



SUB-COMMITTEE ON SAFETY OF  
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53rd session  
Agenda item 3

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## ROUTEING OF SHIPS, SHIP REPORTING, AND RELATED MATTERS

### Area to be avoided “In Roseway Basin, South of Nova Scotia”

#### Submitted by Canada

#### SUMMARY

**Executive summary:** This document sets forth a proposal to establish a recommended seasonal area to be avoided “In Roseway Basin, south of Nova Scotia” for consideration and approval, and forwarding to the Maritime Safety Committee for adoption. The objective of this proposal is to reduce the likelihood of ship strike deaths and serious injuries to right whales from June through December. The ATBA would redirect ship traffic from an area with the highest density right whales to areas where there is a lower density.

**Action to be taken:** Paragraph 22

**Related documents:** General Provisions on Ships’ Routeing as amended; MSC/Circ.1060; MEPC 55; MEPC 55/22; MSC 76/23; MSC 70(23); MSC 69/INF.21; MEPC 40/INF.9; NAV 52/18; NAV 52/3/3; NAV 48/3/5; NAV 47/INF.2 and NAV 44/3/1

#### Introduction

1 The Government of Canada proposes to establish a recommended seasonal area to be avoided (ATBA) “In Roseway Basin, south of Nova Scotia” for ships of 300 gross tonnage and upwards as set forth in annex 1. The proposed area is one of only two known, high-use, seasonal aggregation areas for North Atlantic right whales in Canadian waters and is an important feeding and socializing habitat for this critically endangered species. In recognition of its importance to the very survival of the right whale population, a portion of Roseway Basin was designated by Canada in 1993 as a Right Whale Conservation Area.

2 Extensive research has been compiled that shows the need for establishing this ATBA in Roseway Basin. Research has shown that there is a significant density of right whales in this area and that they are at risk from transiting ship traffic (annex 2). Ship-related mortality and injury to right whales are considered significant obstacles to the successful recovery and viability of the species, particularly in light of its small population size and the whales’ low birth rate. The objective of establishing this ATBA is, therefore, to minimize ship traffic in this environmentally sensitive area where right whale densities are significant.

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3 Internationally, a group of international scientists, convened by the International Whaling Commission (IWC) to evaluate the status of right whales species world wide, has recognized the urgent need for protective measures to prevent the demise of this population in the western North Atlantic. Moreover, most recently, the report of the Ship Strikes Working Group of the IWC's Conservation Committee was submitted to the October 2006 meeting of the Marine Environment Protection Committee (MEPC 55). The MEPC agreed with the Working Group that the IMO is the competent body to address ship strikes of cetaceans and invited delegations to submit proposals to relevant Committees and Sub-committees for consideration. This proposal is in accordance with that invitation.

## **Background**

4 North Atlantic right whales are one of the most endangered of the world's large whale species and vessel strikes account for the greatest amount of known human-induced mortality incurred by the species. Extensive individual identification studies of right whales over the last three decades indicate that the population is now estimated to number less than 400 animals. The population size remains very small despite more than 70 years of international protection from whaling.

5 The shape, behavioural characteristics, and habitat preferences of right whales make them especially vulnerable to being struck by vessels. Right whales are difficult for mariners to see, especially in rough seas and at night due to their low profile and dark colouration. They are black in colour, have a broad back, and no dorsal fin. Right whales move slowly and they spend extended periods at or near the surface. Typical behaviour includes resting at the surface, social activity (*i.e.* courtship), skim feeding (*i.e.* swimming slowly near or at the surface as they filter zooplankton from the water), and nursing their young. They appear oblivious or slow to respond to approaching vessels. Calves have limited dive capabilities, spend most of their time at the surface and are likely most vulnerable. Roseway Basin, along with the lower Bay of Fundy, Canada, and three areas in United States waters are the only areas in the western North Atlantic where right whales are known to repeatedly aggregate on a seasonal basis for several months at a time. Each of these important habitats is intersected by or located near major shipping routes.

6 The impact of ship strikes on right whales has been well demonstrated. Massive wounds (*e.g.*, fractured skulls and vertebrae, severed tails, and propeller cuts) on right whale carcasses show that ship strikes are clearly, and often, lethal. From 1970 through January 2007, 75 right whale deaths were documented along the eastern seaboard of Canada and the United States. Twenty-eight of these fatalities were traced to ship strikes while eight were traced to entanglement in fixed fishing gear. The remainder were neonatal deaths (18) and deaths of unknown cause (21). Twenty-one of the 28 ship strikes (75%) have occurred over the period 1991 through January 2007 and represent 50% of the total right whale mortalities for this period. The actual total number of deaths resulting from human activities is unknown; however, it is almost certainly higher than the observed number because not all carcasses of injured right whales are found.

7 Considerable research conducted over the last three decades shows that 59% of the known right whale population has been documented on Roseway Basin during the northern hemisphere's summer and autumn months (June through December). Roseway Basin is well established as an important area for right whales for feeding and socializing (courtship activity). Annex 2 provides location and extent of the density of right whales sightings. In developing this proposed ATBA, several scenarios were evaluated for their effectiveness at reducing the

probability of a ship/whale interaction. One research project in 2006<sup>1</sup> assessed the relative probability of ship/whale collisions on Roseway Basin and estimated that excluding vessel traffic from the configuration of the proposed Roseway Basin ATBA would reduce the relative probability of a ship/whale encounter by at least 2 orders of magnitude (i.e., the probability of a vessel encountering a right whale is 10 to 1000 times greater within the proposed ATBA than outside). In light of the above, the proposed ATBA is necessary to increase protection of the endangered right whales and reduce the risk of ship/whale collisions. A recent fatal ship strike in August 2006 further demonstrates the need to take immediate action to address this issue<sup>2</sup>.

## **Proposal**

8 Canada proposes to establish a recommended seasonal area to be avoided for ships of 300 gross tonnage and upwards solely in transit for the seven-month period from June 1st – December 31st to significantly reduce the risk of ship strikes to right whales in Roseway Basin.

9 Annex 1 provides the geographic co-ordinates and reference chart information of the proposed Roseway Basin ATBA. Chartlets indicating the density of right whales sightings and the relative probabilities of encounters with vessels are shown in annex 2.

10 In designing the proposed ATBA, consideration was given to several alternatives and to minimizing any impact on existing shipping. The ATBA would apply to ships solely in transit and maritime safety has been taken into consideration in the development of this proposal. Reducing the risk of ship strikes will also reduce the risk of any potential damage that may occur to the ship from hitting a large whale<sup>3</sup>. Canada has held extensive consultations on the proposed ATBA with representatives of the shipping and fishing industries, master mariners, environmental interests, marine mammal researchers, representatives of the national and local government bodies and the government scientists and managers that are members of the National Marine Mammal Peer Review Committee of Fisheries and Oceans Canada. The stakeholders' concerns were carefully considered and taken into account in the development of this ATBA proposal, including the impact on industry and the protection of right whales.

11 The proposed ATBA is a polygon that measures about 962 square nautical miles and has depths of 60 to 90 fathoms. The boundaries of the proposed ATBA are based on right whale sightings obtained through 2006 and on estimated relative probabilities of encounter taking into account marine traffic information through 2005 (annex 2). The size of the ATBA has been kept to a minimum to cover only that area considered critical for the protection the whales so as to minimize any impact on transiting ship traffic.<sup>4</sup> To further minimize any impacts on ships in

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<sup>1</sup> Taggart, C.T., A.S.M. Vanderlaan A. Serdyska. 2007. Vessel traffic and right whale strike probabilities along the east coast of North America. Environment Canada, Habitat Stewardship Programme Report, 2006-HSP4182, 30 March 2007, 20p.

Taggart, C.T., A.S.M. Vanderlaan A. Serdyska. 2006. Vessel traffic and right whale strike probabilities along the east coast of North America. Environment Canada and World Wildlife Endangered Species Recovery Fund, Report, 2006-ESR1337, 15 December 2006, 18p.

<sup>2</sup> 24 August 2006. Right whale carcass reported by S.V. Bowdoin at 43° 09.5'N x 065°19.5'W. Necropsy on 3 September 2006 found multiple broken vertebrae. Cause of death determined to be overwhelming blunt trauma.

<sup>3</sup> Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S., and Podesta, M. 2001. Collisions between ships and whales. *Marine Mammal Science* 17(1):35-75.

<sup>4</sup> The ATBA covers the area where the probability of a ship strike and the density of right whales is considered greatest, but does not cover the entire Roseway Basin area where the whales have been seen.

transit, the ATBA would have only a seasonally limited effective period of seven months (June through December)<sup>5</sup> each year when the largest percentage of the right whales are known to be in the area and consequently, when the risk of ship strikes are greatest. The previously designated Roseway Basin Conservation Area (shown in annex 2) is a different shape and smaller than the proposed ATBA, because it was only representative of right whale sightings obtained prior to 1993. Survey data from 1993 to the present reveal that the whales inhabit a much larger area. Undoubtedly, the bottom topography in the area is what contributes to the presence of the right whales' favorite food of plankton (copepods).

### **Traffic considerations**

12 Roseway Basin is located about 20 nautical miles south of Nova Scotia on the southwestern Scotian Shelf. There is ample sea room for vessels to pass north of the area between the proposed ATBA and the coast of Nova Scotia, or south of the area. Container ships, bulk carriers, passenger ships, cargo ships, tankers and a variety of other vessel classes, including some fishing vessels, navigate through and around the area of the proposed ATBA.

13 The total number of ships that actually transit the area is not known. However, an estimate can be made using ECAREG (Eastern Canada Vessel Traffic Services Zone), ICOADS (International Comprehensive Ocean-Atmosphere Data Set) and AMVER (Automated Mutual-Assistance Vessel Rescue System) data sources. Based on these reporting systems, it has been estimated that a minimum of 1,700 ships navigate in and around the area annually and that many of the vessels are bound to or from ports in Halifax Nova Scotia, Saint John New Brunswick, the United States, the United Kingdom, Russia, Belgium, Norway and other European destinations and the route used generally reflects the Great Circle route from Europe and the east coast of North America. The analyses also show that approximately three times as many ships pass to the north of the proposed ATBA than through it. There are approximately the same numbers of ships that navigate to the south of the proposed ATBA as transit through the proposed ATBA. There are a few fishing boats that also transit from north to south through the area. The traffic pattern is generally in a southwest-northeast direction.

14 The impact of this proposal on transiting ships is expected to be minimal for the following reasons: 1) the ATBA is only seasonal in its application thus it is recommended only when it is absolutely necessary for right whale conservation; 2) the size has been kept to a minimum and the shape is oriented to minimize the impact on the predominant southwest-northeast traffic flow; and 3) the majority of ships transiting south of Nova Scotia in the vicinity of the proposed ATBA, already transit to the north of it rather than through it.

15 This proposal for the establishment of an ATBA is supported by adequate hydrographic surveys and charts of the area and appropriate aids to navigation are in place. With modern navigation equipment, mariners are adequately able to determine their positions in relation to the proposed area. There is also complete differential GPS coverage and LORAN-C coverage.

16 With respect to environmental conditions during the time of applicability for the proposed ATBA, Roseway Basin has strong tidal streams and prevalent fogs. Roseway Basin is considered ice-free since strong tidal action and vertical mixing prevent significant ice formations.

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<sup>5</sup> Mellinger, D.K., Nieukirk, S.L., Matsumoto, H., Heimlich, S.L., Dziak, R.P., Haxel, J., and Fowler, M. 2007. Seasonal occurrence of North Atlantic right whale (*Eubalaena glacialis*) vocalizations at two sites on the Scotian Shelf. Marine Mammal Science. In press.

### **Other measures taken by Canada**

17 Canada has taken several measures to protect this critically endangered species. In 2002, the Maritime Safety Committee unanimously adopted the Canadian proposal to amend the Bay of Fundy Traffic Separation Scheme to significantly reduce ship strikes of right whales. This amendment, which came into effect in 2003, was designed to relocate vessel traffic using the TSS from an area with a high density of right whales to an area with a lower density, thus reducing the relative probability of a ship strike by approximately 80%. Surveys for right whales in years subsequent to the amendment have demonstrated that the reduction in the overlap between right whales and ship traffic has been achieved as intended.

18 As noted above, in 1993, Canada designated Roseway Basin and the Grand Manan Basin in the lower Bay of Fundy as Right Whale Conservation Areas. The Canadian Notices to Mariners annual edition and the Sailing Directions for the Atlantic Region provide detailed information about right whales in the Roseway Basin and Grand Manan Basin Conservation Areas with precautionary measures for reducing the risk of an interaction. Detailed information on avoiding ship strikes is now available on the back of Canadian Hydrographic Service Charts 4011 and 4012.

19 The Department of Fisheries and Oceans Canada has distributed educational materials to mariners through harbour pilots in Saint John, New Brunswick, and Halifax, Nova Scotia. The purpose of the program is to provide vessel operators with the latest data on where right whales are located and practical advice on how to avoid collisions. Vessel captains transiting the Bay of Fundy receive regular advisories on right whale locations seasonally from June through December through Saint John vessel traffic services (Fundy Traffic). These advisories are based on periodic vessel surveys.

20 Other efforts include the distribution of brochures, flyers, videos, and other information to mariners on the endangered status of the right whales and precautionary measures to avoid collisions. Workshops have also been conducted with representatives of the shipping community, whale biologists, environmental groups, and government agencies to examine relevant information and management options. As well, a Canadian Recovery Plan for the North Atlantic right whale has been developed.

21 While these efforts are helpful for reducing ship strikes of right whales, their effectiveness is limited. For example, the periodic vessel surveys are difficult or impossible during bad weather and at night, and even during good sighting conditions whales are often missed. Efforts are ongoing to determine better ways to locate the whales and address the issue of ship strikes throughout the range of the western North Atlantic right whale.

### **Action requested of the Sub-Committee**

22 The Sub-Committee is invited to approve this proposal for the establishment of an Area to be Avoided "In Roseway Basin, South of Nova Scotia" as set forth in annex 1 and forward the proposal to the Maritime Safety Committee for adoption. Canada also requests that the effective date of implementation be six months after adoption.

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## ANNEX 1

## IN ROSEWAY BASIN, SOUTH OF NOVA SCOTIA

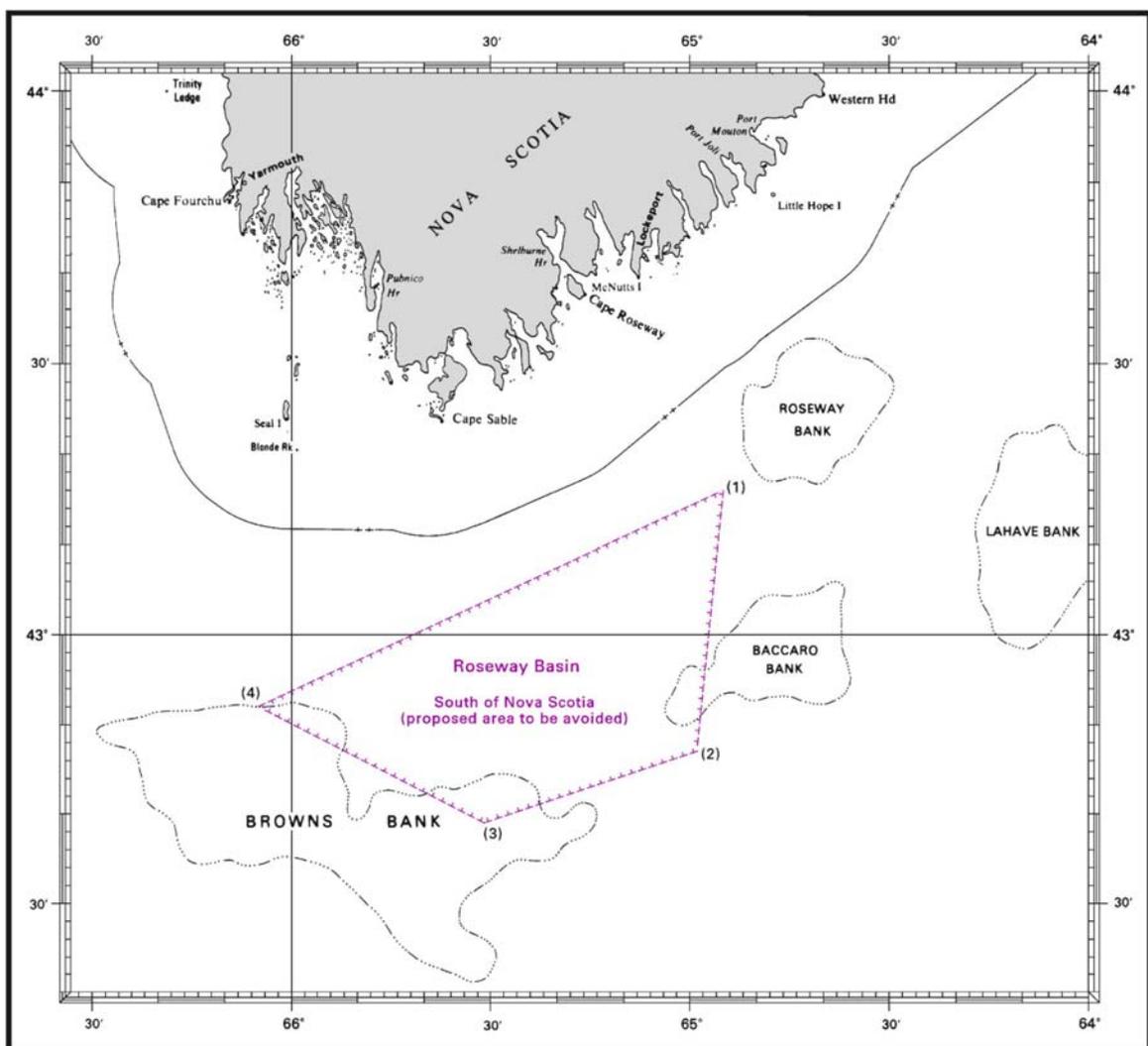
(Reference chart: Canadian Hydrographic Service Chart 4003, 2003 edition.

Note: This chart is based on North American 1983 Geodetic Datum.)

## Description of the area to be avoided

In order to significantly reduce the risk of ship strikes of the highly endangered North Atlantic right whale, it is recommended that ships of 300 gross tonnage and upwards solely in transit during the period of June 1st through December 31st should avoid the area bounded by lines connecting the following geographical positions:

- |    |           |            |
|----|-----------|------------|
| 1) | 43° 16' N | 064° 55' W |
| 2) | 42° 47' N | 064° 59' W |
| 3) | 42° 39' N | 065° 31' W |
| 4) | 42° 52' N | 066° 05' W |

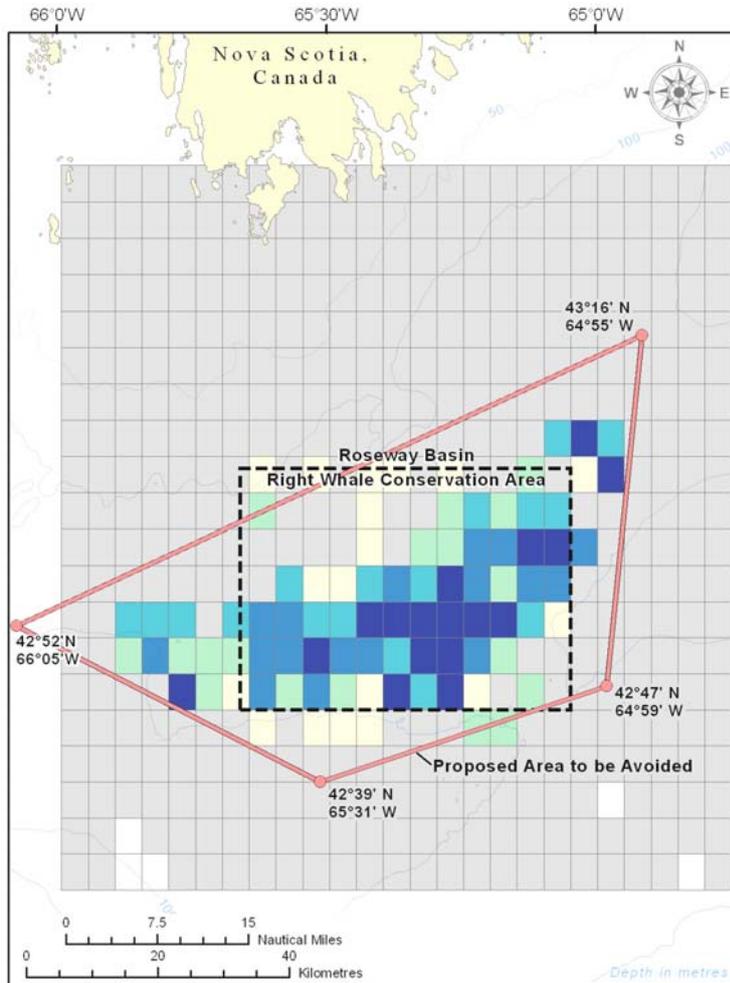


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ANNEX 2

Chartlet A: The proposed area to be avoided and Right Whale sightings



**Sightings Per Unit Effort of Right Whales in Roseway Basin 1979-1980, 1987-2006**

Effort corrected sightings of right whales from aerial and shipboard survey effort on and around Roseway Basin in 1979-1980 and 1987-2006. The region between 42°30'N and 43°30'N and 66°00'W and 64°45'W were portioned into 500 3-minute cells. Only those data collected in standardized acceptable conditions (observers on watch, sea state of Beaufort 3 or below, and clear visibility greater than 2 nautical miles; plus altitude <= 305 metres for aerial surveys) were included.

All available survey data from April through October were used. An index of Sightings Per Unit Effort (SPUE, whales per 1,000 km of trackline) per 3-minute cell was created by dividing the number of right whales sighted by the total length of survey tracks. There were 408 cells with non-zero effort, but no right whale sightings (SPUE = 0), and 87 cells with SPUE > 0. The cells with SPUE > 0 were classified into quartiles.



Data Sources  
 Bathymetry: U.S. Geological Survey  
 Coastline: Geobase.ca  
 Prepared by: Kerry Lagueux,  
 New England Aquarium  
 Sightings per Unit  
 Effort Analysis:  
 Robert Kenney, Ph.D.,  
 University of Rhode Island

Mercator Projection  
 Central Meridian: 65.5 W  
 Standard Parallel: 43.00 N

*Chartlet B: The proposed area to be avoided and relative probabilities of encounter taking into account marine traffic*

Bathymetric chart (Mercator Projection; 100 m isobath) of the Roseway Basin region showing the relative probability of a vessel encountering a right whale based on vessel traffic data (ECAREG-2000 through 2002; ICOADS-2004 through 2005; AMVER-1989 through 2002) and right whale sightings per unit effort data (1987 through 2004) within the right whale survey-grid boundaries (solid grey), the Right Whale Conservation Area (dashed black) and the proposed Area To Be Avoided polygon (solid red). This chart illustrates that the probability of a vessel encountering a right whale is 10 to 1000 times greater within the ATBA than outside.

