

---

## 2 ALTERNATIVES

---

This chapter describes the alternatives the National Marine Fisheries Service (NMFS) is considering to implement the proposed regulatory and nonregulatory operational measures. These measures are one of the five components of the *North Atlantic Right Whale Ship Strike Reduction Strategy* (Strategy). Section 2.1 describes in detail the operational measures of the Strategy by geographical area. Section 2.2 outlines the six alternatives analyzed in the EIS, including taking no action. The alternatives include all operational measures being considered for implementation, and varies from proposing none at all, (Alternative 1: No Action) to individual measures, (Alternatives 2, 3 and 4) a combination, (Alternatives 5) and finally a subset of the operational measures (Alternative 6). Other alternatives considered by NMFS, but dismissed from further analysis, are discussed in Section 2.3. NEPA only requires that reasonable alternatives be considered in an EIS. An exception to this is the No Action Alternative, which, even if it is not a reasonable alternative, is analyzed in accordance with the Council on Environmental Quality's Regulations to provide a baseline against which to assess the impacts of the other alternatives.

---

### 2.1 Proposed Operational Measures

The proposed regulatory and nonregulatory operational measures that are a component of the Strategy would affect three regions along the East Coast of the United States: the southeastern United States region (SEUS), the mid-Atlantic United States region (MAUS), and the northeastern United States region (NEUS), where right whales aggregate or migrate through (Figures 1-1, 1-2 and 1-3). Some regulations would apply to all waters along the Atlantic Coast within the US Exclusive Economic Zone<sup>1</sup> (EEZ).

The major operational measures proposed are as follows:

- **Dynamic Management Areas (DMAs).** DMAs would impose temporary restrictions on vessels (described in Section 2.1.3.4) in areas where right whales are detected and no specific measure(s) are in place or in force at this time (NMFS, 2004g).
- **Seasonal Management Areas (SMAs).** SMAs would create seasonal speed restrictions in (a) a 30 nm (56 km) radius around specified ports in the MAUS (see Figure 1-2); (b) in specified areas in Cape Cod Bay, Off Race Point, and Great South Channel; and (c) in specified areas in the waters off the coasts of Georgia and Florida.
- **Vessel Routing Measures.** Routing measures include recommended shipping routes (also referred to as shipping lanes) that have been proposed by NMFS for the NEUS and SEUS and assessed by the United States Coast Guard (USCG) with regard to navigational and environmental safety through a Port Access Routes Study (PARS). Mariners would be required to abide by speed restrictions in recommended routes that are located within a SMA. After recommended routes have been established, NMFS

---

<sup>1</sup> The US EEZ extends to a distance 200 nautical miles from the baseline from which the breadth of the territorial sea is measured ([www.archives.gov/federal\\_register/codification/proclamations/05030.html](http://www.archives.gov/federal_register/codification/proclamations/05030.html)).

intends to monitor mariner use of the routes. If the routes are not used routinely, consideration will be given to making them mandatory through regulation. NMFS is also proposing an area to be avoided (ATBA) in Great South Channel and realigning a portion of the Boston Traffic Separation Scheme (TSS). All of the routing measures would be implemented via nonregulatory measures.

In all regions, unless otherwise noted, the operational measures would apply only to nonsovereign<sup>2</sup> vessels subject to the jurisdiction of the US that are 65 ft (19.8 m) or greater in length overall (Section 1.4). Sixty-five feet is a size class of vessel recognized by the maritime community and commonly used in maritime regulations (e.g., Automatic Identification System [AIS]; International Navigational Rules Act, Rules of the Road sections) to distinguish between a motorboat and a larger vessel.

With regard to speed restrictions, NMFS is considering<sup>3</sup>, and this EIS is assessing, three alternative speeds: 10, 12, or 14 knots. Of the records available, the majority of serious injuries to, or deaths of, whales resulting from ship strikes involved ships operating at speeds of 14 knots or more (Laist *et al.*, 2001; Jensen and Silber, 2003); therefore, it is assumed that a vessel traveling less than 14 knots would reduce the likelihood and the severity of a ship strike. Recent analysis indicates that the probability of death or serious injury increases with increasing ship speed. A predicted 50 percent (0.27–0.62 95 percent C.I.) chance of death or serious injury occurred from strikes at 10.5 knots. The probability increased to 75 percent at 14 knots (Pace and Silber, 2005). Additionally, vessels traveling at lower speeds may also produce weaker hydrodynamic forces that, at higher speeds, have the capacity to first push a whale away from a moving ship and then draw the whale back toward the ship or propeller (Knowlton *et al.*, 1998). Projects assessing issues of hydrodynamics and vessel speed are either underway or being contemplated, and research continues on the relationship between speed and whale death or serious injury.

---

### 2.1.1 Southeastern United States

Sighting data indicates that right whales occur in consistent aggregations in specific areas during certain times of the year; such areas and times are the foci of the measures for the SEUS region. Right whales occur in waters off the SEUS in winter and early spring as calving and nursery grounds. In fact, the only known calving area for North Atlantic right whales exists in waters off the SEUS. This area, adjacent to the coast of northern Florida and Georgia, was designated critical habitat for right whales in 1994 (59 FR 28793).

**Note:** NMFS received a petition on July 11, 2002, requesting the expansion of the Southeast critical habitat boundaries by approximately 2,700 nm<sup>2</sup> (5003.6 km<sup>2</sup>). On August 28, 2003, NMFS made a determination not to expand the critical habitat<sup>4</sup>, as the information presented in the petition did not adequately support the proposed boundaries (68 FR 51758).

---

<sup>2</sup> Nonsovereign vessels are commercial and recreational vessels, not owned, operated, or under contract to the US Federal Government.

<sup>3</sup> NMFS is proposing 10 knots in the proposed rule and requesting comments on 12 and 14 knots.

<sup>4</sup> The determination stated that the requested revision, "...is not warranted at this time. However, NMFS will continue to analyze the physical and biological habitat features essential to the conservation of right whales.

### 2.1.1.1 Area and Time

In the SEUS region, the proposed operational measures apply to an area bounded to the north by latitude 31°27'N (coinciding with the northernmost boundary of the mandatory ship reporting system [MSRS]; see Section 1.2.1.2); to the south by latitude 29°45'N; to the east by longitude 80°51.6'W (eastern boundary of the MSRS), and to the west by the shoreline (Figure 1-1). This area is referred to as Southeast SMA.

The proposed operational measures would apply from November 15 to April 15. Studies of right whale occurrence indicate that this is the time during which most right whales are in the SEUS calving and nursery areas. Because this is the only known calving area for North Atlantic right whales, the welfare of reproducing females in this area is vital to the recovery of the species and is a priority for protective measures. Estimates of the relative density of right whales in the SEUS region have been developed based on survey data from 1992 to 2003. In December, the areas of high sighting per unit effort (SPUE) occur in the northern part of the region. In January, the highest SPUE occurs in the central area of the habitat. In February, right whales are concentrated in the southern and central areas with very high SPUE values near Fernandina Beach and Jacksonville, FL. In March, SPUE values are generally low, with higher occurrences in the northern area (NMFS, *unpublished*).

### 2.1.1.2 Operational Measures

In the SEUS region, NMFS proposes speed restrictions in the Southeast SMA from November 15 to April 15 (Section 2.1.1.1). In addition, recommended shipping routes would be established within this SMA to reduce the simultaneous occurrence of vessels and whales. Routes would be established in the approaches to the ports of Jacksonville and Fernandina Beach, FL, and Brunswick, GA, located within the SEUS right whale critical habitat area. This area experiences high levels of vessel traffic and currently there are no defined approaches to the three ports. NOAA has submitted the proposed routes to the USCG for analysis by a PARS. The routes were developed to consolidate the vessel traffic into specific lanes that would take vessels through waters with relatively lower right whale densities (Garrison, 2005). The proposed lanes are shown graphically (relative to ship strike risk reduction) in Figures 2-1 and 2-2 (southeastern ports). Defining geographical coordinates for the green areas with the highest reduction in risk are listed in Table 2-1 (at this time the coordinates for the exact approaches have yet to be determined).

The USCG is analyzing the proposed lanes, and if necessary, will make recommendations to modify them to ensure navigational safety. The analysis is underway and as a result, specific approach routes for each port have yet to be identified.<sup>5</sup>

Vessels that are 65 ft (19.8 m) or more in length would be required to abide by the speed restrictions and expected to use the recommended shipping routes from November 15 to April 15. As previously noted, this EIS analyzes three speeds: 10, 12, or 14 knots, although NMFS is only proposing one speed, 10 knots, in the proposed rulemaking.

---

<sup>5</sup> The USCG released the PARS on May 24, 2006; however, the recommendations in the report are not final until comments are considered, therefore the specific routes will be analyzed in the Final EIS. The report is available at [http://dmses.dot.gov/docimages/pdf96/398771\\_web.pdf](http://dmses.dot.gov/docimages/pdf96/398771_web.pdf).

**Table 2-1  
Coordinates for Proposed Shipping Lanes in the SEUS**

Port	Southern Limit	Northern Limit	Best Approach	Percent Reduction	Pilot Buoy
Jacksonville	30° 06.1'	30° 23.3'	30° 21.2'	27%	30° 23.6' N 81° 19.1' W
Fernandina	30° 12.6'	30° 40.5'	30° 21.2'	32%	31° 40.8' N 81° 11.8' W
Brunswick	30° 55.6'	30° 59.9'	31° 04.2'	16%	31° 03.2' N 81° 15.2' W

**Note:** The approaches are listed as the latitude in degrees – minutes at the edge of the MSRS box (approximately 80° 38' W longitude).

## 2.1.2 Mid-Atlantic Region of the United States

The MAUS region includes a coastal migratory corridor that right whales use to travel between their calving and nursery grounds in the SEUS region and feeding grounds in the NEUS region and Canada. Many ships enter ports throughout the MAUS region and traverse the migratory corridor, and as a result, create a high-risk situation for migrating right whales. Two right whale calves were found dead in the MAUS region in 2001, and there is a high probability that these deaths were caused by ship strikes. A dead mature female right whale observed floating off Virginia subsequently stranded on the coast of North Carolina in 2004, which almost certainly died as a result of a vessel collision.

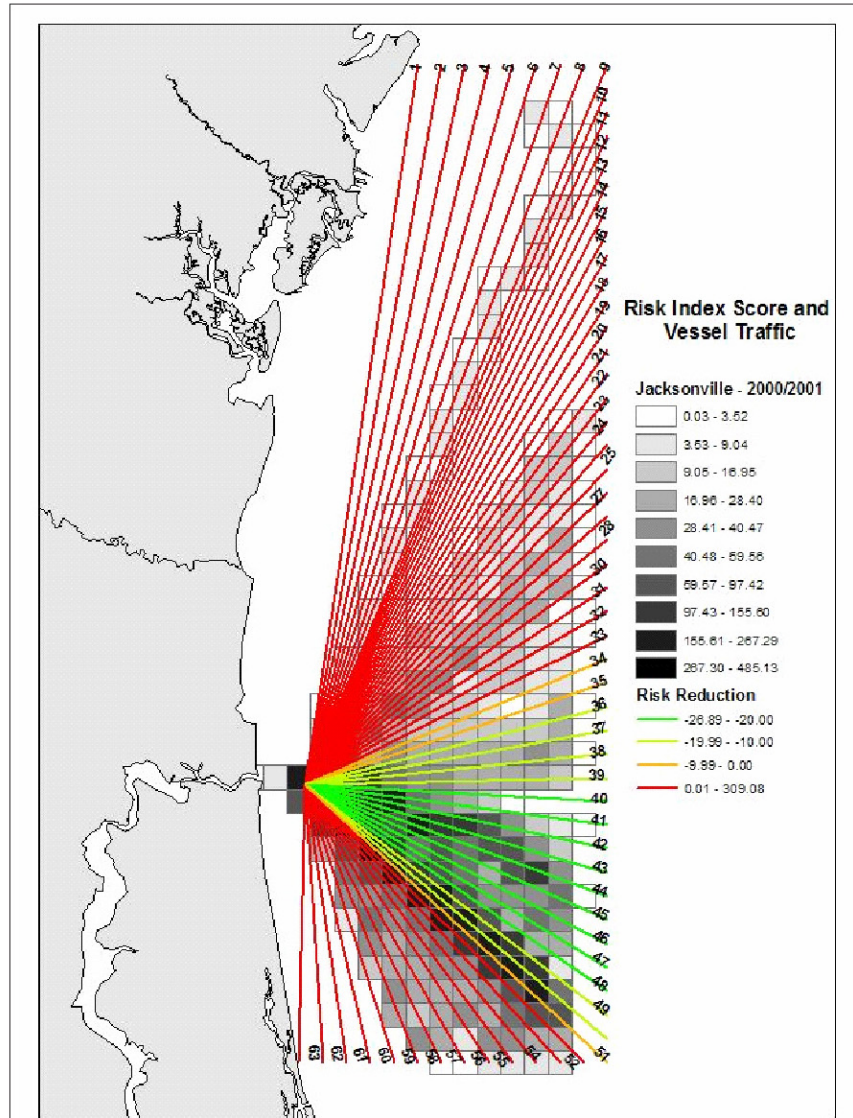
### 2.1.2.1 Area and Time

The operational measure applicable to the MAUS region would be the designation of SMAs around nine ports included at the end of this section and also shown in Figure 1-2. Each SMA would have a radius of 30 nm (56 km) (except in the case of Block Island Sound, which has rectangular area), sufficient to cover approximately 90 percent of right whale sighting records along the US East Coast. Speed restrictions would apply for each SMA from November 1 to April 30. This time is consistent with right whale sighting data.

#### MAUS Regulated Areas (SMAs)

1. South and east of Block Island Sound (Montauk Point to western end of Martha's Vineyard). Figure 2-3
2. Ports of New York and New Jersey. Figure 2-4
3. Delaware Bay (Ports of Philadelphia and Wilmington). Figure 2-5
4. Entrance to Chesapeake Bay (Ports of Hampton Roads and Baltimore). Figure 2-6
5. Ports of Morehead City and Beaufort, NC. Figure 2-7
6. Port of Wilmington, NC. Figure 2-8
7. Port of Georgetown, SC. Figure 2-9
8. Port of Charleston, SC. Figure 2-10
9. Port of Savannah, GA. Figure 2-11

## Reduction in Ship Strike Risk for Each Potential Approach into the Jacksonville Pilot Buoy\*

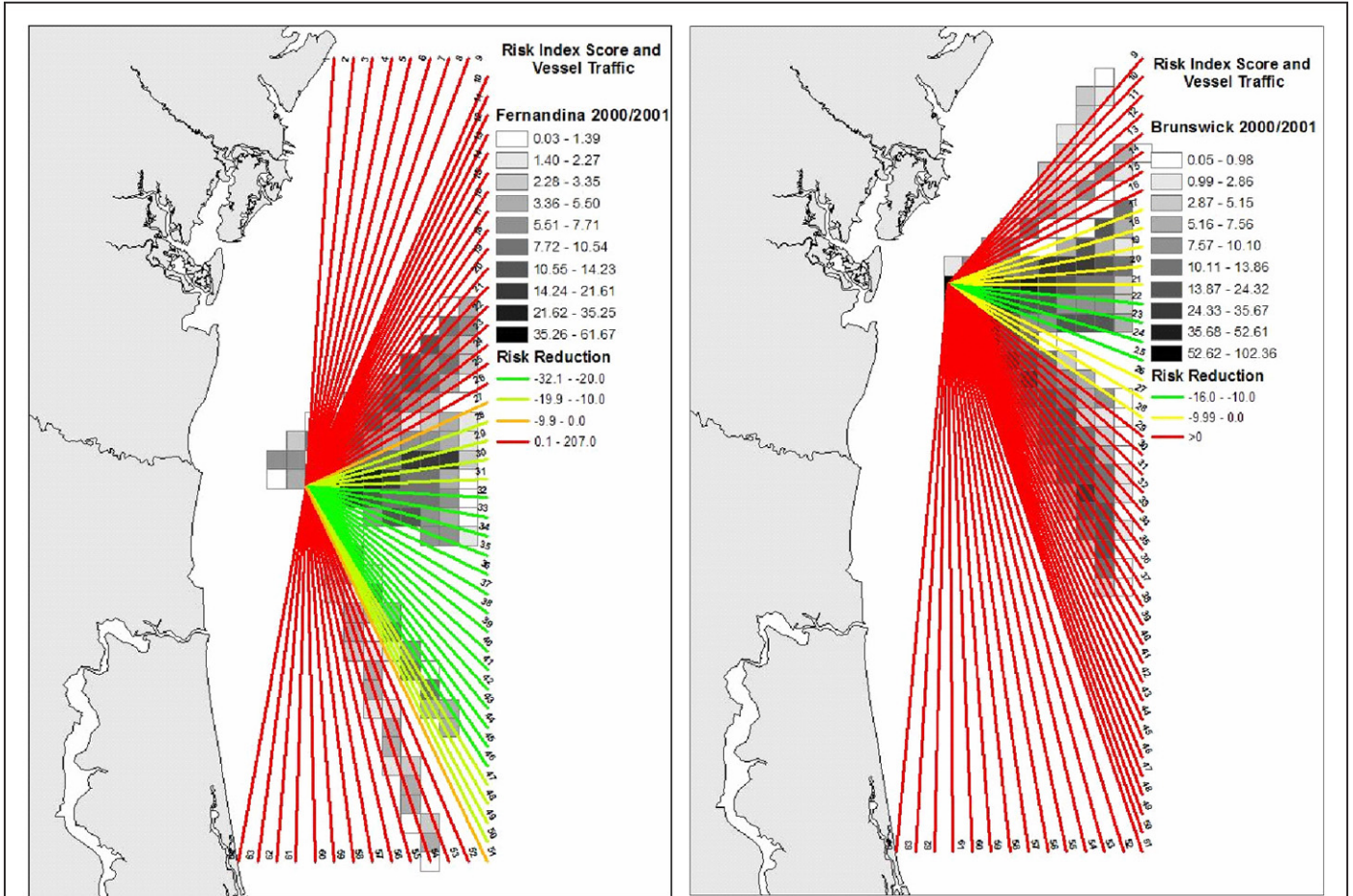


*\*Note: The shaded grey boxes show the vessel traffic pattern from the MSRS for 2000/2001.*

**Figure 2-1**

**This Page Intentionally Left Blank**

Reduction in Ship Strike Risk for Each Potential Approach into the Fernandina and Brunswick Pilot Buoys\*



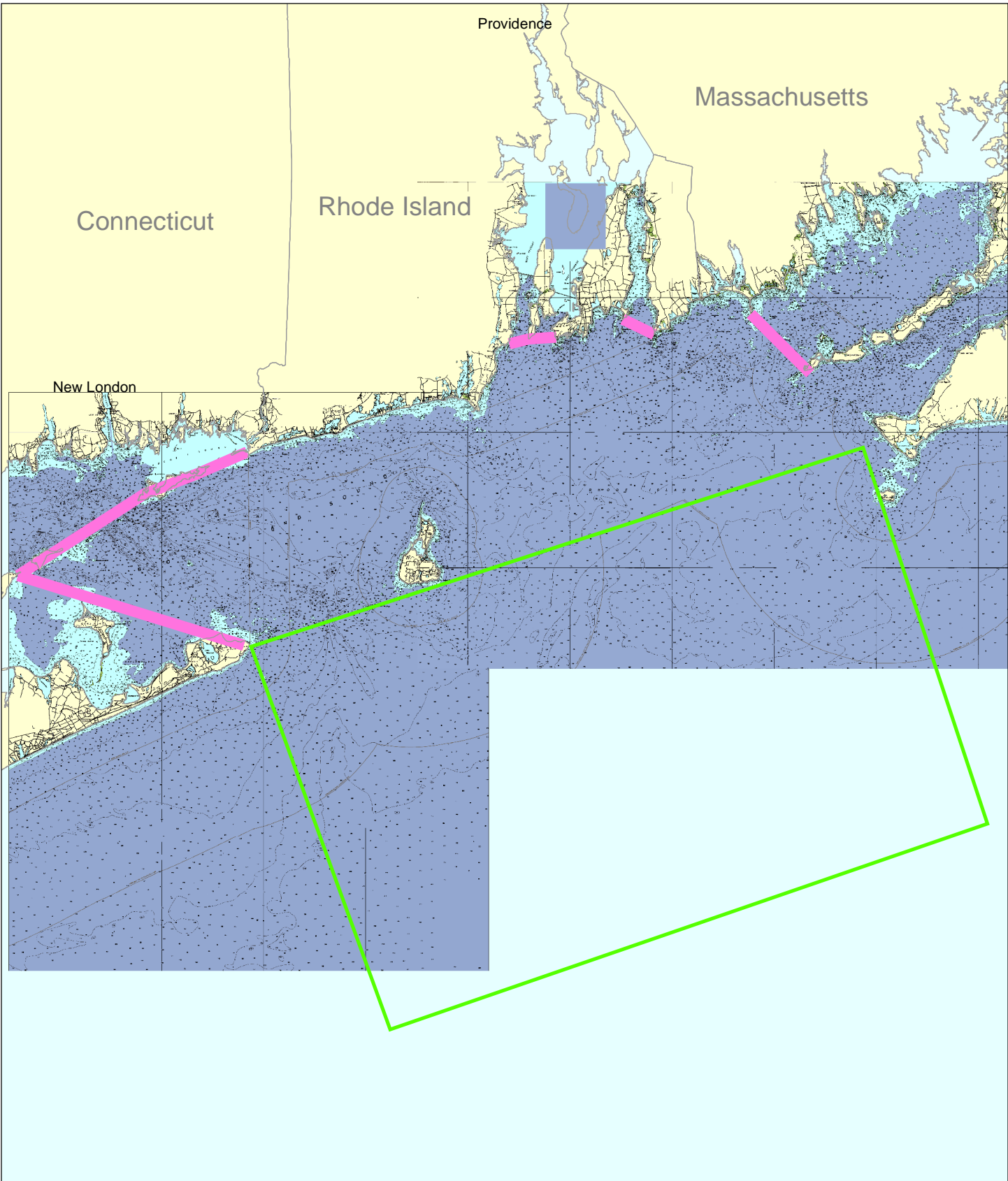
\*Note: The shaded grey boxes show the vessel traffic pattern from the MSRS for 2000/2001.



Figure 2-2

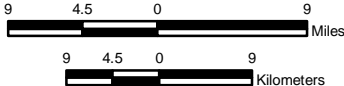
**This Page Intentionally Left Blank**



# South & East of Block Island Sound Seasonal Management Area (SMA)



-  COLREGS Line
-  30 Nautical Mile SMA



Note: COLREGS lines are approximate and this chart should not be used for navigation.

Figure 2-3

**This Page Intentionally Left Blank**

# Ports of New York and New Jersey Seasonal Management Area (SMA)



- COLREGS Line
- 30 Nautical Mile SMA

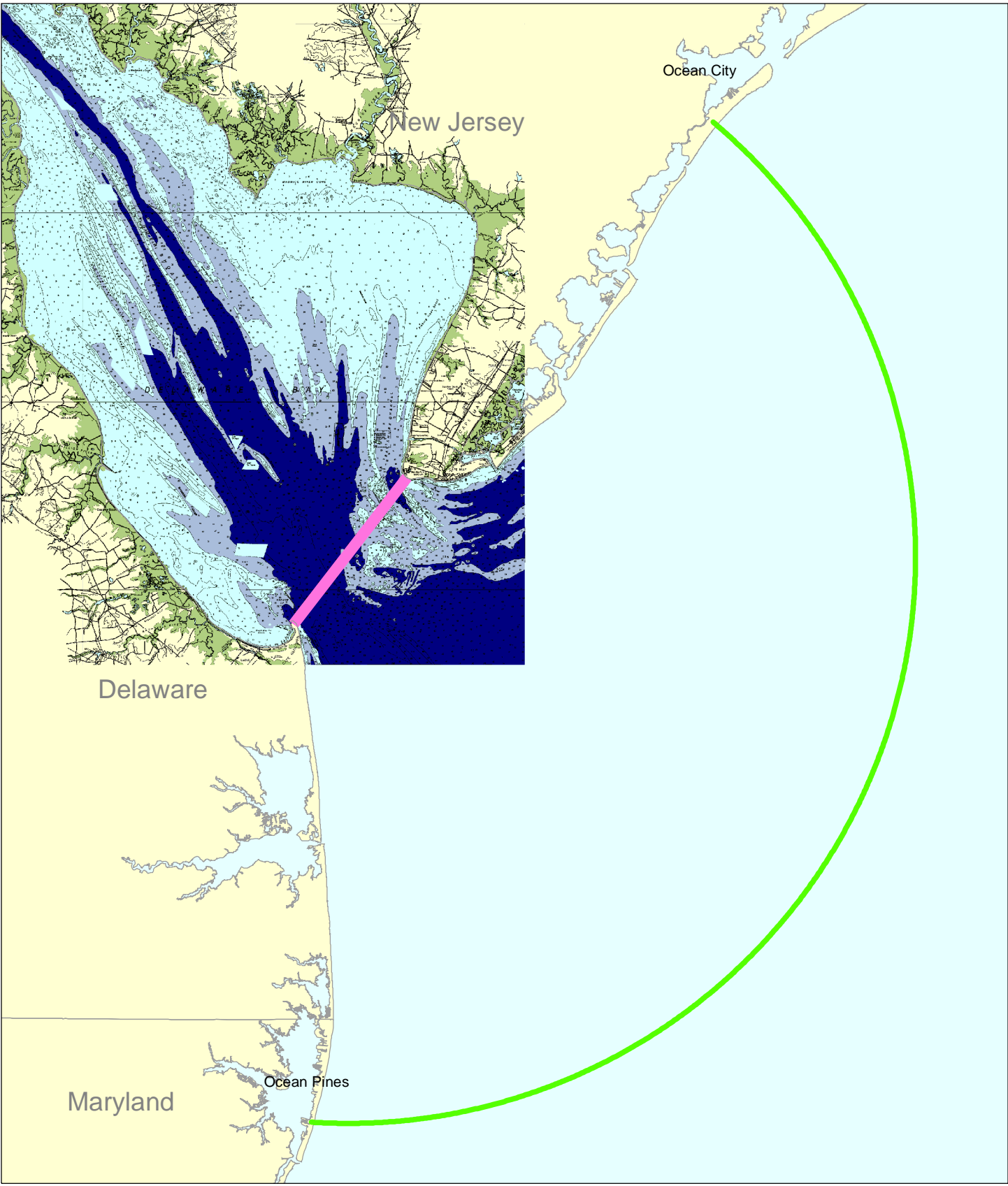


Note: COLREGS lines are approximate and this chart should not be used for navigation.

Figure 2-4

**This Page Intentionally Left Blank**

# Delaware Bay Seasonal Management Area (SMA)



- COLREGS Line
- 30 Nautical Mile SMA

Note: COLREGS lines are approximate and this chart should not be used for navigation.

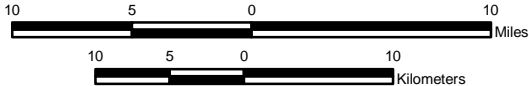
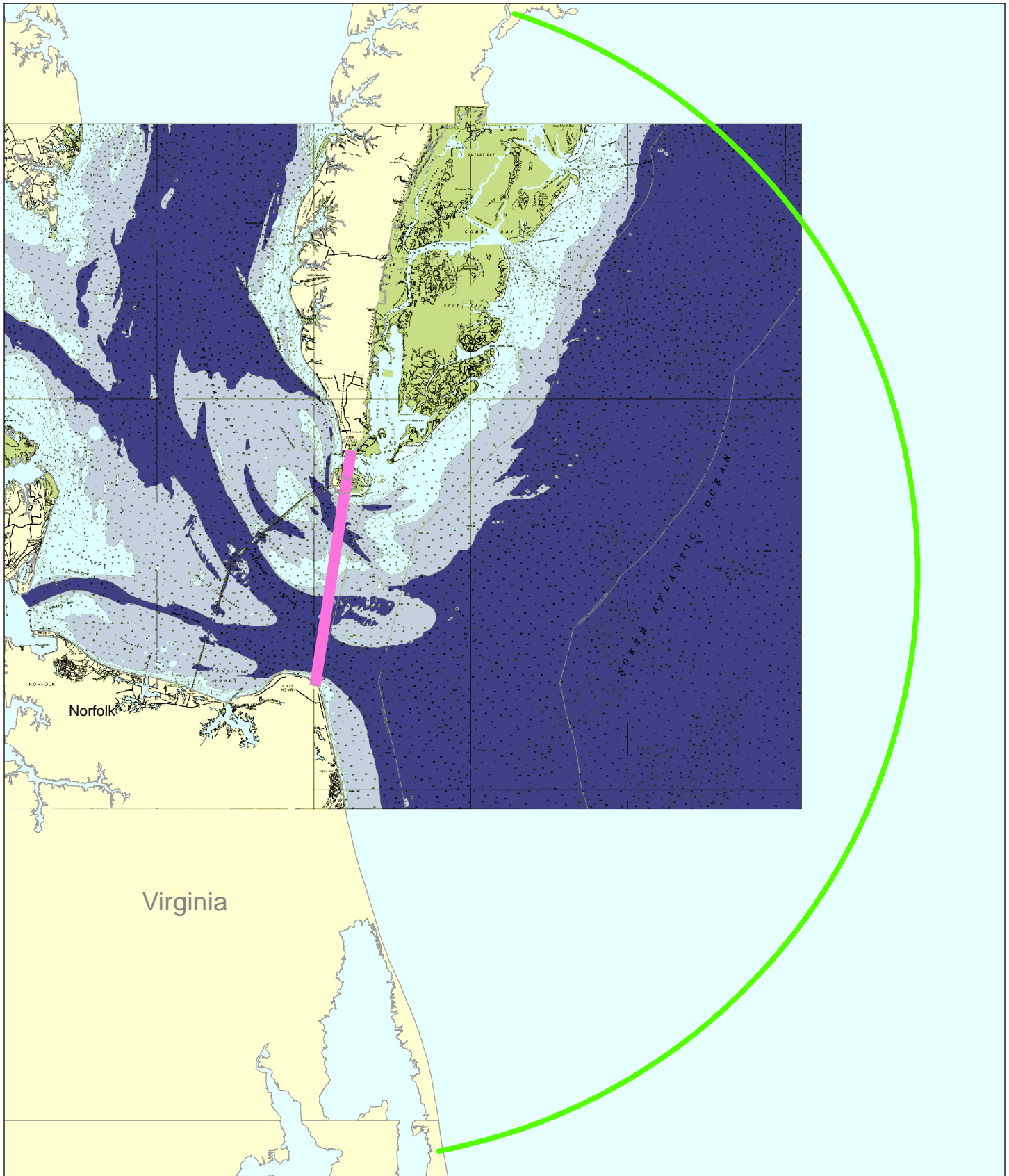




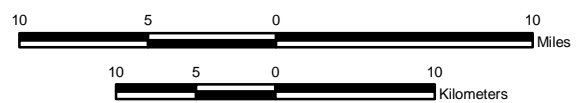
Figure 2-5

**This Page Intentionally Left Blank**

# Chesapeake Bay Seasonal Management Area (SMA)



-  COLREGS Line
-  30 Nautical Mile SMA



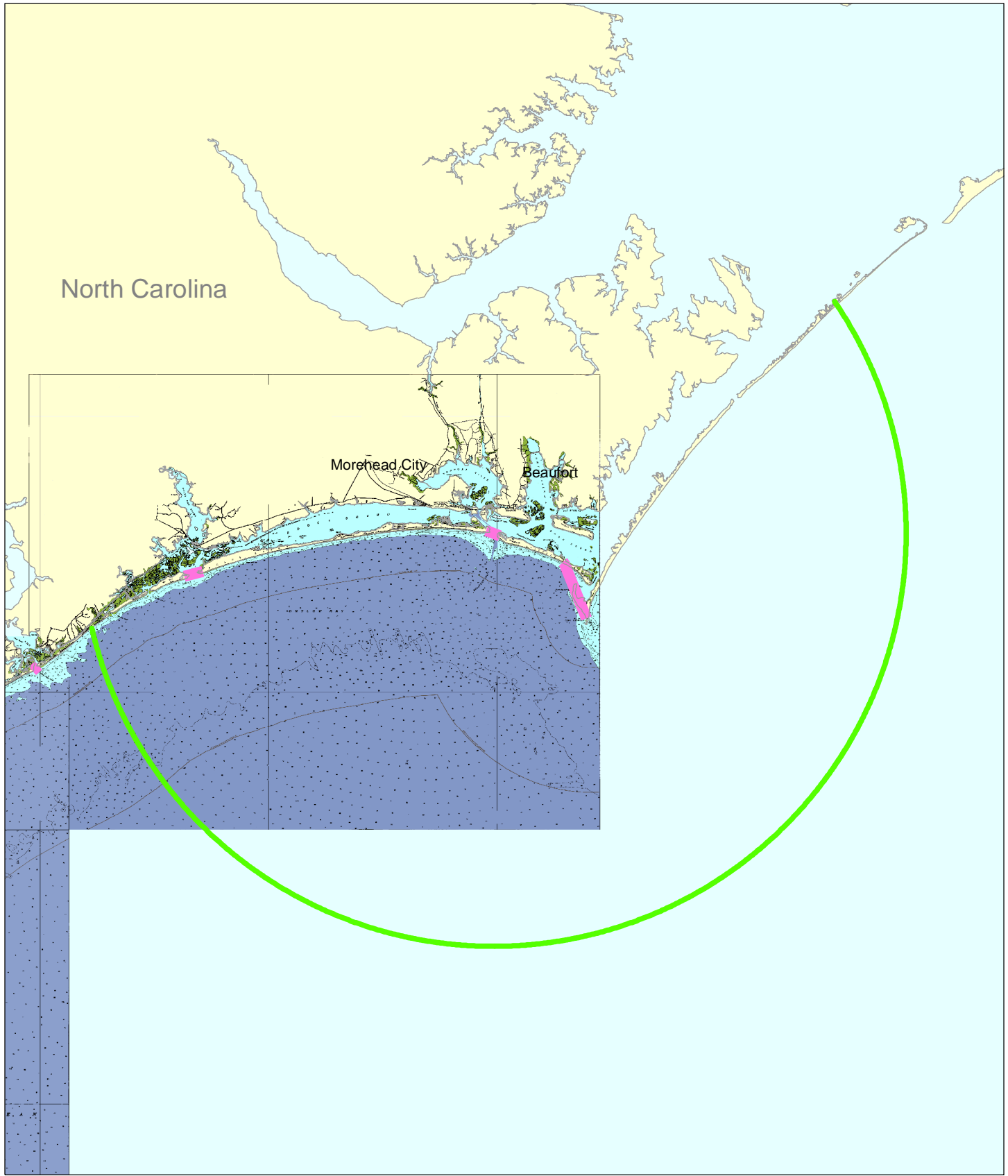
Note: COLREGS lines are approximate and this chart should not be used for navigation.



Figure 2-6

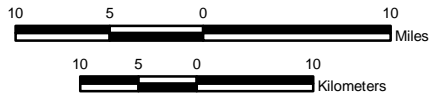
**This Page Intentionally Left Blank**



# Morehead City & Beaufort, NC Seasonal Management Area (SMA)



-  COLREGS Line
-  30 Nautical Mile SMA

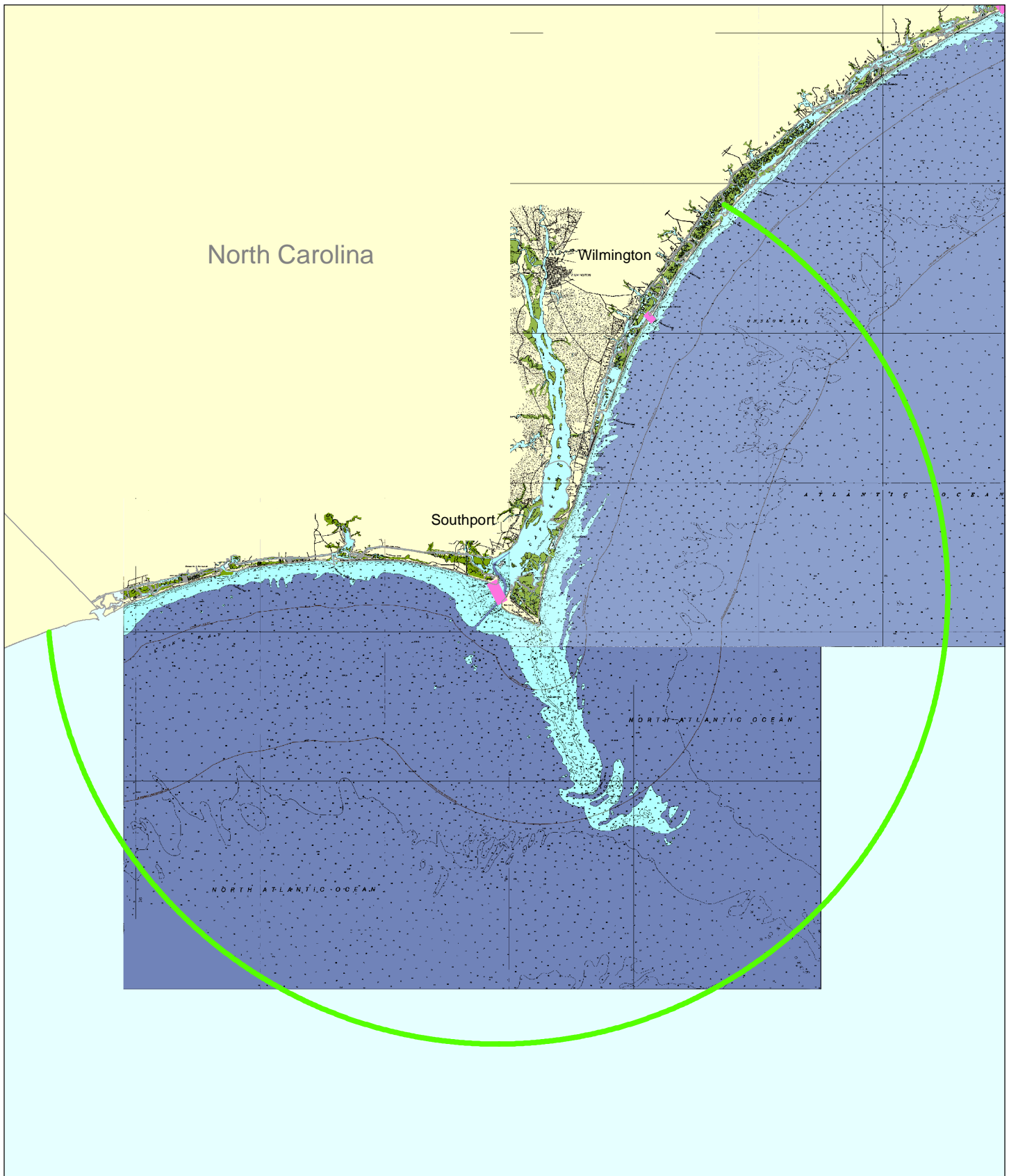




Note: COLREGS lines are approximate and this chart should not be used for navigation.

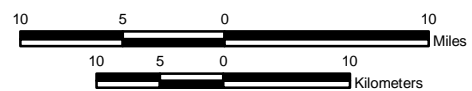
Figure 2-7

**This Page Intentionally Left Blank**

# Wilmington, NC Seasonal Management Area (SMA)



-  COLREGS Line
-  30 Nautical Mile SMA

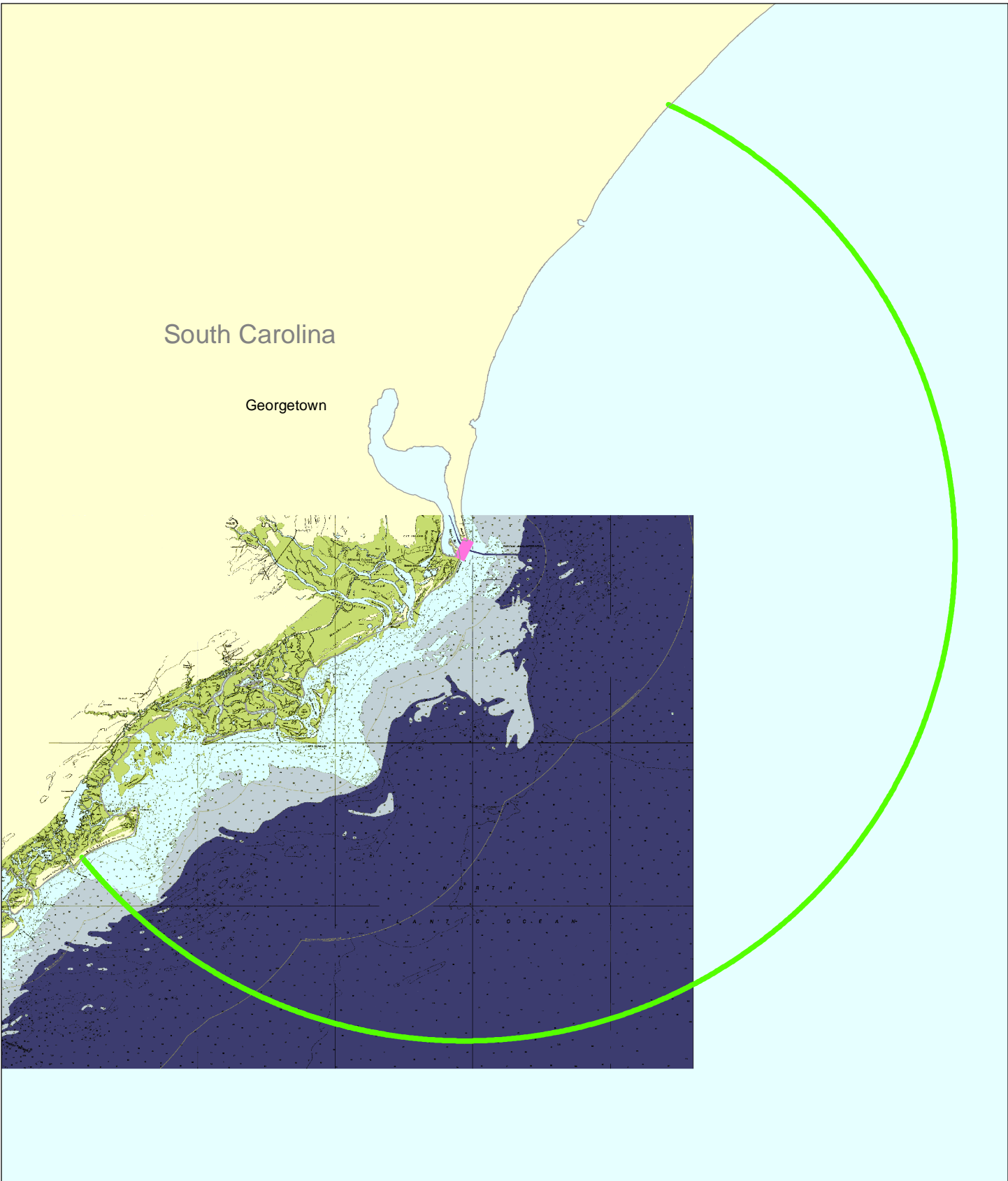


Note: COLREGS lines are approximate and this chart should not be used for navigation.

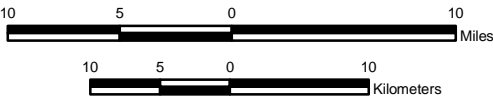
Figure 2-8

**This Page Intentionally Left Blank**

# Georgetown, SC Seasonal Management Area (SMA)



- COLREGS Line
- 30 Nautical Mile SMA

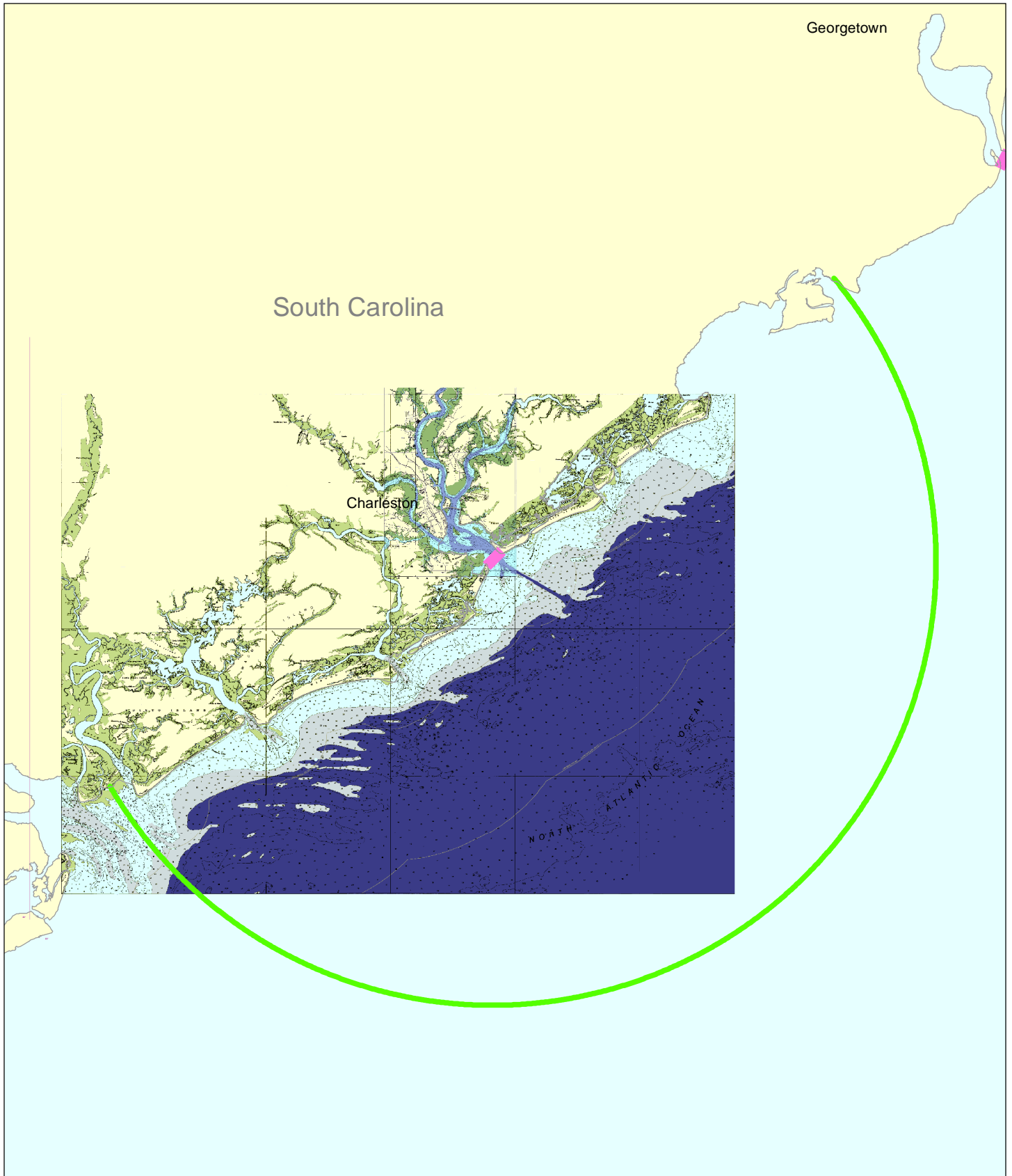




Note: COLREGS lines are approximate and this chart should not be used for navigation.

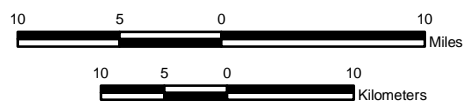
Figure 2-9

**This Page Intentionally Left Blank**

# Charleston, SC Seasonal Management Area (SMA)



-  COLREGS Line
-  30 Nautical Mile SMA



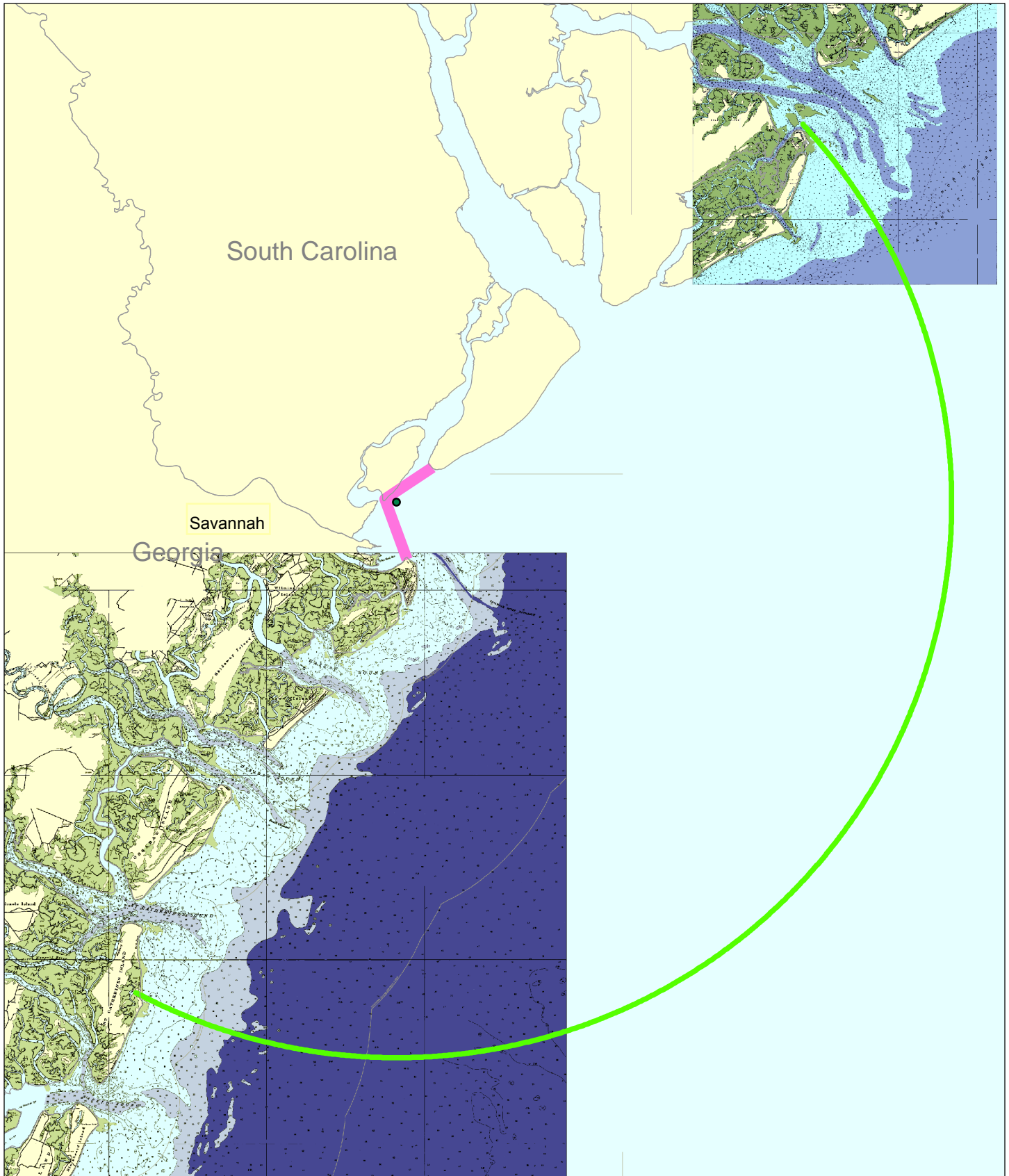
Note: COLREGS lines are approximate and this chart should not be used for navigation.

Figure 2-10

**This Page Intentionally Left Blank**



# Savannah, GA Seasonal Management Area (SMA)



- COLREGS Line
- 30 Nautical Mile SMA



Note: COLREGS lines are approximate and this chart should not be used for navigation.

Figure 2-11

**This Page Intentionally Left Blank**

### **2.1.2.2 COLREGS Demarcation Lines**

The COLREGS demarcation lines, which were developed by the Convention on International Regulations for Preventing Collisions at Sea 1972 (72 COLREGS), demarcate harbor entrances and provide the baseline for the 30 nm (56 km) zones around the ports in the MAUS. These lines have been established to delineate the waters where mariners must comply with the 72 COLREGS and the Inland Navigational Rules Act of 1980 (Inland Rules). The waters inside of the lines are Inland Rules Waters and the waters outside of these lines are COLREGS Waters. Vessels transiting in waters inside these lines (Inland Rules Waters) would not have to adhere to speed restrictions or any operational measure. All vessels transiting seaward of the COLREGS lines would be required to adhere to speed restrictions and other operational measures in the 30 nm (56 km) designated zones. The applicable COLREGS lines for the MAUS ports are provided in Appendix C.

### **2.1.2.3 Operational Measures**

Within the designated SMAs and during designated times, uniform speed restrictions would apply to all vessels 65 ft (19.8 m) or longer. As previously noted, speeds of 10, 12, or 14 knots are being considered.

---

## **2.1.3 Northeastern United States**

Right whales use the NEUS region mostly for foraging activities. Data indicate that right whales concentrate their feeding efforts in four distinct zones of the NEUS region: Cape Cod Bay, Off Race Point, the Great South Channel, and the Gulf of Maine. Proposed measures for the NEUS vary with the zone considered. Together, they include designation of new shipping lanes, and speed restrictions (10, 12, or 14 knots) within SMAs and DMAs.

### **2.1.3.1 Cape Cod Bay**

#### **Area and Time**

Right whales feed in Cape Cod Bay winter through spring while food is abundant. Cape Cod Bay was designated as a right whale critical habitat in 1994, as it is an important feeding and aggregation area for the right whale. (The critical habitat petition referred to in Section 2.1.1 also requested the expansion and combination of the Cape Cod Bay and Great South Channel critical habitat areas. NMFS concluded that this request was unwarranted at the time, but analysis is underway about redefining the areas).

The Cape Cod Bay SMA covers the entire bay, including the Cape Cod Bay Critical Habitat and the entire area directly west of the critical habitat to the shoreline, with a northern boundary of 42°12'N latitude (Figure 1-3).

Operational restrictions would apply to this management area, corresponding with right whale occurrence.

#### **Operational Measures**

NMFS proposes to restrict vessel speed throughout the Cape Cod Bay SMA from January 1 to May 15. In addition, assuming navigational risks relative to the routes being proposed are not indicated by the USCG PARS analysis, routes providing reduction in the risk of collisions

between vessels and whales would be established. Routes are being considered from Cape Cod Canal through right whale critical habitat, on the western side of the bay, towards Massachusetts Bay and other points north (see Figure 2-12). Mariners would be required to abide by the speed restrictions in recommended routes that are located within SMAs. Recommended shipping routes would be established to minimize the travel distance through Cape Cod Bay critical habitat for ships entering and leaving the port of Provincetown from Cape Cod Canal or from the north, by routing ships along the edges of the critical habitat (NMFS, 2004e). The coordinates for the proposed shipping lanes are listed in Table 2-2.

**Table 2-2**  
**Coordinates of Proposed Shipping Lanes in Cape Cod Bay**

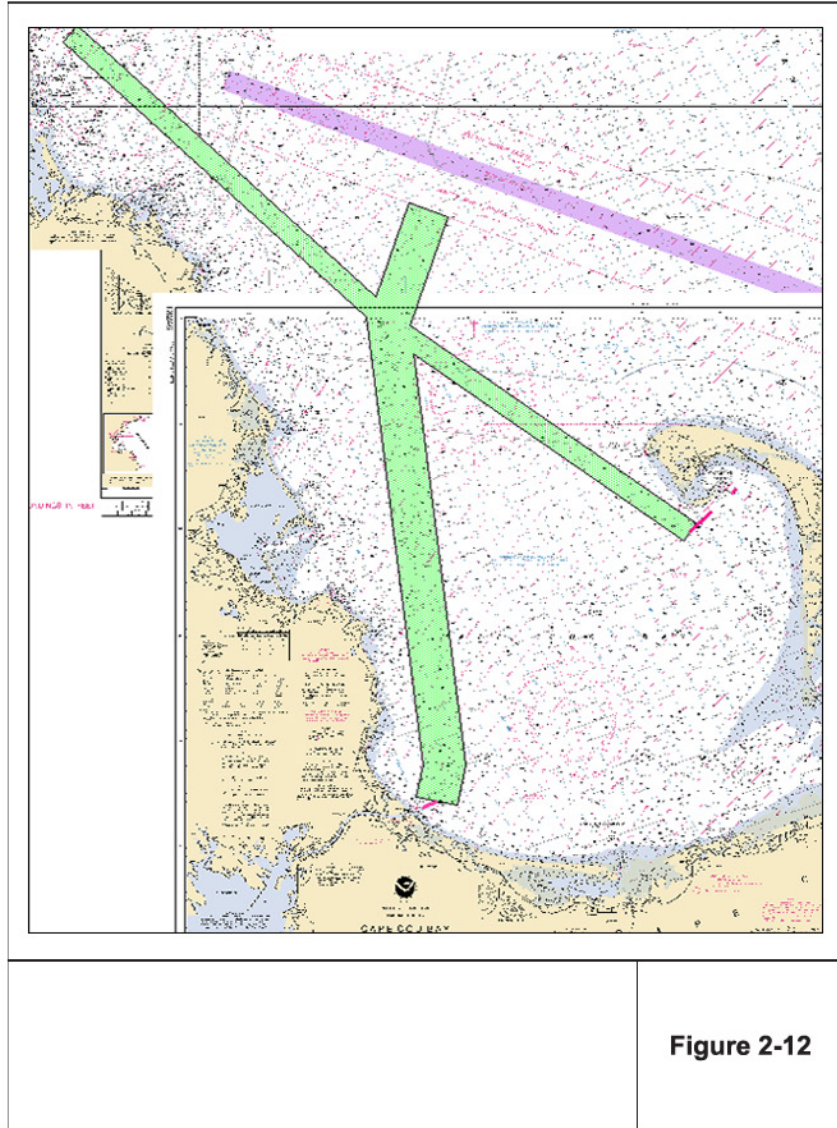
LAT (deg)	LON (deg)	LAT (deg-min-sec)	LON (deg-min-sec)
-70.4896772	41.7885455	-70° 29' 22.83792"	41° 47' 18.7638"
-70.4827343	41.8146559	-70° 28' 57.84348"	41° 48' 52.76124"
-70.5424946	42.1675345	-70° 32' 32.98056"	42° 10' 3.1242"
-70.8654784	42.3844524	-70° 51' 55.72224"	42° 23' 4.02864"
-70.8502658	42.3967622	-70° 51' 0.95688"	42° 23' 48.34392"
-70.5239957	42.1778024	-70° 31' 26.38452"	42° 10' 40.08864"
-70.4869337	42.2550552	-70° 29' 12.96132"	42° 15' 18.19872"
-70.4657938	42.2492941	-70° 27' 56.85768"	42° 14' 57.45876"
-70.505568	42.1664195	-70° 30' 20.0448"	42° 9' 59.1102"
-70.1920919	42.0055935	-70° 11' 31.53084"	42° 0' 20.1366"
-70.2047347	41.991752	-70° 12' 17.04492"	41° 59' 30.3072"
-70.4923409	42.1392357	-70° 29' 32.42724"	42° 8' 21.24852"
-70.437294	41.814436	-70° 26' 14.2584"	41° 48' 51.9696"
-70.4458163	41.782085	-70° 26' 44.93868"	41° 46' 55.506"

### 2.1.3.2 Off Race Point Area

#### Area and Time

Race Point is a specific location at the tip of Cape Cod, and the Off Race Point SMA is located around the northern end of Cape Cod. As food resources in Cape Cod Bay diminish toward the end of April, right whales begin to migrate offshore to the Great South Channel in search of prey aggregations. Before reaching the Great South Channel, right whales tend to transit or aggregate in neighboring areas, such as Stellwagen Bank, areas east of Stellwagen Bank, and the northern end of Provincetown Slope, which is the area east of Cape Cod to the Great South Channel. For the purposes of this EIS, the areas are referred to as the "Off Race Point" area; a box approximately 50 nm by 50 nm to the north and east of Cape Cod. Based on right whale sighting data and vessel traffic patterns, the Off Race Point area (Figure 1-3) within which the proposed measures would apply, is defined by the following latitudes and longitudes.

# Proposed Shipping Lanes in Cape Cod Bay



**Figure 2-12**

**This Page Intentionally Left Blank**

Location	Latitude (N)	Longitude (W)	Comment
NW Corner	42° 30'	70° 30'	
NE Corner	42° 30'	69° 45'	
SE Corner	41° 40'	69° 45'	
Southern Mid-point	41° 40'	69° 57'	Continues North along the eastern shore of Cape Cod to the next point
Western Center-point	42° 04.8'	70° 10'	(Northern tip of Cape Cod)
Western Center-point	42° 12'	70° 15'	(NE corner of critical habitat)
SW Corner	42° 12'	70° 30'	(NW corner of critical habitat)

Ship traffic within the Off Race Point area is heavy, primarily in and out of Boston Harbor, thereby exposing right whales to the possibility of ship strikes. In fact, Boston was the most frequently reported destination for ships that traveled through designated critical habitat areas; 69 percent of the 2,146 ships that reported to the Northeast MSRS were headed for Boston (Ward-Geiger *et al.*, 2005). Operational restrictions would apply to the Off Race Point area from March 1 to April 30, consistent with historic right whale sighting information.

### Operational Measures

During the designated time of year, mariners within the Off Race Point area would be required to abide by speed restrictions or to route around the area.

#### 2.1.3.3 Great South Channel

##### Area and Time

During spring and early summer, large numbers of right whales aggregate in the Great South Channel, a designated critical habitat and an important feeding ground. This critical habitat area is located in the southern portion of the Great South Channel management area (Figure 1-3). At times, more than half the entire right whale population is feeding in or passing through the Great South Channel. Some individuals are rarely, if ever, observed in other feeding grounds (such as the Bay of Fundy) at this time of year.

Based on right whale sighting and recent survey data, the designated area in the Great South Channel within which the proposed measures would apply including part of Georges Bank (Figure 1-3), is defined by the following latitudes and longitudes:

Location	Latitude (N)	Longitude (W)
NW Corner	42° 30'	69° 45'
NE Corner	42° 30'	67° 27'
SE Corner	42° 09'	67° 08.4'
Southern Mid-point	41° 00'	69° 05'
SW Corner	41° 40'	69° 45'

The Great South Channel experiences heavy commercial ship traffic; analysis of reports to the MSRS identified three high-use traffic corridors that extend across Great South Channel critical habitat (Ward-Geiger *et al.*, 2005). Thus vessel collisions with right whales are a serious risk in spring and early summer feeding season. Operational restrictions would apply to the Great South Channel area from April 1 to July 31, corresponding with the peak period of right whale presence.

## Operational Measures

All vessels 65 ft (19.8 m) and over would be required to adhere to speed restrictions in the Great South Channel management area, including the critical habitat area from April 1 to July 31. As previously noted, three speed limits are being considered: 10, 12, and 14 knots.

### 2.1.3.4 Gulf of Maine

#### Area and Time

For the purposes of this EIS, the Gulf of Maine area is considered to be all waters within the US jurisdiction north of aforementioned NEUS management areas. Operational restrictions would apply to the Gulf of Maine area at all times.

#### Operational Measures

The Gulf of Maine would be subject to DMAs until better data are available to support seasonal management or implementation of other specific measures. A description of the triggers for and area of a DMA is provided in Section 2.1.4.

### 2.1.3.5 Summary of Proposed Operational Measures in the NEUS Region

A summary of the proposed measures in the NEUS region is presented in Table 2-3.

**Table 2-3**  
**Summary of Proposed Operational Measures in the NEUS Region**

Area	Type of Measure	Period When Applicable
Cape Cod Bay	Speed restrictions in the CCB seasonal management area and portions of the shipping lanes within this area	January 1 to May 15
Off Race Point Area	Speed restrictions in the Off Race Point SMA	March 1 to April 30
Great South Channel	Speed restrictions in the Great South Channel management area, including critical habitat	April 1 to July 31
Gulf of Maine	DMAs	Year round

### 2.1.4 All Areas

In addition to the region-specific measures previously described, all areas within the Atlantic Ocean (US Territorial waters and EEZ) would be subject to the designation of DMAs as described below.

DMAs consist of a circular buffer zone drawn around a core area of whale sightings that would protect certain aggregations against ship strikes outside of the times and locations of SMAs. The size of the buffer is determined by the number of whales sighted in a specific area, which is described below. Vessels in that area would be required to travel at a reduced speed or route around.

Certain right whale aggregations, locations, and behaviors would trigger the implementation of a DMA, and are based on the ALWTRP DAM trigger criteria, which was developed by Clapham and Pace (2001). In addition, several new triggers that are being proposed for DMA implementation. These additional triggers account for whale aggregations and behavior that would make a whale highly vulnerable to ship strikes. A DMA action would be triggered by a



single reliable report from a qualified individual<sup>6</sup> of an aggregation of three or more right whales within 75 square nautical miles ( $\text{nm}^2$ ) ( $257 \text{ km}^2$ ), such that right whale density is equal to or greater than 0.04 right whales per  $\text{nm}^2$  ( $3.43 \text{ km}^2$ ), which is equivalent to four right whales per  $100 \text{ nm}^2$  ( $343 \text{ km}^2$ ). The following conditions would also trigger the designation of a DMA:

1. A concentration of three or more right whales.
2. One or more whales within a TSS, recommended shipping route, or within a mid-Atlantic 30 nm (56 km) port entrance zone and the whales show no evidence of continued coast-wise transiting (e.g., they appear to be nonmigratory or feeding).

Once a DMA is triggered, NMFS is considering the use of the following procedures and criteria to establish a DMA:

1. A circle with a radius of at least 2.8 nm (5.2 km) would be drawn around the location of each individual sighting. This radius would be adjusted for the number of observed whales, so that a density of four right whales per  $100 \text{ nm}^2$  ( $343 \text{ km}^2$ ) is maintained. Information on how to calculate the length of the radius can be found in the Final Rule to amend the regulations that implement the ALWTRP (67 FR 1133).
2. If any circle or group of contiguous circles includes three or more right whales, this core area and its surrounding waters would be a candidate DMA zone.

Once NMFS identifies a core area containing three or more whales, the agency would expand this initial core area to provide a buffer in which the whales could move and still be protected. NMFS will determine the extent to the DMA zones as follows:

1. A large circular zone would be drawn extending 15 nm (27.8 km) from the perimeter of a circle around each core area.
2. The DMA would be a polygon drawn outside, but tangential to, the circular buffer zone(s), defined by the latitudinal and longitudinal coordinates of its corners.

A DMA would remain in effect for a minimum of 15 days from the date of the initial designation and automatically expire after that period if NMFS does not modify the duration of the DMA. The period may be changed if subsequent surveys within the 15-day period demonstrate (a) whales are no longer present in the zone, in which case the DMA would expire immediately upon making this determination; or (b) the aggregation had persisted, in which case NMFS would extend the period for an additional 15 days from the date of the most recent sightings in the zone.

Mariners would be required to proceed at the designated restricted speed in the DMA or route around the area. As previously noted, three potential speeds are being considered in this EIS: 10, 12, and 14 knots.

---

<sup>6</sup> A qualified individual is an individual ascertained by NMFS to be reasonably able, through training or experience, to identify a right whale. Such individuals include, but are not limited to, NMFS staff, USCG and Navy personnel trained in whale identification, scientific research survey personnel, whale watch operators, naturalists, and mariners trained in whale species identification through disentanglement training or some other training program deemed adequate by NMFS. A reliable report is a credible right whale sighting based upon which a DAM zone would be triggered.

## 2.1.5 Summary of Proposed Operational Measures

A summary of the proposed operational measures is provided in Table 2-4.

**Table 2-4  
Summary of Proposed Operational Measures**

Region	Proposed Measures	Areas of Application	Period of Application
Southeast (SEUS)	Speed restrictions in the Southeast SMA and shipping lanes	Ports of Jacksonville, FL; Fernandina, FL; Brunswick, GA; and SE management area	November 15 to April 15
Mid-Atlantic (MAUS)	SMA around nine port areas with speed restrictions	South & east of Block Island Sound (Montauk Point to western end of Martha's Vineyard) ----- Ports of New York & New Jersey ----- Delaware Bay (Ports of Philadelphia & Wilmington) ----- Entrance to Chesapeake Bay (Ports of Hampton Roads & Baltimore) ----- Ports of Morehead City & Beaufort, NC ----- Port of Wilmington, NC ----- Port of Georgetown, SC ----- Port of Charleston, SC ----- Port of Savannah, GA	November 1 to April 30
Northeast (NEUS)	Speed restrictions in the CCB seasonal management area and shipping lanes	Cape Cod Bay	January 1 to May 15
	Speed restrictions in the ORP seasonal management area	Off Race Point	March 1 to April 30
	Speed restrictions in GSC seasonal management area	Great South Channel	April 1 to July 31
	DMAs	Gulf of Maine area	Year round
All Three Regions	DMAs	US territorial waters and EEZ	Year round

## 2.2 Alternatives Considered in This EIS

Aside from Alternative 1, each of the alternatives considered in this EIS implements the operational measures described in Section 2.1, from none at all, (Alternative 1: No Action) to individual measures, (Alternatives 2, 3, and 4) a combination, (Alternative 5) and finally a subset of the operational measures (Alternative 6). In some cases, the measures proposed for implementation under a given alternative have been modified to ensure that the alternative is a

reasonable and feasible option to meet NMFS' purpose and need. For all alternatives that include speed restrictions, the EIS evaluates three potential maximum speeds: 10, 12, and 14 knots. The final rule will identify the final speed restriction.

---

### **2.2.1 Alternative 1 – No Action Alternative**

Under the No Action Alternative, none of the operational measures would be implemented. Mariners would not be subject to new regulations to reduce right whale ship strikes. NMFS would continue to implement existing measures and programs to reduce the likelihood of right whale mortalities from ship strikes. Research would continue and existing technologies would be used to determine whale locations and pass this information on to mariners. Other ongoing activities would include the use of aerial surveys to notify mariners of right whale sighting locations, the operation of MSRS, support of Recovery Plan Implementation Teams, education and outreach programs for mariners, and ongoing research on technological solutions. The Strategy's other components (see Section 1.3) may be implemented, and existing conservation measures (see Section 1.2) would remain active.

Alternative 1 is not a reasonable alternative because existing conservation measures have not sufficiently reduced the threat of ship strike or improved chances for recovery. Therefore, this alternative does not meet the requirements of the ESA and the MMPA, and NMFS would not be able to fulfill its mandate to protect the endangered North Atlantic right whale as specified in these two statutes. However, it is analyzed throughout the EIS per the Council on Environmental Quality's regulations, because it provides a baseline against which to assess the impacts of the action alternatives.

---

### **2.2.2 Alternative 2 – Dynamic Management Areas**

Alternative 2 would incorporate the elements of Alternative 1 (i.e., continuing existing conservation measures) plus the DMA component of the proposed operational measures, as described in Section 2.1.4. DMAs would be defined, as warranted by right whale sightings, in all areas within the Atlantic Ocean (US Territorial waters and EEZ).

Successful implementation of this alternative would depend on maintaining survey efforts and ensuring that efforts are made to make, record, and make available the specific sighting locations. Therefore, it would require a commitment to continuing aircraft surveillance coverage and expanding coverage in the mid-Atlantic, as necessary. This alternative would require a larger commitment of resources than the other alternatives as aerial surveys are time intensive and expensive. Aerial surveys can also present human safety issues when there is inclement weather or low visibility.

---

### **2.2.3 Alternative 3 – Speed Restrictions in Designated Areas**

This alternative includes the elements of Alternative 1 plus certain speed restrictions in designated areas. Since speed restrictions would be the only measure implemented under this alternative, the areas and times applied to these restrictions would be different from the areas and times for similar restrictions proposed as part of the entire set of measures described in Section 2.1. Specifically, the designated areas considered under this alternative are both larger in size and

would extend for a greater length of time, with the exception of those located in the SEUS, where speed restrictions would be in place for a shorter length of time. There are no routing measures and no DMAs proposed under Alternative 3. The proposed restrictions would apply as follows:

- In the NEUS region, year-round restrictions within all waters in the Seasonal Area Management (SAM) zones designated in the ALWTRP. There are currently two SAM zones in the Northeast: SAM West, in effect from March 1 to April 30; and SAM East, in effect from May 1 to July 31. The boundary between SAM West and SAM East is 69°24'W longitude. These areas adjoin, although are exclusive of, Cape Cod Bay and the Great South Channel critical habitats (NMFS, 2005a). The preferred alternatives considered in the ALWTRP DEIS propose to expand these zones. The proposed SAM zones are shown in Figure 2-13. By the time the operational measures of the Strategy are implemented, it is likely that the expanded zones in the ALWTRP would be operational; therefore, these would be the application zones for this alternative.
- In the MAUS region, restrictions from October 1 to April 30. The restricted area would include all waters 25 nm (46 km) out from the US coastline between Providence, RI/New London, CT (Block Island Sound), and Savannah, GA.
- In the SEUS region, restrictions from December 1 to March 31. The restricted area would include all waters within the MSRS WHALESSOUTH reporting area (Section 1.2.1.2) and the presently designated right whale critical habitat (Figure 2-14).

---

## 2.2.4 Alternative 4 – Recommended Shipping Routes

This alternative includes all the elements of Alternative 1 plus the recommended shipping routes component of the proposed operational measures, as described in Sections 2.1.1 (for the SEUS region) and 2.1.3 (for the NEUS region), and an ATBA in the Great South Channel. The shipping lanes would be operational in the NEUS from January 1 to April 30 and in the SEUS from December 1 through March 31. Alternative 4 does not propose speed restrictions in these shipping lanes. No measures would apply to the MAUS region.

The Great South Channel management area (see 2.1.3.3) would be designated an ATBA in Alternative 4. This ATBA would be proposed to the International Maritime Organization (IMO) for endorsement. If accepted by the IMO and when implemented, the ATBA would apply to all ships 300 gross registered tonnage (GRT) and above. These ships would be expected to avoid the area on a voluntary basis from April 1 to July 31. Vessels under 300 GRT but 65 ft (19.8 m) long or more would be subject to uniform speed restrictions within the ATBA.

Additionally, as part of Alternative 4, NOAA is proposing a shift in the Boston Traffic Separation Scheme (TSS) to avoid high density aggregations of whales at the northern end of Cape Cod Bay and Stellwagen Bank (Figure 2-15). A 12 degree (not in latitude and longitude) northern rotation of the east-west leg of the Boston TSS has been proposed. The proposed change would increase the length of the TSS by approximately 3.75 nm (6.9 km). The second component of the proposed amendment would narrow each lane of the TSS from two miles to one and a half miles in width; however, the separation zone between the two lanes would remain unchanged at its current one mile width. The interagency review process was completed in

## Expanded Seasonal Area Management (SAM) Areas

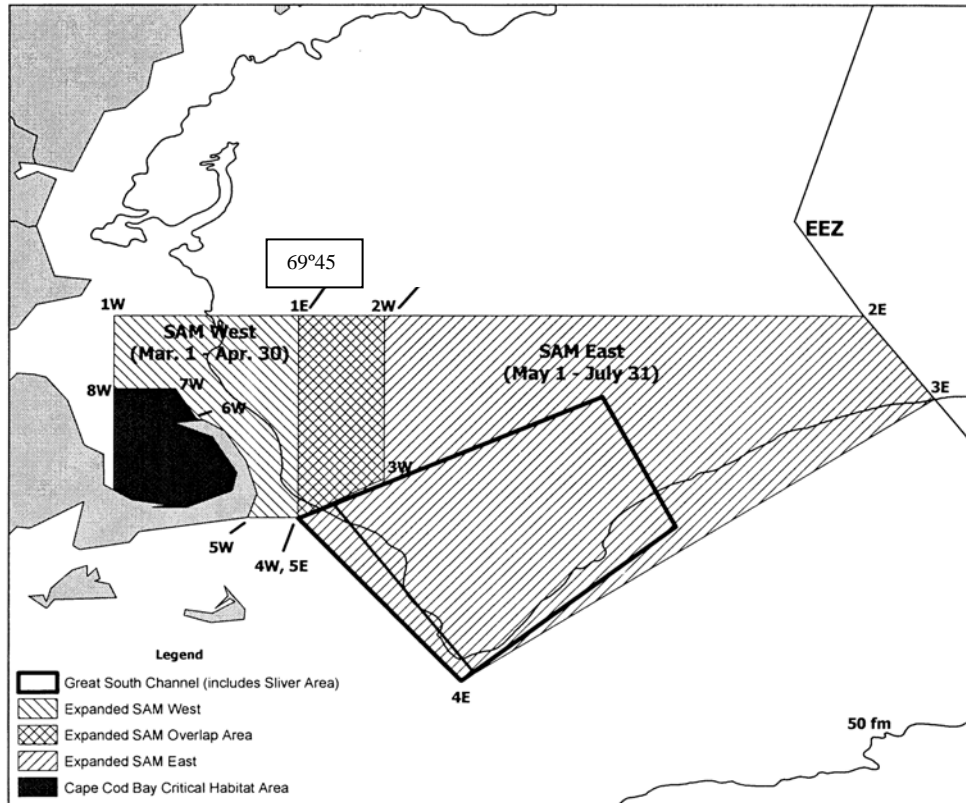


Figure 2-13

**This Page Intentionally Left Blank**

### Alternative 3 – U.S. East Coast Proposed Regulatory Areas

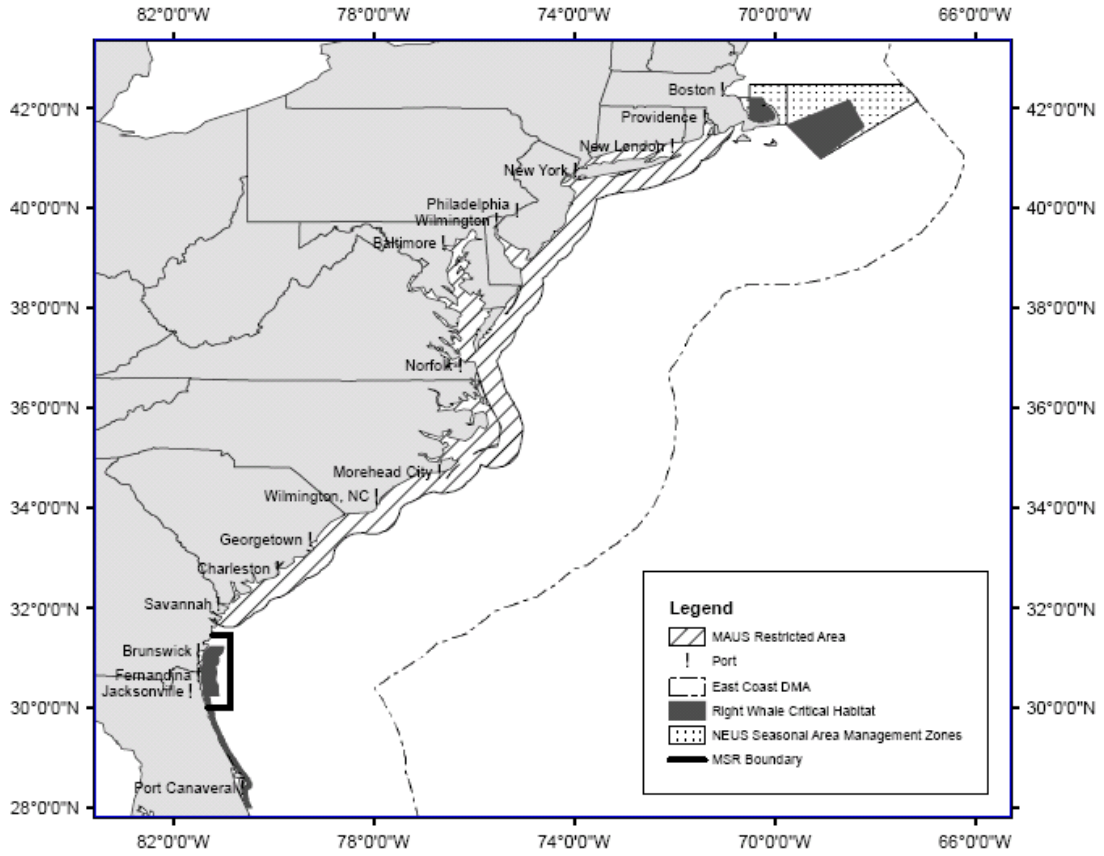
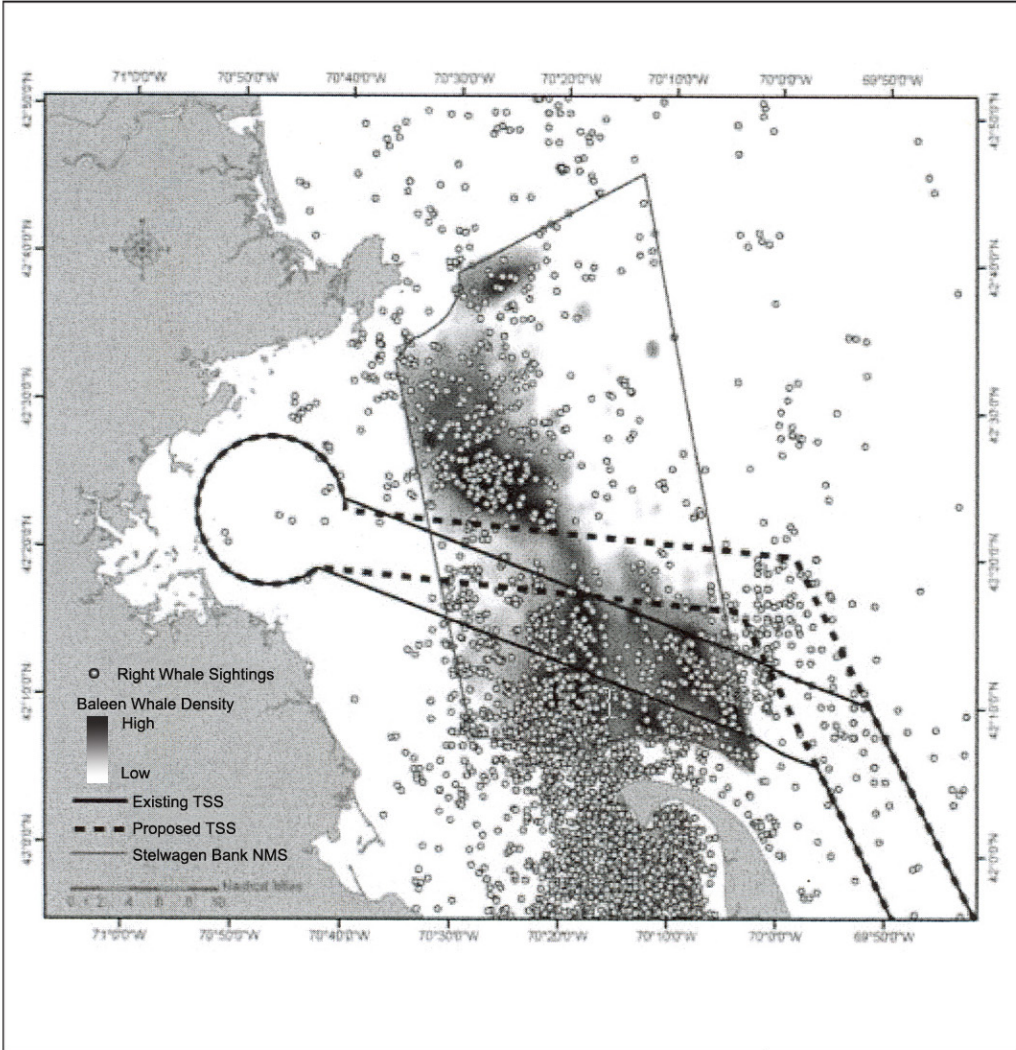


Figure 2-14

**This Page Intentionally Left Blank**



# Distribution of Right Whales Relative to the Existing & Proposed Boston TSS



*\*Note: Baleen Whale Density is also depicted.*

**Figure 2-15**

**This Page Intentionally Left Blank**

March of 2006, and the proposal was submitted to the IMO in April 2006. If endorsed by the IMO, NOAA expects to make the change to the TSS in 2007. The shifted segment is defined by the following coordinates.

Location	Latitude (N)	Longitude (W)
NW Corner	42° 22' 47.50"	70° 40' 13.15"
NE Corner	42° 20' 7.08"	69° 58' 30.83"
SW Corner	42° 18' 55.12"	70° 42' 33.77"
SE Corner	42° 16' 26.04"	70° 3' 31.50"

---

### 2.2.5 Alternative 5 – Combination of Measures

This alternative would include all elements of Alternatives 1 to 4 as previously described. Therefore, it would implement all the operational measures described in Section 2.1, and additionally incorporate the modified speed restriction areas and dates that are part of Alternative 3, the Great South Channel ATBA, and the proposed change to the Boston TSS proposed under Alternative 4. Alternative 5 is similar to Alternative 6, although it includes speed restrictions in larger areas and for a greater length in time (Section 2.2.3), and the additional routing requirements mentioned above (Section 2.2.4). As Alternative 5 includes all of the operational measures (regulatory and nonregulatory) it also provides the highest level of protection to the right whale population.

---

### 2.2.6 Alternative 6 (Preferred) – Right Whale Ship Strike Reduction Strategy

Under Alternative 6, the preferred alternative, NMFS would implement the operational measures as initially identified in the Right Whale Ship Strike Reduction Strategy and described in Section 2.1, except for the ATBA and Boston TSS, the nonregulatory measures analyzed in Alternative 4 and 5. These nonregulatory measures are ultimately an IMO action from a United States proposal, and are not proposed as a part of the proposed rule.

---

### 2.2.7 Summary of Alternatives

Table 2-5 summarizes the alternatives considered in this EIS.

---

## 2.3 Alternatives Considered and Dismissed from Further Analysis

Based on consultations, meetings, and public comments involving participants from NMFS, other Federal agencies, state agencies, concerned citizens and citizen groups, environmental organizations, and the shipping industry, many potential operational measures were identified that might be considered to reduce right whale ship strikes. This section discusses alternatives that were considered and dismissed from further analysis because the measures did not meet the purpose and need of the EIS because they:

**Table 2-5  
Summary of Alternatives Considered in this EIS**

Operational Measure	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
New routing requirements	No	No	No	Yes, in SEUS and NEUS regions, plus proposed modification to Boston TSS, and ATBA.	Yes, in SEUS and NEUS regions, plus proposed modification to Boston TSS, and ATBA.	Yes, in SEUS and NEUS regions
DMAs	No	Yes, in US Territorial waters and the EEZ	No	No	Yes	Yes, in SEUS, MAUS, and NEUS regions
SMAAs	No	No	No	No	No	Yes, in SEUS, MAUS and NEUS regions
Speed restrictions	No	Yes, associated with DMAs	Yes, within specific areas in each implementation region, year round in NEUS region and seasonal in MAUS and SEUS regions.	No	Yes, associated with DMAs, and within the areas defined for Alternative 3	Yes, associated with DMAs, and all SMAAs.

- Were not sufficiently protective of right whales.
- Imposed too many restrictions on the shipping industry or would significantly hinder maritime commerce.
- Failed to allow the agency to fulfill its mandate and/or required too much in terms of agency resources.
- Were based on currently unavailable technology.

Measures potentially applicable to more than one geographic area are addressed in Sections 2.3.1 to 2.3.8. Sections 2.3.9 to 2.3.13 address dismissed alternatives that were region-specific.

### 2.3.1 Speed Restrictions 8 Knots or less or over 14 Knots

NMFS dismissed alternatives involving speeds at or less than 8 knots because these speeds might affect the vessel's maneuverability and would result in undue economic hardship to the shipping industry. Although a speed restriction of 8 knots or less would significantly reduce the severity and number of ship strikes, it would also have an economic impact several magnitudes higher than that of the range of speed restrictions considered in the alternatives. Therefore, speed restrictions at this lower end of the spectrum would not meet the purpose and need.

Speeds greater than 14 knots, on the other hand, would have significantly less economic impacts. However, speed restrictions at this higher end of the spectrum would not meet the purpose and

need because they would not substantially reduce the risk of ship strikes since the majority of historical ship strikes occurred with vessels traveling at 14 knots or faster (Jensen and Silber, 2003; Laist *et al.*, 2001).

---

### 2.3.2 Restrictions for Vessels less than 65 Feet

Although vessels less than 65 ft (19.8 m) in length may cause damage to right whales, the majority of ship strike records involve large ships. Smaller, faster vessels with planning hulls have shallow drafts and are highly maneuverable, resulting in lower risk. Similarly sized vessels with single positive displacement hulls are limited in speed by their hull speed<sup>7</sup>, which is proportional to their waterline length; therefore these vessels also have a lesser chance of seriously injuring or killing a whale. Consequently, NMFS dismissed any alternatives that would include restriction to vessels less than 65 ft (19.8 m) in length.

---

### 2.3.3 Satellite Tagging

NMFS dismissed the option of attaching implantable satellite tags to all or nearly all individual right whales for tracking and avoidance from further consideration because satellite tags are difficult to attach to whales, often have a short useful life, and may cause health problems, as a few tagged whales have shown swelling at the implantation sites. Even if tags could be successfully and safely attached to most or all whales and real-time information on the location of the whales could be transmitted to ships, mariners would need to avoid collisions and such avoidance would still require slowing down or entirely avoiding certain area maneuvers that are not always possible or feasible. Therefore, in light of potential health concerns of putting implantable tags in a significant number of right whales and technological and logistical constraints associated with tagging, this option was considered unreasonable and was dismissed from further consideration.

---

### 2.3.4 Escort Boats Equipped with Acoustic Detection and/or Deterrence Devices

Under this option, escort boats would accompany vessels in the vicinity of regulated port areas and while transiting in critical habitat areas. The escort boat would be equipped with detection or acoustic deterrence devices. A detection device would inform the captain of the presence of whales in the area; a deterrence device would emit some kind of acoustic alert that would encourage the whale to stay away from the ship. However, the kind of technology required for this system does not yet exist and the cost of developing and implementing it (including outfitting the escort boats) would be prohibitive. In addition, studies have shown that the behavioral changes demonstrated when right whales are exposed alarm devices may actually increase their risk of ship strike (Nowacek *et al.*, 2003). Last, there are concerns about the impact of adding new sources of noise to the ocean. Consequently, NMFS is not considering this alternative further.

---

<sup>7</sup> The maximum speed of a ship with a displacement hull is dependent upon the waterline length of the vessel. This speed is called the hull speed. The longer the hull, the higher the hull speed.

---

### **2.3.5 Limit Port Approaches to Daylight Transits Only**

The premise for this potential measure is that vessels cannot spot a right whale at night; therefore, vessels would limit their travel through whale-sensitive areas to daytime only. However, there is little expectation that vessel crews could reliably, consistently, and under all sea conditions, spot a right whale even in daylight. Further, sighting a whale does not ensure that the mariner would be able to then avoid the whale. This measure would significantly hinder maritime commerce for little potential return. Therefore, NMFS dismissed this option from further consideration.

---

### **2.3.6 Voluntary Measures**

NMFS also dismissed from further consideration voluntary compliance implementing suggested—as opposed to mandatory—operational measures. Shipping companies that would choose to participate would suffer a competitive disadvantage compared to the companies that would choose not to participate, and therefore, few companies would likely choose to participate. As a result, merely voluntary measures would not fulfill NMFS requirements under the ESA. The relatively low initial compliance rate for the MSRS (Section 1.2.1.2) confirms that without associated education and enforcement programs, a ship strike reduction strategy would have very limited success. Therefore, voluntary measures would not be a viable alternative to meet NMFS purpose and need.

---

### **2.3.7 Requiring Trained Marine Mammal Observers on Commercial Shipping Vessels**

NMFS has considered requiring the posting of trained marine mammal observers on vessels 65 ft (19.8 m) and greater to detect whales in advance of vessels. However, there are several limitations associated with this measure that preclude it from being a viable ship strike prevention measure. The bridge of most commercial shipping vessels is toward the aft of the ship, which would limit the observer's field of view and prevent the individual from sighting a whale directly in front of the vessel. Further, the probability of an observer sighting a whale in rough seas or in times of low visibility are limited, and null during the night. In the event that a whale is sighted by the observer, depending on the location of the whale relative to the vessel, there might not be sufficient time for the captain to slow the vessel or change direction to avoid the whale. For these reasons, NMFS is not considering this measure further in this EIS.

---

### **2.3.8 Including Federal Vessels**

NMFS has considered including vessels owned or operated by, or under contract to, Federal agencies into one or more of the alternatives. NMFS believes that the national security, navigational and human safety missions of some agencies may be compromised by mandatory vessel speed restrictions. As mentioned in Section 1.8.3, NMFS will be reviewing the Federal actions involving vessel operations to determine where ESA Section 7 consultations would be appropriate. NMFS also requests all Federal agencies to voluntarily observe the conditions of the proposed regulations when and where their missions are not compromised.

---

### **2.3.9 Management Measures South of the SEUS Critical Habitat**

Extending the Southeast management area south of the SEUS critical habitat boundary was found to be unnecessary, though the critical habitat extends south of that area, 5 nm (9.3 km) from the coast, down to Port Canaveral. The waters are shallow, keeping deep draft and other vessels offshore. The pilot buoy for Port Canaveral is 3 nm (5.6 km) from the coast. Most vessels calling at Port Canaveral take on a pilot and would have to slow well before the pilot buoy. No operational measures for this area are appropriate; therefore, this consideration is dismissed from further analysis.

---

### **2.3.10 New Shipping Lanes in the MAUS Region**

The option to define new shipping routes in the MAUS region is not reasonable because of the expansive size of the area, right whale migratory patterns in this region are somewhat unpredictable, and there are not many existing shipping lanes in the MAUS. Defining new shipping lanes in the MAUS region would unnecessarily constrain the shipping industry without resulting in any substantial benefits to the right whale population. Therefore, NMFS is not considering this option in the EIS.

---

### **2.3.11 Implement an MSRS in the MAUS Region**

Implementing an MSRS in the MAUS region was dismissed from further analysis because the MAUS region is a relatively narrow migratory corridor for right whales, and few if any sustained aggregations occur in this area. Migrating whales are difficult to spot via surveys; the whales, generally in transit, are more difficult to sight, thus only a small amount of real-time information would be transmitted back to a ship. Also, the sighting locations are likely to be short-lived due to whale movement. Another factor that makes implementation of an MSRS impractical is the large expanse of waters in the MAUS region where whales might be found. Finally, whales' presence varies seasonally in the MAUS, which would complicate compliance with the MSRS. Overall, the conservation benefits of this measure likely would not outweigh the resources needed to operate and maintain the system. Therefore, implementation of an MSRS in the MAUS area is not a reasonable alternative and NMFS is not considering this measure further in this EIS.

---

### **2.3.12 Expand Existing MSRS into the Gulf of Maine**

Many of the vessels over 300 GRT entering the Gulf of Maine transit through the existing MSRS reporting area in the Northeast. Whale sightings throughout the Gulf of Maine (within the area of responsibility of the First Coast Guard District) are reported to ships via the MSRS, NAVTEX<sup>8</sup>, and Broadcast Notice to Mariners. Therefore, formal extension of the MSRS to the Gulf of Maine is unwarranted, and NMFS is not considering this option further in this EIS. NMFS is planning a comprehensive outreach and education program that would accomplish the same

---

<sup>8</sup> NAVTEX is an IMO-designated communication system used to transmit urgent marine safety information to ships worldwide. In the US, NAVTEX is broadcast from USCG facilities.

goals as an MSRS without the additional regulatory burden to address those operators and areas (tugs and tows, small ports and pilots) not necessarily covered by the existing MSRS.

---

### **2.3.13 Seasonal Management Measures in the Gulf of Maine**

While right whales do occur in this area, the occurrence is neither regular nor periodic. Neither where nor when a right whale or aggregation of right whales will appear can be predicted in advance. Therefore, definition of SMAs in the Gulf of Maine area is unwarranted and would unnecessarily burden the shipping industry with little advantage to right whales. Consequently, NMFS is not considering this option further in this EIS.