APPENDIX D

22 September 1995 Environmental Assessment

ENVIRONMENTAL ASSESSMENT

of

POTENTIAL IMPACTS

of

U.S. COAST GUARD ACTIVITIES

ALONG THE U.S. ATLANTIC COAST

September 22, 1995

prepared

by

THE U.S. COAST GUARD

and

BATTELLE OCEAN SCIENCES

ENVIRONMENTAL ASSESSMENT

OF

POTENTIAL IMPACTS

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U.S. COAST GUARD ACTIVITIES

ALONG THE U.S. ATLANTIC COAST

This Environmental Asssessment (EA) was prepared in accordance with Coast Guard Commandant's Instruction M16475.1B and is in compliance with the National Environmental Policy Act of 1969 (P.L. 91-190) and the Council of Environmental Quality Regulations (40 CFR Parts 1500-1508).

This EA serves as a concise public document to provide sufficient evidence and analysis for determining the need to prepare an environmental impact statement or a finding of no significant impact.

This EA concisely describes the proposed action, the need for the proposal and alternatives, comparative analysis of the action and alternatives, a statement of environmental significance, and lists the agencies and persons consulted during its preparation.

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Date	Responsible Official	Title/Position

PROPOSED

U. S. COAST GUARD

— FINDING OF NO SIGNIFICANT IMPACT

FOR

U. S. COAST GUARD ACTIVITIES

ALONG THE U. S. ATLANTIC COAST

This action has been thoroughly reviewed by the Coast Guard and it has been determined, by the undersigned, that these activities will have no significant effect on the human environment.

This finding of no significant impact is based on the attached U.S. Coast Guard Environmental Assessment, prepared with the assistance of Battelle Ocean Sciences, which has been determined to adequately and accurately discuss the environmentla issues and impacts of these activities and provides sufficient evidence and analysis for determining that an environmental impact statement is not required.

Date	Preparer	Title/Position
Date	Environmental Reviewer	Title/Position
Date	Responsible Official	Title/Position

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1. INTRODUCTION

As the "world's premier maritime service," the United States Coast Guard (USCG) provides maritime humanitarian, law enforcement, and safety services in the estuarine and marine waters of the United States. These services are performed through the following operations: aids-to-navigation, vessel traffic control, icebreaking, search and rescue, law enforcement, marine safety, and environmental protection response and have the potential for interacting with the marine and coastal environment. The National Environmental Policy Act (NEPA), which is the basic charter for protecting the environment [40 CFR §1500.2(f)], requires that Federal agencies take into account the effects of their policies, procedures, and actions on the environment and use all practicable means, consistent with their mission, to restore and enhance the environment. The USCG has established procedures (COMDTINST M16475.1B) to meet the requirements of NEPA. Based on these procedures, the USCG has determined that an environmental assessment of its routine activities along the U.S. Atlantic coast is necessary.

This programmatic environmental assessment analyzes the potential environmental effects of USCG operations within the three Districts (First, Fifth, and Seventh) that occur along the Atlantic coast of the United States. The goal of this environmental assessment is to assess and analyze the environmental impacts of current USCG operations and alternatives on the physical, biological, and socioeconomic environments along the Atlantic coast.

2. PURPOSE AND NEED FOR PROPOSED ACTION

2.1 Missions of the U.S. Coast Guard

The USCG, established on August 4, 1790, is the principal Federal agency for national marine transportation policy, and for marine safety and maritime law enforcement on the high seas and in all waters under jurisdiction of the United States. It is a military service that operates within the Department of Transportation during peace time and within the Navy in times of war.

As one of America's five Armed Forces, the United States Coast Guard performs several activities, primarily in the Exclusive Economic Zone (EEZ) of U.S. territorial waters, that focus on law enforcement, protection of human health and property, ensuring the security of the United States, and environmental management and protection. The USCG has been tasked with the following missions:

- Enforce or assist in the enforcement of all applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States.

- Engage in maritime air surveillance or interdiction to enforce or assist in the enforcement of the laws of the United States.

- Administer laws and promulgate and enforce regulations for the promotion of safety of life and property on and under the high seas and waters subject to the jurisdiction of the United States, covering all matters not specifically delegated by law to some other executive department.

- Develop, establish, maintain, and operate, with due regard to the requirements of national defense, aids to maritime navigation, icebreaking facilities, and rescue facilities for the promotion of safety on, under and over the high seas and waters subject to the jurisdiction of the United States.

- Engage in oceanographic research on the high seas and in waters subject to the jurisdiction of the United States.

- Maintain a state of readiness to function as a specialized service in the Navy in time of war, including the fulfillment of Maritime Defense Zone command responsibilities.

- Establish and maintain a coordinated environmental program and a comprehensive ports and waterways system, including all aspects of marine transportation.

These missions are conducted by the following organizational components of the USCG:

2.1.1 Civil Engineering

The Office of Engineering, Logistics, and Development provides support in aeronautical, civil, and naval engineering; logistics; and research and development for the USCG. This office's mission is to provide engineering services, including design, construction, maintenance, and outfitting and alteration of vessels and aircraft; provide aids to navigation, shore establishments, machinery, and utilities; and to administer a program of research and development responsive to the needs of the USCG for new or improved systems, equipment, methods, and procedures. Due to the nature of USCG missions and operations, most of the engineering activities occur in the coastal and nearshore environment.

2.1.2 Marine Environmental Protection

The mission of the Marine Environmental Protection Office is to protect the public, the environment, and U.S. economic interests by the prevention and mitigation of marine pollution. There are 14 Marine Environmental Protection Offices located on the east coast of the United States. These offices generally maintain small boats and "first aid" pollution response equipment. The majority of responses result in the mechanical cleanup of oil or hazardous materials, but alternative cleanup responses include *in-situ* burning of oil, and the use of dispersants and sinking agents.

2.1.3 Marine Safety and Security

The purpose of the Marine Safety and Security Program is to minimize the occurrence and magnitude of accidents and emergencies on vessels. This office conducts vessel boardings (40,000 in 1993) of U.S. and foreign-flagged vessels, administers designated anchorage areas, conducts harbor patrols, and grants licenses for marine events such as regattas and parades.

2.1.4 Vessel Traffic Control

The Vessel Traffic Control Program functions as the eyes and ears of the port. It is responsible for enhancing the safe and efficient use of the nation's waterways by effectively managing a system of Vessel Traffic Services (VTS). The primary mission of the Vessel Traffic Control Program is to facilitate the safe and efficient movement of vessel traffic to prevent collisions, groundings, and the human, property, environmental, or economic losses or consequences associated with such accidents. This office has the communications suitable to then report the incident to the responsible authority or to the mariner for trip planning. The Vessel Traffic Control Program office also has the sensors to monitor or manage appropriate responses to the incident. The Vessel Traffic Control Program does not actively operate vessels of any type; it does, however, advise mariners on hazards to navigation. On the east coast of the United States, the Vessel Traffic Control Program is located in New York City.

2.1.5 Law Enforcement and Defense

The USCG is the nation's leading maritime law enforcement agency tasked with enforcing the full range of applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States. The Enforcement of Laws and Treaties (ELT) Program focuses primarily on protecting fisheries and other living marine resources, combating illicit drug trafficking, and interdicting illegal migrants at sea. The USCG conducts fisheries law enforcement to provide enforcement support that promotes a high rate of compliance with the laws and regulations which are designed to support the conservation and management of the nation's living marine resources. The platforms used in this program are varied and range from small, rigid-hull inflatable boats to 378-ft ships, and from short-range recovery helicopters to long-range fixed-wing aircraft. The USCG uses vessels and aircraft to ensure that regulations on closure areas, fishing gear, and targeted species, as well as many other activities, are effectively enforced.

2.1.6 Search and Rescue (SAR)

Search and Rescue missions are those which have the goal of preventing the loss of life and property. Most **Search and Rescue** (SAR) cases involve a disabled or endangered vessel in a known position and in need of assistance. The USCG response vessel or aircraft proceeds to the appropriate position at "maximum safe speed" (defined with regards to personnel safety). The response often results in towing a vessel back to port at the most economical speed. Search-and-rescue cases occur all along the east coast of the United States, with more than 90% of these cases occurring within 20 miles of shore. Also, most of the SAR cases are non-emergency in nature, which means that USCG resources need not respond at "maximum safe speed" or even directly to the incident. Emergency operations are operations for which rapid response is required to avoid loss of life The remaining SAR cases are distress situations and involve searching for a lost or unlocated vessel. Vessels and aircraft are deployed to a specific area to "search" the area by using specified optimal search patterns. Any deviation from this optimal search pattern will increase the risk of not locating the vessel.

2.1.7 Aids to Navigation

The USCG maintains several thousand aids to navigation **(ATON)** along the Atlantic coast. These aids range from large, shore-based lighthouses, fog signals, and deep-water moored buoys to small, single-pile structures and unlighted buoys in shallow water. ATON work is conducted from 16 seagoing and coastal buoy tenders in shallow waters (less than 200 ft); the majority of work is conducted in water less than 50 ft deep. Maintenance of each ATON includes a routine servicing visit of 1-2 hours once each year, or more often if the aid is compromised (*e.g.*, extinguished light, off assigned position, buoy struck, etc.). In addition to maintenance, ATON crews construct pile structures (south of Maryland) and assist with search and rescue, environmental cleanup, and other "multi-missions."

2.1.8 Aviation

The role of the Aviation Office is to provide logistics and support to all USCG programs. This office's resources include HC-25 and HU-130 fixed-wing aircraft, which are used for medium- and long-range surveillance (*i.e.*, usually law enforcement searches to locate a specific vessel or concentration of vessels). Typically, this entails reconnaissance at altitudes well above 500 ft. These aircraft operate at altitudes below 500 ft only when dropping rescue equipment or to identify a vessel. In addition to fixed-wing aircraft, the office uses two types of helicopters for short- and medium-range recovery roles. Routine patrols and transits to and from search areas are, weather permitting, normally above 500 ft. Flying low over water is sufficiently dangerous that it is normally avoided unless required by the mission being flown. Searches for persons in the water must be conducted below 500 ft to be effective. The recovery of persons in the water and dropping rescue equipment must be done while hovering below 500 ft. When operating any USCG airborne platform, the following protocol is followed:

> *Commandant Instruction 3710.1 (series), 8: "Disturbance of Wildlife. Commanding Officers shall take necessary steps to prevent unnecessary flying over known haunts of wildlife. When it is necessary to fly over such areas, an absolute altitude of at least 3000 feet shall be maintained (if maintaining such an altitude is not detrimental to the mission)..."*

The various missions of the USCG are performed in fulfillment of the requirements of various laws and acts promulgated by the U.S. Congress. In addition, the U.S. Congress or Administrative Branch has delegated responsibility to the USCG for enforcement of, or compliance with, various international laws and conventions dealing with activities in state, Federal, and international waters.

These missions are based at the 143 stations along the east coast of the United States (Figure 2-1). The Federal and international regulations that authorize the USCG to conduct its missions are presented in Appendix A. Details on the organization and operations of the USCG are presented in Appendix B.

2.2 Proposed Action

The USCG will modify activities to enhance the ability to avoid or minimize harm to protected species while performing its mission. Modifications include increasing aircraft altitude and adjusting vessel speed to the slowest safe speed, considering: (1) the protected species (*e.g.*, transiting marine sanctuaries, critical habitats, high-use areas, and areas of intermittent species concentrations, such as nesting areas, when the animals are likely to be present; (2) the vessel capabilities (*e.g.*, hull speed necessary to maintain safe steerage); (3) the nature of the mission [*e.g.*, responding to an emergency; any USCG mission (such as SAR, oil spill response, and law enforcement) has the potential of becoming an emergency]; and (4) the operating conditions (*e.g.*, sea state and wind velocity). In addition, the USCG will increase overall USCG awareness of the marine environment and inhabitants through cross-agency training programs, and the USCG First, Fifth, and Seventh Districts'

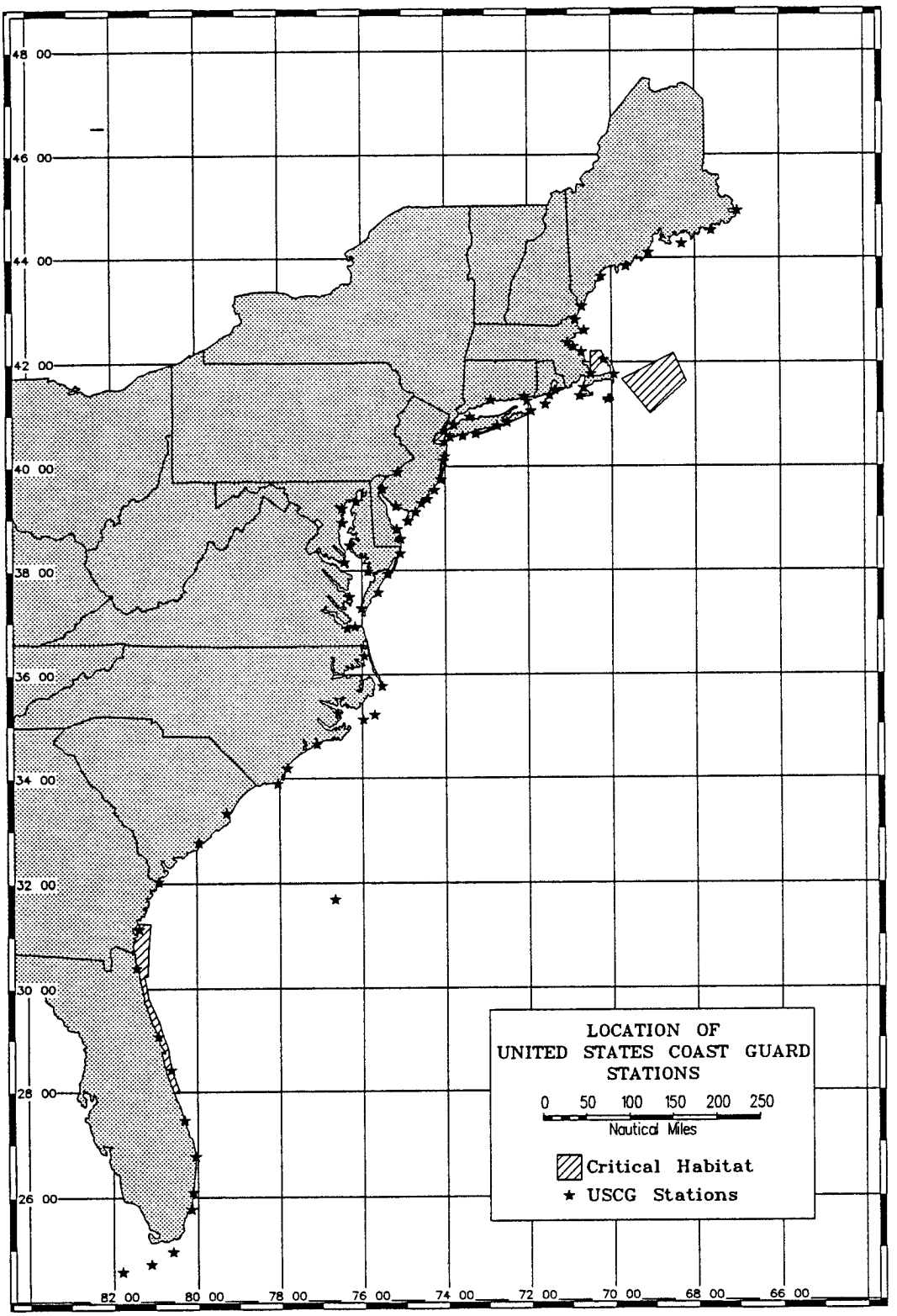

Figure 2-1. Locations of USCG Stations Along the East Coast of the United States (USCG First, Fifth, and Seventh Districts).

Endangered Species Act plans will continue to be updated and used. Copies of the USCG Endangered Species Act plans are in Appendix C.

2.3 Purpose and Need for Proposed Action

In fulfilling its missions, it is necessary that the Coast Guard comply with the laws of the United States (for example, The Endangered Species Act and the Marine Mammals Protection Act). Our purpose is to ensure appropriate compliance with these environmental laws.

3. ALTERNATIVE ACTIONS, INCLUDING THE PROPOSED ACTION

The Alternative Actions, including the Proposed Action, are described in this section. The following five alternatives were considered:

1. Conduct USCG activities in state, Federal, and EEZ waters of the Atlantic Ocean, including Puerto Rico and the U.S. Virgin Islands, as they were prior to the last strike of a right whale by the USCG.

2. Modify USCG activities to enhance the ability to avoid or minimize harm to protected species while performing the mission. Of the five alternatives this is the one preferred by the USCG.

3. At all times, use slow safe speed (increase aircraft altitude) when transiting all areas where protected species have been identified during marine mammal or other protected species surveys.

4. Avoid all high-density areas, critical habitats, and marine sanctuaries during USCG patrols.

5. Do not patrol U.S. coastal waters.

Alternative 1 (No Action). This action, the No Action alternative, proposes to conduct USCG activities with no new limits on vessel and aircraft movements. Chance observations of protected species would be reported and individuals would be avoided, as necessary, for safe operation of the vessel.

Alternative 2 (Proposed Action). This alternative, the one preferred by the USCG, involves modifying routine operations and practices in order to avoid or minimize disturbance or harm to endangered or threatened species, or species of special concern and their critical habitats. The changes that will be made to current USCG operations can be implemented without significantly increasing risks to human health, property, and the environment. The proposed changes include the following:

- Increase overall USCG awareness of marine environment and inhabitants through cross-agency training programs. This measure may be the most effective means of minimizing the adverse effects of USCG operations on wildlife, particularly endangered and threatened species. It may also enhance enforcement efforts. This measure has received enthusiastic support from local, state and Federal agencies along the Atlantic coast.

- Plot critical habitat and marine sanctuary boundaries on all navigational and law enforcement working charts. This will alert the crews of USCG vessels and aircraft to sensitive areas and locations where encounters with wildlife are likely.

- During non-emergency (see Note below) operations, use slow safe vessel speed (increase aircraft altitude) when transiting marine sanctuaries, critical habitats, and areas of intermittent protected species concentrations (*e.g.*, nesting areas, seasonal high-use areas). The areas of intermittent protected species concentrations, such as bald eagle nests and cetacean feeding areas, will be identified during informal consultation with regional USFWS and NMFS offices. [Note: emergency operations are operations for which rapid response is required to avoid loss of life, such as Search and Rescue (SAR)]

- Continue to post a lookout. Posting a lookout and identifying and avoiding objects in the water are standard operating procedures aboard USCG vessels of all sizes. This measure ensures the safety of the crew, minimizes vessel damage, and protects wildlife in the area. However, marine mammals and turtles are often very difficult to spot, and collisions may still occur, especially at night or if weather conditions are adverse (*i.e.*, foggy or windy). Spotting whales, manatees, and turtles, and maneuvering around them is an acquired skill that comes with experience and education. The USCG is currently working in collaboration with the regional NMFS and USFWS offices to determine the best means of training USCG personnel to improve their wildlife observation skills so that the chance of collisions is further minimized.

- Give wildlife a "wide berth." During non-emergency operations, vessels transiting these areas are directed to "use caution and be alert" for marine animals. If a whale is sighted, vessels are to (1) "give whales a wide berth, using speed appropriate to the mission to reduce the possibility of whale strikes" and (2) "notify vessels in the vicinity about the locations of whales via VHF radio, and direct them to proceed through the area with caution" (LEB 33-94; see Appendix C). USCG vessels in the vicinity of sea turtle nesting beaches (primarily Seventh District) use extreme caution during April through October, the months when females are abundant just offshore.

- Carefully review all permit applications for marine events such as regattas and parades. In the Seventh District, permits are not issued for power boat races (where speeds exceed 10 knots) held during the months of April through October until a Section 7 consultation with NMFS is completed. This ensures that the impact of marine events on nesting turtles in the area is minimized. In addition, the USCG is working with USFWS and Florida DEP to finalize draft guidelines for marine events in manatee habitat.

- Enforce existing regulations (*i.e.*, Marine Mammal Protection Act, Endangered Species Act) protecting sensitive species. The USCG has continued to increase its enforcement of the Marine Mammal Protection Act and the Endangered Species Act. USCG units have now been directed to target "significant violators" or those vessel operators that act in a manner that may result in injury or harassment of protected species (see Appendix C). Educating the public about proper boat-handling techniques around whales, sea turtles, and manatees is a fundamental part of the new enforcement efforts.

- Implement and update the USCG First, Fifth and Seventh Districts' Marine Mammal and Endangered Species Act Protection Programs when necessary. The USCG has developed a Marine Mammal and Endangered Species Act Protection program that outlines initiatives to further the federally mandated protection and recovery objectives for threatened and endangered marine mammals and turtles. Guidelines will be developed for these programs which include a description of areas of special interest (including designated critical habitat and marine sanctuaries), and enforcement procedures, recovery efforts, operational control (OPCON) responsibilities, and guidelines for the disposition of dead or injured protected species. Standardized forms for reporting boat collisions with marine animals, or entangled turtles or whales will be included, as are the names and phone numbers for stranding network personnel.

The USCG will also:

- Continue to contribute to Southeastern United States (SEUS) early warning right whale surveys.

- Maintain active membership in the SEUS Right Whale Recovery Team.

- Publish and broadcast seasonal notice to mariners advising caution in right whale critical habitat.

- Participate in Naval Telecommunications Exchange (NAVTEX) posting of right whale locations in SEUS and the northeast; will investigate expanding to other areas.

- Participate in the ESA Interagency Working Group (Washington, DC.)

In addition to the measures outlined above to minimize chances for collisions with protected species, the following measures will also minimize any physical or acoustic disturbance resulting from USCG operations described in the Proposed Action:

- Limit aircraft time at low altitudes. If the guidelines for aircraft outlined in the First Coast Guard District Law Enforcement Bulletin 33-94 (Appendix C) are followed, the chance for harassment by aircraft will be minimized. As per Commandant Instruction 3710.1.8, aircraft must maintain an altitude of at least 3000 ft when flying over wildlife habitat. At this altitude, harassment of marine mammals, turtles, and birds will be negligible. However, during some USCG operations, particularly Search and Rescue (SAR) missions, it may be necessary to fly lower than 3000 ft, and often lower than 500 ft. Such operations have the potential to disturb cetaceans and birds. Because low-altitude flying is dangerous for the aircraft and crew, this altitude is maintained for the minimum time necessary to complete the objective of the mission. Only during emergency conditions does the potential for harassment from aircraft exist and during those times it may be unavoidable.

- Avoid sensitive pinniped rookeries two hours before and after low tide, if possible. When passing a haul-out site, use slow safe speed and increase distance if animals appear startled. None of the five species of pinnipeds found in Atlantic waters along the U.S. is endangered or threatened. This measure will be implemented only if NMFS determines that a particular site is very sensitive to vessel or aircraft traffic.

Alternative 3. The effects on USCG operations that would result from implementing this alternative are similar to those for Alternative 1. However, *all* USCG vessel operations would be conducted at slow safe speed and aircraft would operate at higher altitudes. This would have a direct impact on operations that are emergencies; USCG vessel and aircraft would have to operate at slow safe speed and higher altitude, respectively, when responding to an emergency call.

Alternative 4. Under this alternative, the USCG will, during all of its patrols and marine operations, avoid all high-use areas and critical habitats of protected whales and sea turtles, and marine birds during times of the year when the protected species are likely to be present based on marine mammal and other protected species surveys. Critical habitats and seasons of occupancy by protected species include the following:

- Cape Cod Bay and Great South Channel off Massachusetts during late February through November (right, humpback, and fin whales).

- Coastal waters to 15 miles offshore of Georgia and north Florida (Atlantic coast) during December through February (female right whales with calves and some juveniles).

- Stellwagen Bank Marine Sanctuary off Massachusetts during late February through November (humpback and fin whales, and some right whales).

- Archie Carr National Seashore in Florida during April through October (nesting female loggerhead, green, leatherback, and hawksbill sea turtles, and newly emergent hatchlings).

- Sand Point Critical Habitat Area in St. Croix, U.S. Virgin Islands during April through October (nesting female leatherback, loggerhead, green, and hawksbill sea turtles).

Seasonal high-use habitats for protected whales and sea turtles include the following:

- Mouths and immediate offshore waters of Delaware and Chesapeake Bays (juvenile humpback whales).

- Southern Chesapeake Bay (feeding juvenile loggerhead and Kemp's ridley turtles).

- Coastal waters of Long Island (feeding juvenile Kemp's ridley and loggerhead turtles).

- Coastal bays and nearshore waters of southern North Carolina (wintering loggerhead and Kemp's ridley turtles).

- Entire Atlantic coast of Florida (nesting green, loggerhead, and leatherback turtles).

- Small islands around Puerto Rico (nesting green, hawksbill, loggerhead, and leatherback turtles).

Alternative 5. Under this alternative, the USCG would cease to conduct all marine activities in coastal and offshore waters of the U.S. territorial waters of the Atlantic Ocean between the U.S./Canadian border and Key West, Florida, including Puerto Rico and the U.S. Virgin Islands.

4. THE AFFECTED ENVIRONMENT AND SPECIES OF CONCERN

4.1 The Physical Environment

The physical, chemical, and biological characteristics of the marine environment along the U.S. Atlantic coast determine the distribution of marine and coastal biological resources. The U.S. Atlantic coast can be divided into three regions: the North Atlantic (Gulf of Maine and Georges Bank), the Middle Atlantic (Nantucket Shoals to Cape Hatteras), and the South Atlantic (Cape Hatteras to Key West).

The Gulf of Maine is a 90,700 km^2 embayment of the western North Atlantic, with an average depth of 150 m (Uchupi and Austin, 1987). It is bordered on the north and northeast by Canada, and on the west and southwest by New England. In the east and southeast, the Gulf of Maine is bordered by Georges Bank and the Great South Channel. Georges Bank is a shallow sandy bank east of Cape Cod; it is approximately 150 km wide and 280 km long with water depths less than 40 m at its crest (Backus and Bourne, 1987). Cape Cod Bay is a small bay, about 40 km in diameter, located in the southern Gulf of Maine, and bordered by Cape Cod and the Massachusetts coast. Water depth increases from south to north, with a maximum depth of about 60 m at the confluence of Cape Cod and Massachusetts Bays. The Great South Channel is a large funnel-shaped depression separating Cape Cod and Nantucket Shoals from Georges Bank. Its average depth is about 175 m (DOC, 1994).

The general water circulation of the Gulf of Maine, including Cape Cod Bay, is a counter-clockwise gyre, with semidiurnal tidal flows superimposed (NEFSC, 1995; DOC, 1994). The mean net circulation on Georges Bank is a clockwise gyre that is open, at least in the winter, to the southwest (Backus and Bourne, 1987). The overall circulation of the western North Atlantic is strong; although seasonal water column stratification does occur, the waters are generally well mixed and nutrient rich.

The Middle Atlantic Bight is a vast, wide continental shelf region, bisected by several submarine canyons, the most prominent of which are the Hudson and Baltimore Canyons. It is bordered to the east by the Gulf Stream, and to the west by the mid-Atlantic states and several endangered species seasonal habitats, including Long Island Sound, Delaware Bay, and Chesapeake Bay. The net surface water flow in the bight is to the southwest from Georges Bank along the coast south to Cape Hatteras (MMS, 1992). Intrusions of warm, Gulf Stream waters in the form of filaments, meanders, and warm core rings may alter circulation locally (MMS, 1992). Delaware Bay is a shallow estuary with an area of about 1600 km^2 and an average depth of about 10 m (Gastrich, 1992; Versar, 1991). Water circulation is good and there is a gradual increasing salinity gradient from the head to the mouth of the estuary (Versar, 1991). Chesapeake Bay is the largest estuary in the United States, with a length of 320 km and a width varying from 6 to 48 km (EPA, 1989). The average water depth is 9 m, but the central channel is deeper than 100 m in some places. The circulation is that of a typical salt-wedge estuary with a net outward flow of low-salinity water at the surface, especially in the western bay, and a net inflow of high-salinity water along the bottom, particularly in the eastern bay (EPA, 1989). The waters of the bay are

generally well mixed, but salinity and temperature stratification in the summer may lead to hypoxic bottom water in the deeper basins.

The South Atlantic Bight is characterized by a narrow, sloping continental shelf bordered to the east by the warm waters of the Gulf Stream and to the west by the south Atlantic states. The continental shelf broadens from south to north. It is only about 5 km wide off Palm Beach, Florida, about 50 km wide off Cape Canaveral, Florida, more than 120 km wide off Georgia and South Carolina, and narrows again off Cape Hatteras (Menzel, 1993). Surface-water flows on the inner shelf are controlled by tidal flows and winds, with a general southward flow. Farther offshore, the Gulf Stream and its meanders control local circulation (Menzel, 1993). Waters of the middle shelf are stratified in the summer, but well mixed in the winter. Salinity increases with distance offshore (MMS, 1986). Upwelling of nutrient-rich water occurs seasonally along the continental shelf break, north of the major shoals, and in the Charleston Trough.

4.2 Biological Environment

Because this environmental assessment (EA) focuses on the USCG activities in the Atlantic Ocean along the east coast of the United States, only species that have populations in this area will be discussed.

4.2.1 Marine Mammals

Cetaceans

The right, humpback, and fin whales (*Eubalaena glacialis, Megaptera novaeangliae,* and *Balaenoptera physalus*) are all listed as endangered in the western North Atlantic Ocean. They are observed frequently in nearshore waters along the U.S. Atlantic coast at different times of year. The blue, sei, and sperm whales (*Balaenoptera musculus, Balaenoptera borealis,* and *Physeter catadon*), also listed as endangered in the western North Atlantic, are restricted primarily to more northerly waters and to offshore slope and deep ocean waters, and are rarely encountered inshore along the coast of the United States. All six species of endangered whales make large-scale seasonal migrations to the north in the spring to foraging areas and to the south in the fall to wintering and reproduction areas (NMFS, 1995).

Fewer than 350 right whales survive in the western North Atlantic population (Knowlton *et al.*, 1994). Right whales, some with newborn or yearling calves, arrive in the Great South Channel (Kraus and Kenney, 1991) and Cape Cod Bay (Mayo and Marx, 1990; Hamilton and Mayo, 1990) in late February and remain until about May to feed in the bay's rich patches of zooplankton. The whales then move north to Canadian waters for the remaining months of summer and early fall. Some right whales pass through Cape Cod Bay and the Great South Channel on their way south in the late fall to wintering grounds. A small fraction of the right whale population, consisting of pregnant or lactating females and some juveniles, winter in nearshore waters off Georgia and northern Florida. Most calving takes place in this area. The winter distribution of the remainder of the North Atlantic population of right whales is not known. During spring and fall migrations between summer feeding

areas and winter habitats, some right whales move through the Middle and South Atlantic Bights inshore of the Gulf Stream (NMFS, 1991a).

The western North Atlantic population of humpback whales numbers about 5500 animals (Katona and Beard, 1990; Whitehead, 1982), of which perhaps as many as 800 individuals visit New England waters once or more during the summer to feed. Of the estimated 7200 fin whales in the western North Atlantic population, as many as 5000 visit coastal waters of the United States between the Canadian border and Cape Hatteras, and as many as 3000 may visit the Gulf of Maine during the summer (Hain *et al.,* 1992). Humpback and fin whales visit coastal waters of the Gulf of Maine, mainly the Great South Channel, Stellwagen Bank, and Jeffreys Ledge, to feed on small schooling fish and euphausiids during spring and summer each year. During the summer, some individuals make frequent foraging migrations between these areas and the southern Bay of Fundy and the banks off Nova Scotia, Canada (Hain *et al.,* 1992; NMFS, 1991b; CeTAP, 1982).

In the fall, all of the humpback and most of the fin whales migrate south from New England and Canadian waters (CeTAP, 1982). The winter distribution of fin whales is poorly understood. Some congregate in the Middle Atlantic Bight, particularly in continental shelf waters east of New Jersey and the Delmarva Peninsula (Hain *et al.,* 1992). Most of the humpbacks migrate southward through the Middle Atlantic Bight in offshore waters to wintering grounds in the Caribbean. Most of the humpback whales, including the reproductively active adults, winter on Silver and Navidad Banks off the north coast of the Dominican Republic, Virgin Bank off the Leeward Islands, Mona Passage off Puerto Rico, and Samana Bay, Dominican Republic. Humpback calving occurs in these protected southern waters (NMFS, 1991b; Katona and Beard, 1990; Matilla *et al.,* 1989). Some juvenile humpbacks may spend the winter off Virginia, especially off the mouth of Chesapeake Bay, and along the North Carolina coast north of Cape Hatteras. The mouth of Delaware Bay may also be an important winter habitat for some juveniles (Wiley *et al.,* 1995; Swingle *et al.,* 1993). Fin and humpback whales migrate northward in the spring in coastal and offshore waters, some passing near Bermuda (NMFS, 1991b).

Sei and blue whales occur primarily in boreal and subarctic waters north of the U.S. border (CeTAP, 1982). During the summer, on rare occasions, they may visit nearshore waters of the Gulf of Maine in pursuit of their preferred zooplankton food (Payne *et al.,* 1990; Wenzel *et al.,* 1988). In recent years, there have been only a few sightings of these whales in the vicinity of Stellwagen Bank. Sperm whales are restricted primarily to deep offshore waters on the continental slope, where they may dive to great depths in pursuit of their cephalopod food. In spring and summer, they are occasionally sighted in deep water of the Middle Atlantic Bight and off southern Georges Bank. In the winter, they may congregate in large numbers in deep water east and northeast of Cape Hatteras (CeTAP, 1982).

In addition, two species of non-endangered baleen whales are also found in these waters: the minke whale *(Baleanoptera acutorostrata)* and the Bryde's whale *(B. edeni)*.

The major interactions between whales and human activities that may lead to injury or death of the whales include entanglement in fishing gear and marine debris, collisions with vessels,

marine pollution, habitat change, and general harassment. Between 1973 and 1993, 27% of documented right whale mortalities along the Atlantic coast were due, all or in part, to collisions with vessels (Kenney and Kraus, 1993).

There are more than 20 species of odontocetes found in the North Atlantic waters of the United States. In general, they can be divided into two groups. The nearshore or "on-shelf" group includes the harbor porpoise *(Phocoena phocoena)*, the white-sided dolphin *(Lagenorhynchus acutus)*, the common dolphin *(Delphinus delphis)*, and the bottlenose dolphin *(Tursiops truncatus)*. Other species, such as pilot whales *(Globicephala spp.)*, grampus *(Grampus griseus)*, spotted dolphins *(Stenella sp.)* and striped dolphins *(Stenella coeruleoalba)*, are part of a diverse assemblage of offshore species that are typically associated with the continental shelf edge. The seasonal distribution of the offshore species may shift inshore in response to the movements of their prey (CeTAP, 1982).

Pinnipeds

There are five species of pinnipeds that occur along the east coast of the United States. All of these are phocids (true seals) and their distribution is limited primarily to the nearshore waters of New England. Occasionally, individual animals stray as far south as South Carolina. The harbor seal (*Phoca vitulina*) is the most abundant pinniped on the east coast. It is commonly found in waters north of 30°N, breeds from New Hampshire to the Arctic, and winters south to New York (and occasionally to the Carolinas). The greatest summer concentrations of harbor seals are along the coast islands and ledges of Maine (J. Gilbert pers. comm., 1995), and in winter, on Cape Cod and Nantucket Island (Payne and Selzer, 1989).

Gray seals (*Halichoerus grypus*) are the second most common pinniped along the Atlantic seaboard of the United States. They inhabit temperate and subarctic waters and, in the United States, are found from Maine to Long Island Sound, New York. Pupping colonies have recently been identified at Muskeget Island (Nantucket Sound), Monomoy National Wildlife Refuge, and in eastern Maine (Rough, 1995).

The ice seals, harp (*Phoca groenlandica*), hooded (*Cystophora cristata*), and ringed (*Phoca hispida*) seals are uncommon in U.S. waters, although recent stranding data indicate their wintering range may be expanding southward.

None of these seals is Federally listed as an endangered or threatened species in Canada or in the United States, and there is strong evidence that both harbor and gray seal populations are increasing.

Sirenians

The West Indian manatee *(Trichechus manatus)* is a large, slow-moving herbivore, and the only Sirenian in North American waters (Geraci and Lounsbury, 1993). Manatees are found primarily in the shallow fresh, brackish, and marine waters along the coast of Florida. Individuals usually remain in 3- to 5-m-deep waters, and rarely in water exceeding 6 m. Historically, the distribution of manatees shifts south of central Florida in winter because of their intolerance of temperatures below 20°C (Irvine, 1983). However, over the past 30

years, the winter distribution has shifted northward due to habitat loss and the construction of power plants/industrial sites that discharge warm-water effluent. In the spring and summer, manatees appear around the warm-water outfall pipes in Georgia, and occasionally move as far north as the Carolinas and Virginia (Rathbun *et al.*, 1982).

The manatee is one of the most endangered marine mammals in the United States. Recent aerial surveys have counted 1856 animals in 1992 and 1822 manatees in February 1995. One-third or more of manatee deaths are human related (MMC, 1995). The largest single mortality factor is collision with boats and barges, primarily vessels exceeding 7.3 m (24 ft) with inboard motors and propellers over 38 cm (15 in) in diameter. Most deaths are due to impact, not propeller wounds. Eighty percent of all deaths from boat/barge collisions occur in eastern Florida, particularly Brevard County and the St. Johns River (O'Shea *et al.*, 1985). No-wake zones, manatee protection areas, and an extensive educational effort have been implemented by state and Federal agencies to mitigate these adverse human impacts (Florida DEP pers. comm., 1995).

4.2.2 Sea Turtles

The loggerhead sea turtle (*Caretta caretta*), with an estimated population of nearly 400,000 individuals in the western North Atlantic, is the most abundant sea turtle in coastal waters of the eastern United States (NMFS and USFWS, 1991). It is listed as threatened throughout its range. Except for the breeding populations in Florida and on the Pacific coast of Mexico where they are listed as endangered, green turtles (*Chelonia mydas*) also are listed as threatened (NMFS, 1994; USFWS, 1986). The other sea turtles encountered in U.S. Atlantic coastal waters — the Kemp's ridley, leatherback, and hawksbill turtles (*Lepidochelys kemppi, Dermochelys coriacea,* and *Eretmochelys imbricata*) — are all listed as endangered in the western North Atlantic (USFWS, 1986).

Loggerhead turtles nest on sandy beaches northward of Key Biscayne, Florida, to North Carolina, south of Cape Hatteras (Shoop *et al.*, 1985; Schmid, 1995). Peak nesting occurs south of Cape Canaveral, Florida. Green turtles and, to a lesser extent, leatherback turtles also nest on south Florida beaches. Most nesting of leatherback and hawksbill turtles in U.S. Atlantic waters is in the U.S. Virgin Islands, including the recently designated sea turtle critical habitat at Sandy Point, St. Croix, and in Puerto Rico (NMFS and USFWS, 1993; 1992; Pritchard, 1982). Nearly the entire population of Kemp's ridley turtles nests along a single, 15-km beach at Rancho Nuevo, Mexico (Marquez, 1994).

All five species of sea turtles spend the first one or more years after hatching in the offshore pelagic environment associated with rafts of sargassum weed or in convergence zones. Their distribution during this juvenile, pelagic period is poorly understood (Witherington, 1994; Carr, 1986a,b). As sub-adults, they move into nearshore waters to feed and grow. During the summer, sub-adult loggerhead, ridley and, to a lesser extent, green turtles migrate northward along the U.S. Atlantic coast to feed in nearshore waters as far north as the southern Gulf of Maine. Important northern feeding areas for these species include Long Island Sound, the south shore of Long Island, and the southern parts of Delaware and Chesapeake Bays (Henwood, 1987; Keinath *et al.*, 1987; Morreale *et al.*, 1989; MMS, 1992;

Shoop and Kenney, 1992; Schmid, 1995). In the fall, they migrate southward and tend to congregate in large numbers in coastal waters, inlets, and lagoons of south Florida. During northward migrations in spring and southward migrations in fall, these turtles may be abundant in coastal waters off Cape Hatteras. Sub-adult turtles also may be abundant during the winter in nearshore waters of North Carolina, south of Cape Hatteras (Musick *et al.*, 1994).

Leatherbacks are highly pelagic and move into coastal waters primarily during the summer to feed on jellyfish (Lee and Palmer, 1981; Payne *et al.*, 1984; Barnard *et al.*, 1989). They are temperate animals, preferring more northern waters for foraging than the other species. They are encountered frequently during the summer in the Gulf of Maine, and southward around Long Island and off Chesapeake Bay (NMFS and USFWS, 1992). In the winter, leatherbacks sometimes congregate in large numbers off Cape Canaveral, Florida. Hawksbill turtles are a tropical species, restricted to the warmer Caribbean Sea. They occur sporadically in south Florida, and in greater numbers around Puerto Rico and the U.S. Virgin Islands. They tend to congregate over coral and other hard-bottom reef areas less than about 40 m deep where they feed on benthic animals, particularly sponges (NMFS and USFWS, 1993; Witzell, 1983).

As described for the whales (above), sea turtles experience similar unfavorable interactions with human activities. Since 1988, more than 17% of turtles stranded along the U.S. Atlantic coast showed evidence of collision with a vessel or the propeller of a vessel (Teas, 1994a,b). However, the major documented cause of mortality of sea turtles — especially loggerheads, ridleys, and greens — is entanglement in fishing gear, particularly shrimp nets. This source of mortality alone may account for 50,000 deaths each year in U.S. waters (Witzell and Cramer, 1995; NOAA and NCDE, 1992; Anon., 1992; NRC, 1990; Henwood and Stuntz, 1987). Sea turtles are vulnerable to human disturbance during nesting, through nesting habitat alteration or destruction, vehicular traffic on nesting beaches, and artificial lighting of nesting beaches which disorients emerging females and the seaward-migrating hatchlings (NMFS, 1994). In addition, adult sea turtles and their eggs are still heavily exploited in some areas for food or turtle products, particularly tortoise shell (NRC, 1990).

4.2.3 Fish

The Atlantic coast of the United States supports a wide range of fish species with specific habitat requirements and distributions. In this section, a summary description of the fish in the two major regions of the U.S. Atlantic coast is provided. The regions have been designated by the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS); NMFS monitors fish stocks on the Atlantic coast by region. The Northeast Region extends from the coast of Maine to North Carolina (Cape Hatteras). The southeast region begins at Cape Hatteras and extends south.

NMFS assigns species to groupings that reflect the ocean environment in which they reside: pelagic - water column; groundfish - near or on the ocean floor; and reef - on or associated with natural or artificial reefs. These groupings have been defined by the NMFS, Northeast and Southeast Fisheries Science Centers (NEFSC and SEFSC). NMFS monitors fish

populations to determine their "status." The status of a fish stock (*i.e.*, a population of fish of a specific species with physical characteristics that distinguish it from another population of fish of the same species) is classified on the basis of its current exploitation rate and abundance level. Fishing mortality for the species described below relates to the amount or number of fish killed by fishing and is associated with fishing effort (*e.g.*, number of vessels, number of days fishing, net mesh size). Compared to commercial fishing, the impact of recreational fishing on most species is small. However, most bluefish and striped bass are caught by recreational fishermen. The NMFS uses the exploitation rate (*i.e.*, the proportion of a population at the beginning of a given time period that is caught during that time period) to describe the effect of current fishing effort on a population (NOAA, 1995a). The status of a stock determines the type of appropriate management action (fishing seasons, fish closure areas, mesh size restrictions, catch restrictions) necessary to ensure continued viability of the stock. A fish stock is most often expressed as underexploited, overexploited, or fully exploited. Individual states, the Atlantic States Marine Fisheries Commission, and the Fishery Management Councils (in cooperation with NMFS) are also involved in managing fish stocks in marine and coastal waters.

Species of Special Concern

Only one of the species found in the northeast region, the shortnose sturgeon *(Acipenser brevirostrum)* is endangered; this species has not been observed in marine waters in several years. Other species that could be of concern are those with a status of overexploited. Conservation methods (*i.e.*, management and enforcement of management) are implemented to ensure viability of fish stocks.

Unless otherwise indicated, the following text is summarized from the NMFS Status of the Fishery Resources publications produced by the NEFSC and SEFSC (NOAA, 1995a; NOAA, 1995b). Many of these species are also under the management of state agencies.

Northeast Region

In the northeast region, the NEFSC monitors the abundance of numerous fish species of commercial and recreational importance. The commercial yield of fish in the northeast is 49.35% of the eastern United States (including the Gulf of Mexico and the U.S. Caribbean) commercial yield by weight, compared to 7.35% in the southeast, and 0.01% in Puerto Rico and the U.S. Virgin Islands (NOAA, 1995b). The annual Status of the Fishery Resources report includes a summary on 30 species of fish. These species are categorized as pelagic (4 species), groundfish (22 species), and other species (4 species, including river herring). As indicated by the number of species, the groundfish grouping is the most important for commercial species. The groundfish are divided into principal groundfish and others. The principal groundfish have historically been the main component of the trawl fisheries (NOAA, 1995a). The other species (*e.g.*, goosefish, dogfish), although they have not been the dominant species of the trawl fisheries, are becoming more important (NOAA, 1995a). Of the 30 species assessed by the NEFSC, 18 species are overexploited. Nearly all (17 of 18) of the species that are overexploited are groundfish; 77% of the groundfish are overexploited. Four species are underexploited. Of the total number of species monitored, only seven are fully exploited.

Tables 4-1 through 4-4 provide species, status, and distribution of species by category as determined by NOAA, NMFS, NEFSC (NOAA, 1995a). In the Northeast Region, other species of recreational and commercial importance that are not listed in the NEFSC annual report include croaker, spot, weakfish, bluefin and yellowfin tuna, swordfish, sand lance, menhaden, and pelagic sharks.

Table 4-1. Principal Groundfish in the Northeast Region.

Common Name	Species Name	Status	Distribution (N to S)
Atlantic Cod	*Gadus morhua*	Overexploited	Greenland - North Carolina
Haddock	*Melanogrammus aeglefinus*	Overexploited	West Greenland - Cape Hatteras
Redfish	*Sebastes* spp.	Overexploited	Gulf of Maine, Georges Bank
Silver Hake	*Merluccius bilinearis*	Overexploited	Newfoundland - South Carolina
Red Hake	*Urophycis chuss*	Underexploited	Gulf of St. Lawrence - North Carolina
Pollock	*Pollachius virens*	Fully Exploited	Scotian Shelf, Gulf of Maine, Georges Bank
		FLOUNDERS	
Yellowtail	*Pleuronectes ferrugineus*	Overexploited	Labrador - Chesapeake Bay
Summer	*Paralichthys dentatus*	Overexploited	Southern Gulf of Maine - South Carolina
Winter	*Pleuronectes americanus*	Overexploited	Labrador - Georgia
American Plaice	*Hippoglossoides platessoides*	Overexploited	Southern Labrador - Rhode Island
Witch	*Glyptocephalus cynoglossus*	Overexploited	Gulf of Maine, Georges Bank; Continental Shelf Edge - Cape Hatteras
Windowpane	*Scophthalmus aquosus*	Overexploited	Gulf of St. Lawrence - Florida

Although the distribution of many of these species extends into the Southeast Region (under the jurisdiction of the SEFSC), traditionally the greatest concentrations of the species and the largest commercial fishery are located in the Northeast Region.

Table 4-2. Other Groundfish in the Northeast Region.

Common Name	Species Name	Status	Distribution
White Hake	*Urophycis tenuis*	Fully Exploited	Newfoundland – Southern New England
Cusk	*Brosme brosme*	Overexploited	Gulf of Maine
Black Sea Bass	*Centropristis striata*	Overexploited	Entire Atlantic Coast
Scup	*Stenotomus chrysops*	Overexploited	Cape Cod – Cape Hatteras
Weakfish	*Cynoscion regalis*	Overexploited	Massachusetts Bay – Florida[1,2]
Spot	*Leiostomus xanthurus*	Not Available	Southern New England – Florida[1]
Atlantic Wolffish	*Anarhichas lupus*	Overexploited	Nova Scotia – Gulf of Maine[1]
Ocean Pout	*Macrozoarces americanus*	Fully Exploited	Labrador – Delaware
Tilefish	*Lopholatilus chamaeleonticeps*	Overexploited	Nova Scotia – South[3]
Goosefish	*Lophius americanus*	Overexploited	Gulf of St. Lawrence – Cape Hatteras

[1] Bigelow and Schroeder (1953).
[2] Few may be found in Bay of Fundy and Newfoundland.
[3] South includes the southernmost tip of Florida or further south to the Gulf of Mexico or South America.

Table 4-3. Pelagic Fish in the Northeast Region.

Common Name	Species Name	Status	Distribution
Atlantic Herring	*Clupea harengus*	Underexploited	Labrador – Cape Hatteras
Atlantic Mackerel	*Scomber scombrus*	Underexploited	Labrador – North Carolina
Butterfish	*Peprilus triacanthus*	Underexploited	Southern New England – Cape Hatteras
Bluefish	*Pomatomus saltatrix*	Overexploited	Maine – Florida

Southeast Region

In the Southeast Region, the SEFSC monitors the abundance of numerous recreational and commercially important fish species. The commercial yield of fish species in the southeast is significantly less than in the northeast. The annual Status of the Fishery Resources report

Table 4-4. Other Fish Species of Commercial Importance in the Northeast Region.

Common Name	Species Name	Status	Distribution
Spiny Dogfish	*Squalus acanthias*	Fully Exploited	Newfoundland - Georgia
Skate	Family Rajidae[1]	Fully Exploited	Gulf of Maine - Chesapeake Bay
Atlantic Salmon	*Salmo salar*	Fully Exploited	Canada and Maine
Striped Bass	*Morone saxatilis*	Fully Exploited	St. Lawrence Estuary - Florida

[1] Include seven species that occur in the Northeast Region.

includes a summary on 24 species of fish and several species of sharks in the south Atlantic (Cape Hatteras to Florida). Of the 23 species, 42% are overexploited. All of the large coastal sharks are overexploited. Only one fish species — the Atlantic stock of king mackerel — is considered underexploited. The remaining species are either fully exploited (38%) or the status is unknown/unavailable. These species are categorized by SEFSC as oceanic pelagics, coastal pelagics, reef fish, sciaenids, sharks, menhadens, butterfish, and coastal herrings. For the purpose of efficiency, these fish are further categorized into billfish, coastal pelagics, reef fish, sciaenids and others, and sharks. Tables 4-5 through 4-8 below provide species, status, and distribution of species by category as determined by NOAA, NMFS, SEFSC (NOAA, 1995b).

4.2.4 Sharks

More than 350 species of sharks occupy the Atlantic Ocean on the east coast of the United States. This number of species is relatively small compared to the number of fish species. The sharks that are caught along the east coast to the tip of Florida are grouped into two categories for management: large coastal sharks and pelagic sharks. There are 22 species of large coastal sharks, including sandbar *(Carcharhinus plumbeus)*, reef *(Carcharhinus perezi)*, tiger *(Galeocerdo cuvier)*, lemon *(Negaprion brevirostris)*, and the great hammerhead *(Sphyrna mokarran)*. There are 10 species of pelagic sharks, including the thresher *(Alopias vulpinus)*, longfin mako *(Isurus paucus)*, blue *(Prionace glauca)*, shortfin mako *(Isurus oxyrinchus)*, and oceanic whitetip *(Carcharhinus longimanus)*. The large coastal sharks are the target of commercial fishermen and shark tournaments. As a group, they are considered overexploited because of the fishing mortality. The pelagic sharks are caught as bycatch of other commercial fishing operations; the population status of the group is unknown.

4.2.5 Invertebrates

The Atlantic coast of the United States supports a wide range of invertebrates. However, only a small number of these are monitored annually for changes in population size. This section includes a brief summary of the commercially important invertebrates that occupy the

Table 4-5. Tuna and Billfishes in the Southeast Region.

Common Name	Species Name	Status	Distribution
Swordfish	*Xiphias gladius*	Overexploited	Worldwide
Bluefin Tuna	*Thunnus thynnus thynnus*	Overexploited	Labrador and Newfoundland - South[3]
Yellowfin Tuna	*Thunnus albacares*	Not Available	Worldwide (tropical)
Billfish[1]	*Makaira nigricans*	Overexploited	New Jersey - South[2,3]
	Tetrapturus albidus	Overexploited	Gulf of Maine - South[2]
	Istiophorus platypterus	Fully Exploited	N. Florida - South[2]
Bigeye Tuna	*Thunnus obesus*	Fully Exploited	Gulf of Maine - South[2]
Albacore	*Thunnus alalunga*	Fully Exploited	New Jersey - South[2]
Skipjack Tuna	*Katsuwonus pelamis*	Fully Exploited	Cape Cod — South[2]

Note: Species not included in the above table are Atlantic bonito *(Sarda sarda)*, little tunny *(Euthynnus alleletteratus)*, frigate tuna *(Auxis thazard)*, blackfin tuna *(Thunnus atlanticus)*, and wahoo *(Acanthocybium solandri)*.

[1] Includes blue marlin, white marlin, and sailfish.
[2] Approximate, based on latitudes.
[3] South includes the southernmost tip of Florida or further south to the Gulf of Mexico or South America.

Table 4-6. Coastal Pelagic Fish in the Southeast Region.

Common Name	Species Name	Status	Distribution[1]
King Mackerel	*Scomberomorus cavalla*	Underexploited[2]	Gulf of Mexico - South
Spanish Mackerel	*Scomberomorus maculatus*	Overexploited[2]	Maine - South
Dolphin	*Coryphaena* sp.	Not Available	Georges Bank - South
Cobia	*Rachycentron canadum*	Not Available	New England - South
Cero	*Scomberomorus regalis*	Not Available	Massachusetts - South

[1] South includes the southernmost tip of Florida or further south to the Gulf of Mexico or South America.
[2] refers to the Atlantic stock only.

designated Northeast Region and the Southeast Region of the Atlantic Ocean along the east coast of the United States. The regions that have been designated by the NMFS to manage fish populations also are used to manage the populations of commercially important invertebrates. Individual states, Atlantic States Marine Fisheries Commission, and the Fisheries Management Councils (in cooperation with NMFS) are also involved in managing

Table 4-7. Reef Fish in the Southeast Region.

Common Name	Species Name	Status	Distribution[1]
Wreckfish	*Polyprion americanus*	Fully Exploited	Grand Banks, Newfoundland - South
Gag	*Mycteroperca microlepis*	Overexploited	North Carolina - South
Scamp	*Mycteroperca phenax*	Fully or Overexploited	North Carolina - South
Gray Snapper	*Lutjanus griseus*	Fully Exploited	Northern Florida - South
Yellowtail Snapper	*Ocyurus chrysurus*	Fully Exploited	North Carolina - South
Red Porgy	*Pagrus pagrus*	Overexploited	North Carolina - South

[1] South includes the southernmost tip of Florida or further south to the Gulf of Mexico or South America.

Note: Other species of reef fish that are important in this region, but not included in NOAA (1995b) are red snapper, vermillion snapper, triggerfish, snowy grouper, and tilefish.

Table 4-8. Sciaenids and Other Commercially Important Fish in the Southeast Region.

Common Name	Species Name	Status	Distribution[1]
Red Drum	*Sciaenops ocellatus*	Overexploited	Chesapeake Bay - South
Weakfish	*Cynoscion regalis*	Overexploited	Massachusetts - Florida
Atlantic Croaker	*Micropogonias undulatus*	Not Available	Massachusetts - South
Atlantic Menhaden	*Brevoortia tyrannus*	Fully Exploited	Nova Scotia - West Palm Beach, Florida

[1] South includes the southernmost tip of Florida or further south to the Gulf of Mexico or South America.

invertebrates in marine and coastal waters. For the purposes of this EA, only species that occur north of the southern tip of Florida are emphasized.

As described above for fish (section 4.2.3), the NMFS uses the status of a stock to determine the type of appropriate management action (seasonal closings, size restrictions, sex restrictions) necessary to ensure continued viability of an invertebrate stock. The following

section summarizes commercially important invertebrates that occupy the Atlantic Ocean along the east coast of the United States.

Northeast Region
Long-finned and short-finned squid, American lobster, northern shrimp, surf clam, ocean quahog, and sea scallop are important invertebrate species in the Northeast Region (Table 4-9). Of the seven invertebrate species that are assessed, 57% are fully exploited. Two species — the sea scallop and the American lobster — are overexploited (NOAA, 1995a).

Southeast Region
Shrimp (brown, white, and pink), spiny lobster, stone crab, conch, and corals are included in the SEFSC stock assessment document (Table 4-10) (NOAA 1995b). There are many other species of invertebrates that are found in the southeast region: rock, golden, and regal red shrimp; blue crab, oysters, hard clam, bay scallop, and whelks. The number of commercially important invertebrate species in the Southeast Region is lower than in the northeast (Table 4-10). Many of the invertebrate species found in the Southeast Region have larger populations in the Gulf of Mexico. Thus, the management efforts for some species are concentrated on the Gulf populations rather than the Atlantic populations. Invertebrate species found in the southeastern United States include shrimp (white, brown), spiny lobster, and stone crab. The status of only two of these species is available. Spiny lobster are overexploited. Stone crabs are fully exploited. Conch and coral are also managed by the NEFSC, but the status of exploitation data was not presented in the SEFSC document (NOAA, 1995b).

Oysters and Blue Crab
Two other commercially important invertebrate species are the oyster *(Crassostrea virginica)* and blue crab *(Callinectes sabidus)*. Oysters are harvested from natural populations, feral (*e.g.*, manipulated natural production facilities), and aquaculture facilities (NMFS, pers. comm., 1995). Production of oysters has recently decreased (NMFS, pers. comm., 1995). The blue crab is found from Cape Cod, south to Florida. Currently, blue crab populations along the east coast are relatively stable, but may be quickly impacted by habitat changes and overfishing (NMFS, pers. comm., 1995).

The USCG Fisheries Law Enforcement Division uses its resources to ensure that management actions implemented by the NMFS and Fishery Management Councils are enforced. Enforcement of these management actions increases the chances for sustaining invertebrate populations (under- and fully exploited populations) and recovery (overexploited populations) of invertebrate populations.

4.2.6 Coastal and Marine Birds

Threatened and Endangered Species
The marine and coastal environment of the Atlantic Ocean along the eastern United States is a habitat for numerous species of birds and a migratory flyway for other species. The birds using this habitat include endangered and threatened species. The following is a brief

Table 4-9. Commercially Important Invertebrates in the Northeast Region.

Common Name	Species Name	Status[1]	Distribution[1]
Long-Finned Squid	*Loligo pealei*	Fully Exploited	Nova Scotia - Cape Hatteras
Short-Finned Squid	*Illex illecebrosus*	Underexploited	Newfoundland - Cape Hatteras
American Lobster	*Homerus americanus*	Overexploited	Labrador - Cape Hatteras
Northern Shrimp	*Pandalus borealis*	Fully Exploited	Northern Gulf of Maine
Surf Clam	*Spisula solidissima*	Fully Exploited	Southern Gulf of St. Lawrence - Cape Hatteras
Ocean Quahog	*Arctica islandica*	Fully Exploited	Newfoundland - Cape Hatteras
Sea Scallop	*Placopecten magellanicus*	Overexploited	Newfoundland - North Carolina

[1] Does not include any distributions outside the Atlantic Ocean. Data are from NOAA (1995a).

Table 4-10. Commercially Important Invertebrates in the Southeast Region.

Common Name	Species Name	Status	Distribution
White Shrimp	*Penaeus setiferus*	Not Available	South Carolina - Georgia
Brown Shrimp	*Penaeus aztecus*	Not Available	North Carolina - South Carolina
Spiny Lobster	*Panulirus argus*	Overexploited	Florida
Stone Crab	*Menippe* spp.	Fully Exploited	Cape Hatteras - South

description of important biological information on the endangered and threatened species that could be impacted by USCG activities.

- **Bald Eagle *(Haliaeetus leucocephalus)*:** The bald eagle is the only representative of the sea eagles found in North America (SC DNR, 1985). The decline of the bald eagle was primarily caused by the increased use of the pesticide DDT. Since the implementation of restrictions on the use of DDT, the number of bald eagles has increased (USFWS, 1990). In fact, the bald eagle has been downlisted from endangered to threatened in the lower 48 states (50 CFR Part 17). Bald eagles reside in coastal and non-coastal habitats. The northeast contains a large number of bald eagles that inhabit coastal or estuarine areas. Active bald eagle nests are located in coastal counties of several states. A major part of the diet of the bald eagle consists

of fish (SC DNR, 1985). During the winter, this diet is supplemented by birds and small mammals.

- **Peregrine Falcon *(Falco peregrinus)*:** The decline of the peregrine falcon was also primarily caused by the increased use of DDT (USFWS, 1991). Since the prohibitions on the use of DDT and other organochlorines in the early 1970s, the number of peregrine falcons has increased. In fact, the species has been proposed for delisting (Federal Register, July 12, 1995). Breeding in the northeast occurs from mid-March to early August; breeding in the south Atlantic begins earlier in the year. Peregrines in the eastern United States are year-round residents and are not considered migratory (USFWS, pers. comm., 1995). However, large numbers of peregrines that reside in the northern-most areas of North America (*e.g.*, Canada, Labrador, Greenland) use the Atlantic seaboard as a flyway during the winter and spring migrations to and from the Bahamas and Florida (USFWS, pers. comm., 1995). Because their diet may consist of seabirds, peregrines spend time foraging along the coasts and over open water.

- **Piping Plover *(Charadrius melodus)*:** This species is a shorebird that prefers areas with expansive sand or mudflats. The breeding and winter census data for the Atlantic coast population of piping plovers indicate that breeding is concentrated from Maine to North Carolina. The piping plover nests above the high tide line on coastal beaches, dunes, and sandflats. Breeding occurs between March and August. The southeastern United States coastline does not support large numbers of wintering birds; the majority of birds overwinter along the Gulf of Mexico. Piping plovers that winter on the east coast are found on barrier islands, sandy peninsulas, and near-coastal inlets. The plover's foraging area includes intertidal areas, mudflats, sandflats, and shorelines of coastal ponds, lagoons, or salt marshes. Plovers have been rarely sighted (inland or offshore) away from the outer beaches. Habitat loss and degradation and disturbance by humans are important factors contributing to the decrease in the piping plover population (USFWS, 1995).

- **Roseate Tern *(Sterna dougallii)*:** The roseate tern, which is exclusively marine and a colonial water bird, occurs all over the world, but breeds on islands in only two distinct locations (*i.e.*, two populations) in the northern hemisphere: from Maine, and some adjacent portions of Canada, to New York; Florida Keys to Lesser Antilles. As of 1994, there are 1150 pairs that reside (*i.e.*, non-wintering) along the east coast from Newfoundland to North Carolina. The population that breeds in the northeastern United States is classified as endangered. Although breeding may occur from New York to Maine, the majority of nesting occurs on two small islands — in Buzzards Bay, Massachusetts, and at the eastern tip of Long Island, New York. The decrease in the number of nesting sites is attributable to competition with black-backed gulls. The northeastern United States population lays eggs during May and June. The roseate tern forages over open water. It dives into the water to capture small schooling marine fish. Migration occurs between late August and September (USFWS, 1989).

- **Wood Stork *(Mycteria americana)*:** The wood stork is the only stork in the United States; it occurs south of Virginia. The wood stork is one of the largest wading birds. It feeds and nests in fresh, brackish, and saltwater environments. Nesting begins in December in Florida, and at later times in other areas. In 1986, the population was estimated to be approximately 5850 pairs nesting in Florida and Georgia. Since that time, nests have been observed in South Carolina (Cocker and Murphy, 1992).

State-Listed Endangered, Threatened, and Rare Species

Many species of birds are not on the Federal lists of endangered and threatened species; however, states may list species as endangered, threatened, or of special concern (*e.g.*, rare). The following list presents some of those species categorized by habitat, feeding habits, and other unique characteristics. Below is a general description of species of concern whose habitat includes the coast, shore, coastal estuaries, and the ocean.

- **Pelagic Seabirds:** The Atlantic coast supports several species of pelagic birds. These birds are present on the Atlantic coast, but breed in other hemispheres. Examples of pelagic birds include greater shearwater *(Puffinus gravis)*, sooty shearwater *(Puffinus gravis),* and the common loon *(Gavia immer)* (D. Pence, pers. comm., 1995).

- **Shorebirds:** Shorebirds inhabit open beaches, tidal flats, and marshes. Some species breed within inland areas. Shorebirds may be colonial or solitary in nesting habitat. The endangered piping plover is a shorebird. Other species included in this category are Wilson's plover *(Charadrius wilsonia)* and the willet *(Catoptrophorus semipalmalus)* (MMS, 1992; D. Pence, pers. comm., 1995).

- **Water Fowl:** The preferred habitat of water fowl includes coastal oceanic waters, bays, sounds, estuaries, lagoons, and tidal wetlands. The Atlantic coast contains areas defined as important water fowl habitat. One important area is Chesapeake Bay. Water fowl, as with shorebirds, breed within inland regions. Waterfowl include the American black duck (*Anas rubripes*), halequin duck *(Histrionicus histrionicus),* Canada goose *(Branta canadensis)*, common *(Somateria mollissima)* and king *(Somateria spectabilis)* eiders, and scoters [*e.g.*, black scoter *(Melanitta nigra)*] (MMS, 1992; D. Pence, pers. comm., 1995).

- **Colonial Water Birds:** This category includes many coastal birds. The endangered roseate tern is a colonial water bird. Wading birds, which walk through the water searching for prey, are also included in this category. Colonial water birds are distinguishable by the colonies of nests that they build along the coasts. Wading birds occur in all Atlantic coastal states, but prefer tidal creeks, ponds, marshes, mangrove flats, and similar shallow water habitats. Examples of colonial water birds are the brown pelican *(Pelecanus occidentalis)*, great blue heron *(Ardea herodias)*, black-crowned night heron *(Nycticorax violaceus)*, great egret *(Casmerodius albus),* snowy egret *(Egretta thula)*, glossy ibis *(Plegadis falcinellus)*, Leach's storm petral

(Oceanodroma leucorhoa), American oystercatcher *(Haematopus palliatus)*, gull-billed tern *(Stena nilotica)*, and least tern *(Sterna antillarum)*.

- **Raptors:** Raptors hunt for food while in flight; many species hunt for food along the coast. The bald eagle is included in this category. The northern harrier *(Circus cyaneus)*, osprey *(Pandion haliaetus)*, peregrine falcon, and bald eagle, which are threatened, and the short-eared owl *(Asio flammeus)* are raptors that are found along the coast.

- **Marsh Birds:** Marsh birds are found in shallow estuaries where they feed and breed. The king rail *(Rallus elegans)* and the black rail *(Laterallus jamaicensis)* are marsh birds that are of special concern.

- **Song Birds:** The coastal environment is also the home to song birds. Two examples of song birds found in the coastal environment are the sharp-tailed sparrow *(Ammospiza caudacuta)* and the seaside sparrow *(Ammospiza maritima)*.

The USCG will work closely with the U.S. Fish and Wildlife Service (USFWS) to develop and document procedures for eliminating or minimizing any impacts to endangered and threatened species, and species of special concern.

4.2.7 Other Species

USCG has in place or develops procedures for specific operations (e.g., response to oil spills) to protect endangered, threatened, and rare species not included in this EA.

4.2.8 Marine Sanctuaries, Critical Habitats, Areas of Intermittent Protected Species

Table 4-11 lists marine sanctuaries, national wildlife refuges, national parks, and other Federally protected areas where the USCG will take appropriate action as described in the Proposed Action. The location of the nests will be considered areas of intermittent use by protected species and the USCG activities in these areas will be conducted as described in the Proposed Action.

To eliminate and minimize impacts to birds, the USCG will request the location of nests for the endangered, threatened, and species of special concern during consultations with the USFWS.

4.3 Socioeconomic Environment

4.3.1 Fisheries

Commercial

Data on the socioeconomic aspects of commercial fisheries have been collected for many years. The NMFS annually produces the report "Fisheries of the United States" which includes data on commercial (United States and foreign) and recreational fishing, and

Table 4-11. Federally Protected Areas by State.

State	Protected Areas
Delaware	Prime Hood National Wildlife Refuge
Florida	Gray's Reef Marine Sanctuary St. Johns National Wildlife Refuge Merrit Island National Wildlife Refuge Archie Carr National Wildlife Refuge Pelican Island National Wildlife Refuge Hobe Sound National Wildlife Refuge Loxahatachee National Wildlife Refuge (Inland Lake) Biscayne National Park Crocodile Lake National Wildlife Refuge Key Largo National Marine Sanctuary National Key Deer National Wildlife Refuge Looe Key National Marine Sanctuary Great White Heron National Wildlife Refuge
Georgia	Tybee National Wildlife Refuge Savannah National Wildlife Refuge Wassaw National Wildlife Refuge Harris Neck National Wildlife Refuge Blackbeard Island National Wildlife Refuge Wolf Island National Wildlife Refuge Cumberland Island National Seashore
Maine	Moosehorn National Wildlife Refuge Cross Island National Wildlife Refuge Petit Manan National Wildlife Refuge Acadia National Park Seal Island National Wildlife Refuge Franklin Island National Wildlife Refuge Pond Island National Wildlife Refuge Rachel Carson National Wildlife Refuge
Maryland	Chincoteague National Wildlife Refuge
Massachusetts	Thacher Island National Wildlife Refuge Parker River National Wildlife Refuge Stellwagen Bank National Marine Sanctuary Cape Cod National Seashore Monomoy National Wildlife Refuge Nantucket Island National Wildlife Refuge Massoit National Wildlife Refuge Nomans Land Island National Wildlife Refuge
New Jersey	Edwin B. Forsythe National Wildlife Refuge Cape May National Wildlife Refuge

Table 4-11. Federally Protected Areas by State.

State	Protected Areas
New York	Fire Island National Seashore Gateway National Recreation Area
North Carolina	Mackay Island National Wildlife Refuge Currituck National Wildlife Refuge Cape Hatteras National Seashore Pea Island National Wildlife Refuge Alligator River National Wildlife Refuge Mattamuskett National Wildlife Refuge Swanquarter National Wildlife Refuge U.S.S. Monitor National Marine Sanctuary Cedar Island National Wildlife Refuge Cape Lookout National Seashore
Rhode Island	Sachuest Point National Wildlife Refuge Pettaquamscutt Cove National Wildlife Refuge Truston Pond National Wildlife Refuge Block Island National Wildlife Refuge Ninigret National Wildlife Refuge
South Carolina	Cape Romain National Wildlife Refuge Ace Basin National Wildlife Refuge (Inland Lake) Pinckney Island National Wildlife Refuge
Virginia	Wallops Island National Wildlife Refuge Eastern Shore of Virginia National Wildlife Refuge Fisherman Island National Wildlife Refuge Back Bay National Wildlife Refuge

associated activities (*e.g.*, supply of fishery products, cold storage) for the United States and the world. The data presented herein is from the report produced for 1992 and 1993 (NMFS, 1994). The most recent data for landings (*i.e.*, brought into port), and value of landed fish and shellfish in the eastern United States regions (New England, Middle Atlantic, Chesapeake, and South Atlantic) are provided for 1992 and 1993. Landings in 1992 totalled more than 1.8 billion pounds and were valued at approximately $1 billion. In 1993, the weight of fish (1.9 billion pounds) increased, but the value ($1 billion) remained approximately the same. The number of vessels participating in the commercial fishing industry is provided for 1992, the most recent year for which data are available (see Table 4-12). In the northeast region (Maine to Virginia), 4656 vessels (>5 net registered tons) and 18,577 boats (<5 net registered tons) participated, for a total of 23,233 craft. In the south Atlantic region (North Carolina to Florida), 3926 vessels and 16,033 boats participated, for a total of 19,959 craft. The yearly employment for 1992 generated by the processors and wholesalers is summarized by region: 8281 in New England (Maine to Connecticut); 8870 in Middle Atlantic (New York to Virginia); and 6445 in the South Atlantic.

Table 4-12. Commercial Fishing Vessels (>5 Tons), Fishing Boats (<5 Tons) and Total Boats Registered by the USCG in the Atlantic Coast States of the United States in 1992. The total boats includes registered freshwater and marine recreational vessels.

State	Commercial Fishing Vessels	Commercial Fishing Boats	Total Boats Registered
Maine	1,761	5,598	112,9810
New Hampshire	139	474	79,379
Massachusetts	858	4,634	145,991
Rhode Island	253	2,751	31,966
Connecticut	128	442	97,618
New York	692	2,931	438,342
New Jersey	487	1,392	156,288
Total 1st District	4,318	18,222	964,947
Delaware	25	349	40,288
Maryland[1]	68	--	180,391
Virginia[1]	245	6	206,369
North Carolina	960	5,257	283,396
Total 5th District	1,298	5,612	710,444
South Carolina	376	969	351,753
Georgia	326	398	283,898
Florida[2]	2,264	9,409	702,652
Puerto Rico	NA	NA	36,648
U.S. Virgin Islands	NA	NA	7,777
Total 7th District	2,966	10,776	1,382,728
Total	8,582	34,610	3,155,737

[1] Only data collected for Federal waters are available. Inshore data are not available.
[2] Includes both Atlantic (east) and Gulf of Mexico (west) coasts.
NA = No data available.

Recreational

Marine recreational fishery statistics have been collected continuously and systematically since 1979. The NMFS produces an annual report, "Marine Recreational Fishery Statistics

Survey, Atlantic and Gulf Coasts," which includes comprehensive data on the recreational fishery and its participants (*e.g.*, age, number of fishing trips). The preliminary 1993 data are presented in the "Fisheries of the United States" (NMFS, 1994). The estimated total number of fish caught in the North, Mid-, and South Atlantic recreational fisheries totals 131 million. These fish were caught during 31,239 fishing trips by coastal, non-coastal, and non-resident
recreational fishing participants. These fish were caught from shore (14 million), party/charter boats (3 million), and private/rental boats (15 million). Approximately one-third of all fishing trips takes place in the South Atlantic (North Carolina to Florida).

4.3.2 Shipping

The western North Atlantic is also heavily used by commercial ships. The number of commercial vessels using the area has doubled since 1960. However, during the same time period, the level of port traffic has actually decreased, possibly because of increases in vessel sizes and loads (A. Knowlton, pers. comm., 1995). In 1989, there were more than 50,000 large merchant vessel visits to Atlantic ports and channels. The majority of these visits was to ports in the Seventh USCG District.

5. ENVIRONMENTAL CONSEQUENCES OF PROPOSED AND ALTERNATIVE ACTIONS

The purpose of this section is to identify the direct and indirect environmental impacts of the proposed and alternative actions, the significance of these impacts, and the means to mitigate or monitor any adverse environmental impacts. The effects discussed below will primarily be direct effects; indirect effects are typically associated with actions such as construction, which are addressed in separate environmental assessments or environmental impact statements (COMDTINST M16475.1).

5.1 Environmental Consequences of Alternative 1

No Action.

5.1.1 Consequences of Alternative 1 on the Physical Environment

The USCG performs a wide variety of operations in coastal and offshore waters of the U.S. Atlantic coast. Operations that may lead to biologically and ecologically significant alteration of the physical environment include coastal and nearshore engineering projects, such as construction of USCG stations and aids to navigation, and to a lesser extent routine boat operations in coastal waters. All shore-based USCG operations conducted along the coast comply with environmental laws for point source and storm water discharge.

Coastal and nearshore engineering projects may possibly alter critical habitat for protected species of marine mammals, birds, and turtles and commercially important fishery resources. Because these engineering activities may affect the marine environment and the biological resources it supports, the USCG, under the National Environmental Policy Act (NEPA), is required to perform an environmental assessment (EA) or an environmental impact statement (EIS) for all major construction, repair, and maintenance projects performed in areas important to protected or commercially important species. These requirements are described in USCG document COMDTINST M16475.1. Because these activities are covered by individual operation-specific EAs or EISs, they will not be considered further here.

Other missions and operations of the USCG in waters of the U.S. Atlantic Ocean, including marine environmental protection, marine safety and security, aviation, law enforcement, search and rescue, maintenance of aids to navigation, and vessel traffic control, do not ordinarily lead to direct physical alteration of the coastal and offshore marine environment. However, operation of propeller-driven craft in shallow water may resuspend bottom sediments, resulting in increases in turbidity in the water, reducing overall water quality. Boat wakes may erode shoreline, particularly along steep-walled channels that are not protected by breakwaters or riprap. In many coastal waterways, such as the intracoastal waterway, vessel lanes are clearly defined with aids to navigation and speed limits are posted for vessels to minimize sediment resuspension and shoreline erosion. The USCG, in regulating vessel traffic and enforcing speed limits in coastal waters, assists in minimizing physical damage to the marine environment resulting from routine commercial and recreational boat operations. The relative contribution of USCG vessels to the total vessel

traffic in nearshore coastal waters under current operating conditions is so small that, if USCG vessels remain in designated vessel traffic lanes and obey local speed limits except when required to do otherwise in emergency operations, they contribute very little to physical alteration of coastal environments through sediment resuspension and shoreline erosion.

All motor vessels are at risk of releasing fuel to the marine environment through operational accidents (groundings and collisions) or during refueling operations. The number of releases of crude and refined petroleum products and the total volume released each year to U.S. territorial waters varies widely. There were 4,841 to 10,644 recorded releases each year between 1973 and 1993 of crude or refined oil to U.S. waters. The total volume of petroleum products released ranged from 1.88 million gallons (1992) to 21.52 million gallons (1975). Each year, approximately 80 percent of the releases involved less than 100 gallons of petroleum product. There were very few releases associated with USCG operations between 1973 and 1985 (the years for which USCG data are available). The recorded amount of oil released each year during USCG operations has ranged from 0 gallons (1973) to 5,092 gallons (1979), with an average of 4 to 74 gallons per release in different years.

USCG operations contributed well under 0.1 percent to the total volume of petroleum products released to U.S. territorial waters each year. Most releases from USCG operations were small (< 100 gallons) and were of engine fuel (gasoline or diesel fuel). Small spills of these light fuels are not persistent in the marine environment (Neff, 1990). Virtually all the hydrocarbons from small gasoline releases on water and most of the hydrocarbons from small diesel fuel releases on water evaporate quickly (Stiver and Mackay, 1984; Edgerton *et al.*, 1987). Small releases (< 100 gallons) of light fuel oils rarely cause lasting injury to the marine environment or its biological resources (NRC, 1985; Volkman *et al.*, 1994), and affected resources recover rapidly (Meilke, 1990).

Another source of contamination of the marine environment from motor vessel operations is from engine exhaust emissions. The chemicals of major environmental concern in engine exhaust are polycyclic aromatic hydrocarbons (PAHs) and related heterocyclic compounds, some of which are procarcinogens (Neff, 1979). Concentrations of PAHs in the exhaust emissions of properly tuned gasoline and diesel engines are very low and are derived primarily from traces of unburned fuel (Tancell *et al.*, 1995). Most are tightly bound to soot particles and are not bioavailable to marine organisms (Neff, 1979). However, two-stroke gasoline engines of the type used in most outboard motors emit much higher concentrations of hydrocarbons, including PAHs, than more conventional four-stroke gasoline engines or diesel engines (Wachs and Wagner, 1990; Wachs *et al.*, 1992; Jüttner, 1994). This is caused by inefficient combustion of the gasoline/lubricating oil mixture.

The contribution of hydrocarbons from vessel engine exhaust to the total load of hydrocarbons, including PAHs, in coastal marine waters is not known. It is likely to be environmentally significant only in small, enclosed water bodies with little flushing in which there is intensive outboard motor boat activities (Wachs *et al.*, 1992). Relatively few USCG vessels are powered by two-stroke outboard motors, and USCG vessels in general are kept in good running order. Therefore, it is unlikely that routine USCG operations contribute more

than a trace amount to the marine environmental load of petroleum hydrocarbons from engine exhaust.

5.1.2 Consequences of Alternative 1 (No Action) on the Biological Environment

The major, potentially adverse effects of this action on the biological environment are collisions of aircraft or vessels with wildlife; and physical and acoustic harassment of wildlife due to the presence of aircraft, vessels, USCG stations and the personnel required to operate them. This alternative may also have a positive impact on the biological environment through the numerous actions the USCG has undertaken to protect and enhance endangered and threatened species, and through law enforcement efforts. The following is a description of these potential positive and negative impacts. Because this alternative action is quite broad and involves a very large geographic area, the discussion of potential effects on biota will be general in nature and will concentrate on the species most likely to be impacted.

Collision of Vessels or Aircraft with Wildlife
The majority of USCG activities are vessel based and, therefore, it is possible that a vessel collision with wildlife could occur. Encounters with large vessels are particularly problematic for whales, manatees, and turtles because collisions are often deadly. Aircraft collisions with wildlife, other than birds, are unlikely and, therefore, will not be addressed in great detail in this section.

Vessel strikes are a significant source of mortality for inshore species of baleen whales (Kenney and Kraus, 1993; Wiley *et al.*, 1995; NMFS, 1991a,b) and there is some evidence of increased incidents of ship collisions in northeastern U.S. waters (NMFS, 1991b; Wiley *et al.*, 1995). Of special concern are vessel collisions with the critically endangered right whale. Twelve percent of all photo-cataloged right whales have scars from ship propellers (S. Kraus, pers. comm., 1995), and 27% of right whale mortalities documented between 1970 and 1993 were due to collisions with ships (Kenney and Kraus, 1993). Lately, research has pointed to ship-whale interactions as a possible barrier to the recovery of this species (Reeves *et al.*, 1978; Kraus *et al.*, 1988; Kraus, 1990). There are 19 confirmed or probable ship strikes of right whales, including six each in New England waters and off Georgia/Florida (A. Knowlton, pers. comm. 1995). As has been documented for bowhead whales (George *et al.*, 1994), the size and extent of scarring among right whales indicates that collisions are primarily with large vessels such as container ships, tankers, or military vessels. These collisions are fatal to right whales approximately 19% of the time (Kraus, 1990). Thirty percent (6/20) of humpback whales stranded along the middle and south Atlantic coasts of the United States had evidence of injuries from ship strikes (Wiley *et al.*, 1995). Between 1980 and 1994, there are nine records of collisions of ships with fin whales or evidence of propeller scars on fin whales (NMFS, 1994). Major shipping lanes into Massachusetts, New Hampshire, and Maine cross many cetacean high-use areas such as the Great South Channel, Stellwagen Bank, and Jeffreys Ledge (NMFS, 1991b). Right whales monitored by satellite telemetry frequently swam through or near the shipping lanes off Boston, Portland, Maine, and New York City (Mate *et al.*, 1992).

The USCG is active in many of the cetacean high-use areas off the U.S. coast because these areas are also used extensively by commercial ships, fishermen, and recreational boaters. The species likely to be encountered during routine missions are fin whales, humpback whales, and right whales. USCG interactions with blue, sei, and sperm whales are unlikely. The USCG has reported that its vessels have been involved in two collisions with whales, one confirmed to have been a right whale. This represents about 5% of the total recorded ship–whale collisions reported in the western North Atlantic for the three species of protected baleen whales.

There is no indication in the published literature that collisions with vessels are a significant source of injury or mortality for pinnipeds (NMFS pers. comm., 1995; MMC pers. comm., 1995). Pinnipeds are not particularly vulnerable to ship collisions because of their relatively small size, high-speed swimming, and maneuverability. There are few reports of collisions between motor vessels of any size and pinnipeds, and there are no reports of collisions of USCG vessels and pinnipeds in U.S. Atlantic waters. Thus, it is unlikely that USCG vessel operations contribute significantly to the impact of human activities on pinnipeds.

The largest single anthropogenic source of mortality in manatees is collision with boats, primarily vessels exceeding 7.3 m (24 ft) with inboard motors and propellers more than 38 cm (15 in) in diameter. Most manatee deaths are due to impact of the vessels, not propeller wounds. Eighty percent of all deaths from boat/barge collisions occur in eastern Florida, particularly in Brevard County and the St. Johns River (O'Shea *et al.,* 1985). Collisions with seaplanes can also be deadly for manatees (Florida DEP pers. comm., 1995). Again, because of the nearshore distribution of manatees, USCG operations overlap with a significant portion of manatee high-use areas. In addition, most USCG vessels exceed 7.3 m (24 ft); therefore, collisions, if they occur, could potentially be fatal. However, there are no documented reports of collisions of USCG vessels with manatees. No-wake rules for motor vessels are in place in most manatee high-use habitats, and are intended to keep vessel speeds low enough that collisions are less likely and injuries less serious. The USCG observes these rules in posted areas and maintains a lookout as required on all vessels underway. The USCG also reviews permits for marine events in manatee habitat, and must consider the manatee collision hazard that such an event may pose.

Between 1987 and 1993, up to 17% of all stranded sea turtles had boat-related injuries. Ship strikes appear to be a significant source of mortality for sea turtles, and vessel-related injuries have increased in recent years (Teas, 1994a,b). Of the four species of sea turtles that occur along the east coast of the United States, the loggerhead and green turtles appear to be the most susceptible to collisions with boats. USCG high-use areas overlap with areas important for sea turtle nesting and feeding. Therefore, there is potential for adverse vessel–turtle interactions.

However, the major cause of human-induced mortality among sea turtles in coastal waters of the U.S. Atlantic Ocean is entanglement or entrapment in fishing gear, particularly shrimp trawls. Many thousands of turtles die each year through entanglement. There are no reports of injury or death of sea turtles in the western North Atlantic as a result of collisions with

USCG vessels. On the contrary, it is likely that USCG enforcement of TED regulations in the Atlantic Ocean significantly reduces the injury and mortality of sea turtles.

Marine and coastal birds are not vulnerable to collision with USCG or other motor vessels on the water. However, they are vulnerable to collisions with low-flying aircraft. Low-flying aircraft can startle many species of birds, flushing them from their nests which may result in collisions with the aircraft. Bird strike potential is greatest in areas used by birds for foraging or resting, such as wetlands, or in migration corridors and at low altitudes (<3000 ft; USAF, 1988 cited in GAANG, 1995). Of particular concern, due to their habits of nesting or feeding in large groups, are colonial waterbirds and waterfowl. If startled, flocks of colonial birds may fly up into the path of low-flying aircraft. Collisions with these species can be lethal not only to the birds but also to those operating the aircraft. Low-flying fixed-wing aircraft are much more likely than helicopters to collide with birds. Encounters are more likely during aircraft take-offs and landings than when the aircraft is in level, low-altitude flight, as may occur during a SAR patrol. The USCG operates only 17 fixed-wing aircraft along the U.S. Atlantic coast. Most missions of the larger aircraft are flown at altitudes above 500 ft, usually higher than 3000 ft. The number of USCG fixed-wing aircraft and total sortie time is small in comparison to the total numbers of private and commercial fixed-wing aircraft operating along the Atlantic coast. There are no records of collisions of marine birds with USCG aircraft.

There is no indication in the published literature that collisions with vessels are a significant source of injury or mortality for invertebrates and fish. Most invertebrates and fish live sufficiently far below the surface of the water to avoid physical interaction with ships. In addition, the only endangered species of fish in the area, the short-nosed sturgeon, has not been found in marine waters in several years (NOAA, 1995a) and, therefore, interaction with USCG vessels is unlikely. Obviously, collisions between aircraft and marine invertebrates and fish is extremely unlikely.

Physical and Acoustic Disturbance from Vessels, Aircraft, or Human Presence

The USCG operates more than 240 vessels and 50 aircraft in fulfilling its obligations along the Atlantic coastline. During these operations, wildlife may be disturbed due to the sounds produced by these craft, the physical presence of these craft, or the presence of USCG stations and the personnel required to operate them. It is unclear whether the noise from aircraft or their physical presence is the primary source of disturbance for wildlife. The altitude, speed, type of aircraft, and the shadow they cast all affect the reactions of wildlife to aircraft. USCG vessels add noise to an already noisy environment. Vessel size, hull construction, speed, maintenance, and other factors all affect the noise a vessel produces (Table 5-1). Generally, as the size, load, and speed of a vessel increase, so does the noise it generates (Richardson *et al.*, 1991). USCG stations are located primarily along the shoreline, and human activity associated with the station may affect wildlife in the area. Overall, the effects of disturbance on wildlife usually are temporary (Ellis *et al.*, 1991).

Table 5-1. Maximum Broad-Band (20-1000 Hz) Sound Pressure Source Levels for Different Types of Natural Ambient Noise in the Marine Environment. From Richardson *et al.* (1991), McCauley (1994), and Advanced Research Projects Agency (1995).

Noise Source	Maximum Source Level (dB re 1 μPa @ 1 m)	Remarks
Undersea Earthquake	272	Magnitude 4.0 on Richter scale (energy integrated over 50-Hz band width)
Seafloor Volcanic Eruption	255+	Massive steam explosions
Lightning Strike on Water Surface	250	Random events during storm at sea
Baleen Whales	to 188	<2000 Hz simple and complex calls, clicks, pulses, knocks, grunts, moans
Swimbladder Sounds of Fish	~140	Marked spectral peaks in 50-3000 Hz range
Dugong	<90	2000-5000 Hz simple chirps and squeaks
Total Open-Ocean Ambient Noise	74-100	Estimate for offshore central California, sea state 3-5; expected to be higher (≥120 dB) when vessels are present
Rain Storm	80	Heavy rain shower, flat frequency spectrum
Wind	66	Force 3 wind over water

The total ambient noise in the open ocean is about 74 to 100 dB re 1 μPa (Table 5-1). However, several natural sound sources, such as earthquakes, lightning strikes, and some biological noises, may temporarily increase natural ambient noise above these levels.

Sound spectra of aircraft and vessel noises in water are in the general range of natural ambient noises. Small helicopters and fixed-wing aircraft have maximum source levels in the range of 156 to 186 dB re 1 μPa at 1 m in air. At or just below the sea surface under the aircraft, the received sound levels usually are about 160 dB re 1 μPa or less with peak intensity near 100 Hz (Table 5-2).

Vessel noises, caused by the turning of the screws, engine noises, and noises of operating machinery on board, generally fall in the range of 5 to 2000 Hz, with highest intensities

Table 5-2. Dominant Frequency and Maximum Sound Pressure Level of Sounds from Different Types of Aircraft. Values represent the sound levels received at the water's surface directly below the aircraft flying at 1000 ft (300 m) altitude under "Standard Day" conditions (15°C, 70% relative humidity). From Richardson and Malme (1993).

Aircraft Type	Dominant Frequency (Hz)	Maximum Sound Pressure (dB re 1 μPa)
Boeing 737 two-engine jet (take off)	125	130
Boeing 737 two-engine jet (cruise)	160	104
DHC-6 two-engine turboprop. (cruise)	160	103
Cessna 172 light one-engine prop. (cruise)	125	96
Bell 212 (UH-1N) turbine helicopter (cruise)	20	104
Bell 222 turbine helicopter (take off)	125	96
Bell 222 turbine helicopter (approach)	160	105
Bell 206B (OH-58) (cruise)	200	95
Sikorsky S61 (HH-3F) (cruise)	40	102

below 100 Hz (Scrimger and Hietmeyer, 1991). Sound intensity, particularly at higher frequencies, tends to increase with the size of the vessel. Supertankers and large container ships may have a maximum broad-band sound source level of 190 to 200 dB re 1 μPa at 1m (Table 5-3). Small outboard motor vessels produce broad-band sounds of about 150 dB re 1 μPa at 1 m; these sounds are attenuated to the range of 85 to 140 dB re 1 μPa at a distance of 50 m from the source (Richardson *et al.,* 1991).

Most marine animals can perceive underwater sounds over a broad range of frequencies from about 10 Hz to more than 10,000 Hz. Peak acoustic sensitivity of most invertebrates, fish, sea turtles, and baleen whales is below about 1000 Hz; for most toothed cetaceans, pinnipeds, manatees, and sea birds, hearing is best at frequencies above 1000 Hz (McCauley, 1994).

Most baleen whales respond to constant, low-frequency sounds with broad-band intensities of more than about 120 dB re 1 μPa (Advanced Research Projects Agency, 1995). Marine fish

Table 5-3. Estimated Peak ⅓-Octave Sound Pressure Source Levels for Vessels of Different Sizes and Speeds.

Vessel	Speed (knots)	Sound Pressure Level (dB re 1 μPa @ 1 m)	Reference
>250-m Large Oil Tanker	16	203	Cybulski, 1977
274-m Container Ship (23 Hz)	--	198	Richardson *et al.*, 1991
340-m Supertanker	20	190	Buck and Chalfant, 1972
WWII Battleship	20	183	Urick, 1983
337-m Tanker (20 Hz)	16	177	Cybulski, 1977
Icebreaker	10	174	Malme *et al.*, 1989
135-m Freighter	--	172	Richardson *et al.*, 1991
Large Ferry	16	171	Malme *et al.*, 1989
Tug and Loaded Barge	--	170	Miles *et al.*, 1987
210-m Container Ship	19	169	Jennette *et al.*, 1987
Cruise Ship	19	168	Malme *et al.*, 1989
20-m Tug and Empty Barge	--	166	Buck and Chalfant, 1972
200-m Roll On/Off	15	165	Jennette *et al.*, 1987
190-m Car Carrier	16	162	Jennette *et al.*, 1987
Tug and Barge	10	162	Malme *et al.*, 1989
34-m Twin-Diesel Tour Boat	10	159	Malme *et al.*, 1989
Fishing Trawler (transit)	10	158	Malme *et al.*, 1989
Fishing Trawler (trawling)	5	147	Malme *et al.*, 1989
16-m Crew Boat	--	156	Greene, 1985
7-m Boat with 2 x 80-hp outdrive	20	156	Malme *et al.*, 1982
8-m Boat with 260-hp outdrive	10	156	Malme *et al.*, 1982
4-m Boston Whaler/20-hp outboard	20	153	Malme *et al.*, 1982
5-m Zodiac with 20-hp outboard	20	152	Malme *et al.*, 1982
4-m Boat with 25-hp outboard	20	152	Malme *et al.*, 1982
20-m Tour Boat	10	150	Malme *et al.*, 1989
Small Boat with 18-hp outboard	5	150	Evans, 1982

and pinnipeds appear to have similar sound thresholds (Myrberg, 1990). However, actual thresholds for behavioral responses to sounds in the natural environment depend on the level of natural ambient noise. Whales and other marine mammals apparently are able to distinguish sounds in their optimum frequency range that are 10 to 20 dB re 1 μPa above ambient noise at the same frequency (Richardson *et al.,* 1991). The threshold intensity of constant or impulsive sounds for injury to the hearing apparatus of marine mammals and turtles is about 200 to 220 dB re 1 μPa. Strong startle responses have been observed in fish at sound pressure levels of 200 to 205 dB re 1μPa (McCauley, 1994).

Numerous studies have attempted to document the effects of ships on cetaceans (Richardson *et al.,* 1991; 1986; 1985). It is likely that whales react primarily to the noise generated by vessels, not to their physical presence. Numerous studies have attempted to document the effects of ships on cetaceans (Richardson *et al.,* 1991; 1986; 1985). It is likely that whales react not to the physical presence of the ship but to the noise generated by it. There are conflicting reports of the short-term effects of ship engine noise on marine mammals (*i.e.,* some species of whales react to noise at great distances, some do not). There is some limited evidence that abrupt changes in vessel RPMs may disturb whales (Watkins, 1986); however, it appears that they readily acclimate to the noise in their environment. Overall, reactions to human-generated noise vary not only between species, but also within species (Richardson *et al.,* 1991). Some studies indicate that whales may react to short-term acoustic disturbances by moving away from the sound source, changing breathing and diving patterns, or through possible agonistic displays (NMFS, 1991b). Reactions have been documented as far as 4 km from the vessel (Ljungblad *et al.,* 1988; MMS, 1992). Studies off the California and Alaska coastlines have shown that most species of cetaceans adjust to the presence of drilling equipment (Geraci and St. Aubin, 1987). However, studies of bowhead whales in the Arctic indicate that individuals will often change course and behavior when exposed to active rigs and seismic vessels (Ljungblad *et al.,* 1988; Richardson *et al.,* 1985; 1986). Bowhead whales in the Beaufort Sea react, at least briefly, to aircraft, ships, seismic exploration, marine construction and offshore drill sites (Richardson and Malme, 1993). To date, there is no conclusive evidence that this short-term disturbance leads to long-term effects on individuals or populations (Richardson *et al.,* 1991). Proposed studies of marine mammal reactions to low-frequency noise are currently under review.

Most USCG vessels are generally less than ~100 ft in length and, therefore, probably generate sound pressure source levels of 160 dB re 1 μPa at 1 m or less. The larger USCG cutters may generate source pressures of 160 to 170 dB re 1 μPa at 1 m. A low-frequency, 160 dB re 1 μPa sound attenuates with distance to about 120 dB re 1 μPa at about 2 miles from the source. Thus, sounds of USCG vessels will be readily audible to baleen whales, pinnipeds, fish, and possibly sea turtles over a large area of the ocean.

Cetacean reactions to aircraft are inconsistent and appear to depend on the behavior of individuals at the time, weather conditions, and the loudness and speed of the aircraft. Feeding and socializing whales appear less disturbed by aircraft than whales engaged in other activities (Richardson *et al.,*1991).

NMFS guidelines recommend maintaining an altitude of at least 305 m (1000 ft) to minimize the impact of aircraft on marine mammals. However, during some USCG operations, particularly SAR missions, it may be necessary to fly lower than 1000 ft, and often lower than 500 ft, to drop rescue equipment, to search for a missing persons in the water, or to recover persons from the water. Such operations have the potential to disturb cetaceans. Aircraft disturbance usually is short lived in nature and; therefore, the long-term effects are likely to be minimal in all but extreme circumstances.

Vessels may physically displace some species from feeding areas and may interrupt breeding activities if a ship makes repeated approaches or if vessel traffic is dense. There is some evidence that cetaceans have been displaced from traditional feeding and wintering areas due to increased vessel traffic in the area (Baker *et al.*, 1982; Forestell, 1986). Ironically, individuals may also be habituated or "attracted" to boats (Watkins, 1986).

Vessels may physically displace some species from feeding areas and may interrupt breeding activities if a ship makes repeated approaches or if vessel traffic is dense. There is some evidence that cetaceans have been displaced from traditional feeding and wintering areas due to increased vessel traffic in the area (Baker *et al.*, 1982; Forestell, 1986). Ironically, individuals may also be habituated or "attracted" to boats (Watkins, 1986).

Little is known about the effects of acoustic stimuli on pinnipeds. The noise from low-flying aircraft or vessel traffic may disturb hauled-out seals, resulting in possible stampedes, as discussed above under physical harassment. There is limited evidence of behavioral disruption in pinnipeds due to low-frequency sound (Richardson *et al.*, 1991). The acoustic disturbances produced by USCG aircraft and vessels are likely to be of short duration, as opposed to longer-term noise from drilling or seismic activities. Mate and Harvey (1987) report that seals and sea lions are initially startled by "seal bombs" but quickly tolerate this intense underwater sound if they learn that there is no threat associated with the noise. Although USCG vessels may pass close to haul-outs and rookeries, pinnipeds appear quite tolerant of noise overall, and populations appear to be on the increase on the east coast (Gilbert, 1995).

The effects of aircraft on the behavior of pinnipeds has not been well studied. Individuals appear to be most sensitive to low-flying aircraft when they are already stressed (*i.e.*, when hauled out for pupping or molting). Disturbed individuals may rush into the water, crushing pups as they go. Mothers may abandon their pups if disturbed during the first three weeks of nursing. Seals and sea lions may abandon traditional haul-out sites and breeding areas when frequently disturbed (Johnson, 1977). In addition, the regrowth of hair and skin may be slow if molting individuals are repeatedly disturbed (Geraci and St. Aubin, 1980). There are conflicting reports of the effects of human disturbance on pinnipeds (Richardson *et al.*, 1991; Frost and Lowry, 1988; Gales, 1982). However, pinnipeds are quite common in areas of human and industrial activity, and may habituate to disturbance.

The effects of ship traffic on pinnipeds are similar to those listed above for aircraft. Currently, there is no evidence of permanent displacement or any long-term adverse impact on pinnipeds due to shipping activities (MMS, 1992).

Although manatees can react to low-flying aircraft, this disturbance is not considered a significant threat to the overall health of manatee populations (K. Frohlich, pers. comm., 1995). Due to their coastal habitat, manatees are often in areas with much boat traffic associated with fishing, skin diving, and recreational activities. It appears that they have habituated to the noise produced by such activities. As previously stated, such overlap can result in vessel–manatee collisions, which are often lethal for manatees. Disturbance due to vessel-based human activities can result in displacement from preferred habitat and can interrupt breeding activities (Rathbun and O'Shea, 1984). Numerous guidelines, such as no-wake zones and manatee protection zones, have been devised by USFWS and the Florida DEP to minimize the impact of humans on manatees. In addition, the USCG has developed procedures to mitigate any adverse effects of operations on manatees. Again, because of the nearshore distribution of manatees, USCG operations overlap with a significant portion of manatee high-use areas, and the potential for disturbance is high if mitigating measures are not in place.

Aircraft do not appear to be a significant source of disturbance for sea turtles, and it is not likely that physical harassment by USCG vessels is a significant source of disturbance for turtles. The sensitivity of sea turtles to acoustic disturbance has not been well studied. Turtles may use acoustic signals within their environment for orientation to natal beaches (Lenhardt *et al.*, 1983). In addition, loggerhead turtles swam towards the surface when exposed to low-frequency sounds (20-80 Hz, 175-180 dB) while underwater (Lenhardt, 1994). This could expose turtles to collisions with boats. However, typical vessel sounds do not seem to disturb sea turtles. Therefore, the noise added to the marine environment by USCG vessels is not likely to affect sea turtles.

One of the primary sources of anthropogenic mortality for marine turtles is disturbance or destruction of nesting habitat (NMFS, 1994). The five species of sea turtles found along the coast of the eastern United States nest on sandy beaches, habitat used heavily by humans. Construction of sea walls, beach erosion and artificial nourishment, artificial lighting, and vehicular traffic are a few of the obstacles faced by nesting sea turtles. Some USCG activities involve construction on sandy beaches; those actions are addressed in separate EA documents. USCG vehicular traffic on sandy beaches could destroy valuable nesting habitat. Artificial lighting, associated with USCG stations and docks, may adversely affect nesting success of adult females and survival of newly hatched turtles (Witherington, 1990; NMFS and USFWS, 1991).

The effects of vessel traffic on birds include the concerns outlined above. In addition, vessels could temporarily disrupt foraging seabirds. Overall, the responses of birds to disturbance is highly variable and depends on many factors, including the species, reproductive state, nesting habits, and distance from the disturbance (MMS, 1992). Disturbance of birds from low-flying aircraft can result in flushing from nests, feeding, and breeding areas. Eventually, such disturbance could lead to reduced reproductive success. Of primary concern are birds whose young or eggs are vulnerable because they build delicate nests, nest directly on cliffs, and/or incubate their eggs on their feet (*i.e.*, murres). Startled individuals may fly from the nest, and eggs and chicks may fall from the nesting area. In areas where gulls and corvids are common, predation may result in low reproductive success

when adults are startled from the nest (Hunt, 1987). Colonial species, or those that congregate in large groups to forage, are most vulnerable to aircraft. Of the birds Federally listed as endangered or threatened, the wood stork is most likely to be adversely affected by low-flying aircraft because it builds delicate nests in trees (USFWS pers. comm., 1995).

The USCG will continue the following efforts to enhance threatened and endangered species as summarized below:

- Revise area contingency plans (ACPs) as needed.
- Enforce fisheries regulations and Turtle Exclusion Devices (TED) regulations, and control of ship movements within U.S. waters.

5.1.3 Consequences of Alternative 1 (No Action) on the Socioeconomic Environment

The USCG has a significant positive impact on the socioeconomic environment. The various operations performed by the USCG are essential for the protection of human health, property, and the marine environment; for enforcement of state, Federal, and international laws; and for ensuring the security of the United States. In 1993, SAR operations saved 4689 lives nationwide. The USCG develops, establishes, maintains, and operates aids to maritime navigation, icebreaking facilities, education programs for safe boat handling, and rescue facilities. In addition, the USCG participates in enforcement and regulation of the billion dollar commercial and recreational fishing industry. The cumulative economic impact of these activities is difficult to estimate, but likely amounts to billions of dollars per year.

5.1.4 Cumulative Effects of Alternative 1 (No Action) on the Physical, Biological and Socioeconomic Environment

USCG activities along the U.S. Atlantic coast that may result in harm or disturbance to the marine environment and the biological resources it supports are primarily vessel and aircraft operations in support of the various missions of the USCG as mandated in many U.S. laws and regulations. Although the USCG performs or participates in various construction activities in the coastal zone (construction and maintenance of USCG facilities and certain aids to navigation), specific environmental assessments or environmental impact assessments are prepared for these activities, as described in COMDTINST M16475.1. Therefore, potential cumulative effects of USCG construction activities will not be described here.

The cumulative impact of USCG operations on the physical environment should be minimal. The USCG is in compliance with existing environmental laws. The wake caused by USCG vessels will continue to be a contributing factor in shoreline erosion. However, the contribution of USCG vessels to this problem is small compared to the number of non-USCG vessels contributing to shoreline erosion. The USCG vessels regularly undergo scheduled maintenance, which improves fuel efficiency and minimizes emissions. Implementation of this alternative will not significantly affect the physical environment now or in the future.

Routine vessel and aircraft operations that would be carried out in Alternative 1 have the potential to adversely affect marine life and coastal birds through direct collision, resulting in injury or death, and physical and noise disturbance, possibly resulting in altered feeding and social behaviors, displacement from favored habitats, or chronic sublethal injury. These potential effects of USCG activities are superimposed on a wide variety of commercial and recreational activities in U.S. coastal waters that, taken together, may produce adverse cumulative effects in marine and coastal animals and their habitats. The contribution of USCG vessel and aircraft activities to cumulative effects of human activities and natural events on marine animals and birds, with emphasis on protected species, is discussed below.

One of the primary threats to the health of many populations of aquatic protected species such as right whales, humpback whales, manatees, and turtles, is collisions with ships, because collisions are often fatal or produce serious injuries. USCG vessels rarely collide with wildlife, and USCG vessels of all sizes on the U.S. Atlantic coast represent $<0.01\%$ of total small craft and $<0.5\%$ of the large vessels that operate in U.S. Atlantic coastal waters each year. Current operations will therefore have little negative impact on the future of most endangered and threatened species. However, there have been 2 collisions of USCG vessels with whales in the last five years; at least one of these collisions resulted in the death of a right whale. Because the population is at a low level (<350 animals), continuing activities which do not focus on minimizing potentially adverse interactions with right whales is unacceptable in light of the need to protect right whales and other protected species.

There is no danger of physical contact or collision of USCG vessels and aircraft with marine plankton, invertebrates, and fish. Human-induced injury to these marine biological resources results from overfishing, pollution, and habitat alteration. USCG operations do not contribute to cumulative impacts of human activities on these biological resources. Instead, several marine safety and environmental law enforcement activities performed by the USCG contribute to mitigation of environmental harm from other human activities.

Entanglement or entrapment in fishing gear is also a threat to the future of protected species, especially cetaceans, pinnipeds and sea turtles. USCG enforcement efforts of fishing regulations, particularly TED regulations, will benefit the future of protected species affected by these regulations. Other USCG actions, such as responding to pollution events, will also help mitigate environmental harm from other human activities such as commercial and recreational boating. The contribution of funds to efforts such as aerial surveys for right whales should also result in a positive effect on the species.

Deterrence of marine animals from preferred habitats by the physical presence of USCG vessels and aircraft does not appear to be a serious problem. Because of their relatively small numbers, USCG vessels are unlikely to contribute significantly to the cumulative effects of the physical presence of vessels in the habitat of marine animals along the U.S. Atlantic coast. Most wildlife are tolerant of limited physical and acoustic disturbance; however, if this disturbance is chronic, the cumulative impact could be a decrease in breeding success, or abandoning prime habitat. However, the USCG contribution to the total number of vessels, aircraft, and people along the U.S. Atlantic coast is very small and does not contribute significantly to total human disturbance of protected species. Nevertheless,

there have been two reported incidents involving collisions between USCG vessels and protected species, one of them resulting in the death of a right whale. These incidents have contributed to adverse cummulative effects on protected species.

The cumulative effects on the socioeconomic environment are primarily positive. Under this alternative, there are no changes to the current operations of the USCG that would affect the socioeconomic environment. The primary mission of the Coast Guard is to provide humanitarian, safety and law enforcement services for the people of the United States. These services all have a positive impact on the socioeconomic environment.

5.2 Environmental Consequences of Alternative 2

Proposed Action

5.2.1 Consequences of Alternative 2 (Proposed Action) on the Physical Environment

As previously stated, USCG operations overlap with cetacean high-use areas and critical habitat. The operation of ships and aircraft could potentially disturb cetaceans. However, this disturbance will be minimal because of vessel speed reductions, newly implemented approach procedures, aircraft altitude guidelines, and education of USCG personnel. In addition, the number of vessels and aircraft under USCG command is nominal compared to the use of the environment by recreational boaters and commercial fishing and shipping, and private and commercial aircraft.

In Alternative 2, USCG vessels will be required to adjust vessel speed to the slowest safe speed in important habitats for protected and important resource species of marine animals when the animals may be present (*i.e.*, seasonally). This will have the effect of further reducing sediment resuspension and erosion of shorelines.

Alternative 2, because it requires adjusting to the slowest safe speed in high use habitats for protected and valued resource species of marine animals when the animals are present, will reduce the risk of accidental releases of fuels attributable to accidents such as groundings and collisions. Such accidents usually are more serious and fuel release greater if they occur during high-speed vessel operations than if they occur during low-speed operations. Therefore, adoption of Alternative 2 may reduce the risk of harm to the physical environment from USCG operations.

The relationship of engine speed to the rates and amounts of hydrocarbons emissions in exhaust is not clear-cut. Most engines operate less efficiently at low or idling engine speeds, resulting in greater hydrocarbon emissions per unit volume of fuel consumed. However, fuel consumption rate is reduced. Overall, the amounts of hydrocarbons released in exhaust emissions from USCG vessels is unlikely to change substantially as a result of adjusting vessel speed to the slowest safe speed in high-use areas for protected and valued resource species. Therefore, adjusting vessel speed to the slowest safe speed as called for in Alternative 2 probably will have little or no effect on the rate or amount of hydrocarbon emissions in the exhaust of USCG vessels.

5.2.2 Consequences of Alternative 2 (Proposed Action) on the Biological Environment

Currently, the USCG is revising guidelines for routine procedures to reflect a more proactive role in enhancing and protecting endangered and threatened species (see Appendix C). These guidelines have been implemented in the First, Fifth, and Seventh Districts in collaboration with private, state, and Federal organizations.

The major potential adverse effect of this action on the biological environment is collisions of aircraft or vessels with wildlife, and physical and acoustic harassment of wildlife due to the presence of aircraft, vessels, USCG stations, and the personnel required to operate them. Conversely, the Proposed Action may also have a positive impact on the biological environment through the numerous actions the USCG will undertake to protect and enhance endangered and threatened species, and through law enforcement efforts. The following is a description of these potential positive and negative impacts.

Collision of Vessels or Aircraft with Wildlife
Minimizing collisions of any kind is a high priority for the USCG. Vessel strikes are a significant source of mortality for inshore species of whales, and also for manatees and sea turtles. Vessel-wildlife collisions often occur because a submerged animal is not seen by the lookout on duty, or because adverse weather conditions make spotting the animal difficult. Adjusting USCG vessel speed to the slowest safe speed when transiting endangered and threatened species high-use areas will provide personnel additional time to identify wildlife and avoid potential collisions. In addition, education is likely to be a very effective means of greatly reducing the chance of vessel-wildlife collisions during all operations. The USCG's Marine Mammal and Endangered Species Protection Programs focus on educating USCG personnel about animals that are susceptible to collisions (*i.e.*, whales, turtles, and manatees). By working closely with regional NMFS and USFWS offices, USCG personnel will improve their sighting skills, they will learn the most effective means of identifying and maneuvering around vulnerable species, and the chance of vessel collisions with wildlife will be minimized. Recent clarification of MMPA and ESA law enforcement procedures direct USCG personnel to target vessel operators that act in a manner that may result in injury or harassment of protected species. This should also reduce collisions with wildlife.

Overall, this alternative, the Proposed Action, should result in a significant decrease in collisions of vessels with wildlife, and, in particular, with right whales.

Physical and Acoustic Disturbance from Vessels, Aircraft, or Human Presence
Under this alternative, physical and acoustic disturbance from vessels, aircraft, or human presence may still occur during emergency situations. However, less than 25% of USCG operations are emergency in nature, and vessel speed and aircraft altitude restrictions in areas where wildlife are most likely to occur will greatly reduce adverse effects in the majority of non-emergency situations. Typically, physical and acoustic disturbance must be persistent or dramatic to produce any lasting effects (Ellis *et al.*, 1991). Any impact from USCG operations is likely to be of short duration and have an insignificant effect on the biological environment. Consultation and coordination with other agencies (*i.e.* NMFS, USFWS, marine sanctuaries, etc.) will help identify sensitive areas where further changes in

operations might be warranted to reduce any physical and acoustic disturbance from USCG operations.

Positive impacts
The USCG, under this alternative, will take a more pro-active role in the protection and enhancement of endangered and threatened species that occur within Districts 1, 5 and 7. The Marine Mammal and Endangered Species Protection Programs have clarified procedures if an entangled whale or turtle is spotted. Notification of the proper authorities in a timely manner should be the result of this clarification. This, in turn, may provide valuable time for disentanglement efforts. More than 70 whales have been reported as entangled in fishing gear in coastal waters of the northeastern United States between 1970 and 1990. Most were humpback whales. Although most entanglements cause minor injury to the whales, 3% of right whales, 10.6% of humpback whales, and 22% of fin whales recorded as entangled in fishing gear in U.S. Atlantic coastal waters died as a direct or indirect result of entanglement. The USCG is also directed to assist in disentanglement efforts when resources are available.

The whale sighting program recently implemented by the USCG will provide invaluable information on cetaceans. It is particularly important that any sightings endangered right whales, especially those in distress, be reported immediately. This information is often not available to researchers until well after the event, when it is too late to respond. This opportunistic data may help clarify lingering questions about right whale movements and habitat use.

The Proposed Action also requires the cooperation of USCG offices with local, state, and federal agencies, and may result in improved communication regarding unusual events such as mass strandings, oil spills, etc. This cooperation will inevitably lead to further education of USCG personnel, and may result in an improved understanding of the biological environment in which they operate.

In addition, this alternative will have positive effects on the biological environment. By publishing and broadcasting a seasonal notice to mariners advising caution in right whale critical habitat, and through NAVTEX postings of right whale locations, the USCG will increase public awareness of the severely endangered right whale. This should also result in a decrease in commercial and recreational vessel collisions with right whales, and, in general, should increase public awareness of cetaceans.

5.2.3 Consequences of Alternative 2 (Proposed Action) on the Socioeconomic Environment

Alternative 2 will not result in any changes to the ability of the USCG to conduct emergency operations, most often conducted as SAR. However, there will be an effect on non-emergency operations. Alternative 2 may result in an increased law enforcement burden on state and local resources because the area covered by USCG vessels and aircraft during patrols will be reduced. In addition, it may result in an increase in the time spent by vessels and aircraft in endangered and threatened species habitat as state and local agencies increase

their patrols. If this alternative causes a decrease in fishing and shipping law enforcement efforts, natural resources may be inadequately protected, and local economies could be adversely affected.

However, Alternative 2, the Proposed Action, may also have positive effects on the socioeconomic environment. This action would ensure compliance of the USCG with state and federal laws protecting marine mammals and other endangered and threatened species. It would also facilitate the cooperation among state and federal agencies, which could save valuable public resources. Educating the public about critical habitat and endangered and threatened species, and their responsible stewardship, is a major focus of the Proposed Action, and will result in positive impact on the socioeconomic environment.

5.2.4 Cumulative Effects of Alternative 2 (Proposed Action) on the Physical, Biological, and Socioeconomic Environment

The cumulative effects of this alternative will, overall, be positive, compared to Alternative 1. These positive effects are the result of changes in USCG operations and increased education programs (through cross-agency training) which are not part of the USCG the No Action alternative.

The cumulative effects of the Proposed Action on the physical environment have the potential for improving the marine environment. Adjusting vessel speed to the slowest safe speed should contribute to long term efforts to reduce shoreline erosion, even though the USCG contribution to this problem is minimal. The adjustment in vessel speed also will contribute to improved water quality in shallow water areas. In Alternative 1, there is no adjustment of vessel speed in protected species areas; therefore, there may be a greater chance for collisions or groundings. In Alternative 2, the adjustment in vessel speed would result in a lower risk of collisions and groundings.

The proposed changes in vessel and aircraft operations would significantly decrease or eliminate the chance for collisions with wildlife. Although there have been only two collisions between USCG vessels and whales within the past five years under Alternative 1 (No Action), this is unacceptable. Formally implementing the actions proposed for this Alternative should prevent any additional collisions with whales and, in fact, contribute to recovery of the species by eliminating a source of adverse impacts. The lower speeds should also reduce the deterrence of marine animals from preferred habitats by the physical presence of the USCG vessels and aircraft. The cumulative effects on marine plankton, fish, and invertebrates are similar to those for the No Action alternative because the USCG does not contribute to the cumulative impacts of human activities on these biological resources. Instead several marine safety and environmental law enforcement activities performed by the USCG contribute to mitigation of environmental harm from other human activities.

Through education, the increase in USCG knowledge of the marine environment and marine biota, in general, will benefit all biological resources. The USCG will become more sensitive to the effects of its operations on the marine environment. Specifically, improved knowledge will provide USCG with vessel operations skills for maneuvering in the vicinity

of endangered species in a manner that will decrease the risk of harm to the species. This knowledge base will be useful when interacting with other federal agencies in efforts to preserve and protect biological resources. Because more USCG staff will have an improved knowledge of the environment, they will be better equipped to educate the public during boating safety courses and educate colleagues from other countries during international training assignments. This may lead to a future increase in public awareness of the plight of protected species and the importance of critical habitat. With an increased number of USCG staff trained in the marine environment and its resources, the USCG will be able to provide valuable assistance to NMFS and USFWS. USCG staff on vessels will have the expertise to assist in sighting whales, sea turtles, and protected birds, and collecting data and specimens. The ongoing update and improvement of the Marine Mammal and Endangered Species Protection programs for Districts 1, 5, and 7 provide increased enforcement of the MMPA and ESA and may result in future benefits to protected species, such as whales, turtles, and manatees.

The proposed adjustments in vessel speed to slowest safe speed during operations and within special areas should not have any negative impact on human health or the ability of the USCG to effectively conduct operations. The Proposed Action will result in an increase in the time required to conduct non-emergent operations. However, the extra time required to conduct operations will be offset by the benefit (reduced chance for collision, reduced resuspension of sediment, reduced noise) to marine resources.

5.3 Environmental Consequences of Alternative 3

At all times, use slow safe speed (increase aircraft altitude) when transiting all areas where protected species have been located.

5.3.1 Consequences of Alternative Action 3 on the Physical Environment

Alternative 3 may have more effects on the physical environment where protected species are located than Alternatives 1 - 2 described previously. Under this alternative, the USCG will not be able to respond (at high vessel speeds) to emergency or high-priority activities, such as oil spills, that occur in protected species locations. This could be extremely detrimental to the physical environment in which protected species are located. Because the USCG has established protocols for operating at high speeds while responding to emergency and high-priority operations, the impacts to the physical environment resulting from an oil spill or other emergency or high priority operation that could affect the physical environment is much more serious than the chance for collisions or groundings while responding to such emergencies.

5.3.2 Consequences of Alternative Action 3 on the Biological Environment

A reduction in USCG vessel speed to the slowest safe speed in all situations, including emergencies, will decrease the chance of collision with baleen whales and other protected species. However, whether this would be a significant decrease is questionable. In the Proposed Action, vessels are to reduce speed within wildlife high-use areas, rather than

simply any area where wildlife has been identified. By following the guidelines in the Proposed Action, the majority of collisions can be avoided, and this alternative will not result in a significant, further decrease in the chance of collisions with wildlife.

In addition, reduced response time to emergency pollution events such as oil spills may result in increased adverse impacts on cetaceans. Efforts to enforce the Marine Mammal Protection Act and the Endangered Species Act may be reduced. Therefore, the adverse impact of Alternative 3 on protected species may outweigh any benefits realized by its implementation.

An increase in aircraft altitude under the same circumstances will reduce the potential for harassment of cetaceans. Whether this would be a significant decrease is also questionable. This alternative would also prevent the USCG from assisting in aerial surveys for cetaceans and other protected species (aircraft must fly lower than 3000 ft to identify and count cetaceans and sea turtles) or in efforts to locate entangled cetaceans and turtles.

A reduction in USCG vessel speed to the slowest safe speed in all situations, including emergencies, will not affect the chance of collision with pinnipeds because such collisions are unlikely. It may, however, decrease the chance of disturbance when a vessel is passing close to a pinniped haulout or rookery. The implementation of this alternative could adversely affect pinniped populations if the response to pollution events was slowed. Marine Mammal Protection Act enforcement efforts would be decreased because reduced vessel speed would result in decreased areal coverage. An increase in aircraft altitude under the same circumstances will reduce the potential for harassment of pinnipeds. However, whether this would be a significant decrease over the Proposed Action is questionable.

A reduction in USCG vessel speed to the slowest safe speed during all operations will decrease the chance of collision with manatees. However, this alternative could result in negative impact on manatees if law enforcement efforts within manatee habitat are reduced, or if pollution response time is slowed. An increase in aircraft altitude under the same circumstances will reduce the potential for harassment of manatees but, because this source of harassment is not a major source of concern for the population, the significance of this decrease is questionable.

A reduction in USCG vessel speed to the slowest safe speed during all operations will decrease the chance of collision with sea turtles. However, the area that the USCG is capable of patrolling will decrease as vessel speed decreases. This would result in a decrease in overall law enforcement efforts of fishing and TED regulations.

The primary purpose of Alternative 3 is to decrease USCG collisions with and harassment of wildlife. Collisions and harassment are not a significant source of injury or mortality for invertebrates and fish; therefore, this alternative would do little to benefit these species. Furthermore, this alternative may adversely affect fish and invertebrates in that efforts to enforce fishing regulations may be greatly reduced, and USCG response to pollution events may be hindered.

The chance of aircraft collisions with birds will also be reduced if this alternative is implemented. This reduction may not be significant and may adversely affect bird populations if response time to pollution events increases.

When compared to the Proposed Action (Alternative 2), this alternative will not significantly decrease the chance of collisions with or the disturbance of wildlife, and may, in fact, increase the potential for adverse effects on protected species.

5.3.3 Consequences of Alternative Action 3 on the Socioeconomic Environment

The social costs of this alternative are high. Implementation of Alternative 3 would increase the burden on state and local resources, increase loss of life and property due to a slow response in emergency situations, and decrease pollution response time. In addition, local resources may be adversely affected if fishing and shipping law enforcement efforts decrease.

5.3.4 Cumulative Effects of Alternative Action 3

In Alternative 3, speed of USCG vessels would be decreased to the slowest safe speed and altitude of USCG aircraft would be increased during all operations, both emergency and non-emergency, in areas where protected species have been located. The purpose of this alternative is to decrease the likelihood of collisions of USCG motor vessels and aircraft with marine animals and wildlife of concern along the U.S. Atlantic coast. However, in the Proposed Action, vessels are to reduce speed to the slowest safe speed within wildlife high-use areas, and the majority of collisions will be avoided. It is unlikely that extending the area of vessel speed restrictions will further decrease the potential for collisions in a significant or biologically meaningful way. Furthermore, this action will greatly reduce the area covered during a given USCG patrol, which may result in a decrease in MMPA/ESA enforcement efforts and any interagency cooperative activities.

Less than 25% of USCG vessel and aircraft operations are emergency in nature. Therefore, Alternative 3 would not result in a substantial decrease in the risk of collision of USCG vessels and aircraft with marine mammals, turtles, and birds. The option would, however, substantially decrease the effectiveness of the USCG in SAR and law enforcement operations.

The reported incidents of collisions of USCG vessels with marine mammals and sea turtles are very rare. Only two collisions with whales have been reported, one with a right whale and the other with a whale of uncertain identity. Collisions with sea turtles may go undetected. The two whale collisions did not occur during emergency operations. Therefore, it is uncertain whether decreasing the speed of USCG vessels to the slowest safe speed during emergency operations would actually decrease the incidence of collisions of USCG vessels with whales and sea turtles. As discussed above, the contribution of USCG vessel activities, both emergency and non-emergency, to the total cumulative incidence of whale and turtle strikes, and human-induced injury and mortality of these animals is very small. Reduction of USCG vessel speed during emergency operations would contribute only a very small amount to reduction of the cumulative adverse effects of human activities on these marine animals along the U.S. Atlantic coast.

Increasing required USCG aircraft altitude during emergency operations would decrease the incidence of collisions of aircraft with coastal and marine birds. The USCG performs approximately 2000 emergency sorties along the entire U.S. Atlantic coast each year. If 1% of these sorties (an unrealistically high percentage) resulted in collisions with coastal birds, the total number of birds affected would be 20, assuming 1 bird per incident. This number is insignificant compared to the total human-induced mortality of coastal and marine birds along the U.S. Atlantic coast each year. All pilots are aware of the hazard of birds to their aircraft and proceed with caution when performing low-altitude operations in areas where large numbers of birds are present. USCG commanding officers are instructed to fly at higher altitudes over known wildlife habitats, even during emergency operations, if doing so does not substantially compromise the mission. Thus, collisions of low-flying USCG aircraft with coastal and marine birds are rare. Elimination of all low-altitude flights during emergency USCG operations would result in only a small decrease in the cumulative incidence of aircraft–bird collisions at the expense of an increase in the loss of human life and property.

Operation of USCG vessels at a slow safe speed and increasing aircraft altitude during emergency operations would do relatively little to decrease net cumulative noise disturbance of marine animals in and under the water. The number of emergency vessel operations performed by the USCG each year is relatively small when spread over the entire U.S. Atlantic coast. If it is assumed that less than 25% of USCG SAR operations are emergencies, then USCG vessels spend an average of slightly less than 8 hours per day performing "maximum safe speed" operations over the entire Atlantic coast. The highest frequency of high-speed operations (just under 1 hour per day) would be in the Seventh District (South Carolina to Florida). By comparison, nearly 1.4 million boats have USCG registration in the Seventh District, including about 13,000 commercial fishing vessels and boats (Table 4-12). Between 16,000 and 19,000 merchant vessels visit ports in the Seventh District each year (Tables 5-4 and 5-5). U.S. Naval vessels contribute an additional large number of vessels to Atlantic coastal waters. Most of these vessels produce underwater noise that is equivalent to or greater than the noise produced by USCG vessels traveling at "maximum safe speed." Thus, the contribution of USCG vessels to the total underwater ambient noise along the U.S. Atlantic coast is extremely small, and probably can not be distinguished from background at nearly all locations and times.

USCG aircraft flying at low altitude through high-use nesting and rookery habitats of marine and coastal birds and seals along the U.S. Atlantic coast during emergency operations may disturb the animals. This disturbance, particularly if it is in an area where there are few low-flying aircraft, could result in harm to bird eggs and nestlings, and newborn seal pups if the parents panic, or could even lead to abandonment of preferred habitats. The contribution of USCG aircraft to the total number of low-flying ($\leq$500 ft) aircraft in the immediate coastal zone (*e.g.*, over or near nesting sites and rookeries) of the U.S. Atlantic coast is uncertain. Most emergency SAR operations involving aircraft are performed sufficiently far away from the shore that disturbance of nesting sites and rookeries on the shore would be minimal. The overall contribution of low-altitude emergency aircraft operations by the USCG on cumulative disturbance of nesting marine/coastal birds and pupping seals is probably very small.

Table 5-4. Numbers of Trips of Merchant Vessels from the 26 Largest U.S. Atlantic Coast Ports and Channels in 1989, and Maximum Draft of Vessels Visiting Ports in Each State. From Knowlton (pers. comm., 1995).

State	Number of Visits/Year	Maximum Draft (ft)
Maine	690	46
New Hampshire	274	37
Massachusetts	1,896	45
Rhode Island[1]	664	40
Connecticut	846	41
New York/New Jersey	11,537	50
Delaware/Maryland/Virginia	15,844	51
North Carolina	1,388	41
South Carolina	2,407	35
Georgia	3,721	40
Florida	10,958	42
Total	50,255	--

[1] Includes Fall River, Massachusetts.

Overall, this alternative is not likely to significantly benefit the future of endangered and threatened species through a decrease in harassment or collisions, and may actually increase the potential for adverse effects on the biological, physical and socioeconomic environment.

5.4 Environmental Consequences of Alternative Action 4

Avoid all high density areas, critical habitats, and marine sanctuaries during USCG patrols.

5.4.1 Consequences of Alternative Action 4 on the Physical Environment

Alternative 4 will require that no USCG operations be conducted in protected or special species high-density areas, critical habitats, and marine sanctuaries. Therefore, this alternative will completely eliminate adverse effects caused by USCG vessels on the physical environment of these high-density areas, critical habitats, and marine sanctuaries. However, it will also prevent the USCG from performing law enforcement operations and assisting in oil spill response in the high-density areas, critical habitats, and marine sanctuaries, thereby contributing to an increased risk of harm from non-USCG sources on the physical environment of the U.S. Atlantic coast.

Table 5-5. Numbers of Vessel Arrivals in Each Captain of the Port (COTP) Zones on the Atlantic Coast of the United States During Fiscal Year (FY) 1991-1993. Vessels are >1600 gross tons and include U.S. and foreign flag tank vessels, freight vessels, barges, fishing vessels, and other marine traffic required to notify the COTP of their arrival in port.

COTP Zone	FY 91	FY 92	FY 93	Mean FY 91-93
Portland, ME	1,049	1,410	1,654	1,371
Boston, MA	794	1,745	1,775	1,438
Providence, RI	1,087	1,859	2,124	1,690
Long Island Sound, NY	1,253	3,510	3,074	2,612
New York, NY	4,590	4,534	4,470	4,531
Total 1st District	8,773	13,058	13,097	11,642
Philadelphia, PA	2,826	3,518	3,685	3,343
Baltimore, MD	1,913	2,547	2,548	2,336
Hampton Roads, VA	3,293	3,697	3,759	3,583
Wilmington, NC	927	1,223	1,336	1,162
Total 5th District	8,959	10,985	11,328	10,424
Charleston, SC	1,462	1,750	1,903	1,705
Savannah, GA	2,006	2,429	2,550	2,328
Jacksonville, FL	1,751	2,324	2,860	2,312
Miami, FL	5,842	5,124	7,656	6,207
San Juan, PR	4,741	3,657	4,646	4,348
Total 7th District	15,802	15,284	19,615	16,900
Total	**33,534**	**39,327**	**44,040**	**38,966**

5.4.2 Consequences of Alternative Action 4 on the Biological Environment

This alternative will have similar consequences for cetaceans, pinnipeds, manatees, turtles, and birds. Although the chance of collisions and harassment would be greatly reduced, so would USCG efforts to protect and enhance protected, endangered and threatened species. In addition, these areas are often highly productive and rich in other resources. Stellwagen Bank, for instance, is not only a high-use habitat for many cetaceans, but is also one of the

most intensely exploited fishing grounds in the northeast. If the USCG avoided such areas, fisheries enforcement efforts would be greatly reduced and natural resources, such as fish stocks, may be over-exploited. The USCG contribution to overall air and sea traffic is small relative to the total commercial, military and private uses of these areas. Unless all traffic is prohibited from sensitive areas, the overall impact of this alternative on wildlife will be negative.

5.4.3 Consequences of Alternative Action 4 on the Socioeconomic Environment

The social costs of this alternative action are very high. The USCG would be unable to respond to emergency events in these areas, resulting in loss of life and property. If fishing and shipping law enforcement efforts decrease, damage to natural resources may occur. Pollution events in such habitats would be devastating if the USCG could not respond. In addition, Alternative 4 would increase the burden on state and local resources. The USCG believes that the costs of this alternative far outweigh its benefits.

5.4.4 Cumulative Effects of Alternative Action 4

In Alternative 4, the USCG would avoid all high-density areas, critical habitats, and marine sanctuaries during USCG operations. These high-use areas represent a relatively large area of the U.S. Atlantic shore and coastal waters. There are three designated critical habitats for right whales, and two for sea turtles in U.S. Atlantic waters. In addition, there are 51 national wildlife refuges, 5 marine sanctuaries, 3 national seashores, and 1 national park along the Atlantic seaboard of the United States. Restriction of all USCG vessel and aircraft operations from these areas might decrease the incidence of collisions of USCG vessels and aircraft with marine animals and birds, but it would also severely interfere with the ability of the USCG to perform its various missions.

Most of the national wildlife refuges and national seashores, as well as the national park, are shoreline or nearshore environments; USCG activities, other than law enforcement, in these areas are minimal and are unlikely to result in collisions with wildlife. Low-altitude aircraft operations are more likely to take place offshore of the refuges than in them.

On the other hand, the critical habitats for right whales and the marine sanctuaries include large areas of offshore waters, some of them with heavy commercial and recreational vessel and air traffic. Elimination of all USCG operations from these areas might slightly decrease total vessel and aircraft traffic in these areas but, through a lapse in law enforcement activities, might lead to greater total high-speed vessel activities, including harassment of whales and sea turtles. The net cumulative risk of collisions between vessels and marine animals in these areas resulting from this alternative action probably will increase only slightly, if at all. The risk may actually increase if, in the absence of USCG presence, high-speed vessel activities of commercial and recreational vessels increase.

As discussed above, only low-altitude aircraft operations pose a serious risk of collision with coastal and marine birds. Many of the national wildlife refuges along the Atlantic coast are intended to provide nesting and feeding habitat for coastal and marine birds. Thus, the

abundance of nesting birds in these areas is likely to be high. However, most USCG low-altitude aircraft sorties are not over the shore but instead are over offshore waters in search of vessels requiring assistance or in various law enforcement operations. USCG pilots are instructed to avoid low-altitude flights over these wildlife habitats, to the extent possible depending on the mission. Thus, the contribution of USCG aircraft to the cumulative low-altitude aircraft activities over coastal national wildlife refuges, national seashores, and the coastal national park is likely to be very small. USCG emergency, low-altitude aircraft operations contribute very little to the total cumulative incidence of collisions or other sources of human-induced mortality of marine and coastal birds along the U.S. Atlantic coast.

Elimination of all USCG vessel and aircraft operations from high-use areas for marine life and birds would decrease physical and noise disturbance to marine life and coastal birds. However, the USCG performs relatively few operations directly in shoreline and coastal high-use habitats, such as national wildlife refuges. The USCG does operate more frequently in offshore critical habitats and marine sanctuaries. Generally, USCG vessel and aircraft operations are most concentrated in areas where commercial, private, and recreational vessel and aircraft operations are most prevalent. The USCG vessels and aircraft represent only a small fraction of the total vessels and aircraft in these areas. Their contribution to the cumulative human disturbance to marine life and birds from noise and physical presence is extremely small. Little or no net benefit would be gained by eliminating USCG vessel and aircraft operations from all high-use habitats for marine life and birds along the U.S. Atlantic coast.

5.5 Environmental Consequences of Alternative Action 5

Do not patrol U.S. coastal waters

5.5.1 Consequences of Alternative Action 5 on the Physical Environment

Alternative 5 will require a cessation of all USCG vessel activities in coastal waters of the Atlantic coast of the U.S. Therefore, this alternative will completely eliminate adverse effects on the physical environment caused by USCG vessels. However, it will also prevent the USCG from performing law enforcement operations and assisting in oil spill response, thereby contributing to an increase in risk of harm from non-USCG sources on the physical environment of the U.S. Atlantic coast.

5.5.2 Consequences of Alternative Action 5 on the Biological Environment

Many of the USCG missions, including oil spill response, law enforcement operations, vessel traffic control, and air patrols actually promote and enhance the welfare of endangered and threatened species. Both surface and airborne platforms are used opportunistically by scientists to locate and aid entangled marine animals, transport marine animals to shore when necessary, relocate whale carcasses for necropsy, etc. Alternative Action 5 would actually have a negative impact on fish and wildlife recovery efforts.

5.5.3 Consequences of Alternative Action 5 on the Socioeconomic Environment

The USCG is the primary law enforcement, and maritime search and rescue agency for U.S. waters and, therefore, this alternative is not feasible. Pollution prevention and mitigation, vessel traffic control, marine safety and security, and maintenance of aids to navigation, etc. would need to be shifted to other agencies. This alternative would have profound negative economic and social effects, and would certainly result in loss of life, property, and resources.

5.5.4 Cumulative Effects of Alternative Action 5

Alternative 5 would involve cessation of all USCG vessel and aircraft operations in U.S. territorial waters of the Atlantic Ocean. This alternative would completely eliminate the risk of collisions of USCG vessels with marine life and of USCG aircraft with coastal birds along the U.S. Atlantic coast. There are only a few reports of incidents involving collisions of USCG vessels with marine life along the U.S. Atlantic coast that have resulted in injury or death of a marine animal. Therefore, elimination of all USCG vessel operations in U.S. Atlantic coast waters would have little beneficial effect on the total cumulative injury to populations of marine animals living in the coastal and offshore waters of the U.S. Atlantic coast. Similarly, although the risk of collision between low-flying USCG aircraft and birds is real, elimination of all USCG aircraft operations along the Atlantic coast would not result in a substantial decrease in the total cumulative risk of aircraft–bird collisions along the Atlantic coast. The lack of a USCG presence along the Atlantic coast might increase the incidence of vessel strikes or other illegal takes of marine life through the absence of effective law enforcement offshore.

The contribution of USCG vessels and aircraft to the total vessel and aircraft traffic along the U.S. Atlantic coast is extremely small. Elimination of the USCG presence would not result in a measurable decrease in the total level of underwater or aerial noise in coastal waters of the U.S. Atlantic Ocean. Physical disturbance of marine life and birds by USCG vessels and aircraft is also small compared to that provided by the very much larger numbers of commercial, naval, private, and recreational vessels and aircraft along the Atlantic coast of the United States. Thus, the contribution of USCG vessels and aircraft to the total cumulative disturbance of marine life and coastal/marine birds is very small; elimination of all USCG vessel and aircraft operations from the U.S. east coast would not measurably decrease the total cumulative level of human disturbance of marine life and coastal/marine birds.

Overall, this action would negatively affect the future of endangered and threatened species and their habitat, and would result in devastating socioeconomic effects such as loss of life, property and resources.

6. ENVIRONMENTAL SIGNIFICANCE OF THE PROPOSED ACTION (ALTERNATIVE 2)

In summary, the USCG believes that the Proposed Action (Alternative 2) is the most viable of the five alternative actions presented in this Environmental Assessment. The risk of adverse effects from the Proposed Action is likely to be very small due to mitigating measures that minimize negative interactions between the USCG and the physical and biological environments. Alternative Actions 3, 4, and 5 would likely result in further reductions of the potential negative impacts (*i.e.,* collisions and harassment) of USCG operations on the biological environment; however, it is doubtful whether these reductions would be biologically significant. In addition, implementation of these alternatives may lead indirectly to increased risks of harm to protected species. Any reductions of such negative impacts from the Alternative Actions are more than offset by the expected positive effects of the Proposed Action on biological resources (*i.e.,* enforcement of fishing regulations and endangered species enhancement programs). Furthermore, the alternatives would result in profound negative impacts on the socioeconomic environment. Based on the information in this Environmental Assessment, the USCG believes that the Proposed Action is not likely to have significant negative environmental impacts and an Environmental Impact Statement is not necessary.

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