends to DFO for review to ensure they meet the Regulations.
International Maritime Organization	*Convention on the International Maritime Organization* (Canada is a signatory).	Established to allow for cooperation between countries with ships conducting international trade, it aims to improve maritime safety and prevent marine pollution caused by shipping.
Gully Advisory Committee	n/a	Provides advice to DFO on managing the MPA. Meetings of the committee provide a forum for communicating information and concerns about the Gully MPA.
Others	n/a	Other groups (e.g., industry or user groups, university researchers, non-government organizations) play a role by complying with the Regulations, promoting awareness of the Gully, and carrying out research that increases understanding of the Gully ecosystem.

APPENDIX 3: GULLY ADVISORY COMMITTEE MEMBERS (2015)

Chair and Secretariat

Oceans and Coastal Management Division, Fisheries and Oceans Canada

Members

Canada-Nova Scotia Offshore Petroleum Board
Canadian Coast Guard
Canadian Parks and Wilderness Society (Nova Scotia Chapter)
Canadian Wildlife Service
Clearwater Seafood
Dalhousie University
Department of National Defence
Ecology Action Centre
EnCana
ExxonMobil
Fisheries Management Branch, Fisheries and Oceans Canada
Offshore Petroleum Management Division, Natural Resources Canada
Geological Survey of Canada (Atlantic), Natural Resources Canada
Kwilmu'kw Maw-klusuaqn (KMK - Mi'kmaq Rights Initiative)
Maritime Aboriginal Peoples Council
Nova Scotia Department of Fisheries and Aquaculture
Nova Scotia Department of Energy
Nova Scotia Swordfishermen's Association
Science Branch, Fisheries and Oceans Canada
Seafood Producers Association of Nova Scotia
Shell Canada
Transport Canada
Parks Canada
Unama'ki Institute of Natural Resources
World Wildlife Fund

APPENDIX 4: EXAMPLES OF ACCEPTABLE TOURISM VESSEL RESEARCH/ MONITORING ACTIVITIES

RESEARCH/MONITORING ACTIVITIES THAT COULD BE CONDUCTED ONBOARD TOURISM VESSELS THAT WOULD CONTRIBUTE TO ONGOING RESEARCH PROGRAMS WITHIN THE GULLY MPA. THESE PROBABLE ACTIVITIES WERE DEVELOPED WITH ADVICE OF THE GULLY ADVISORY COMMITTEE IN 2012.

ACTIVITY	REQUIREMENTS	DESCRIPTION
Collection of photos for ongoing northern bottlenose whale photo identification (ID) studies	Experience	Adequate experience in data collection for the purpose of cetacean (preferably beaked whale) photo identification is required. OCMD can help recommend experienced researchers.
	Completion of standardized data sheet	Protocols and standardized datasheets are available from OCMD. Accurate dates, times, and GPS positions of each photograph are required.
	Submission of datasheets and photos to the research authority	Data will be analyzed and included in the northern bottlenose whale photo ID catalogue. Data may be used for obtaining population estimates and monitoring movements and whale behaviour.
	Camera with lens ≥ 200 mm	Cameras with appropriate focusing capabilities are needed to take pictures at a resolution high enough for photo ID purposes.
	Vessel of appropriate size	Photos collected from large vessels are generally not useful, thus this activity should be conducted from medium-sized vessels.
Optional addition to photo ID study: collection of video footage of cetacean encounters (especially encounters with northern bottlenose whales)	Completion of standardized data sheet	Protocols and standardized datasheets can be developed with help from OCMD. Accurate dates, times, and GPS positions of each video are required.
	Submission of datasheets and video to the research authority and OCMD	Submitted data may be used for northern bottlenose whale behavioral studies, or for monitoring the behavior of whales during whale-watching encounters.
	Use of video equipment	High-definition video would be preferred.

ACTIVITY	REQUIREMENTS	DESCRIPTION
Vessel-based visual cetacean surveys	Experience or training	Adequate experience in at-sea cetacean identification and/or formal marine mammal observer training is required.
	Completion of standardized data sheet	Protocols and standardized datasheets are available from DFO (OCMD). Accurate dates, times, and GPS positions of sightings, and information on effort and environmental conditions are required.
	Submission of (electronic) datasheets and survey track information to CWS	Submitted data will be included in the DFO Maritimes Region Cetacean Sightings Database. Such data may be used for obtaining information about species presence, distribution and density within the MPA.
	Binoculars (7 x 50 reticule)	Binoculars with a built in reticule and compass are needed to estimate distance and bearing of animals sighted.
Vessel-based visual seabird surveys	Experience or training	Seabird identification skills and familiarization with Eastern Canada Seabirds at Sea protocol/adapted protocol is required. Training can be arranged via Environment and Climate Change Canada's Canadian Wildlife Service (CWS).
	Completion of standardized data sheet	Protocols and standardized datasheets (including information on effort, environmental conditions, and sightings) are available from CWS.
	Submission of (electronic) datasheets and survey track information to CWS	Data will be included in the CWS Eastern Canada Seabirds at Sea database, and can be used for monitoring seabird species presence, density, and location within the MPA.
Mooring deployment/ retrievals	Use of technical equipment (e.g., acoustic releases).	Usefulness of tourism vessels for mooring deployments or retrievals will depend on several factors including timing, weather, size of mooring, number of moorings, etc. However, tourism vessels do offer a potential opportunity for researchers deploying or retrieving moorings from the Gully MPA, and thus this is a potential activity that would contribute to research. This would require collaboration between researchers and tour operators.
	Experience or training	Tour operators would need to have an experienced or well-trained mooring technician or researcher onboard to complete deployments/retrievals.
	Winch	Variable - depends on size of mooring.
	Large vessel	Variable - depends on size of mooring.

APPENDIX 5: REFERENCES

ACTS OF PARLIAMENT

Canadian Environmental Assessment Act, SC 2012, c. 19, s. 52: http://laws-lois.justice.gc.ca/eng/acts/c-15.21/index.html

Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act, SC 1988, c. 28: http://laws-lois.justice.gc.ca/eng/acts/C-7.8/

Canada Shipping Act, SC 2001, c. 26: http://laws-lois.justice.gc.ca/eng/acts/c-10.15/

Coasting Trade Act, SC 1992, c. 31: http://laws-lois.justice.gc.ca/eng/acts/c-33.3/

Fisheries Act, R.S.C., 1985, c. F-14: http://laws-lois.justice.gc.ca/eng/acts/F-14/

Migratory Birds Convention Act, SC 1994, c. 22: http://laws-lois.justice.gc.ca/eng/acts/m-7.01/

Oceans Act, S.C. 1996, c. 31: http://laws-lois.justice.gc.ca/eng/acts/O-2.4

Species at Risk Act, SC 2002, c. 29: http://laws-lois.justice.gc.ca/eng/acts/s-15.3/

REGULATIONS

Canada Gazette 2004. Gully Marine Protected Area Regulations. Canada Gazette Part II, Vol. 128, No. 10, May 19, 2004. Available online: http://laws.justice.gc.ca/eng/regulations/SOR-2004-112/. Accessed November 2015.

Canada Gazette 2010. *Description of critical habitat of the northern bottlenose whale* (Hyperoodon ampullatus), *Scotian Shelf population, in the Gully Marine Protected Area*. Vol. 144, No. 33 — August 14, 2010. http://www.gazette.gc.ca/rp-pr/p1/2010/2010-08-14/html/notice-avis-eng.html

Ballast Water Control and Management Regulations, SOR/2011-237: http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-237/

REFERENCES

Allard, K., Cochrane, N., Curran, K., Fenton, D., Gjerdrum, C., Greenan, B., Head, E., Koropatnick, T., Macnab, P., Moors-Murphy, H., Serdynska, A., Trzcinski, M.K., Vaughan, M., Whitehead, H. 2015. The Gully Marine Protected Area Data Assessment. DFO Can. Sci. Advis. Sec. Res. Doc. 2014/209 p.

Breeze, H. 2002. Commercial fisheries of the Sable Gully and surrounding region: Historical and present activities. Canadian Manuscript Report of Fisheries and Aquatic Sciences 2612.

Brickman, D., and A. Drozdowski. 2012. Development and Validation of a Regional Shelf Model for Maritime Canada based on the NEMO-OPA Circulation Model. Can. Tech. Rep. Hydrogr. Ocean Sci. 278: vii + 57 pp.

Canadian Coast Guard. Notices to Mariners 1 to 46. Annual Edition. Available online: http://www.notmar.gc.ca/

COSEWIC. 2011. COSEWIC assessment and status report on the Northern Bottlenose Whale Hyperoodon ampullatus in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa, ON. xii + 31 p.

Cogswell, A.T., E.L.R. Kenchington, C.G. Lirette, K. MacIsaac, M.M. Best, L.I. Beazley and J. Vickers. 2009. The current state of knowledge concerning the distribution of coral in the Maritime Provinces. Can. Tech. Rep. Fish. Aquat. Sci. 2855: v + 66 p.

CNSOPB. 2015a. Lands Management. Available online: http://www.cnsopb.ns.ca/lands-management (accessed November 2015)

CNSOPB. 2015b. Marine Protected Area - Gully. Available online: http://www.cnsopb.ns.ca/environment/marine-protected-area (accessed November 2015)

CNSOPB. 2017. 2017 Work Plan Memorandum of Understanding CNSOPB, Fisheries and Oceans Canada and Environment and Climate Change Canada. Available online: www.cnsopb.ns.ca/sites/default/files/pdfs/2017_work_plan_mou_cnsopb_dfo_eccc.pdf (accessed September 2017)

DFO. 2006. Impacts of Trawl Gears and Scallop Dredges on Benthic Habitats, Populations and Communities. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2006/025.

DFO. 2008. The Gully Marine Protected Area Management Plan. Oceans and Habitat Branch. Cat. No. Fs23-513/2007E

DFO. 2009. Contaminant monitoring in the Gully marine protected area. DFO Canadian Science Advisory Secretariat Science Advisory report. 2009/002: 15 pp.

DFO. 2010a. Gully marine protected area monitoring indicators, protocols and strategies. DFO Canadian Science Advisory Secretariat Science Advisory Report. 2010/066: 17 pp.

DFO. 2010b. Recovery Strategy for the Blue Whale (*Balaenoptera musculus*), Northwest Atlantic Population, in Canada. *Species at Risk Act* Recovery Strategy Series

DFO. 2010c. Potential impacts of fishing gears (excluding mobile bottom-contacting gears) on marine habitats and communities. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2010/003.

DFO. 2011. Recovery Potential Assessment for Northern Bottlenose Whales (*Hyperoodon ampullatus*) in Canada. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2011/031.

DFO. 2014a. The Gully Marine Protected Area: Ten years of Progress. DFO/2014-1926. Cat. No. Fs104-33/2014; ISBN: 978-1-100-54755-8

DFO. 2014b. Regional Oceans Plan – Maritimes Region: Background and Program Description. Oceans and Coastal Management Division. DFO/2014-1927

DFO. 2015. Review of Mitigation and Monitoring Measures for Seismic Survey Activities in and near the Habitat of Cetacean Species at Risk. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2015/005.

DFO. 2016. Recovery Strategy for the Northern Bottlenose Whale (*Hyperoodon ampullatus*), Scotian Shelf population, in Atlantic Canadian Waters. *Species at Risk Act* Recovery Strategy Series. Fisheries and Oceans Canada, Ottawa.

DFO. 2017a. Action Plan for the Northern Bottlenose Whale (*Hyperoodon ampullatus*), Scotian Shelf population, in Atlantic Canadian waters. *Species at Risk Act* Action Plan Series. Fisheries and Oceans Canada, Ottawa.

DFO. 2017b. Management Plan for the Sowerby's Beaked Whale (*Mesoplodon bidens*) in Canada. *Species at Risk Act* Management Plan Series. Fisheries and Oceans Canada, Ottawa.

DND. 2008. Maritime Command Order: Marine Mammal Mitigation Procedures (MMMP). MARCORD 46-13, Volume 3A. 10 pp.

Dufault, S., and H. Whitehead. 1994. Floating marine pollution in 'the Gully' on the continental slope, Nova Scotia, Canada. *Marine Pollution Bulletin* 28: 489-493.

GOC. 2011. National Framework for Canada's Network of Marine Protected Areas. Fisheries and Oceans Canada, Ottawa. 31 pp.

Harris, L.E., Gross, W.E., and Emery, P.E. 2013. Biology, Status, and Recovery Potential of Northern Bottlenose Whales (*Hyperoodon ampullatus*). DFO Can. Sci. Advis. Sec. Res. Doc. 2013/038. v + 35 p.

Harrison, W.G. and Fenton, D.G. 1998. The Gully – A Scientific Review of it Environment and Ecosystems. DFO Can. Stock Assessment Sec. Res. Doc. 98/83. 282 p.

Hooker, S. K., T. L. Metcalfe, C. D. Metcalfe, C. M. Angell, J. Y. Wilson, M. J. Moore and H. Whitehead. 2008. Changes in persistent contaminant concentration and CYP1A1 protein expression in biopsy samples from northern bottlenose whales, *Hyperoodon ampullatus*, following the onset of nearby oil and gas development. *Environmental Pollution* 152: 205-216.

Kenchington, T.J, 2010. Environmental Monitoring of the Gully Marine Protected Area: A Recommendation. Research Document 2010/075. Canadian Science Advisory Secretariat. pp. 65

Kenchington, E., Cogswell, A., MacIsaac, K., Beazley, L., Law, B. and Kenchington, T. 2013. Limited depth zonation among bathyal and epibenthic megafauna of the Gully submarine canyon, northwest Atlantic. Deep Sea Research II. 104, 67-82

Koropatnick, T., Johnston, S., Coffen-Smout, S., Macnab, P., and Szeto, A., 2012. Development and applications of vessel traffic maps based on Long Range Identification and Tracking (LRIT) data in Atlantic Canada. Can. Tech. Rep. Fish. Aquat. Sci. 2966: 27 pp.

Kostylev, V.E. 2002. Benthic assemblages and habitats of the Sable Island Gully. In: D.C. Gordon and D.G. Fenton, eds. Advances in Understanding the Gully Ecosystem: A Summary of Research Projects Conducted at the Bedford Institute of Oceanography (1999-2001). Canadian Technical Report of Fisheries and Aquatic Sciences 2377. pp. 17-30.

Moors-Murphy, H.B. 2014. Submarine canyons as important habitat for cetaceans, with special reference to the Gully: A review. *Deep-Sea Research II* 104: 6-19

Narazaki, T. 2013. Cruise report: body condition project 2013 – *Hyperoodon* Gully trial. Unpublished report. Sea Mammal Research Unit, University of St. Andrew's, UK. 26 pp.

O'Brien, K. and H. Whitehead. 2013. Population analysis of Endangered northern bottlenose whales on the Scotian Shelf seven years after the establishment of a Marine Protected Area. *Endangered Species Research* 21: 273–284.

Oceans and Coastal Management Division. 2017. Gully Marine Protected Area Ecosystem Monitoring Plan (2018-2022). Canadian Manuscript Report of Fisheries and Aquatic Sciences.

Pomeroy, R.S., Parks, J.E. and Watson, L.M. 2004. How is your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness. IUCN, Gland and Cambridge, xvi + 216pp.

Rutherford, R.J. and H. Breeze. 2002. The Gully Ecosystem. Canadian Manuscript Report of Fisheries and Aquatic Sciences 2615.

Smith, B., Makrides, C., Altheim, B., and Kendell, K. 2014. Resource assessment of undeveloped significant discoveries on the Scotian Shelf. Canada-Nova Scotia Offshore Petroleum Board, xvii + 182pp. Available online: http://www.cnsopb.ns.ca/sites/default/files/pdfs/sda_report_-_finalhighquality_april_3_2014.pdf. (Accessed November 2015)

Stantec. 2013a. Strategic Environmental Assessment for the Eastern Scotian Slope (Eastern Portion) and Laurentian Fan (Western Portion) (Phase 2B). Available online: http://www.cnsopb.ns.ca/sites/default/files/pdfs/seareport_phase2b_final_1.pdf

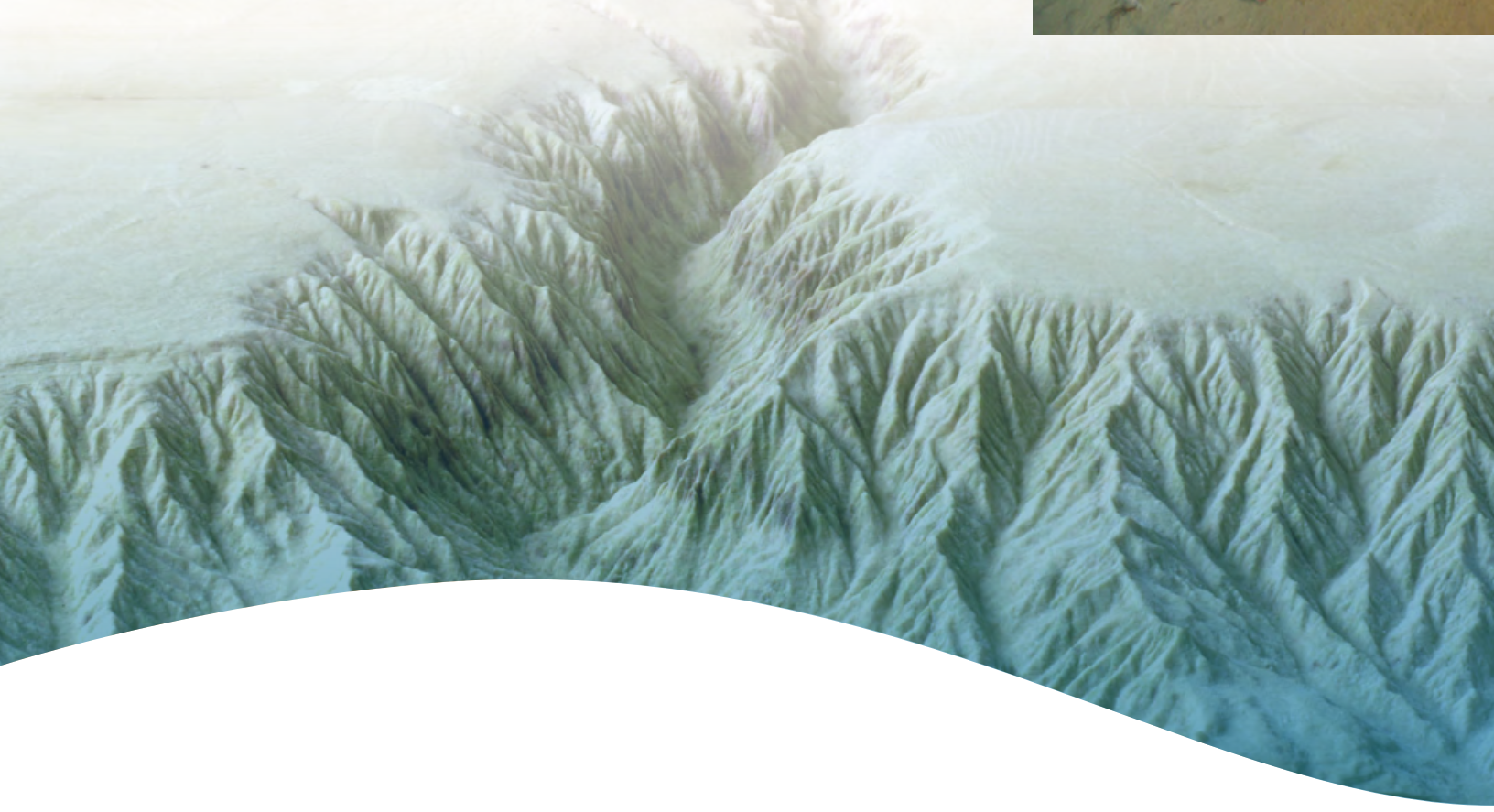
Stantec. 2013b. Strategic Environmental Assessment for the Misaine and Banquereau Banks (Phase 2A). Available online: http://www.cnsopb.ns.ca/sites/default/files/pdfs/seareport_phase2a_final_0.pdf

Stantec 2012a. Strategic Environmental Assessment for the Eastern Scotian Slope (Phase 1B). Available online: http://www.cnsopb.ns.ca/sites/default/files/pdfs/15581_75345.7.2_sea_-_eastern_scotian_shelf_and_slope_middle_and_sable_island_banks_2012_final_reports_phase1b_10032012.pdf

Stantec. 2012b. Strategic Environmental Assessment for the Eastern Scotian Shelf - Middle and Sable Island Banks (Phase 1A). Available online: http://www.cnsopb.ns.ca/sites/default/files/pdfs/15581_75354.7.1_sea_-_eastern_scotian_shelf_and_slope_middle_and_sable_island_banks_2012_final_reportsphase1a_10032012.pdf

Whitehead, H. 2013. Trends in cetacean abundance in the Gully submarine canyon, 1988–2011, highlight a 21% per year increase in Sowerby's beaked whales (*Mesoplodon bidens*). *Canadian Journal of Zoology* 91: 141-148.

Yeats, P., Hellou, J., King, T., and Law, B. 2009. Measurements of chemical contaminants and toxicological effects in the Gully. Canadian Science Advisory Secretariat, Research Document 2008/066.



Fisheries and Oceans Canada
Pêches et Océans Canada

For more information, please contact:

Oceans and Coastal Management Division
Ecosystem Management
Fisheries and Oceans Canada, Maritimes Region
Phone: 902-426-9919
Email: Gully@dfo-mpo.gc.ca
http://www.dfo-mpo.gc.ca/oceans/mpa-zpm/gully-eng.html