Atlantic States Marine Fisheries Commission

South Atlantic State/Federal Fisheries Management Board

May 23, 2013
11:15 a.m.-12:45 p.m.
Alexandria, Virginia

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order *(L. Daniel)* 11:15 a.m.

2. Board Consent **1**1:15 a.m.
   - Approval of Agenda

3. Public Comment 11:20 a.m.

4. Consider Draft Black Drum Fishery Management Plan for Final Approval (*T. Kerns)* **Final Action** 11:25 a.m.

   - Review Options (*T. Kerns)*
   - Public Comment Summary (*T. Kerns*)
   - Advisory Panel and Habitat Committee Reports (*T. Kerns)*
   - Consider final approval of Black Drum FMP

5. Consider North Carolina white paper on Spanish mackerel (*L. Daniel*) **Action** 12:10 p.m.

6. Technical Committee report **Action***(T. Kerns*) 12:20 p.m.
   - Florida red drum recreational measures
   - Black Drum Terms of Reference

7. Discuss Proposed Rule that Designates Beaches as Critical Habitat for Loggerhead Sea Turtles (*L. Daniel*) 12:30 p.m.

8. Review SEAMAP Report (*M. Paine*) 12:35 p.m.

9. Consider Red Drum Habitat Draft Addendum I For Public Comment (*T. Kerns)* **Action** 12: 40 p.m.

10. Other Business/Adjourn 12:45 p.m.

The meeting will be held at the Crowne Plaza Hotel, 901 North Fairfax Street, Alexandria, Virginia; 703-683-6000

MEETING OVERVIEW

South Atlantic State/Federal Fisheries Management Board Meeting
Thursday, May 23, 2013
11:15 a.m. – 12:45 p.m.
Alexandria, Virginia

Chair: Louis Daniel (NC) Assumed Chairmanship: 02/10	Technical Committee Chairs Atlantic Croaker: Chris McDonough (SC) Red Drum: Mike Murphy (FL)	Law Enforcement Committee Rep: Stephen Adams (GA)
Vice Chair: VACANT	Advisory Panel Chair: Bill Windley (MD)	Previous Board Meeting: October 23, 2012
Voting Members: NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS, SAFMC (12 votes)		

2. Board Consent

- Approval of Agenda

3. Public Comment – At the beginning of the meeting, public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Consider Black Drum Interstate Fishery Management Plan for Final Approval (11:25 a.m.- 12:10 p.m.) Final Action

Background

- At the August 9, 2012 meeting, the Board provided guidance to staff to draft the Black Drum Interstate Fishery Management Plan.
- The Plan Development Team has developed options for recreational and commercial management measures based on Board input, current state regulations, and public comment received on the Black Drum Public Information Document.
- The Board approved the Draft FMP for public Comment in October
- Public Hearings were held in the spring of winter of 2013

Presentations

- Options included in Draft Black Drum FMP by T. Kerns (**Briefing CD**)
- Review public comment summary by T. Kerns (**Briefing CD**)
- Advisory Panel and Habitat Committee reports by T. Kerns (**Supplemental Materials**)

Board actions for consideration at this meeting

- Consider management options for the FMP
- Final Approval of the Black Drum FMP

5. Consider North Carolina white paper on Spanish mackerel (12:10-12:20p.m.) Action

Background

- South Atlantic Fishery Management Council discussed allowing for seasonal flexibily in the Spanish mackerel FMP. Specifically to allow for changes in size limits in the North Carolina pound nets fishery in for August and September
- Because it is a state water issues the Council agreed it would be best to be considered by the South Atlantic Management Board.

Presentations

- Overview of the North Carolina white paper T. Kerns (**Supplemental Materials)**

Board actions for consideration at this meeting

- Consider initiation of an addendum to allow for seasonal flexibility

6. Technical Committee Report (12:20-12:30 p.m.) Action

Background

- Florida increased their recreational bag limit in the Northeastern region in 2012, the Board tasked the TC to review the measures possible impact to the stock
- The TC needs to reviewed the report and found no concerns that the measure would drop the escapement/sSPR below the required levels
- The black drum stock benchmark stock assessment will be completed in 2015. The TC recommend a set of Terms of Reference for the Board to consider

Presentations

- Overview of the FL measures and TC findings by T. Kerns (**Briefing CD**)
- Overview of the Black Drum TORs by T. Kerns (**Briefing CD**)

Board actions for consideration at this meeting

- Approval of the FL NE region bag limit
- Approval of the Black Drum Terms of Reference

7. Discuss proposed rule that designated beaches as critical habitat for loggerhead sea turtles (12:30-12:35 p.m.)

Background

- USFWS submitted a proposed rule to designate specific areas in GA, SC, GA, FL, AL, and MS as critical habitat for the NW Atlantic Ocean DPS of the loggerhead sea turtle (**Briefing CD**)
- Comment for the rule closes on May 24, 2013

Presentations

- Discuss proposed rule by L. Daniel.

Board actions for consideration at this meeting

8. Review SEAMAP Report (12:35-12:40 p.m.)

Background

- The SEAMAP-South Atlantic Committee met in August 2012

Presentations

- Staff will provide a report on SEAMAP-South Atlantic activities and funding status

9. Consider Red Drum Habitat Draft Addendum I (12:40-12:45 p.m.)

Background • The Habitat Committee updated and revised the red drum habitat section of the FMP
Presentations • Overview of draft Addendum by T.Kerns
Board actions for consideration at this meeting • Consider approval of the draft Addendum for public comment

10. Other Business/Adjourn

Fishery Management Report

of the

Atlantic States Marine Fisheries Commission

DRAFT Interstate Fishery Management Plan for Black Drum

October 2012

FOR PUBLIC COMMENT

Interstate Fishery Management Plan for Black Drum

Prepared by
Atlantic States Marine Fisheries Commission
Black Drum Plan Development Team

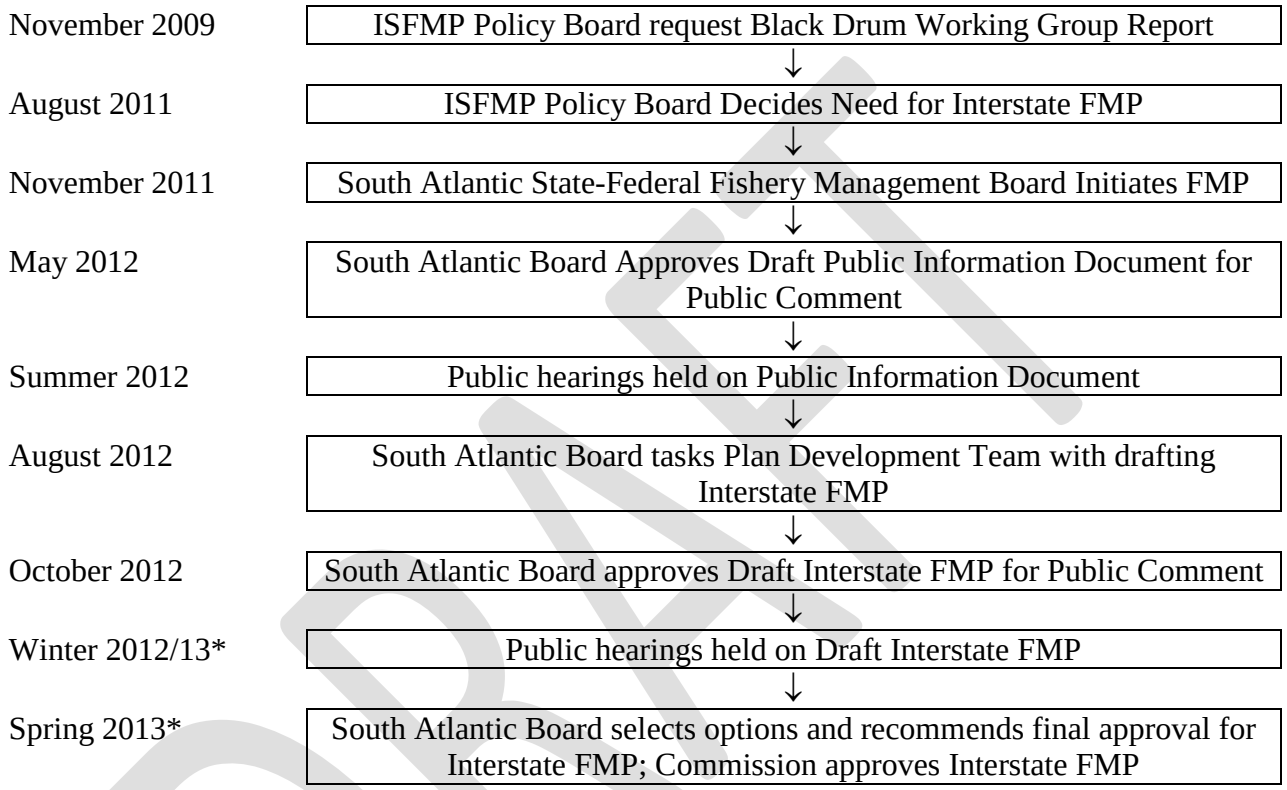
Plan Development Team Members:
Danielle Brzezinski, Atlantic States Marine Fisheries Commission
Joe Cimono, Virginia Marine Resources Commission
Michelle Sempsrott, Florida Fish and Wildlife Conservation Commission
Chris Stewart, North Carolina Division of Marine Fisheries

This Plan was prepared under the guidance of the Atlantic States Marine Fisheries Commission's South Atlantic State/Federal Fisheries Management Board, Chaired by Dr. Louis Daniel of North Carolina and Aaron Podey of Florida. Technical and advisory assistance was provided by the Black Drum Technical Committee, the Black Drum Stock Assessment Subcommittee, the Law Enforcement Committee, and the South Atlantic Species Advisory Panel.

This is a report of the Atlantic States Marine Fisheries Commission pursuant to U.S. Department of Commerce, National Oceanic and Atmospheric Administration Award Nos. XXXXXXXXX.

AMENDMENT PROCESS AND TIMELINE

In August 2011, the South Atlantic State/Federal Fisheries Management Board initiated the development of an interstate fishery management plan for black drum. This followed a report by the Black Drum Work Group to the Board on the status of biological and fisheries data, as well as policy recommendations. The diagram below depicts the Plan development process.



The Atlantic States Marine Fisheries Commission seeks your comment on an Interstate Fishery Management Plan for Black Drum

The public is encouraged to submit comments regarding this document during the public comment period. Comments will be accepted until **5:00 PM (EST) on April 26, 2013.** Regardless of when they were sent, comments received after that time will not be included in the official record. The South Atlantic State-Federal Fisheries Management Board will consider public comment on this document when determining final options for Interstate Fishery Management Plan.

You may submit public comment in one or more of the following ways:

1. Attend public hearings held in your state or jurisdiction.
2. Refer comments to your state's members on the South Atlantic State-Federal Fisheries Management Board or South Atlantic Species Advisory Panel, if applicable.
3. Mail, fax, or email written comments to the following address:

Toni Kerns
Atlantic States Marine Fisheries Commission
1050 North Highland St., Suite 200A-N
Arlington, Virginia 22201
Fax: (703) 842-0741
comments@asmfc.org (subject line: Black Drum)

If you have any questions please call Toni Kerns at (703) 842-0740.

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1. INTRODUCTION

1.1. Background Information

At the November 5th, 2009 meeting of the Interstate Fishery Management Program (ISFMP) Policy Board, Commissioners expressed an interest in determining the feasibility of developing a coastwide stock assessment and fishery management plan for black drum (*Pogonias cromis*). Concerns were raised because the status of the coastwide stock is unknown, and the black drum population may be vulnerable to fisheries directed at immature animals. Commission staff was tasked with contacting state biologists and identifying available fishery dependent and independent data sources for black drum along the Atlantic coast. Major data sources from New Jersey to Florida were summarized in a memo and presented to the Policy Board on February 3, 2010. Subsequently, the Board requested a more thorough data review from the state biologists as well as a recommendation on the feasibility of conducting a coastwide stock assessment. Given budget limitations, a data workshop was conducted via a series of webinars in spring 2011. The report was presented to the Policy Board at the August 2011 meeting and included the recommendation to initiate an interstate fishery management plan (FMP), although there were no immediate management or biological concerns. Upon review of the report, the Policy Board voted to initiate the FMP and assigned its development and administration to the South Atlantic State-Federal Management Board (Board), which administers the FMPs for red drum, Atlantic croaker, spot, spotted seatrout, and Spanish mackerel.

The Board initiated development of an FMP for black drum in November 2011 and approved the Public Information Document for public comment in May 2012. Public comment was received and hearings held in June and July of 2012, and the Board tasked the Plan Development Team (PDT) with developing a Draft FMP for Black Drum in August 2012.

1.1.1. Statement of the Problem

The black drum fishery is currently managed at the state level across its range in the United States. With the exception of North Carolina, state regulations have been implemented from New Jersey to Florida. As identified in the Public Information Document, there are four main reasons why the Board has considered black drum a species in which interstate management would benefit the fisheries. These include:

1. Tagging evidence suggests black drum migrate along the coast, and are thus an interstate species.
2. There is a lack of consistent coastwide regulations or management goals.
3. The targeted fishery in some areas may be on very young fish, which have yet to contribute to the population, and other areas may be more heavily targeting the established breeding stock.
4. An Interstate FMP establishes a management framework to address future concerns or changes in the fishery or population.

In the past years, harvest of black drum has increased substantially in both the commercial and recreational sectors. Although no trends indicated an immediate need for emergency action

(ASMFC 2011), a proactive approach to establishing an efficient management process allows for future changes to management, if needed.

1.1.2. Benefits of Implementation

1.1.2.1. Social and Economic Benefits

More sustainable management practices and policies for a long-lived species such as black drum can increase economic benefits and provide social stability in the fishing community while ensuring a fishery for future generations. Greater cooperation and uniform management measures among the states ensure that the conservation efforts of one state or group will not be undermined.

Historically, the commercial market has been local with residents the main end user for fillets and roe on the eastern shore of Virginia and Maryland during April and May (Jones et al. 1990), but little information exists on the current market. Continued availability of this local fair would be beneficial to local residents and fishermen.

Although the recreational season is short (April – June at most), it occurs before many other popular species are readily available, thus, supporting local business during that lull time (Jones and Wells 2001).

Setting forth coastwide management objectives will elucidate the potential differences between managing for maximum sustainable yield, as with most commercial fisheries, and managing for large, trophy fish, as may be desired within the black drum fishery. Increased production of larger fish occurs when fishing mortality is below the estimated maximum fishing mortality and when recruitment is high, whereas models are generally used in management to produce maximum sustainable biomass, sometimes at the expense of larger, recreationally-desired fish (Jones and Wells 2001). Agreement on management objectives may help to align management measures, balancing these potentially competing interests.

1.1.2.2. Ecological Benefits

Consistent management goals across jurisdictions can provide greater protections to a migratory stock. Black drum are long-lived (Murphy *et al*. 1998) and can have multiple opportunities to contribute to the population if allowed to reach older ages, which can be afforded by regulatory protections across the range of the population and age classes.

Jones and Wells (2001) modeled yield-per-recruit curves and found that, although black drum in the Chesapeake Bay were not likely subject to growth overfishing, black drum are vulnerable when heavy fishing is directed at young fish, which occurs in the southern portion of their range along the U.S. East Coast. Capture at young ages prior to maturity can also raise concerns for recruitment overfishing.

1.2. Description of the resource

1.2.1. Species Life History

Black drum, the largest members of the family Sciaenidae, can reach over 46" and 120 lbs. A long-lived fish, black drum can reach nearly 60 years of age (Murphy *et al*. 1998; Jones and Wells 1998; Campana and Jones 1998). Black drum are approximately 11”–14" at age 1, 15”–17" at age 2, and 19”–21" at age 3 (Murphy and Taylor 1989; Murphy and Muller 1995; Jones and Wells 1998). Jones and Wells (1998) found rapid growth until age 15, slowing by age 20. Black drum spawn during the winter and early spring, with spawning occurring earlier in the southern areas (November – April) and later in the northern areas (April – June) (Joseph et al. 1964; Richards 1973; Silverman 1979). Females mature at age 4–6 years and are prodigious, multiple spawners. Jones and Wells (1998) concluded black drum add weight rapidly until approximately 6 years of age, near when maturity occurs. An average-sized female (13.4 lbs) may spawn 32-million eggs each year (Fitzhugh *et al.* 1993). Recruitment appears to be sporadic, with infrequent large events (Murphy and Muller 1995).

Black drum are primarily bottom feeders. Young black drum feed on small fish and invertebrates, such as copepods, annelids, and amphipods (Pearson 1929; Thomas 1971). Larger black drum in Texas estuaries eat mostly mollusks, crabs, and shrimps (Miles 1949).

Black drum eggs and larvae were shown to be subject to predation by ctenophores and hydromedusae in the Chesapeake Bay (Cowan et al. 1992), with potentially very high levels of predation during years where both predators had high abundances. As juveniles, black drum are prey to a wide range of estuarine piscivores (e.g., spotted seatrout, crevalle jack). Larger drum are probably subject to predation by sharks (Murphy and Muller 1995).

The range of black drum extends along the nearshore western Atlantic coast from the Gulf of Maine to Florida, into the Gulf of Mexico, and as far south as Argentina. Atlantic coast black drum conduct an age-specific inshore migration northward in the spring and southward in the fall (Jones and Wells 2001). Gold and Richardson (1991) suggested that there was little differentiation into subpopulations in U.S. waters; however, later work (Gold and Richardson 1998) emphasized a significant degree of clinal variation among black drum *mt*DNA haplotypes along the U.S. Gulf of Mexico coast, correlating with the isolation-by-distance model. Work by Rooker et al. (2004) on strontium concentrations deposited in otoliths supported movement into lower-salinity, estuarine environments during early life stages, followed by movement into more saline, oceanic conditions when older.

1.2.2. Stock Assessment Summary

There has not yet been a coastwide stock assessment on the black drum population. State stock assessments have been performed in Florida (1995). Murphy and Taylor (1989) qualitatively assessed the black drum life history and suggested the species was inadequate for an intensive or moderate fishery. They stated the long life-span of black drum suggests a low natural mortality rate and low surplus production, leaving little room for fishery removals. They predicted moderate levels of fishing could reduce abundance and truncate the age classes that make up the

spawning population. Both low and moderate levels of fishing, they noted, could lead to growth and recruitment overfishing, respectively.

For a coastwide stock assessment, it is important to identify the stock boundaries, as subpopulations may harbor important variations in phenotypes like growth or maturity rate, fecundity or disease resistance (Stepien 1995).

1.2.3. Abundance and Present Condition

No coastwide index of abundance is available for black drum. Few reliable regional indices of abundance can be generated due to lack of targeted monitoring programs and low incidental catch of black drum in most existing surveys. In particular, few surveys consistently encounter and sample adult fish across the wide range of potential ages. Surveys with the best potential to track regional stock trends are the Delaware Bay Trawl Survey (juveniles), the Maryland Coastal Bays Seine Survey (juveniles), the North Carolina Independent Gill Net Survey (Program 915), the South Carolina trammel net survey (primarily juveniles), the Georgia Trammel Net Survey, the Northeast Area Monitoring and Assessment Program (NEAMAP), and Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMap). These surveys do not indicate any major trends in the status of the population, which may be due to low or inconsistent intercepts of black drum.

Past studies, such as Murphy and Muller (1995), predicted the stock was in good shape as of the mid-1990s, with low fishing mortality. Although Jones and Wells (1998, 2001) did not capture animals ages 1-5 in their estimation of age, implying either sustained failed recruitment or movement of these ages of animals out of the Chesapeake Bay, Murphy and Taylor's (1989) ageing work suggested less than 20% of the sampled animals were greater than four years old. Jones and Wells (1998) concluded, by looking at other older studies of the Chesapeake Bay that also did not sample young black drum (Frisbie 1961; Richards 1973), movement of these ages out of the Chesapeake Bay, and possibly to the southern areas like Florida, is likely.

1.3. Description of the Fishery

1.3.1. Commercial Fishery

Coastwide commercial landings of black drum reported by NMFS averaged approximately 368,000 lbs in the 1950s and 60s, then declined to an average of approximately 211,000 lbs in the 1970s and 80s (Figure 1). Since 1990, landings have slowly increased to an average of approximately 270,000 lbs. Since 2000, the majority of black drum harvested coastwide are landed in North Carolina and Virginia. A smaller portion of the coastwide black drum harvest is landed in Delaware, Florida, New Jersey, and Maryland. Landings reported from South Carolina are generally low and indicative of reported bycatch rather than a targeted fishery. Georgia, New York, Connecticut, Rhode Island, and Maine occasionally report small amounts of black drum landings as well; however, the magnitude of these landings is so small that the total annual state landings records are confidential. In recent years, gill nets and pound nets, similar to red drum commercial catches, have been the primary gear used coastwide (Table 1).

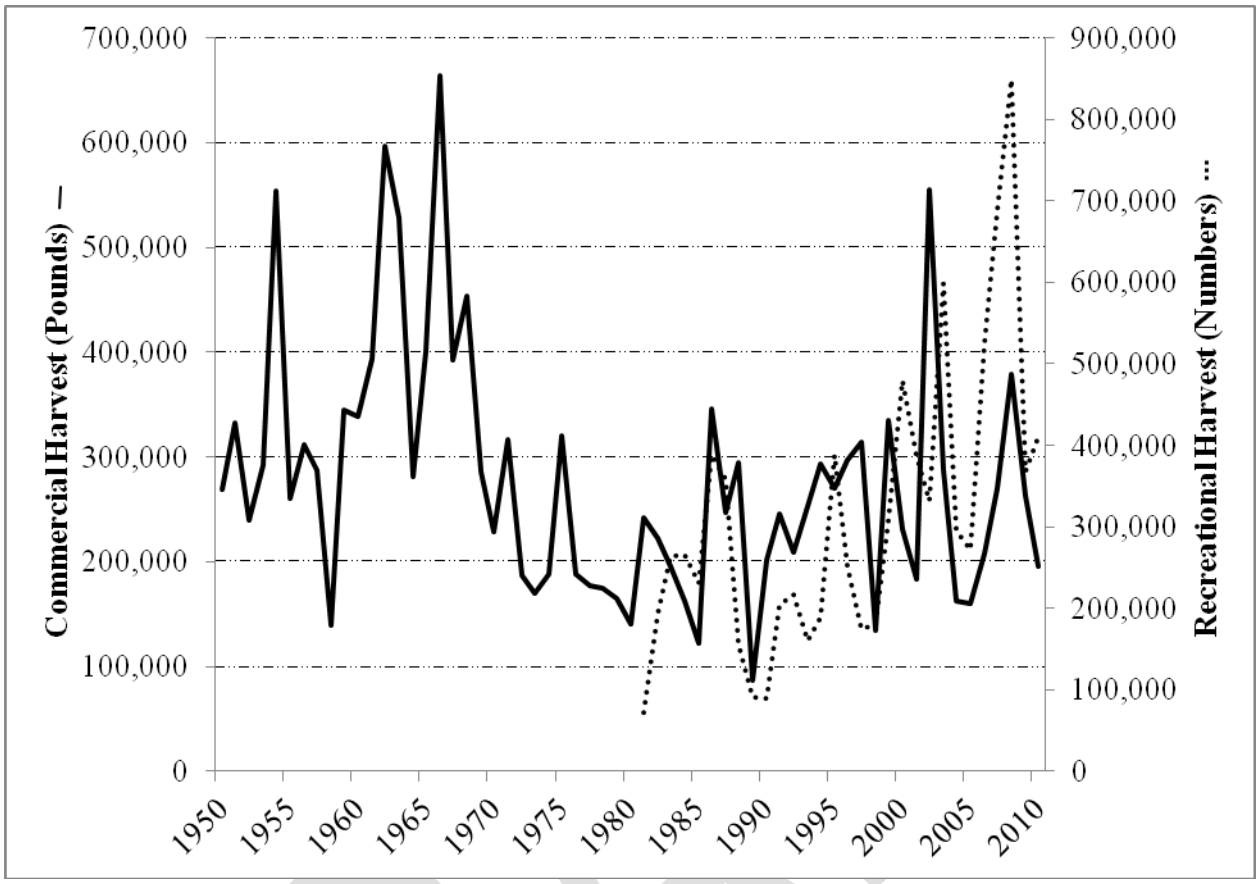

Figure 1. Commercial (pounds) and recreational (numbers of fish) harvest of black drum since 1950 and 1981, respectively (Personal Communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD).

Table 1. Commercial harvest by gear type from 2000-2011 (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD).

Gear	Harvest lbs (2000-2011)
Gill nets	1,944,836
Pound Nets	560,644
Otter Trawl - Bottom	140,787
Hand Lines	128,638
Haul Seines	109,294
Long Lines	64,639
Cast Nets	34,250
Not Coded	28,129
Pots and Traps	10,995
Spears	6,889
Rod and Reel	6,054
Combined Gears	3,099
Dredge	923
Otter Trawl - Midwater	556
Hand	394
Fyke and Hoop Nets	126
Dip Nets	108
Diving outfits	37
Beam Trawls	28

1.3.2. Recreational Fishery

Recreational harvest of black drum has increased along the Atlantic coast in the last decade (Figure 1). In 2009-2011, harvest was down from the time series peak observed in 2008. Although New Jersey, Delaware, Virginia, Georgia, and Florida have experienced apparent increases in black drum harvested by anglers, the majority of the recent coastwide increase in harvest comes from North Carolina (Figure 2); increased harvest in South Carolina also occurred until harvest restrictions were enacted in 2007. Florida and North Carolina fisheries comprise the majority of black drum harvested recreationally along the Atlantic Coast (Figure 2). Uncertainty in MRIP estimates, represented by average proportional standard error (PSE), generally decreased from north to south but remained high (> 20%) at the state level for all states except Florida (Figure 3). Length distribution information from MRIP is limited and likely unreliable. One concern with MRIP estimates of weight and length is that black drum angling in some states (e.g., Delaware) is conducted during the evenings and nighttime. If these times of day are not adequately sampled, as has been the case with the previous MRFSS protocol, dockside intercept samples may not be representative of the population. Also, black drum seasons in some states (e.g., Maryland and Virginia) are of short duration, so the number of angler intercepts during these time periods may not be adequate to characterize these pulse fisheries.

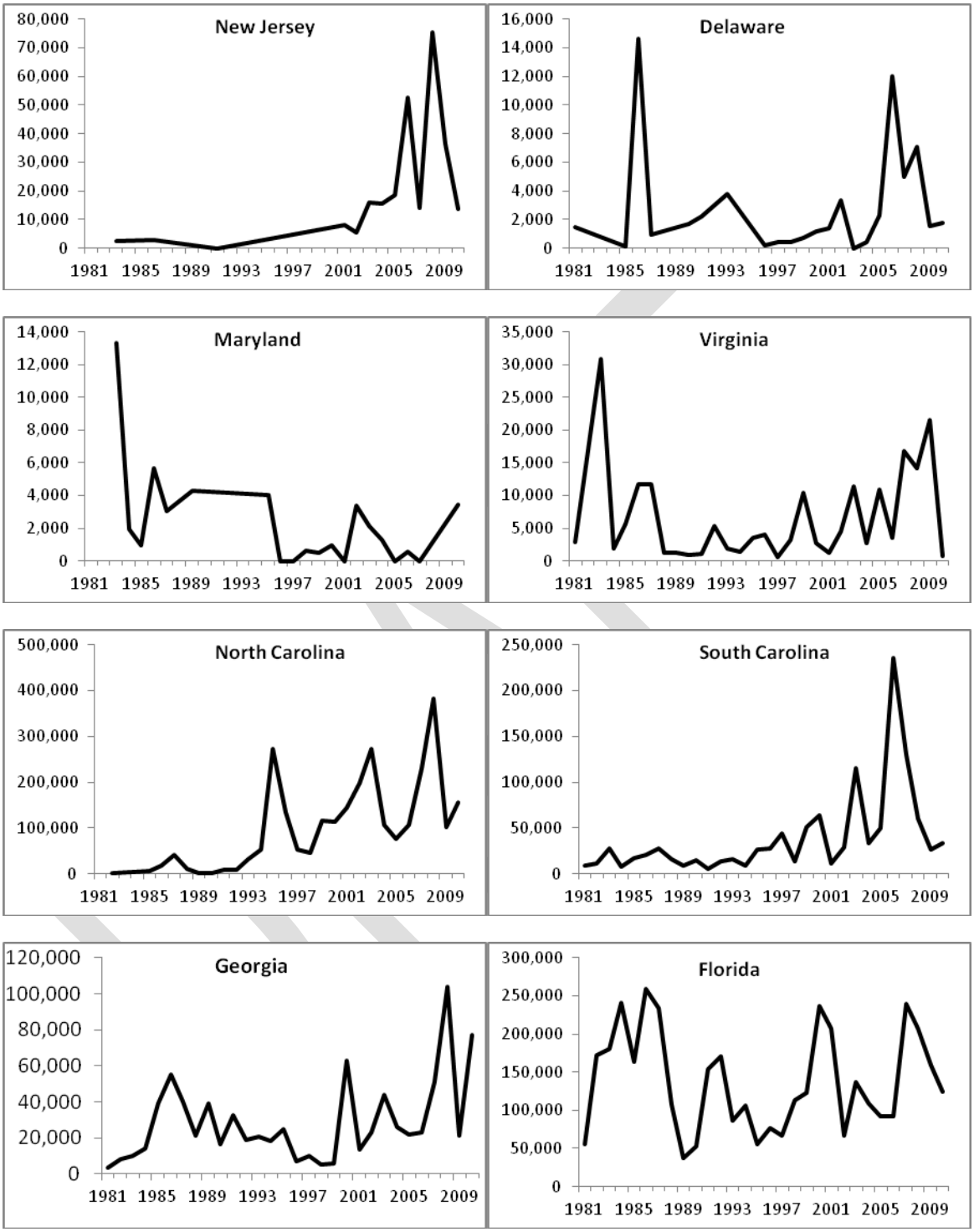

Figure 2. State trends in estimated recreational harvest (Type A + B1; in numbers) of black drum from 1981-2010 (MRIP, June 2011). Note differences in scale.

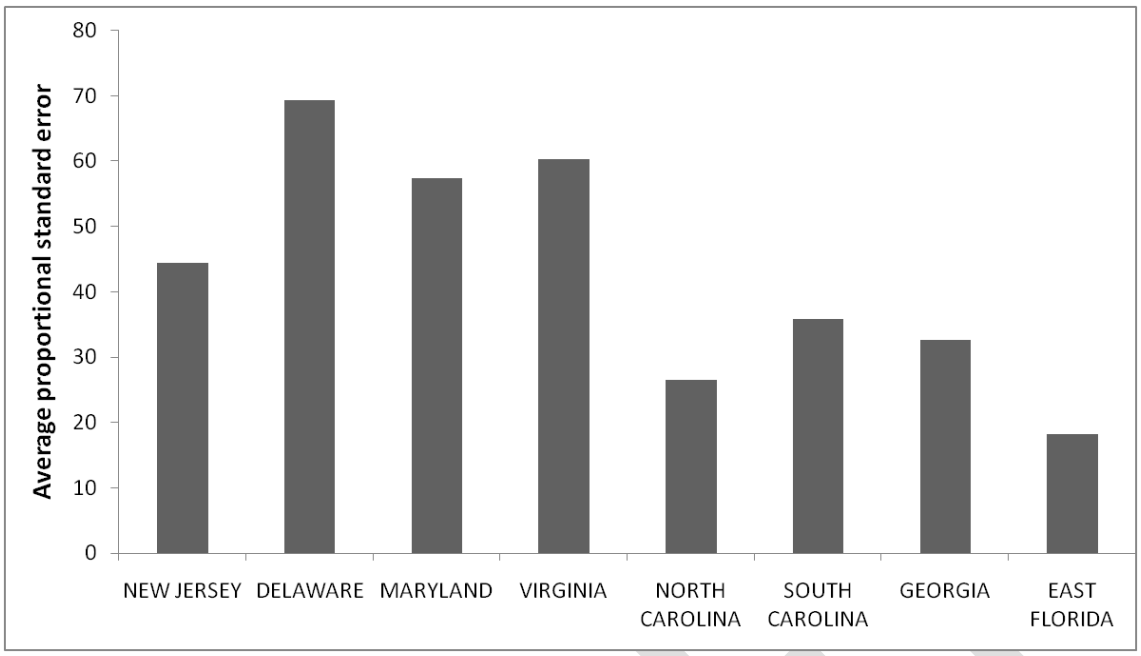

Figure 3. Average proportional standard error (PSE) of black drum harvest estimates by state from 1981-2010 (MRIP, June 2011).

1.3.3. Subsistence Fishery

Although many recreational anglers will catch black drum for their own consumption, there is some aversion to eating black drum. Large animals tend to have large pockets of worms. Although anecdotal accounts convey these pockets can be easily removed, the large presence of worms deters some fishermen from consuming black drum. Fishermen who target or are required to target, via regulation, smaller animals do not generally encounter these pockets of worms. Beyond the recreational aspect, there is no known subsistence fishery for black drum.

1.3.4. Non-Consumptive Factors

No non-consumptive factors were identified that were of significance to the black drum resource.

1.3.5. Interactions with Other Fisheries, Species, or Users

Unlike its relatives within the drum family, such as Atlantic croaker and spot, the black drum fishery tends to be a targeted fishery with little bycatch (J. Zimmerman, pers. comm.) in the northern range. In the southern range, fishing for black drum often coincides with other targeted species, such as sheepshead (T. Roller, pers. comm.). Large black drum have occasionally been caught in shrimp trawls off the Atlantic coast, although this is not a frequent occurrence (Murphy and Muller 1995).

Behavioral characteristics of black drum can make them highly susceptible to fishing, as they school up for spawning in the spring and can be easily captured by encircling gear (run-around gill nets, trammel nets, purse seines). Off the Gulf coast of Florida, historical adult black drum

purse seine catches had been estimated to be as great as 120,000 lbs. Off northeast Florida, shrimp trawlers historically made large catches of adults during the spring (Murphy and Taylor 1989).

Juveniles are likely prey for a wide range of estuarine species, including spotted seatrout and jack crevalle. Larger drum are likely susceptible to shark predation (Murphy and Muller 1995), although their size likely lends protection against predation by most species.

1.4. Habitat Considerations

1.4.1. Habitat Important to the Stocks

1.4.1.1. Description of the Habitat

Spawning: Black drum spawn from April to June in the northern range (Joseph et al. 1964; Richards 1973; Silverman 1979). Spawning occurs in the mouth of the Chesapeake Bay and seaside inlets on the Eastern shore (Chesapeake Bay Program 2004). The presence of a large spring/early summer fishery on spawners during this time period in the Delaware Bay also supports evidence of spawning occurring inshore and in the spring. Evidence in Florida suggests spawning occurs in deep waters inshore, from November through April, with peaks in February and March (Murphy and Taylor 1989). As in the northern range, these peaks in spawning had corresponded with peaks in Florida's catch (Murphy and Muller 1995).

Fitzhugh et al. (1993) noted the difference in sex ratios in Louisiana during the spawning season between fish caught offshore by trawls (dominated by males), and fish caught inshore by gillnet and haul-seines (dominated by females). These same skewed sex ratios were not found before or after the spawning period. The authors concluded the catches reflected a true segregation of the sexes during the spawning period, suggesting the use of different habitats.

Larval: Larval black drum tend to stay in the salt marshes and estuaries (ASMFC 2011). Peters and McMichael (1990) reported black drum larvae in the bays of Florida, where salinities ranged from 22 – 30 I. They found these larvae primarily feeding on copepods. Gold and Richardson (1998) characterized black drum as estuarine-dependent in the early years. Work by Rooker et al. (2004) on strontium concentrations deposited in otoliths supported movement into lower-salinity, estuarine environments during early life stages.

Young-of-year: Gill net sampling in Florida nearshore lagoons found high levels of young-of-the-year , indicating young-of-year black drum remain inshore. Gold and Richardson (1998) characterized black drum as estuarine-dependent in the early years for use in genetic studies. Work by Rooker et al. (2004) on strontium concentrations deposited in otoliths supports movement into lower-salinity, estuarine environments during early life stages.

Juvenile: Black drum juveniles have been found in salt marshes and estuaries along the coast, suggesting these areas serve as nurseries for larvae up to juveniles (ASMFC 2011; Murphy and Muller 1995; Pearson 1929). Beach seine sampling in Florida nearshore lagoons found high levels of juveniles , indicating juvenile black drum remain inshore. Juveniles can tolerate a wide

range of salinities and temperatures but have often been found, in Florida, in low to medium salinities and over unvegetated mud bottoms (Peters and McMichael 1990). As juveniles grow, they range into higher salinity areas, more similar to adult habitat (Rooker et al. 2004). Small juveniles primarily feed on amphipods, mollusks, polychaetes, and small fish (Peters and McMichael 1990). As juveniles grow, Peters and McMichael (1990) found their consumption of shrimp, crabs, fish, and mollusks became more dominant, with the crossover correlating with the development of pharyngeal molars. Richards (1973) correlated juvenile muddy, nutrient rich, marsh habitat during the first three months to rapid growth.

Murphy and Taylor (1989) noticed the capture of small drum throughout the year by recreational and commercial fishermen in Florida's nearshore areas, suggesting year-round occupation of these nearshore estuarine to marine habitats.

Adult: Evidence suggests adults are euryhaline, although high salinities tend to cause stress as do sudden drops in temperature (Simmons and Breuer 1962). Adults move between estuaries and nearshore shelf waters, although they tend to move to deeper channel areas as they grow and mature (ASMFC 2011). Evidence suggests an age-specific migration in the Mid-Atlantic: northward and inshore in the spring; southward and offshore in the fall (Jones and Wells 2001). Mollusks, decapods, fishes, and annelids dominate the diet for adults (Murphy and Muller 1995).

Black drum move offshore at sexual maturity and form large, offshore schools that can migrate extensively (Matlock 1987; Murphy and Taylor 1990; Simmons and Breuer 1962). Work by Rooker et al. (2004) on strontium concentrations deposited in otoliths supports movement into more saline, oceanic conditions when older.

1.4.1.2. Identification and Distribution of Habitat and Habitat Areas of Particular Concern

The following section is adapted from the Amendment 2 to the Red Drum FMP

Habitat Areas of Particular Concern (HAPCs) are defined by the Atlantic States Marine Fisheries Commission as areas within the species habitat which satisfy one or more of the following criteria: (1) provide important ecological function, (2) are sensitive to human-induced environmental degradation, (3) are susceptible to coastal development activities, or (4) are considered to be rarer than other habitat types. For black drum, this includes the following habitats: tidal freshwater, estuarine emergent vegetated wetlands (flooded saltmarshes, brackish marsh, and tidal creeks), estuarine scrub/shrub (mangrove fringe), submerged rooted vascular plants (sea grasses), oyster reefs and shell banks, unconsolidated bottom (soft sediments), ocean high salinity surf zones, and artificial reefs. These areas overlap with the designated HAPCs for red drum, designated in Amendment 2 to the Red Drum Fishery Management Plan (ASMFC 2002). These HAPCs include all coastal inlets, all state-designated nursery habitats (i.e. Primary Nursery Areas in North Carolina), sites where spawning aggregations of red drum have been documented and spawning sites yet to be identified, areas supporting submerged aquatic vegetation (SAV), as well as barrier islands off the South Atlantic states as they maintain the estuarine environment in which young black drum develop.

A species' primary nursery areas are indisputably essential to its continuing existence. Primary nursery areas for black drum can be found in estuaries, such as coastal marshes, shallow tidal creeks, bays, tidal flats of varying substrate, tidal impoundments, and seagrass beds. Since young black drum move among these varying environments, it is impossible to designate specific areas as deserving more protection than others. Moreover, these areas are not only primary nursery areas for black drum, but they fulfill the same role for numerous other resident and estuarine-dependent species of fish and invertebrates.

Similarly, juvenile black drum habitat extends over a broad geographic range and adheres to the criteria that define HAPCs. Juvenile black drum are found throughout tidal creeks and channels of southeastern estuaries, in backwater areas behind barrier islands and in the front beaches during certain times of the year. It is during this period that juveniles begin moving between low and higher salinity areas (Rooker et al. 2004). Therefore, the estuarine system as a whole, from the lower salinity reaches of rivers to the mouth of inlets, is vital to the continuing existence of this species.

Prior to transfer of management authority for red drum from the South Atlantic Fishery Management Council to ASMFC, the SAFMC reviewed the Essential Fish Habitat (EFH) and HAPC designations for red drum. The SAFMC concluded the EFH and HAPCs would still be protected, as similar areas had been designated for other federally managed species. As a result, these areas, which serve an important role in the black drum life cycle, have retained protection and are referenced here and in the Amendment 2 to the Red Drum FMP (ASMFC 2002).

The designated EFH includes tidal freshwater, estuarine emergent vegetated wetlands (flooded salt marsh, brackish marsh, and tidal creeks), estuarine scrub/shrub (mangrove fringe), submerged rooted vascular plants (seagrass), oyster reefs and shell banks, unconsolidated bottom (soft sediment), ocean high salinity surf zones, and artificial reefs (SAFMC 1998). The area covered ranges from Virginia through the Florida Keys, to a depth of 50 m offshore.

1.4.1.3. Present Condition of Habitats and Habitat Areas of Particular Concern

The following section is adapted from the Amendment 2 to the Red Drum FMP

Coastal Spawning Habitat: Condition and Threats
It is reasonable to assume that areas where coastal development is taking place rapidly, habitat quality may be compromised. Coastal development is a continuous process in all states and all coastal areas in the nation are experiencing significant growth. The following section describes particular threats to the nearshore habitats in the South Atlantic that meet the characteristics of suitable spawning habitat for black drum.

One threat to the spawning habitat for black drum is navigation and related activities such as dredging and hazards associated with ports and marinas. According to the SAFMC (1998), impacts from navigation related activities on habitat include direct removal/burial of organisms from dredging and disposal of dredged material, effects due to turbidity and siltation; release of contaminants and uptake of nutrients, metals and organics; release of oxygen-consuming substances, noise disturbance, and alteration of the hydrodynamic regime and physical

characteristics of the habitat. All of these impacts have the potential to substantially decrease the quality and extent of black drum spawning habitat.

Besides creating the need for dredging operations that directly and indirectly affect spawning habitat for black drum, ports also present the potential for spills of hazardous materials. The cargo that arrives and departs from ports includes highly toxic chemicals and petroleum products. Although spills are rare, constant concern exists since huge expanses of productive estuarine and nearshore habitat are at stake. Additional concerns related to navigation and port utilization are discharge of marine debris, garbage and organic waste into coastal waters.

Maintenance and stabilization of coastal inlets is of concern in certain areas of the southeast. Studies have implicated jetty construction to alterations in hydrodynamic regimes thus affecting the transport of larvae of estuarine-dependent organisms through inlets (Miller *et al*. 1984; Miller 1988).

Estuarine Spawning, Nursery, Juvenile and Subadult Habitat: Condition and threats
Coastal wetlands and their adjacent estuarine waters constitute primary nursery, juvenile and sub-adult habitat for black drum along the coast. Between 1986 and 1997, estuarine and marine wetlands nationwide experienced an estimated net loss of 10,400 acres. However, the rate of loss was reduced over 82% since the previous decade (Dahl 2000). Most of the decline resulted from urban and rural activities and the conversion of wetlands for other uses. Along the southeast Atlantic coast, the state of Florida experienced the greatest loss of coastal wetlands due to urban or rural development (Dahl 2000). However, the loss of estuarine wetlands in the southeast has been relatively low over the past decade although there is some evidence that invasion by exotic species, such as Brazilian pepper (*Schinus terebinthifolius*), in some areas could pose potential threats to fish and wildlife populations in the future (T. Dahl, pers. comm.).

Throughout the coast, the condition of estuarine habitat varies according to location and the level of urbanization. In general, it can be expected that estuarine habitat adjacent to highly developed areas will exhibit poorer environmental quality than more distant areas. Hence, environmental quality concerns are best summarized on a watershed level.

Threats to estuarine habitats of the southeast were described in Amendment 2 to the Red Drum FMP (ASMFC 2002). Due to the black drum's dependence on estuarine habitats throughout its early years, these same threats are likely to impact black as well as red drum.

Nutrient enrichment of estuarine waters throughout the southeast is a major threat to the quality of estuarine habitat. Forestry practices contribute significantly to nutrient enrichment in the southeast. Areas involved are extensive and many are in proximity to estuaries. Urban and suburban developments are perhaps the most immediate threat to black drum habitat in the southeast. The almost continuous expansion of ports and marinas in the South Atlantic poses a threat to aquatic and upland habitats. Certain navigation-related activities are not as conspicuous as port terminal construction but have the potential to significantly impact the estuarine habitat upon which black drum depend. Activities related to watercraft operation and support pose numerous threats including discharge of pollutants from boats and runoff from impervious surfaces, contaminants generated in the course of boat maintenance, intensification of existing

poor water quality conditions, and the alteration or destruction of wetlands, shellfish and other bottom communities for the construction of marinas and other related infrastructure.

Estuarine habitats of the southeast can be negatively impacted by hydrologic modifications. The latter include activities related to aquaculture, mosquito control, wildlife management, flood control, agriculture and silviculture. Also, ditching, diking, draining and impounding activities associated with industrial, urban and suburban development qualify as hydrologic modifications that may impact the estuarine habitat. Alteration of freshwater flows into estuarine areas may change temperature, salinity and nutrient regimes as well as alter wetland coverage. Studies have demonstrated that changes in salinity and temperature can have profound effects in estuarine fishes (Serafy *et al*. 1997) and that salinity partly dictates the distribution and abundance of estuarine organisms (Holland *et al*. 1996). Hence, black drum are probably as susceptible as any other estuarine organism to such changes in the physical regime of their environment.

Adult Habitat: Condition and Threats
Threats to the black drum's adult habitat are not as numerous as those faced by postlarvae, juveniles and subadults in the estuary and coastal waters. Threats to the nearshore and offshore habitats that adult black drum utilize in the South Atlantic include navigation and related activities, dumping of dredged material, mining for sand and minerals, oil and gas exploration, offshore wind facilities, and commercial and industrial activities (SAFMC 1998).

An immediate threat is the sand mining for beach nourishment projects. Associated threats include burial of bottoms near the mine site or near disposal sites, release of contaminants directly or indirectly associated with mining (i.e. mining equipment and materials), increase in turbidity to harmful levels, and hydrologic alterations that could result in diminished desirable habitat.

Offshore mining for minerals may pose a threat to black drum habitat in the future. Currently, there are no mineral mining activities taking place in the South Atlantic. However, various proposals to open up additional areas off the Atlantic coast to seabed mining have been introduced by the Federal Executive and Legislative branches.

Offshore wind farms may also pose a threat to black drum habitat in the future. Currently, there are no offshore wind farms established in the United States. However, the Atlantic coast is a potential candidate for future wind farm sites.

1.5. Impacts of the Fishery Management Program

1.5.1. Biological and Environmental Impacts

Adoption of coastwide management measures can provide protection to various size classes of black drum. Limits on catch can provide additional protection throughout its geographic range and support a sustained population and thus fishery.

Concerns about the fishery in the Chesapeake Bay Black Drum FMP (Chesapeake Bay Program 2004) cited a decline of citation-size fish and long-term fluctuations in population abundance, although a lack of accurate catch and effort data for the mid-Atlantic black drum fishery made it impossible to determine whether these changes were a result of natural variation in dominant year classes or over exploitation and population decline. Jones and Wells (2001) concluded from yield-per-recruit analyses that growth overfishing in Chesapeake Bay, where the majority of the catch is older fish, is not likely occurring.

1.5.2. Social Impacts

Regulatory changes in fisheries have social impacts. When regulations are created or made more restrictive on a fishery by way of size and bag limits, area closures, or season closures, ultimately the dynamic of the fishing regimen will change. For instance, areas once fished by locals and tourists alike may close, causing a shift in fishing location and thus a shift in lodging, fuel purchases, food consumption at local restaurants, etc., away from that economy. Regulatory changes though have positive social impacts as well, though many times, these impacts are seen in the future and not immediately. Regulations are put in place so a fishery may continue to be sustainable or recover to a sustainable level. This in turn increases fishing opportunities into the future and may bring people into these local areas, benefitting the economy.

Following are some considerations that could be used for assessments of social and economic impacts in the future.

There is very little information on fishermen, fishing-dependent businesses, or communities that depend on the black drum fisheries. In order to understand the impact that any new rules and regulations may have on participants in the any fishery, in-depth community profiles need to be developed that will aid in the description of communities, both present and historical, involved in a fishery. Limited social science research has been conducted by NMFS in communities in the South Atlantic. Until more research is completed, and in-depth community profiles are developed for sample communities, it is not possible to fully describe the possible impacts of any change in fishing regulations on any fishery.

While not an in-depth ethnographic study, a project employing rapid assessment was completed to document the location, type and history of fishing communities in the South Atlantic region. South Atlantic Fishery Management Council staff worked collaboratively with the University of Florida to describe fishing communities in a broad manner (for example, whether the community is characterized mostly by commercial fishing, for-hire, recreational or some combination of all sectors), and link on-the-ground fieldwork with the collection of as much secondary data as possible. The secondary data included U.S. Census records, landings, permits, and state information. All of this information is used to form a baseline dataset to assist in the measurement of social and economic impacts. [1]

1 Jepson, M., K. Kitner, A. Pitchon, W.W. Perry, and B. Stoffle. 2006. Potential fishing communities in the Carolinas, Georgia, and Florida: An effort in baseline profiling and mapping. SAFMC and NMFS-SERO, Fisheries Social Science Branch.

1.5.2.1. Recreational Fishery

The recreational sector of the black drum fishery is much larger than the commercial sector and black drum is an important species for recreational anglers and the for-hire sector. MRIP estimates indicate that the private recreational sector is the dominant component of the black drum recreational fishery (Figure 4), and most landings are associated with New Jersey, Virginia and Florida in recent years.

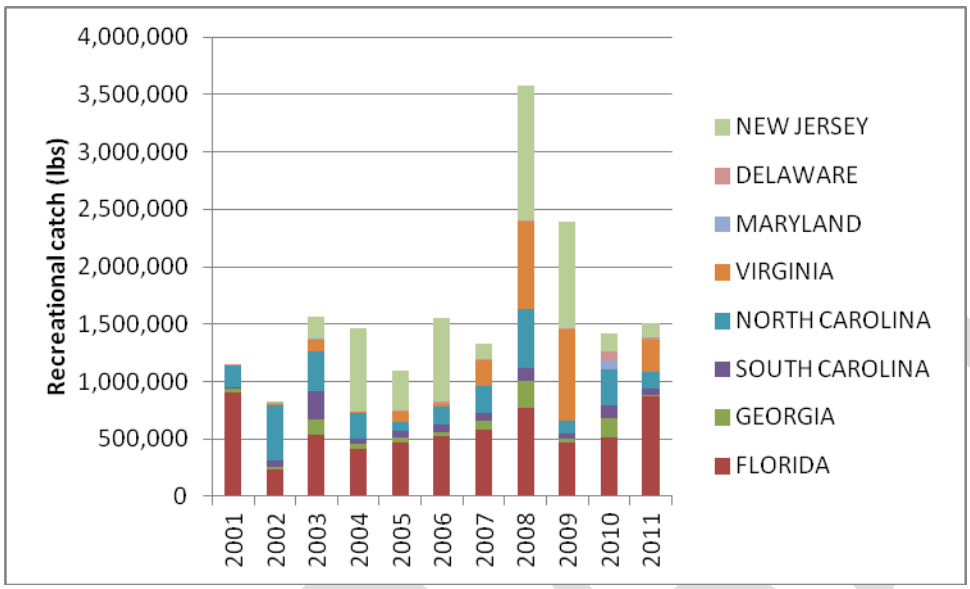

Figure 4. Recreational catch estimates for black drum for the private recreational (private/rental boats and land-based). Data source: MRIP.

Establishment of the black drum FMP would not be expected to impact the recreational sector at this time, but similar to the commercial sector, changes in access to other fisheries through regulations or availability may increase the importance of black drum to the for-hire fleet and private anglers. Specifically it is likely that impacts would be the most significant for recreational fishermen and for-hire businesses in New Jersey, Florida, and Virginia. Implementation of future management measures for black drum could result in reduced participation of recreational anglers, and may affect for-hire businesses that depend on access to black drum. However, the FMP would also allow management to maintain stock health and recreational participation, in addition to consistency in regulations between all states.

1.5.2.2. Commercial Fishery

Virginia instituted limited entry in its commercial fishery in 1994 (Chesapeake Bay Program 2004). Maryland closed its commercial fishery in the Chesapeake Bay and coastal bays and tributaries beginning in 1999, and limited total allowable catch from the Atlantic side to 1500 pounds. The Potomac River Fisheries Commission adopted a one fish, 16” size limit for commercial (and recreational) fisheries. Florida set regulations for its black drum commercial fishery in 1989, creating a minimum size limit of 14 inches and a maximum size limit of 24 inches with a vessel limit of 500 pounds per day.

Historically, the commercial market has been local with residents the main end user for fillets and roe on the eastern shore of Virginia and Maryland during April and May (Jones et al. 1990). Continued availability of this local fair would be beneficial to local residents and fishermen.

The black drum commercial fishery has a lower level of landings and economic value relative to other commercial fisheries in the Atlantic region. Landings are primarily in North Carolina and Virginia, although Florida, New Jersey, Maryland and Delaware also have reported landings in recent years (Figure 5).

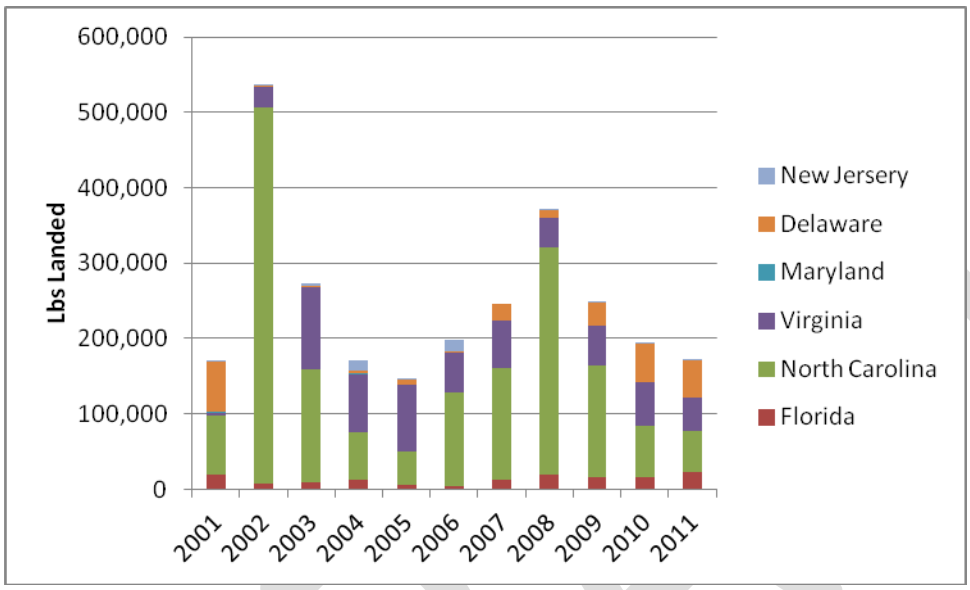

Figure 5. Black drum commercial landings. Data source: ACCSP.

In North Carolina, a majority of commercial landings of black drum are reported in Dare, Carteret, Hyde, and Pamlico Counties, and most harvest is with gillnet and fixed net. Accomack and Northampton Counties make up most of Virginia's reported landings, and almost all landings are with gillnet. While gillnets are the dominant gear type for harvest, hook and line, dip nets, and cast nets are also used to catch black drum in other states (ACCSP, confidential dealer reports).

Many commercial fishermen in these areas fish multiple fisheries and target different species throughout the year based on regulations, availability, and market demand. It is likely that fishermen who harvest black drum will switch fisheries as needed, and participation in the fishery may be a minimal component of the income for the commercial fleet. In general, establishment of the black drum FMP would not be expected to result in negative impacts on commercial fishermen and associated communities and businesses at this time. However, as new regulations in other commercial fisheries are implemented, specifically lower catch limits, limited entry programs or catch share programs, and other management measures, the black drum commercial fishery may become more important if access to other fisheries is restricted.

Establishment of the black drum FMP would be expected to produce broad social benefits for the commercial sector. Management measures implemented to address changes in the stock, effort,

or other factors that may impact the fleet could minimize risk of overfishing of black drum. Interstate management of the migratory stock will also benefit the commercial sector through consistent management measures along the Atlantic coast.

1.5.2.3. Subsistence Fishery

Although many recreational anglers will catch black drum for their own consumption, there is some aversion to eating black drum. Large animals tend to have large pockets of worms. Although anecdotal accounts convey these pockets can be easily removed, the large presence of worms deters some fishermen from consuming black drum. Fishermen who target or are required to target, via regulation, smaller animals do not generally encounter these pockets of worms. Beyond the recreational aspect, there is no known subsistence fishery for black drum.

1.5.2.4. Non-consumptive Factors

No non-consumptive factors were identified that were of significance to the black drum resource.

1.5.3. Economic Impacts

1.5.3.1. Recreational Fishery

Desfosse (1987) reported the recreational fishery on black drum to be important to Virginia, with the need to set a catch limit so as to protect the fishery for years to come. He reported large support across the charter and recreational participants for a limit on the recreational and the commercial fisheries.

Black drum recreational fishing contributes to the tourism industry on the Eastern Shore of Virginia (Chesapeake Bay Program 2004). Although the recreational season is short (April – June at most), it occurs before more popular fish enter the Chesapeake Bay, supporting local business during that lull time (Jones and Wells 2001).

Black drum are an important species in the complex of recreational species targeted or caught by anglers in the mid-Atlantic and South Atlantic region. Fisheries Economics of the U.S. 2009,[2] shows that in these two regions combined, recreational fishing resulted in trip and durable equipment expenditures of $9.3 billion. In addition to the economic impacts created by angler spending on recreational fishing, the fishing activity creates net economic benefits to participating fishermen. Several studies on this economic value of recreational value have been conducted in the mid-Atlantic and South Atlantic (McConnell and Strand 1994; Whitehead et al. 2000), but none estimate the specific value for black drum fishing.

Although the recreational season is short, it occurs before more popular fish enter the Bay, and the fishery supports local business at that time (Jones and Wells 2001). Jones et al. (1990)

2 National Marine Fisheries Service. 2010. Fisheries Economics of the United States, 2009. U.S. Dept. Commerce, NOAA Tech. Memo. NMFS-F/SPO-118, 172p. Available at: https://www.st.nmfs.noaa.gov/st5/publication/index.html

reported the black drum fishery being important to the economies of the two poorest counties in Virginia, located on the Eastern Shore.

1.5.3.2. Commercial Fishery

The highest yearly estimate of black drum commercial landings on the Atlantic coast occurred in 2009, with total landings of 259,006 pounds, nominally worth $320,338 (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD). In 2009, Virginia had the highest value of landings on the Atlantic coast at $223,143 (70%), but North Carolina landed the highest poundage at 149,057 (58%).

In real terms, using 2011 as the base year and adjusting for inflation by the consumer price index, the lowest price per pound on the Atlantic coast occurred in 2002 at $0.31, while the highest occurred in 1998 at $1.85 (Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD). The highest year of total value, 2009, was the fourth highest price at $1.30.

From 1950 up until 2008, and with the exception of the anomalous record price in 1998, black drum prices have fluctuated around a fairly narrow range with a mean price of $0.48. From 2008-2011, prices have risen steadily from $0.88 per pound in 2008 to a $1.55 per pound in 2011.

1.5.3.3. Subsistence Fishery

Although many recreational anglers will catch black drum for their own consumption, there is some aversion to eating black drum. Large animals tend to have large pockets of worms. Although anecdotal accounts convey these pockets can be easily removed, the large presence of worms deters some fishermen from consuming black drum. Fishermen who target or are required to target, via regulation, smaller animals do not generally encounter these pockets of worms. Beyond the recreational aspect, there is no known subsistence fishery for black drum.

1.5.3.4. Non-consumptive Factors

No non-consumptive factors were identified that were of significance to the black drum resource.

1.5.4. Other Resource Management Efforts

1.5.4.1. Artificial Reef Development/Management

Approximately 120,000 acres (155 nm^2) of ocean and estuarine bottom along the south Atlantic coast have been permitted for the development of artificial reefs (ASMFC 2002). The Georgia Department of Natural Resources is responsible for the development and maintenance of a network of man-made reefs both in estuarine waters and in the open Atlantic Ocean. Funding for the artificial reef program is provided by Federal Aid in Sport Fish Restoration, fishing license revenues, and private contributions. To date, there are 15 reefs within the estuary proper, which are constructed of a variety of materials including concrete rubble, metal cages, and

manufactured reef units. These provide habitat for juvenile black drum and several other species of recreationally important fishes. In 2001, three "beach" reefs were constructed in locations within Georgia's territorial waters just off the barrier island beaches. These are experimental in nature, but should provide some habitat for juvenile and adult black drum. There are 19 man-made reefs in the EEZ ranging from depths of 40 to 130 feet. These reefs are constructed of a variety of materials including surplus vessels, concrete rubble, barges, bridge spans, and manufactured reef units. Both juvenile and adult black drum are known to use these reefs.

The Florida Fish and Wildlife Conservation Commission's (FWC) Division of Marine Fisheries Management administers a state artificial reef program that provides financial and technical assistance to coastal local governments, nonprofit corporations and state universities to develop artificial reefs and to monitor and evaluate these reefs. To date, there are 919 artificial reefs located in the Atlantic off Florida with 38 of these reefs being located within estuarine waters. The estuarine reefs are located in two Florida counties one being Dade County which has 32 and Palm Beach County which has 6. Artificial habitats off Florida range in depth from 6 feet to 420 feet of water and consist of a variety of materials i.e. concrete culverts, bridge spans, barges, and decommissioned military ships such as the Hoyt Vandenberg which has become a very popular dive destination. Oyster shells are also used to create artificial habitat in Florida waters, but the FWC does not keep track of these reefs. These artificial habitats should provide habitat for juvenile and adult black drum off Florida's Atlantic coast.

New Jersey has also developed and invested in an artificial reef program, with the state agency involved since 1984. Similarly, Delaware has invested in an artificial reef program, with 14 sites within Delaware Bay. Artificial reef construction is especially important in the Mid-Atlantic region, where near shore bottom is usually featureless sand or mud.

States should continue support for habitat restoration projects, including oyster shell recycling and oyster hatchery programs as well as seagrass restoration, to provide areas of enhanced or restored bottom habitat.

1.5.4.2. Bycatch

Murphy and Muller (1995) indicated that black drum were rarely caught in shrimp trawls, although small numbers were caught during the late winter to early summer when adults occur in nearshore shelf waters. All shrimp trawlers in the South Atlantic, since passage of Amendment 2 to the Federal Shrimp Fishery Management Plan in 1996, are required to use bycatch reduction devices, which has greatly reduced the interactions.

Maryland's pound net fishery has caught black drum, both targeted and bycatch, although these fish likely have a high survival rate, as these fish were used in tagging studies in the mid to late 1990s (H. Rickabaugh, pers. comm.). Approximately 20% of those tagged were recaptured within 100 days, supporting these observations.

1.6. Location of Technical Documentation for FMP

1.6.1. Review of Resource Life History and Biological Relationships

The Black Drum Work Group compiled a life history on black drum and the available data in two reports provided to the ASMFC Interstate Fishery Management Program Policy Board (ASMFC 2010, 2011).

1.6.2. Stock Assessment Document

No coastwide stock assessment has yet to be performed.

1.6.3. Economic Assessment Document

Economic value of commercial catches was taken from National Marine Fisheries Service, Fisheries Statistics Division, in Silver Spring, Maryland.

1.6.4. Law Enforcement Assessment Document

The Commission's Law Enforcement Committee has developed a guidelines document for evaluation of potential management measures in Commission FMPs. This document will be used to provide recommendations to the South Atlantic Board concerning the enforceability of proposed measures.

2. GOALS AND OBJECTIVES

2.1. History and Purpose of the Plan

2.1.1. History of Prior Management Actions

No coastwide management program, whether among the states or at the federal level, currently exists for black drum on the Atlantic coast. At present, six states have implemented harvest regulations for black drum (Table 2).

New Jersey: New Jersey currently has a 10,000 pound commercial trip limit and a 65,000 pound annual quota. Anglers in the recreational fishery may take three black drum ≥16 inches. The state is considering adoption of new commercial (5,000 pound trip limit and 50,000 pound annual quota) and recreational (two fish ≥ 32 inches) regulations for harvest of black drum. If adopted, similar regulations will be considered by Delaware in the Delaware River and Bay areas.

Delaware: The Delaware Division of Fish and Wildlife entered a joint management plan with the state of New Jersey for black drum in the Delaware Bay in March 2010. This bi-state fishery management plan established the same recreational size and bag limits and commercial quota as New Jersey.

Maryland: Prior to 1994 Maryland had no restrictions on the harvest of black drum. In 1994 regulations were adopted including a 30,000 pound Chesapeake Bay commercial quota, a 1 fish per angler recreational creel limit, and a 16 in total length size limit for both commercial and recreational fisheries. In 1998 the Chesapeake Bay commercial fishery was closed except for scientific studies and a 1,500 pound per year cap was placed on the Atlantic Ocean commercial fishery. Also, a 6 fish per boat limit was added to the recreational fishery in addition to the one fish per person creel limit.

Virginia: The minimum size limit for black drum in Virginia's commercial fishery has been 16 inches (total length) since 1987. In 1992, a one fish possession limit (recreational and commercial) was established for any person using hook and line, rod and reel, or hand line. The commercial Black Drum Harvesting and Selling permit was created in 1987. This permit is required to land more than one black drum per day for commercial purposes. Until 1993, any commercial fisherman was able to attain a permit, but by 1993 that fisherman was required to be a registered commercial fisherman. In 1994, the harvesting and selling permit was tied to specific previous permit and documentation of harvest requirements for the 1988-1993 period. In addition, any fisherman active in 1992 or 1993 was required to have reported that activity in order to maintain a permit in 1994; weekly mandatory reporting of daily activity has been required since 1987. Since 2002, the annual commercial quota has been 120,000 pounds in order to cap landings.

North Carolina: Currently, there is no commercial quota, trip limit, or size limit for black drum in North Carolina; however, since 1994 all black drum commercial landings have required documentation in the North Carolina Division of Marine Fisheries Trip Ticket Program. Recreationally, smaller black drum are harvested while larger drum are typically caught and released for sport. Currently, this is no recreational size or bag limit.

South Carolina: Commercial landings in South Carolina reported by NMFS are generally low and indicative of reported bycatch rather than a targeted fishery. Section 50-5-360 of the South Carolina Code requires that anyone, who buys, receives or handles any live or fresh saltwater fish or any saltwater fishery products taken or landed in the state for sale, must obtain a wholesale dealers license. Prior to 2007, there were no recreational management regulations for black drum in South Carolina. In 2007 the South Carolina legislature amended section 50-5-1705 of the South Carolina Code creating a slot limit of 14 to 27 inches total length and a daily bag limit of 5 fish per person that applies to both commercial and recreational fisheries.

Georgia: Black drum were not regulated in Georgia until April 1998, when the current fifteen fish bag limit and 10-inch minimum total length regulations were enacted. Commercial regulations are the same as those for the recreational fishery.

Florida: With the increase in popularity of blackened redfish dishes in the 1980s, concerns were raised about subsequent overfishing of drums. Therefore, regulations were established in Florida in 1989, including a minimum size limit for both recreational and commercial black drum fisheries of 14 inches and a maximum size limit of 24 inches. Possession of one fish over 24 inches is allowed for recreational fishers only. The recreational fishery has a daily limit of 5 fish per day, and the commercial fishery has a limit of 500 pounds per day.

Table 2. Current state regulations for black drum.

State	Recreational		Commercial			Notes
	Size limit	Bag limit	Size limit	Trip Limit	Annual Quota	
ME->NY	-	-	-	-	-	
NJ	16” min	3/person/day	16” min	10,000 lbs	65,000 lbs	
NJ Proposed	32” min	2/person/day	32” min	5,000 lbs	50,000 lbs	
DE	16” min	3/person/day	16” min	10,000 lbs	65,000 lbs	
MD	16” min	1/person/day 6/vessel (Bay)	16” min		1,500 lbs Atlantic Coast	Ches Bay closed to commercial harvest
VA	16” min	1/person/day	16” min	1/person/day*	120,000 lbs	*without Black Drum Harvesting and Selling permit
NC	-	-	-	-	-	
SC	14” min 27” max	5/person/day	14” min 27” max	5/person/day		Commercial fishery primarily bycatch
GA	10” min	15/person/day	10” min	15/person/day		
FL	14” min 24” max	5/person/day	14” min 24” max	500 lbs/day		One fish >24” allowed for recreational fishers

2.1.2. Purpose and Need for Action

Currently there is no immediate management or biological concerns for black drum, but four main reasons have been identified as to why/how interstate management would benefit the fishery:

1) Tagging evidence suggests black drum migrate along the coast;
2) There is lack of consistent regulations and goals;
3) The targeted fishery in some areas may be very young fish while others areas may target the breeding stock; and
4) An Interstate FMP establishes a framework to address future concerns or changes in the fishery or population.

2.2. Goals

The goal of the Black Drum Interstate FMP shall be to provide for an efficient management structure to implement coastwide management goals in a timely manner.

2.3. Objectives

1) Provide a flexible management system to address future changes in resource abundance, scientific information, and fishing patterns among user groups or area.
2) Promote cooperative collection of biological, economic, and sociological data required to effectively monitor and assess the status of the black drum resource and evaluate the management efforts.
3) Manage the black drum fishery to protect both young individuals and established breeding stock.
4) Develop research priorities that will further refine the black drum management program to maximize the biological, social, and economic benefits derived from the black drum population.

2.4. Specification of Management Unit

The management unit is defined as the black drum (*Pogonias cromis*) resource throughout the range of the species within U.S. waters of the northwest Atlantic Ocean from the estuaries eastward to the offshore boundaries of the EEZ. The selection of this management unit is based on the distribution of the species along the Atlantic coast, as noted in tagging studies from Maryland, Virginia, South Carolina, and Georgia, and historical harvest patterns that have identified fisheries for black drum from Florida north through New Jersey.

2.4.1. Management Areas

The management area shall be the entire Atlantic coast distribution of the resource from the east coast of Florida north through New Jersey.

2.5. Definition of Overfishing

As no coastwide stock assessment has yet to be performed, there is no definition of overfishing for black drum. A definition of overfishing along with absolute values may be established, following a stock assessment, through adaptive management.

2.6. Stock Rebuilding Program

The status of the black drum population is unknown, and therefore a specific rebuilding program and schedule cannot be determined. Most catch data indicate that the stock is currently healthy, but status of the stock can only be determined after a coastwide stock assessment is conducted.

3. MONITORING PROGRAM SPECIFICATIONS/ELEMENTS

The South Atlantic Species Advisory Panel will meet as necessary to review the stock assessment, once available, for black drum and all other relevant data pertaining to stock status. The Advisory Panel will forward its report and any recommendations to the Management Board.

The Black Drum Technical Committee will meet annually, or as necessary, to review state management program changes, developments in the fishery, or other changes or challenges in the fishery. The Black Drum Stock Assessment Subcommittee will generally meet every five years to review and update or perform a benchmark stock assessment on the black drum stock. This schedule may be modified as needed to incorporate new information and consideration of the black drum biology.

The Black Drum Plan Review Team (PRT) will annually review implementation of the management plan and any subsequent adjustments (addenda), and report to the Management Board on any compliance issues that may arise. The PRT will also prepare the annual Black Drum FMP Review and coordinate the annual update and prioritization of research needs (see Section 6.2).

3.1. Assessment of Annual Recruitment

Annual juvenile recruitment (appearance of juveniles in the ecosystem) of black drum is measured through various fishery-independent, state and federal surveys in order to provide an indication of future stock abundance. When low numbers of young-of-year (age-0) fish are produced in a given year, recreational and commercial catch from that year-class may be lower when surviving fish become available to the fisheries. Recruitment is measured by sampling current year juvenile fish abundance in nursery areas.

The FMP recommends the continuation of surveys from which black drum juvenile abundance indices are, or could be, developed. These indices are required in order to tune future stock assessments for this species. Efforts should be made to validate the ability of juvenile abundance indices to predict future year-class strength, as these indices can play a pivotal role in setting future catch levels and predicting trends in stock status.

3.2. Assessment of Spawning Stock Biomass

Black drum are caught in various fishery-independent, state and federal surveys. Survey results are used to develop estimates of relative biomass or abundance. Relative abundance/biomass indices provide an indication of current stock size, and may be used to tune future stock assessment. The FMP encourages the continuation of surveys from which adult abundance indices are, or could be, developed.

3.3. Assessment of Fishing Mortality Target and Measurement

As no coastwide stock assessment has occurred, no coastwide estimates of fishing mortality are available. Fishing mortality method of measurement, target, and threshold may be updated following a coastwide stock assessment.

3.4. Summary of Monitoring Programs

The FMP includes no requirements regarding fishery-dependent monitoring programs, but encourages all state fishery management agencies to pursue full implementation of the standards of the Atlantic Coastal Cooperative Statistics Program (ACCSP). The Management Board recommends a transitional or phased-in approach be adopted to allow for full implementation of the ACCSP standards. Until the ACCSP standards are implemented, the Management Board encourages state fishery management agencies to initiate implementation of specific ACCSP modules, and/or pursue pilot and evaluation studies to assist in development of reporting programs to meet the ACCSP standards. The ACCSP partners are the 15 Atlantic coast states from Maine through Florida, the District of Columbia, the Potomac River Fisheries Commission, the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the three fishery management councils, and the Atlantic States Marine Fisheries Commission. Participation by program partners in the ACCSP does not relieve states from their responsibilities in collating and submitting harvest/monitoring reports to the Commission as required under the FMP.

3.4.1. Catch, Landings, and Effort Information

Commercial Catch and Effort Data

The ACCSP's standard for commercial catch and effort statistics is mandatory, trip-level reporting of all commercially harvested marine species, with fishermen and/or dealers required to report standardized data elements for each trip by the tenth of the following month. Refer to the ACCSP Program Design document for more details on standardized data elements.

Recreational Catch and Effort Data

The ACCSP has selected the Marine Recreational Information Program (MRIP) as the base program for recreational fishing data collection for shore and private boat fishing. The MRIP provides statistics for finfish, but does not cover shellfish fisheries, which will require development of new surveys. The MRIP combines data from two independent surveys to produce estimates of fishing effort, catch, and participation.

Household Telephone Survey for Effort Data

For private/rental boats and shore, fishing effort data should be collected through a random digit-dialed telephone survey of recreational marine fishing license holders. A "wave" is a two-month sampling period, such as January through February (Wave 1) or March through April (Wave 2). The random-digit dialing survey for effort data is conducted in two-week periods that begin the last week of each wave and continue through the first week of the next wave.

Intercept Survey for Catch Data

Catch data for private/rental boats and shore fishing should be collected through an access-site intercept survey. State Partners are encouraged to increase their involvement in conducting the intercept survey. The ACCSP is addressing transition of conduct of the intercept survey for catch from a contractor to a cooperative agreement involving states at varying levels.

For-hire Catch and Effort Data

The ACCSP has selected the NOAA Fisheries For-Hire Survey as the preferred methodology for collecting data from charterboats and headboats (partyboats), also called the "for-hire" sector. The For-Hire Survey is similar to the MRIP with two major improvements; it uses: 1) a telephone survey to collect fishing effort data from vessel representatives and 2) a validation process for the self-reported data. Catch data are collected in conjunction with the MRIP with the addition of on-board samplers for headboats.

The independent survey components of the For-Hire Survey include: 1) a vessel effort survey; 2) an effort validation survey; 3) an access-site intercept survey for catch data; and 4) at-sea samplers on headboats for catch data. Using the data collected through these surveys, NOAA Fisheries generates catch and effort estimates for for-hire fisheries.

Vessel Telephone Survey for Effort Data

The vessel effort survey is a mandatory survey for for-hire vessels that uses a coastwide directory of such vessels as the sampling frame for for-hire fishing effort. The directory is continually updated as intercept and telephone interviewers identify changes in the fleet. Optimal sampling levels will be determined following evaluation of the Atlantic coast For-Hire Survey results from the first three years. Until the optimal sampling level is determined, a minimum of 10% of for-hire vessels or three charterboats and three headboats (whichever is greater), will be randomly sampled each week in each state. A vessel representative, usually the captain, is called and asked to provide information on the fishing effort associated with that vessel during the previous week. Vessel representatives are notified in advance that they have been selected for sampling and an example form is provided. To be included in the sample frame for particular wave, a vessel record must include: 1) at least one vessel representative's telephone number; 2) the name of the vessel or a vessel registration number issued by a state or the U.S. Coast Guard; 3) the county the boat operates from during that wave, and 4) designation as either a charter or guide boat (both called "charter") or headboat.

Validation Survey for Effort Data

To validate the self-reported effort data collected through the vessel telephone survey, field samplers periodically check access sites used by for-hire vessels to observe vessel effort. Interviewers record the presence or absence of a for-hire vessel from its dock or slip, and if the

vessel is absent, they try to ascertain the purpose of the trip. Those observations are compared to telephone data for accuracy and to make any necessary corrections.

Catch Data

Vessels that meet the ACCSP definition of a charterboat, "typically hired on a per trip basis," are sampled for catch data through an intercept site survey of anglers at access points, similar to the MRIP. The intercept survey has been in progress since 1981.

Some Partners collect for-hire effort data using VTRs, which are mandatory for some vessels and contain all minimum data elements collected by the For-Hire Survey. In areas where the survey runs concurrently with VTR programs, captains selected for the weekly telephone survey are permitted to fax their VTRs in lieu to being interviewed by phone.

At-sea Sampling of Headboats

At-sea samplers collect catch data aboard headboats, defined by the ACCSP as "any vessel-for-hire engaged in recreational fishing that typically is hired on a per person basis." Samples collected at-sea are supplemented by dockside sampling.

3.4.2. Biological Information

The ACCSP has set standards for how biological data should be collected and managed for commercial, recreational, and for-hire fisheries. Trained field personnel, known as port agents or field samplers, should obtain biological samples. Information should be collected through direct observation or through interviews with fishermen. Detailed fishery statistics and/or biological samples should be collected at docks, unloading sites, and fish houses. Biological sampling includes species identification of fish and shellfish; extraction of hard parts including spines and otoliths; and tissue samples such as gonads, stomachs, and scales.

3.4.3. Social and Economic Information

Commercial Fisheries

The ACCSP is testing its sociological and economic data collection standards for commercial harvesters. Standards for these kinds of data for dealers and fishing communities are in development with the Committee on Economics and Social Sciences. The ACCSP should collect baseline social and economic data on commercial harvesters using the following voluntary surveys:

- An annual fixed cost survey directed at the owner/operator,
- A trip cost survey to evaluate variable costs associated with a particular vessel's most recent commercial fishing trip to be directed at the vessel captain, and
- An annual owner/captain/crew/survey to gather sociological information.

Surveys may also be conducted using permit and registration data and vessel trip reports or sampling frames.

Recreational and For-hire Fisheries

The ACCSP's sociological and economic data for recreational and for-hire fisheries should come from periodic add-ons to existing telephone and intercept surveys. The standard is voluntary surveys of finfish fisheries conducted at least every three years.

3.4.4. Observer Programs

No specific observer programs are in place to monitor the black drum fishery. Observer programs already in place, whether state or federal, may observe capture of black drum in other monitored fisheries or specific gear types.

3.5. Stocking Program

No current stocking program for black drum is currently underway.

3.6. Bycatch Reduction Program

Bycatch is defined as "portion of a non-targeted species catch taken in addition to the targeted species. It may include non-directed, threatened, endangered, or protected species, as well as individuals of the target species below a desired or regulatory size" (ASMFC 2009a). Bycatch can be divided into two components: incidental catch and discarded catch. Incidental catch refers to retained or marketable catch of non-targeted species, while discarded catch is the portion of the catch returned to the sea because of regulatory, economic, or personal considerations.

The ACCSP's bycatch standards include both quantitative and qualitative components. The quantitative components include at-sea sampling programs and collection of bycatch data through fisherman reporting systems. The qualitative components include sea turtle and marine mammal entanglement and stranding networks, beach bird surveys, and add-ons to existing recreational and for-hire intercept and telephone surveys. Specific fisheries priorities will be determined annually by the Bycatch Prioritization Committee.

Unlike its relatives within the drum family, such as Atlantic croaker and spot, the black drum fishery tends to be a targeted fishery with little bycatch (J. Zimmerman, pers. comm.) in the northern range. In the southern range, fishing for black drum often coincides with targeting other species, such as sheepshead (T. Roller, pers. comm.). Large black drum have occasionally been caught in shrimp trawls off the Atlantic coast, although this is not a frequent occurrence (Murphy and Muller 1995). All shrimp trawlers in the South Atlantic are required to use bycatch reduction devices, as of the 1996 Amendment 2 to the Federal Shrimp Fishery Management Plan. Maryland's pound net fishery has caught black drum, both targeted and bycatch, although these fish likely have a high survival rate, as these fish were used in tagging studies in the mid to late 1990s (H. Rickabaugh, pers. comm.). Approximately 20% of those tagged were recaptured within 100 days, supporting these observations.

3.7. Habitat Program

Particular attention should be directed toward black drum habitat utilization and habitat condition (environmental parameters). A list of existing state and federal programs generating environmental data such as sediment characterization, contaminant analysis, and habitat coverage (marsh grass, oyster beds, submerged aquatic vegetation) should also be produced and updated as new information arises. Habitats utilized by black drum range from the fresh water dividing line out to and likely beyond, the shelf break. Thus, virtually any study generating environmental data from estuarine or coastal ocean systems could be of value.

4. MANAGEMENT PROGRAM IMPLEMENTATION

4.1. Recreational Fisheries Management Measures

Options for Recreational Fisheries Management include a range of options and sub-options. Except for Options 1 and 2, the options are not exclusive to one another. The sub-options incorporate current state management measures as well as additional options for consideration.

Option 1: Minimum size
Note: The Board may opt to implement a size limit, incrementally, over time. Feedback on this approach is welcome.

Sub-option 1a: No coastwide minimum size (status quo)
Sub-option 1b: 10” minimum size (Georgia)
Sub-option 1c: 14” minimum size (South Carolina and Florida)
Sub-option 1d: 16” minimum size (New Jersey, Delaware, Maryland, Virginia)
Sub-option 1e: 20” minimum size (additional option added for public comment)
Sub-option 1f: 32” minimum size (under consideration by New Jersey and Delaware)

Option 2: Slot Limit

Sub-option 2a: No coastwide size limits (status quo)
Sub-option 2b: 14” minimum, 24” maximum (Florida)
Sub-option 2c: 14” minimum, 27” maximum (South Carolina)
Sub-option 2d: 16” minimum, 32” maximum (public comment)
Sub-option 2e: 30” minimum, 48” maximum (public comment)
Sub-option 2f: 10” minimum, 24” maximum (mix of Georgia and Florida)

Option 3: Trophy allowance

Sub-option 3a: No retention of a “trophy fish” above the maximum size limit (status quo)
Sub-option 3b: One “trophy fish,” a fish exceeding the maximum size limit, is allowed to be retained, per person, per day.

Option 4: Bag Limit

Sub-option 4a: No coastwide bag limit (status quo)
Sub-option 4b: 1 per person, per day (Maryland and Virginia)
Sub-option 4c: 2 per person, per day (under consideration by New Jersey and Delaware)
Sub-option 4d: 3 per person, per day (New Jersey and Delaware)
Sub-option 4e: 5 per person, per day (South Carolina and Florida)
Sub-option 4f: 15 per person, per day (Georgia)

Option 5: Vessel Limit

Sub-option 5a: No coastwide vessel limit (status quo)
Sub-option 5b: 6 per vessel per day (Maryland)
Sub-option 5c: 12 per vessel per day
Sub-option 5d: 20 per vessel per day

Option 6: Maintenance of current recreational management measures

All states shall maintain their current level of restrictions, i.e. no relaxation of current recreational fisheries management measures. [This approach may be used in conjunction with other options or requirements.]

4.2. Commercial Fisheries Management Measures

Option 1: Minimum size

Sub-option 1a: No coastwide minimum size (status quo)
Sub-option 1b: 10” minimum size (Georgia)
Sub-option 1c: 14” minimum size (South Carolina and Florida)
Sub-option 1d: 16” minimum size (New Jersey, Delaware, Maryland, Virginia)
Sub-option 1e: 32” minimum size (under consideration by New Jersey and Delaware)

Option 2: Slot Limit

Sub-option 2a: No coastwide size limits (status quo)
Sub-option 2b: 14” minimum, 24” maximum (Florida)
Sub-option 2c: 14” minimum, 27” maximum (South Carolina)
Sub-option 2d: 16” minimum, 32” maximum (public comment)
Sub-option 2e: 30” minimum, 48” maximum (public comment)
Sub-option 2f: 10” minimum, 24” maximum (mix of Georgia and Florida)

Option 3: Trip Limit

Sub-option 3a: No coastwide commercial trip limit (status quo)
Sub-option 3b: 5 per person, per day (South Carolina)
Sub-option 3c: 15 per person, per day (Georgia)

Sub-option 3d: 500 pounds per vessel per day (Florida)
Sub-option 3e: 5,000 pounds per vessel per day (Proposed for New Jersey)
Sub-option 3f: 10,000 pounds per vessel per day (New Jersey and Delaware)
Sub-option 3g: Bycatch allowance of XX% is allowed (fleet may not catch often but will catch a large number when do)

Option 4: Limited entry

Sub-option 4a: No requirement for limited entry (status quo)
Sub-option 4b: States are required to implement a limited-entry permit system, by which a limited number of permits shall be issued for commercial harvest of black drum. In setting the maximum number of permits to be issued, the states shall consider that the goal of this policy is to prevent expansion of the current commercial fishery.

Option 5: Maintenance of current commercial management measures

In order to avoid the establishment of any new commercial fisheries for black drum, all states shall maintain their current level of restrictions, i.e. no relaxation of current commercial fisheries management measures. [This approach may be used in conjunction with other options or requirements and is based on the approach taken in Amendment 2 to the Red Drum FMP.]

4.3. Habitat Conservation and Restoration

1. Where sufficient knowledge is available, states should designate black drum habitat areas of particular concern for special protection. These locations should be accompanied by requirements that limit degradation of habitat, including minimization of non-point source and specifically storm water runoff, prevention of significant increases in contaminant loadings, and prevention of the introduction of any new categories of contaminants into the area.
2. Where habitat areas have already been identified and protected, states should ensure continued protection of these areas by notifying and working with other federal, state, and local agencies. States should advise these agencies of the types of threats to black drum and recommend measures that should be employed to avoid, minimize, or eliminate any threat to current habitat quality or quantity.
3. States should minimize loss of wetlands to shoreline stabilization by using the best available information, incorporating erosion rates, and promoting incentives for use of alternatives to vertical shoreline stabilization measures, commonly referred to as living shorelines projects.
4. All State and Federal agencies responsible for reviewing impact statements and permit applications for projects or facilities proposed for black drum spawning and nursery areas should ensure that those projects will have no or only minimal impact on local stocks. Any project that would result in the elimination of essential habitat should be avoided, if possible, or at a minimum, adequately mitigated.
5. Each State should establish windows of compatibility for activities known or suspected to adversely affect black drum life stages and their habitats. Activities may include, but are

not limited to, navigational dredging, bridge construction, and dredged material disposal, and notify the appropriate construction or regulatory agencies in writing.

6. Each state should develop water use and flow regime guidelines, where applicable, to ensure that appropriate water levels and salinity levels are maintained for the long-term protection and sustainability of the stocks. Projects involving water withdrawal or interrupt water flow should be evaluated to ensure that any impacts are minimized, and that any modifications to water flow or salinity regimes maintain levels within black drum tolerance limits.
7. The use of any fishing gear that is determined by management agencies to have a negative impact on black drum habitat should be prohibited within habitat areas of particular concern. Further, states should protect vulnerable habitat from other types of non-fishing disturbance as well.
8. States should work with the U.S. Fish and Wildlife Service's Divisions of Fish and Wildlife Management Assistance and Ecological Services, and National Marine Fisheries Service's Offices of Fisheries Conservation and Management and Habitat Conservation, to identify hydropower and water control structures that pose significant threats to maintenance of appropriate freshwater flows (volume and timing) to black drum nursery and spawning areas and target these dams for appropriate recommendations during FERC re-licensing.
9. States should conduct research to evaluate the role of submerged aquatic vegetation (SAV) and other submersed structures in the spawning success, survival, growth and abundance of black drum. This research could include regular mapping of the bottom habitat in identified areas of concern, as well as systematic mapping of this habitat where it occurs in estuarine and marine waters of the states.
10. States should continue support for habitat restoration projects, including oyster shell recycling and oyster hatchery programs as well as seagrass restoration, to provide areas of enhanced or restored bottom habitat.
11. Water quality criteria for black drum spawning and nursery areas should be established, or existing criteria should be upgraded, to ensure successful reproduction of these species. Any action taken should be consistent with Federal Clean Water Act guidelines and specifications.
12. State fishery regulatory agencies, in collaboration with state water quality agencies, should monitor water quality in known habitat for black drum, including turbidity, nutrient levels, and dissolved oxygen.
13. States should work to reduce point-source pollution from wastewater through such methods as improved inspections of wastewater treatment facilities and improved maintenance of collection infrastructure.
14. States should develop protocols and schedules for providing input on water quality regulations and on Federal permits and licenses required by the Clean Water Act, Federal Power Act, and other appropriate vehicles, to ensure that black drum habitats are protected and water quality needs are met.

4.4. Alternative State management Regimes

Once approved by the South Atlantic State/Federal Fisheries Management Board, states are required to obtain prior approval from the Management Board of any changes to their

management program for which a compliance requirement is in effect. Changes to non-compliance measures must be reported to the Management Board but may be implemented without prior Management Board approval. A state can request permission to implement an alternative to any mandatory compliance measure only if that state can show to the Management Board's satisfaction that its alternative proposal will have the same conservation value as the measure contained in this amendment or any addenda prepared under Adaptive Management (***Section 4.5***). States submitting alternative proposals must demonstrate that the proposed action will not contribute to overfishing of the resource. All changes in state plans must be submitted in writing to the Board and to the Commission either as part of the annual FMP Review process or the Annual Compliance Reports.

4.4.1. General Procedures

A state may submit a proposal for a change to its regulatory program or any mandatory compliance measure under the Black Drum Fishery Management Plan to the Commission, including a proposal for *de minimis* status. Such changes shall be submitted to the Chair of the Plan Review Team, who shall distribute the proposal to the Management Board, the Plan Review Team, the Technical Committee, the Stock Assessment Committee, and the Advisory Panel.

The Plan Review Team is responsible for gathering the comments of the Technical Committee, the Stock Assessment Committee and the Advisory Panel, and presenting these comments as soon as possible to the Management Board for decision.

The South Atlantic State/Federal Fisheries Management Board will decide whether to approve the state proposal for an alternative management program if it determines that it is consistent with the "target fishing mortality rate applicable" and the goals and objectives of this FMP.

4.4.2. Management Program Equivalency

The Black Drum Technical Committee, under the direction of the Black Drum Plan Review Team, will review any alternative state proposals under this section and provide to the South Atlantic State/Federal Fisheries Management Board its evaluation of the adequacy of such proposals.

Following the first full year of implementation of an alternate management program, the Black Drum Plan Review Team will have the responsibility of evaluating the effects of the program to determine if the measures were actually equivalent with the standards in the FMP or subsequent amendments or addenda. The Black Drum PRT will report to the Management Board on the performance of the alternate program.

4.4.3. *De minimis* Fishery Guidelines

The ASMFC Interstate Fisheries Management Program Charter defines *de minimis* as "a situation in which, under the existing condition of the stock and scope of the fishery, conservation, and enforcement actions taken by an individual state would be expected to

contribute insignificantly to a coastwide conservation program required by a Fishery Management Plan or amendment" (ASMFC 2009b).

States may petition the South Atlantic State/Federal Fisheries Management Board at any time for *de minimis* status. Once *de minimis* status is granted, designated states must submit annual reports including commercial and recreational landings to the Management Board justifying the continuance of *de minimis* status. States must include *de minimis* requests as part of their annual compliance reports.

***De Minimis* Criteria Options**

Option 1: Recreational and Commercial separate de minimis status

States may apply for *de minimis* status, if for the preceding three years for which data are available, their average commercial landings or recreational landings (by weight) constitute less than ***X*** percent of the average coastwide commercial or recreational landings for the same period. A state that qualifies for *de minimis* based on their commercial landings will qualify for exemptions in their commercial fishery only, and a state that qualifies for *de minimis* based on their recreational landings will qualify for exemptions in their recreational fishery only.

Sub-option 1a: X = 1%
Sub-option 1b: X = 2%
Sub-option 1c: X = 3%

Option 2: Recreational and Commercial combined de minimis status

States may apply for *de minimis* status, if for the preceding three years for which data are available, their average combined, commercial and recreational landings (by weight) constitute less than ***X*** percent of the average coastwide combined, commercial and recreational landings for the same period.

Sub-option 2a: X = 1%
Sub-option 2b: X = 2%
Sub-option 2c: X = 3%

Table 3. Qualified States under the *de minimis* options. Maryland and Georgia qualify under any of the proposed options. Virginia, North Carolina, and Florida do not qualify under any of the proposed options.

De minimis	**Commercial**	**Recreational**	**Combined**
1%	MD, SC, GA	DE, MD, GA	MD, GA
2%	MD, SC, GA, NJ	DE, MD, GA	MD, GA

3%	MD, SC, GA, NJ	DE, MD, GA, SC	MD, GA, DE, SC

4.4.4. *De minimis* Exemptions

States who qualify for *de minimis* are not required to implement the following requirements: **XXXXXX**.

4.5. Adaptive Management

The South Atlantic State/Federal Fisheries Management Board may vary the requirements specified in this amendment as a part of adaptive management in order to conserve the black drum resources. Specifically, the Management Board may change target fishing mortality rates and harvest specifications, or other measures designed to prevent overfishing of the stock complex or any spawning component. Such changes will be instituted to be effective on the first fishing day of the following year, but may be put in place at an alternative time when deemed necessary by the Management Board.

4.5.1. General Procedures

The Black Drum Plan Review Team (PRT) will monitor the status of the fisheries and the resources and report on that status to the South Atlantic State/Federal Fisheries Management Board annually or when directed to do so by the Management Board. The PRT will consult with the Black Drum Technical Committee, Stock Assessment Committee, and South Atlantic Species Advisory Panel, in making such review and report. The report will contain recommendations concerning proposed adaptive management revisions to the management program.

The South Atlantic State/Federal Fisheries Management Board will review the report of the PRT, and may consult further with the Technical Committee, Stock Assessment Committee, or Advisory Panel. The Management Board may, based on the PRT Report or on its own discretion, direct the PRT to prepare an addendum to make any changes it deems necessary. The addendum shall contain a schedule for the states to implement its provisions.

The PRT will prepare a draft addendum as directed by the Management Board, and shall distribute it to all states for review and comment. A public hearing will be held in any state that requests one. The PRT will also request comment from federal agencies and the public at large. After a 30-day review period, the PRT will summarize the comments and prepare a final version of the addendum for the Management Board.

The Management Board shall review the final version of the addendum prepared by the PRT, and shall also consider the public comments received and the recommendations of the Technical Committee, Stock Assessment Committee, and Advisory Panel; and shall then decide whether to adopt or revise and, then, adopt the addendum.

Upon adoption of an addendum implementing adaptive management by the Management Board, states shall prepare plans to carry out the addendum, and submit them to the Management Board for approval according to the schedule contained in the addendum.

4.5.2. Measures Subject to Change

The following measures are subject to change under adaptive management upon approval by the South Atlantic State/Federal Fisheries Management Board:

(1) Fishing year and/or seasons;
(2) Area closures;
(3) Overfishing definition, MSY and OY;
(4) Rebuilding targets and schedules;
(5) Catch controls, including bag and size limits;
(6) Effort controls;
(7) Bycatch allowance
(8) Reporting requirements;
(9) Gear limitations;
(10) Measures to reduce or monitor bycatch;
(11) Observer requirements;
(12) Management areas;
(13) Recommendations to the Secretaries for complementary actions in federal jurisdictions;
(14) Research or monitoring requirements;
(15) Frequency of stock assessments;
(16) *De minimis* specifications;
(17) Management unit;
(18) Maintenance of stock structure;
(19) Catch allocation; and
(20) Any other management measures currently included in the FMP.

4.6. Emergency Procedures

Emergency procedures may be used by the South Atlantic State/Federal Fisheries Management Board to require any emergency action that is not covered by or is an exception or change to any provision in the FMP. Procedures for implementation are addressed in the ASMFC Interstate Fisheries Management Program Charter, Section Six (c)(10) (ASMFC 2009b).

4.7. Management Institutions

The management institution for black drum shall be subject to the provisions of the ISFMP Charter (ASMFC 2009b). The following is not intended to replace any or all of the provisions of the ISFMP Charter. All committee roles and responsibilities are included in detail in the ISFMP Charter and are only summarized here.

4.7.1. ASMFC and the ISFMP Policy Board

The ASMFC and the ISFMP Policy Board are generally responsible for the oversight and management of the Commission's fisheries management activities. The Commission must approve all fishery management plans and amendments, and must make all final determinations concerning state compliance or non-compliance. The ISFMP Policy Board reviews any non-compliance recommendations of the various Management Boards and Sections and, if it concurs, forwards them on to the Commission for action.

4.7.2. South Atlantic State/Federal Fisheries Management Board

The South Atlantic State/Federal Fisheries Management Board was established under the provisions of the Commission's ISFMP Charter (Section Four; ASMFC 2009b) and is generally responsible for carrying out all activities under this FMP.

The South Atlantic State/Federal Fisheries Management Board (Management Board) establishes and oversees the activities of each species' Plan Development and Plan Review Team, Technical Committee and Stock Assessment Subcommittee, and the South Atlantic Species Advisory Panel. Among other things, the Management Board makes changes to the management program under adaptive management and approves state programs implementing the amendment and alternative state programs under ***Sections 4.4*** **and** ***4.5***. The Management Board reviews the status of state compliance with the management program, at least annually, and if it determines that a state is out of compliance, reports that determination to the ISFMP Policy Board under the terms of the ISFMP Charter.

4.7.3. Plan Development Team and Plan Review Team

The Plan Development Team (PDT) and Plan Review Team (PRT) for black drum will be composed of a small group of scientists and/or managers whose responsibility is to provide all of the technical support necessary to carry out and document the decisions of the South Atlantic State/Federal Fisheries Management Board. An ASMFC FMP Coordinator chairs the PDT and PRT. The PDT and PRT are directly responsible to the Management Board for providing information and documentation concerning the implementation, review, monitoring and enforcement of the species management plan. The PDT and PRT shall be comprised of personnel from state and federal agencies who have scientific and management ability and knowledge of the relevant species. The Black Drum PDT is responsible for preparing all documentation necessary for the development of the FMP, using the best scientific information available and the most current stock assessment information. The PDT will either disband or assume inactive status upon completion of the FMP. Alternatively, the Board may elect to retain PDT members as members of the species-specific PRT or appoint new members. The PRT will provide annual advice concerning the implementation, review, monitoring, and enforcement of the FMP once it has been adopted by the Commission.

4.7.4. Technical Committee

The Black Drum Technical Committee will consist of representatives from state and/or federal agencies, Regional Fishery Management Councils, Commission, university or other specialized personnel with scientific and technical expertise and knowledge of the relevant species. The Management Board will appoint the members of a Technical Committee and may authorize additional seats as it sees fit. Its role is to act as a liaison to the individual state and federal agencies, provide information to the management process, and review and develop options concerning the management program. The Technical Committee will provide scientific and technical advice to the Management Board, PDT, and PRT in the development and monitoring of a fishery management plan or amendment.

4.7.5. Stock Assessment Subcommittee

The Black Drum Stock Assessment Subcommittee will be appointed and approved by the Management Board, with consultation from the Black Drum Technical Committee, and will consist of scientists with expertise in the assessment of the relevant population. Its role is to assess the species population and provide scientific advice concerning the implications of proposed or potential management alternatives, or to respond to other scientific questions from the Management Board, Technical Committee, PDT or PRT. The Black Drum Stock Assessment Subcommittee will report to the Black Drum Technical Committee.

4.7.6. Advisory Panel

The South Atlantic Species Advisory Panel was established according to the Commission's Advisory Committee Charter. Members of the Advisory Panel are citizens who represent a cross-section of commercial and recreational fishing interests and others who are concerned about the conservation and management of black drum, as well as Spanish mackerel, spot, and spotted seatrout, red drum, and Atlantic croaker. The Advisory Panel provides the Management Board with advice directly concerning the Commission's management program for these six species.

4.7.7. Federal Agencies

4.7.7.1. Management in the Exclusive Economic Zone (EEZ)

Management of black drum in the EEZ is within the jurisdiction of the Mid Atlantic and South Atlantic Fishery Management Councils under the Magnuson-Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. 1801 et seq.). In the absence of a Council Fishery Management Plan for black drum, management of this species is the responsibility of the National Marine Fisheries Service (NMFS) as mandated by the Atlantic Coastal Fisheries Cooperative Management Act (16 U.S.C. 5105 et seq.).

4.7.7.2. Federal Agency Participation in the Management Process

The Commission has accorded the United States Fish and Wildlife Service (USFWS) and the NMFS voting status on the ISFMP Policy Board and the South Atlantic State/Federal Fisheries Board in accordance with the Commission's ISFMP Charter. The NMFS and USFWS may also participate on the Management Board's supporting committees described in *Sections 4.7.3-4.7.6*.

4.7.7.3. Consultation with Fishery Management Councils

In carrying out the provisions of this FMP, the states, as members of the South Atlantic State/Federal Fisheries Management Board, shall closely coordinate with the Mid Atlantic and South Atlantic Fishery Management Councils to cooperatively manage the Atlantic coast population of black drum. In accordance with the Commission's ISFMP Charter, a representative of the South Atlantic Fishery Management Council shall be invited to participate as a full member of the South Atlantic State/Federal Fisheries Management Board.

4.8. Recommendations to the Secretaries for Complementary Actions in Federal Jurisdictions

[Recommendations to the Secretaries for complementary actions in federal jurisdictions will be developed by the South Atlantic State/Federal Fisheries Management Board upon selection of management options for implementation in state waters.]

4.9. Cooperation with Other Management Institutions

At this time, no other management institutions have been identified that would be involved with management of black drum on the Atlantic coast. Nothing in the FMP precludes the coordination of future management collaborations with other management institutions should the need arise.

5. COMPLIANCE

Full implementation of the provisions of this FMP is necessary for the management program to be equitable, efficient and effective. States are expected to implement these measures faithfully under state laws. Although the ASMFC does not have authority to directly compel state implementation of these measures, it will continually monitor the effectiveness of state implementation and determine whether states are in compliance with the provisions of this fishery management plan. This section sets forth the specific elements states must implement in order to be in compliance with this fishery management plan, and the procedures that will govern the evaluation of compliance. Additional details of the procedures are found in the ASMFC Interstate Fisheries Management Program Charter (ASMFC 2009b).

5.1. Mandatory Compliance Elements for States

A state will be determined to be out of compliance with the provisions of this fishery management plan, according to the terms of Section Seven of the ISFMP Charter if:

- Its regulatory and management programs to implement *Section 4* have not been approved by the South Atlantic State-Federal Fisheries Management Board; or
- It fails to meet any schedule required by *Section 5.1.2*, or any addendum prepared under adaptive management (*Section 4.6*); or
- It has failed to implement a change to its program when determined necessary by the South Atlantic State-Federal Fisheries Management Board; or
- It makes a change to its regulations required under *Section 4* or any addendum prepared under adaptive management (*Section 4.6*), without prior approval of the South Atlantic State-Federal Fisheries Management Board.

5.1.1. Mandatory Elements of State Programs

To be considered in compliance with this fishery management plan, all state programs must include harvest controls on black drum fisheries consistent with the requirements of *Sections 4.1, 4.2, 4.3*; except that a state may propose an alternative management program under *Section 4.5*, which, if approved by the South Atlantic State-Federal Fisheries Management Board, may be implemented as an alternative regulatory requirement for compliance.

5.1.1.1. Regulatory Requirements

Each state must submit its required black drum regulatory program to the Commission through the ASMFC staff for approval by the South Atlantic State-Federal Fisheries Management Board. During the period from submission until the Board makes a decision on a state's program, a state may not adopt a less protective management program than contained in this amendment or contained in current state law. The following lists the specific compliance criteria that a state/jurisdiction must implement in order to be in compliance with this FMP:

[Will be included once final options are selected]

Once approved by the South Atlantic State-Federal Fisheries Management Board, states are required to obtain prior approval from the Board of any changes to their management program for which a compliance requirement is in effect. Other measures must be reported to the Board but maybe implemented without prior Board approval. A state can request permission to implement an alternative to any mandatory compliance measure only if that state can show to the Board's satisfaction that its alternative proposal will have the same conservation value as the measure contained in this amendment or any addenda prepared under Adaptive Management (*Section 4.6*). States submitting alternative proposals must demonstrate that the proposed action will not contribute to overfishing of the resource. All changes in state plans must be submitted in writing to the Board and to the Commission either as part of the annual FMP Review process or the Annual Compliance reports.

5.1.1.2. Monitoring Requirements

There are requirements for additional monitoring.

5.1.1.3. Research Requirements

The Plan Development Team and Technical Committee have prioritized the research needs for black drum (*Section 6.2*). Appropriate programs for meeting these needs may be implemented under Adaptive Management (*Section 4.6*) in the future.

5.1.1.4. Law Enforcement Requirements

All state programs must include law enforcement capabilities adequate for successfully implementing that state's black drum regulations. The adequacy of a state's enforcement activity will be monitored annually by reports of the ASMFC Law Enforcement Committee to the Black Drum Plan Review Team. The first reporting period will cover the period from January 1, 20XX to December 31, 20XX.

5.1.1.5. Habitat Requirements

There are no mandatory habitat requirements in the FMP, although requirements may be added under Adaptive Management (*Section 4.6*). See *Section 4.4* for Habitat Recommendations.

5.1.2. Compliance Schedule

States must implement the FMP according to the following schedule:

Month XX, 20XX:	States must submit programs to implement the FMP for approval by the South Atlantic State-Federal Fisheries Management Board. Programs must be implemented upon approval by the Management Board.
Month XX, 20XX:	States with approved management programs must implement FMP requirements. States may begin implementing management programs prior to this deadline if approved by the Management Board.

Reports on compliance must be submitted to the Commission by each jurisdiction annually, no later than Month XX, beginning in 20XX.

5.1.3. Compliance Reporting Content

Each state must submit an annual report concerning its black drum fisheries and management program for the previous calendar year. A standard compliance report format has been prepared and adopted by the ISFMP Policy Board. States should follow this format in completing the annual compliance report.

5.2. Procedures for Determining Compliance

Detailed procedures regarding compliance determinations are contained in the ISFMP Charter, Section Seven (ASMFC 2009b). Future revisions to the ISFMP Charter may take precedence over the language contained in this FMP, specifically in regards to the roles and responsibilities of the various groups contained in this section. The following summary is not meant in any way to replace the language found in the ISFMP Charter.

In brief, all states are responsible for the full and effective implementation and enforcement of fishery management plans in areas subject to their jurisdiction. Written compliance reports as specified in the Plan (or subsequent Amendments and/or Addenda) must be submitted annually by each state with a declared interest. Compliance with the FMP will be reviewed at least annually. The South Atlantic State-Federal Fisheries Management Board, ISFMP Policy Board or the Commission, may request that the Black Drum Plan Review Team conduct a review of plan implementation and compliance at any time.

The South Atlantic State-Federal Fisheries Management Board will review the written findings of the PRT within 60 days of receipt of a State's compliance report. Should the Management Board recommend to the Policy Board that a state be determined to be out of compliance, a rationale for the recommended non-compliance finding will be included addressing specifically the required measures of the FMP that the state has not implemented or enforced, a statement of how failure to implement or enforce the required measures jeopardizes black drum conservation, and the actions a state must take in order to comply with the FMP requirements.

The ISFMP Policy Board shall, within thirty days of receiving a recommendation of non-compliance from the South Atlantic State-Federal Fisheries Management Board, review that recommendation of non-compliance. If it concurs in the recommendation, it shall recommend to the Commission that a state be found out of compliance.

The Commission shall consider any FMP non-compliance recommendation from the Policy Board within 30 days. Any state which is the subject of a recommendation for a non-compliance finding is given an opportunity to present written and/or oral testimony concerning whether it should be found out of compliance. If the Commission agrees with the recommendation of the Policy Board, it may determine that a state is not in compliance with the FMP, and specify the actions the state must take to come into compliance.

Any state that has been determined to be out of compliance may request that the Commission rescind its non-compliance findings, provided the state has revised its black drum conservation measures or shown to the Board and/or Commission's satisfaction that actions taken by the state provide for conservation equivalency.

5.3. Recommended (Non-Mandatory) Management Measures

The South Atlantic State-Federal Fisheries Management Board, through Amendment 2, requests that those states outside the management unit (New York through Maine, and Pennsylvania) implement complementary regulations to protect the black drum spawning stock.

5.4. Analysis of Enforceability of Proposed Measures

[Law Enforcement Committee analysis]

6. MANAGEMENT AND RESEARCH NEEDS

Characterized as High (H), Medium (M), or Low (L) priority, these management and research needs will be reviewed annually as part of the Commission's FMP Review process. The annual Black Drum FMP Review will contain an updated list for future reference.

6.1. Stock Assessment and Population Dynamics

A coastwide stock assessment has yet to be completed for black drum but is considered a high priority need. As such, a coastwide stock assessment, led by ASMFC, is currently in progress. The assessment will provide much needed data on the status of the black drum resource, establish reference points, as well as contribute to recommendations for additional management needs, if any.

6.2. Research and Data Needs

6.2.1. Biological

- Conduct studies to estimate catch and release mortality estimates.
- Obtain better estimates of harvest from the black drum recreational fishery (especially in states with short seasons).
- Increase spatial and temporal coverage of age samples collected regularly in fishery dependent and independent sources. Analyze existing otoliths that have been collected but not aged. Prioritize collection of adult age data from fishery independent sources in states where maximum size regulations preclude the collection of adequate adult ages.
- Collect genetic material (i.e., create "genetic tags") over long time span to obtain information on movement and population structure, and potentially estimate population size.
- Conduct a high reward tagging program to obtain improved return rate estimates. Continue and expand current tagging programs to obtain mortality and growth information and movement at size data.
- Continue to collect and analyze current life history data from fishery independent programs, including full size, age, maturity, histology workups and information on spawning season timing and duration. Any additional data that can be collected on adult black drum would be highly beneficial.
- Conduct studies to estimate fecundity-at-age coastwide and to estimate batch fecundity (especially for adults in South Atlantic).
- Obtain better estimates of bycatch of black drum in other fisheries, especially juvenile fish in South Atlantic states.
- Obtain estimates of selectivity-at-age for black drum through observer programs or tagging studies.

- Monitor adult abundance estimates

6.2.2. Social

- Obtain better coverage of shore and nighttime anglers.

6.2.3. Economic

- Obtain better data on the economic impacts of recreational and commercial black drum fishing on coastal communities.

6.2.4. Habitat

- If possible, expand existing fishery independent surveys in time and space to better cover black drum habitats (especially adult fish).
- Conduct otolith microchemistry studies to identify regional recruitment contributions.
- Conduct new and expand existing acoustic tagging programs to help identify spawning and juvenile habitat use and regional recruitment sources.

7. PROTECTED SPECIES

In the fall of 1995, Commission member states, the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) began discussing ways to improve implementation of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) in state waters. Historically, these policies have been only minimally enforced in state waters (0-3 miles). In November 1995, the Commission, through its Interstate Fisheries Management Program (ISFMP) Policy Board, approved amendment of its ISFMP Charter (Section Six (b)(2)) so that interactions between ASMFC-managed fisheries and species protected under the MMPA, ESA, and other legislation, including the Migratory Bird Treaty Act be addressed in the Commission's fisheries management planning process. Specifically, the Commission's fishery management plans describe impacts of state fisheries on certain marine mammals and endangered species (collectively termed "protected species"), and recommend ways to minimize these impacts. The following section outlines: (1) the federal legislation which guides protection of marine mammals, sea turtles, and marine birds; (2) the protected species with potential fishery interactions; (3) the specific type(s) of fishery interactions; (4) population status of the affected protected species; and (5) potential impacts to Atlantic coastal state and interstate fisheries.

7.1. Marine Mammal Protection Act (MMPA) Requirements

Since its passage in 1972, one of the primary goals of the MMPA has been to reduce the incidental serious injury and mortality of marine mammals permitted in the course of commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate. Under the 1994 Amendments, the MMPA requires the National Marine Fisheries Service (NMFS) to develop and implement a take reduction plan to assist in the recovery or prevent the depletion of each strategic stock that interacts with a Category I or II fishery.

Specifically, a strategic stock is defined as a stock: (1) for which the level of direct human-caused mortality exceeds the potential biological removal (PBR)[3] level; (2) which is declining and is likely to be listed under the Endangered Species Act (ESA) in the foreseeable future; or (3) which is listed as a threatened or endangered species under the ESA or as a depleted species under the MMPA. Category I and II fisheries are those that have frequent or occasional incidental mortality and serious injury of marine mammals, respectively, whereas Category III fisheries have a remote likelihood of incidental mortality and serious injury of marine mammals. Each year, NMFS publishes an annual List of Fisheries which classifies commercial fisheries into one of these three categories.

Under the 1994 mandates, the MMPA also requires fishermen participating in Category I and II fisheries to register under the Marine Mammal Authorization Program (MMAP), the purpose of which is to provide an exception for commercial fishermen from the general taking prohibitions of the MMPA for non-ESA listed marine mammals. All fishermen, regardless of the category of fishery they participate in, must report all incidental injuries and mortalities caused by commercial fishing operations within 48 hours.

Section 101(a)(5)(E) of the MMPA allows for the authorization of the incidental taking of individuals from marine mammal stocks listed as threatened or endangered under the ESA in the course of commercial fishing operations if it is determined that (1) incidental mortality and serious injury will have a negligible impact on the affected species or stock; (2) a recovery plan has been developed or is being developed for such species or stock under the ESA; and (3) where required under Section 118 of the MMPA, a monitoring program has been established, vessels engaged in such fisheries are registered in accordance with Section 118 of the MMPA, and a take reduction plan has been developed or is being developed for such species or stock. Currently, there are no permits that authorize takes of threatened or endangered species by any commercial fishery in the Atlantic. Permits are not required for Category III fisheries; however, any serious injury or mortality of a marine mammal must be reported.

7.2. Endangered Species Act (ESA) Requirements

The taking of endangered sea turtles and marine mammals is prohibited and considered unlawful under Section 9(a)(1) of the ESA. In addition, NMFS or the USFWS may issue Section 4(d) protective regulations necessary and advisable to provide for the conservation of threatened species. There are several mechanisms established in the ESA to allow exceptions to the take prohibition in Section 9(a)(1). Section 10(a)(1)(A) of the ESA authorizes NMFS to allow the taking of listed species through the issuance of research permits for scientific purposes or to enhance the propagation or survival of the species. Section 10(a)(1)(B) authorizes NMFS to permit, under prescribed terms and conditions, any taking otherwise prohibited by Section 9(a)(1)(B) of the ESA, if the taking is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Finally, Section 7(a)(2) requires federal agencies to consult with NMFS to ensure that any action that is authorized, funded, or carried out by such agency is not

[3] PBR is the number of human-caused deaths per year each stock can withstand and still reach an optimum population level. This is calculated by multiplying "the minimum population estimate" by "½ stock's net productivity rate" by "a recovery factor ranging from 0.1 for endangered species to 1.0 for healthy stocks."

likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species. If, following completion of consultation, an action is found to jeopardize the continued existence of any listed species or cause adverse modification to critical habitat of such species, reasonable and prudent alternatives will be identified so that jeopardy or adverse modification to the species is removed and section 7(a)(2) is met (see Section 7(b)(3)(A)). Alternatively, if, following completion of consultation, an action is not found to jeopardize the continued existence of any listed species or cause adverse modification to critical habitat of such species, reasonable and prudent measures will be identified that minimize the take of listed species or adverse modification of critical habitat of such species (see Section 7(b)(4)). Section (7)(o) provides the actual exemption from the take prohibitions established in Section 9(a)(1), which includes Incidental Take Statements that are provided at the end of consultation via the ESA Section 7 Biological Opinions.

Under Section 7 of the Endangered Species Act of 1973, as amended, a review of listed species and designated critical habitat(s) known to occur in the area of proposed action(s) and potential impacts to these species and habitat(s) is required of federal FMPs. Although not required for Commission FMPs, the following is included for informational purposes.

Marine listed species and critical habitat designations in the eastern U.S.

Endangered

Blue whale	*Balaenoptera musculus*
Humpback whale	*Megaptera novaeangliae*
Fin whale	*Balaenoptera physalus*
North Atlantic right whale	*Eubalaena glacialis* (Critical Habitat Designated)
Sei whale	*Balaenoptera borealis*
Sperm whale	*Physeter macrocephalus*
Leatherback sea turtle	*Dermochelys coriacea*
Hawksbill sea turtle	*Eretmochelys imbricata*
Kemp's ridley turtle	*Lepidochelys kempii*
Green turtle*	*Chelonia mydas*
Shortnose sturgeon	*Acipenser brevirostrum*
Atlantic sturgeon[+]	*Acipenser oxyrinchus oxyrinchus*
Atlantic salmon	*Salmo salar* (Gulf of Maine Distinct Population Segment)
Smalltooth sawfish	*Pristis pectinata*

*Note: Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. Atlantic and Gulf of Mexico waters.

[+]Note: Five distinct population segments (DPS) of Atlantic sturgeon are listed on the ESA, four of which are listed as endangered (New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs).

Threatened

Loggerhead turtle (Northwest Atlantic Ocean DPS)	*Caretta caretta*
Atlantic sturgeon[+]	*Acipenser oxyrinchus oxyrinchus*

Gulf sturgeon	*Acipenser oxyrinchus desotoi*
Johnson's seagrass	*Halophilia johnsonii* (Critical Habitat Designated)

[+]Note: Five distinct population segments (DPS) of Atlantic sturgeon are listed on the ESA, one of which is listed as threatened (Gulf of Maine DPS).

Proposed Species

False Killer Whale	*Pseudorca crassidens*

Proposed Critical Habitat

None

Candidate Species

Alewife	*Alosa pseudoharengus*
Blueback Herring	*Alosa aestivalis*
Nassau grouper	*Epinephelus striatus*
Scalloped Hammerhead Shark	*Sphyrna lewini*

Species Under U.S. Fish and Wildlife Service Jurisdiction:

West Indian manatee	*Trichechus manatus* (Critical Habitat Designated)
American crocodile	*Crocodylus acutus* (Critical Habitat Designated)

7.3. Migratory Bird Treaty Act (MBTA) Requirements

Under the Migratory Bird Treaty Act it is unlawful "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory birds except as permitted by regulation (16 USC. 703). Section 50 CFR 21.11 prohibits the take of migratory birds except under a valid permit or as permitted in the regulations. USFWS Policy on Waterbird Bycatch (October 2000) states, "It is the policy of the US Fish and Wildlife Service that the Migratory Bird Treaty Act of 1918, as amended, legally mandates the protection and conservation of migratory birds".

7.4. Protected Species Interactions with Existing Fisheries

The majority of directed harvest of black drum occurs in recreational fisheries. Bottlenose dolphins, in particular, interact with hook and line gear by taking catch/ bait off the gear or waiting nearby to feed on undersized thrown-back fish. Bottlenose dolphin stranding data document serious injuries and deaths from entanglement in and ingestion of hook and line gear. Recreational fisheries may catch sea turtles and marine birds incidentally. Black drum may occur as bycatch in some commercial fisheries that have been identified as having interactions with protected species (e.g. gillnets, haul seines, stop nets, and pound nets). Those interactions are described in those species' respective fishery management plans.

There are numerous protected species that inhabit the range of the black drum management unit covered under this FMP. Nineteen species are classified as endangered or threatened under the ESA, while the remaining species are protected by the MMPA.

Listed below are ESA and MMPA protected species found in coastal and offshore waters of the Atlantic Ocean within the range of black drum fisheries which operate only in state waters. USFWS species of management concern that have the potential to interact with black drum fisheries are also listed. Species of management concern are protected under the MBTA, but lack the protections mandated by the ESA.

ESA – Endangered
Atlantic sturgeon *(Acipenser oxyrinchus oxyrinchus)*, NY Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs
Fin whale (*Balaenoptera physalus)*
Humpback whale (*Megaptera novaeangliae)*
North Atlantic right whale (*Eubalaena glacialis)*
Sei whale (*Balaenoptera borealis)*
Green sea turtle[4] (*Chelonia mydas*)
Hawksbill sea turtle (*Eretmochelys imbricata)*
Kemp's ridley sea turtle *(Lepidochelys kempii)*
Leatherback sea turtle (*Dermochelys coriacea)*
Shortnose sturgeon (*Acipenser brevirostrum)*
Bermuda petrel (*Pterodroma cahow*)
Roseate tern *(Sterna dougallii dougallii*), *NY, NJ, VA, NC*

ESA – Threatened
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), Gulf of Maine DPS
Elkhorn coral (*Acropora palmata*)
Green sea turtle (*Chelonia mydas)*
Johnson's seagrass *(Halophila johnsonii)*
Loggerhead sea turtle[5] *(Caretta caretta)*, Northwest Atlantic Ocean DPS
Roseate tern *(Sterna dougallii dougallii*), *SC, GA, FL*
Piping plover *(Charadrius melodus)*
Staghorn coral *(Acropora cervicornis)*

MMPA – Protected
Includes all marine mammals above in addition to:
Atlantic spotted dolphin *(Stenella frontalis)*
Bottlenose dolphin *(Tursiops truncatus)*
Gray seal *(Halichoerus grypus)*
Harbor porpoise *(Phocoena phocoena)*
Harbor seal *(Phoca vitulina)*
Minke whale *(Balaenoptera acutorostrata)*

4 The breeding populations of green turtles in Florida and on the Pacific coast of Mexico are listed as endangered; the remainder of the population is listed as threatened. http://www.nmfs.noaa.gov/pr/species/esa/turtles.htm
5 A distinct population unit, or DPS, is a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the entire species. The ESA provides for listing species, subspecies, or DPS of vertebrate species.

ESA – Species of Concern
Alewife (*Alosa pseudoharengus)*
Barndoor skate *(Dipturus laevis)*
Blueback herring *(Alosa aestivalis)*
Dusky shark *(Carcharhinus obscures)*
Mangrove rivulus (*Rivulus marmoratus)*
Nassau grouper (*Epinephelus striatus)*
Night shark *(Carcharinus signatus)*
Opossum pipefish *(Microphis brachyurus lineatus)*
Porbeagle shark *(Lamna nasus)*
Rainbow smelt *(Osmerus mordax)*
Sand tiger shark *(Carcharias taurus)*
Speckled hind (*Epinephelus drummondhayi)*
Striped croaker *(Bairdiella sanctaeluciae)*
Warsaw grouper *(Epinephelus nigritus)*

MBTA—USFWS Species of Management Concern
Canvasback (*Aythya valisineria*)[6]
Redhead (*Aythya americana*) [5]
Greater scaup (*Aythya marila*) [5]
Lesser scaup (*Aythya affinis*) [5]
Surf scoter (*Melanitta perspicillata*) [5]
White-winged scoter (*Melanitta fusca*) [5]
Black scoter (*Melanitta americana*) [5]
Long-tailed duck (*Clangula hyemalis*) [5]
Common goldeneye (*Bucephala clangula*) [5]
Red-throated loon (*Gavia stellata)*
Black-capped petrel (*Pterodroma hasitata)*
Greater shearwater (*Puffinus gravis*)
Audubon's shearwater (*Puffinus lherminieri*)
Band-rumped storm-petrel (*Oceanodroma castro*)
Masked booby (*Sula dactylaria*)
Brown booby (*Sula leucogaster*)
Pied-billed grebe (*Podilymbus podiceps*)
Horned grebe (*Podiceps auritus*)
Magnificent frigatebird (*Fregata magnificens*)
Least tern (*Sternula antillarum*), non-listed Atlantic coast subspecies
Gull-billed tern (*Gelochelidon nilotica*)

7.4.1. Marine Mammals

Marine mammal interactions have been recorded in the following fisheries targeting black drum: Mid-Atlantic gill net and Virginia pound net (see chart below derived from the 2012 MMPA List of Fisheries). Fisheries with past but no recently documented interactions include: Chesapeake

6 *These waterfowl species are USFWS Birds of Management Concern*

Bay inshore gill net; Delaware River/Bay gill net; and Mid-Atlantic hook-and-line. These fisheries are primarily Category II, except the Mid-Atlantic gill net fishery is Category I.

The chart below provides the marine mammal species and stocks documented as incidentally killed or injured in each fishery. Subsequent sections discuss the number of documented interactions with the following species of concern described in the 2012 List of Fisheries: bottlenose dolphin, harbor porpoise, and humpback whale. These bycatch reports do not represent a complete list, but represents those available, mainly from the US Atlantic and Gulf of Mexico Marine Mammal Stock Assessment Reports. It should be noted that without an observer program for many of these fisheries and/or very low observer coverage, accurate numbers of interactions are likely not reflected.

Fisheries for black drum and the marine mammal species and stocks incidentally killed or injured (Source: 2012 MMPA List of Fisheries).

Fishery Description	**Marine Mammal Species and Stocks Incidentally Killed/Injured**
CATEGORY I	
Mid-Atlantic gill net	Bottlenose dolphin –Northern Migratory coastal, Southern Migratory coastal, Northern NC estuarine system, Southern NC estuarine system, WNA offshore; common dolphin – WNA; gray seal – WNA; harbor seal – WNA; harp seal –WNA; long-finned pilot whale – WNA; short-finned pilot whale – WNA; White-sided dolphin – WNA; humpback whale – GME; harbor porpoise – GME/BF

Fishery Description	**Marine Mammal Species and Stocks Incidentally Killed/Injured**
CATEGORY II	
Virginia pound net	Bottlenose dolphin – Northern Migratory coastal, Southern Migratory coastal, Northern NC estuarine

Mid-Atlantic Gill Net

The Mid-Atlantic Gillnet Fishery utilizes both drift and sink gillnets, including nets set in a sink, stab, set, strike, or drift fashion. Black drum may be targeted, and landings records from 2000-2010 indicate gill nets account for the largest portion of black drum landings along the Atlantic Coast (National Marine Fisheries Service, Fisheries Statistics Division, Silver Spring, MD). The fishery is classified as Category I because the total annual mortality and serious injury of bottlenose dolphin stocks (Northern Migratory coastal, Southern Migratory coastal, Northern NC estuarine system, Southern NC estuarine system, SC/GA coastal, Central FL coastal, Northern FL coastal, WNA offshore) in this fishery is greater than 50% of the stocks' PBR level. Documented interaction with harbor porpoise, white-sided dolphin, harbor seal, gray seal, harp seal, estuarine bottlenose dolphin, coastal bottlenose dolphin, offshore bottlenose dolphin, common dolphin, minke whale (Canadian East Coast stock), humpback whale (Gulf of Maine stock), Risso's dolphin, and long-finned and short-finned pilot whale were reported in this

fishery. Estimated observer coverage from 1995-2007 ranges between one and five percent annually (Waring et al. 2012).

Bottlenose Dolphin

From 1995 to 2008, a total of 19 coastal bottlenose dolphin takes were observed in the Mid-Atlantic gillnet fishery (Waring et al. 2012). The Mid-Atlantic gillnet fishery is a combination of small vessel fisheries that target a variety of fish species, including black drum, bluefish, croaker, spiny and smooth dogfish, kingfish, Spanish mackerel, spot, striped bass and weakfish (Steve et al. 2001). It operates in different seasons targeting different species in different states throughout the range of coastal bottlenose dolphins.

The Mid-Atlantic gillnet fishery has the highest documented level of mortality of bottlenose dolphins, and the North Carolina sink gillnet fishery is its largest component in terms of fishing effort and observed takes. Of 12 observed mortalities between 1995 and 2000, 5 occurred in sets targeting spiny or smooth dogfish, 1 was in a set targeting "shark" species, 2 occurred in striped bass sets, 2 occurred in Spanish mackerel sets, and the remainder were in sets targeting kingfish, weakfish or finfish generically (Rossman and Palka 2001). From 2001-2008, 7 additional bottlenose dolphin mortalities were observed in the mid-Atlantic gillnet fishery. Three mortalities were observed in 2001 with 1 occurring off of northern North Carolina during April and 2 occurring off of Virginia during November. Four additional mortalities were observed along the North Carolina coast near Cape Hatteras: 1 in May 2003, 1 in September 2005, 1 in September 2006 and 1 in October 2006. Because the Northern Migratory, Southern Migratory, Northern North Carolina Estuarine System and Southern North Carolina Estuarine System bottlenose dolphin stocks all occur in waters off of North Carolina, it is not possible to definitively assign all observed mortalities, or extrapolated bycatch estimates, to a specific stock. (Waring et al. 2012)

Harbor Porpoise

In the mid-1980s, using rough estimates of fishing effort, NMFS estimated that a maximum of 600 harbor porpoises were killed annually in this fishery. Before 1998, most of the documented harbor porpoise takes from US fisheries were from the Northeast sink gill net fishery as NMFS started an observer program for this fishery in 1990 (Waring et al. 2002). Although takes were likely occurring in the Mid-Atlantic gillnet fishery as well, an observer program was not established for this fishery until 1993, and it was not until 1995 that observer coverage was present in this fishery when harbor porpoises are present in this region (Waring et al., 2002). Annual average estimated harbor porpoise mortality and serious injury from the mid-Atlantic gillnet fishery during 1995 to 1998, before the Take Reduction Plan, was 358. The average annual harbor porpoise mortality and serious injury in the mid-Atlantic gillnet fishery from 2005 to 2009 was 318. The NMFS Sea Sampling Program has observed harbor porpoise mortalities related to this fishery, with estimates of annual bycatch ranging from 2,900 animals in 1990 to 270 animals in 1999 (post implementation of the HPTRP), and 591 animals in 2009 (Waring et al. 2012).

In July 1993, NMFS initiated an observer program in the Mid-Atlantic coastal gill net fishery. This fishery, which extends from North Carolina to New York, is a combination of small vessel fisheries that target a variety of fish species; some of the vessels operate right off the beach,

some use drift nets and others use sink nets. From 1995 to 2000, 114 harbor porpoise were observed taken (Waring et al. 2002). During that time, fishing effort was scattered between New York and North Carolina from the beach to 50 miles from shore. After 1995, documented bycatch was observed from December to May. Annual average estimated harbor porpoise mortality and serious injury from the Mid-Atlantic coastal gill net fishery before implementation of the HPTRP (1995-1998) was 358 animals. Following implementation of the HPTRP and other fishery management plans for groundfish, fishing practices changed during 1999 (Waring et al. 2002), and the average annual harbor porpoise mortality and serious injury in this fishery fell to 65 animals (2000-2004). The average annual harbor porpoise mortality and serious injury in the mid-Atlantic gillnet fishery from 2005 to 2009 was 318 (Waring et al. 2012).

Humpback Whale

Assessing the level of interactions between humpback whales and fisheries has been difficult and is derived from two primary sources -- observed takes and non-observed fishery entanglement records, including strandings records. Between 2005-2009 (U.S. and Canada), there were 19 documented humpback whale interactions with fishing gear (6 mortalities and 13serious injuries) (Waring et al. 2012). Unfortunately, most of the records do not contain the detail necessary to assign entanglements to a particular fishery or location because often times a whale is carrying a piece of line that cannot easily be attributed to a specific fishery. Additionally, observing a humpback whale or other large whale becoming entangled in fishing gear is extremely rare. More information is needed on fisheries interactions with humpback whales, specifically the location of the interaction and types of gear involved.

Virginia Pound Net

Pound Nets are a stationary gear fished in nearshore coastal and estuarine waters of Virginia (Waring et al. 2012). The gear consists of a large mesh lead posted perpendicular to the shoreline extending outward to the corral, or “heart”, where the catch accumulates. Black drum may be targeted. Occasional interactions with coastal bottlenose dolphins have been observed while monitoring for sea turtle interactions in both the commercial and experimental fisheries. Three takes of coastal bottlenose dolphins were observed in 2003, 2004, and 2009. Stranded bottlenose dolphins have also shown evidence of interactions with pound nets. From 2002 to 2009, 21 bottlenose dolphins were removed dead from Virginia pound nets, and 4 dolphins were disentangled alive (Personal Communication, S. Barco, Virginia Aquarium, 2012). Data from the Chesapeake Bay suggest that the likelihood of Bottlenose Dolphin entanglement in pound net leads may be affected by the mesh size of the lead net (Bellmund *et al.* 1997), but the information is not conclusive (Waring et al. 2012). The fishery has been defined as a Category II fishery in the 2011 List of Fisheries (75 FR 68468, November 8, 2010) and is managed under the Bottlenose Dolphin Take Reduction Plan.

7.4.2. Sea Turtles

Gill Nets

The mid-Atlantic represents important foraging habitat for several species of sea turtles. Stranded loggerhead, Kemp's ridley, and green sea turtles have been partially or completely entangled in gillnet material, and are most likely to come in contact with the gear in shallow coastal waters. Loggerhead, Kemp’s ridley, green, and leatherback sea turtles have been

captured in the Mid-Atlantic gill net fishery. Leatherbacks are present especially when warmer waters bring jellyfish, their preferred prey, into coastal areas. Hawksbill sea turtles are only rare visitors to the areas where fishing effort occurs; preferring coral reefs with sponges for forage, so interaction would be limited. However, entanglement in gillnets has been identified as a serious threat for hawksbills in the Caribbean (NMFS and USFWS 1993).

Spring and fall gillnet operations have been strongly implicated in coincident sea turtle stranding events from North Carolina through New Jersey. On average, the highest numbers of interactions occurred in spring, followed by summer and fall. The southern states appear to have had more spring interactions, while the northern states had more summer interactions, probably due to the northern migration of sea turtles in the warmer months.

Gill net gear found on stranded turtles varied widely, from 2 - 11.5" (5-29 cm) stretch mesh, and ranged from small, cut pieces of net, to lengths (up to 1200' (365m)) of abandoned net. Gill net gear was of various materials including nylon, cotton, and propylene, and in various colors including blue, black, and green. Gear type included monofilament, twine, gillnets, pound nets, trammel nets, seines, sink nets, and nets attached to anchors, cork floats, and buoys.

Virginia Pound Net

Most of pound net fishery interactions result in live releases and are documented primarily from North Carolina, Virginia, New York (Long Island), and Rhode Island. In Chesapeake Bay, Virginia, turtles become entangled in pound nets starting in mid-May with increasing numbers of entanglements until late June. The construction of leaders in pound nets has been found to be a significant factor in these entanglements (Bellmund et al. 1987). NMFS has documented that fishing with pound net leaders results in lethal and non-lethal take of sea turtles. The NEFOP began observing effort in this fishery in 2001. In 2002 and 2003, NMFS monitored pound nets in Virginia. The 2002 and 2003 monitoring results documenting sea turtle entanglement in and impingement on pound net leaders with less than 12 inches (30.5 cm) stretched mesh appeared to be more of a significant problem than originally assessed. NMFS continued to monitor pound nets during the 2004 spring season. In 2004, NMFS characterized 88 nets, 51 of which were active. Out of 1,190 surveys conducted, 4 sea turtles were observed to have been impinged or entangled in pound net leaders. Out of the four turtles that interacted with the pound net gear, one was released alive. In 2004 and 2005 an experimental fishery was conducted in an area of the Chesapeake Bay that was closed to commercial pound net fishing effort from May to July for sea turtle conservation. The results from these studies determined a modified pound net leader could be used for pound net fishing while providing sea turtle conservation benefits (Waring et al. 2012). NMFS issued a final rule on May 5, 2004 (69 FR 24997), which prohibited the use of offshore pound net leaders in a portion of the Virginia Chesapeake Bay. The 2004 rule also prohibited the use of 12 inches (30.5 cm) and greater stretched mesh and stringers in nearshore pound net leaders in Pound Net Regulated Area I and all pound net leaders employed in the remainder of the Virginia Chesapeake Bay. A recent study conducted by Barco et al. in 2009 examined the use of modified pound net leaders adopted for sea turtle conservation because they believed it would also be effective in reducing bottlenose dolphin interactions in pound net leads. The study took place in the lower Chesapeake Bay and evaluated the effect of modified pound net leaders on finfish bycatch to ensure it maintained catch efficiency. Results show modified

pound net leader had similar or greater catches of finfish compared to traditional leaders (e.g., leaders that were not modified for sea turtle conservation) (Waring et al. 2012).

7.4.3. Atlantic Sturgeon

Data from the NEFSC Sea Sampling (Observer) Program Database and the USFWS tag reports (Eyler et al. 2004) identify sink gillnets as the principal source of Atlantic sturgeon bycatch and bycatch mortality. Sink gillnet fisheries are numerous along the Atlantic coast, targeting both large and small species in inshore and offshore waters (ASMFC 2007). The Mid-Atlantic Gillnet Fishery utilizes both drift and sink gillnets, including nets set in a sink, stab, set, strike, or drift fashion. This fishery is described above in 7.4.1.

ASMFC sponsored a workshop in 2007 to conduct a focused assessment of the NEFSC Observer Database, which principally covers fisheries in New England and the Middle Atlantic state waters. During the period 2001-2006, 511 Atlantic sturgeon were observed in gillnet fisheries. On a proportionate basis of all observed trips, 2.9 to 6.1% of gillnet trips encountered sturgeon (ASMFC 2007). Means to reduce bycatch mortality in the monkfish sink gillnet fishery and other sink gillnet fisheries through modification of gear deployments (e.g., soak time, presence of tiedowns) could result in substantial reductions in sturgeon deaths.

7.4.4. Sea Birds

The roseate tern, Bermuda petrel, and piping plover are the only ESA listed bird species within the mid-and south-Atlantic maritime regions. The roseate tern and Bermuda petrel are uncommon in inshore and coastal waters of the mid- and south-Atlantic and thus, have relatively low likelihoods of interacting with black drum fisheries. Nevertheless, exceptional efforts to avoid deleterious interactions with these species are warranted as they are rare and highly vulnerable to even minimal levels of mortality. The piping plover could be impacted by shore-based fishing activity if individuals were disturbed or killed by vehicles related to fishing efforts. However, during the nesting season, when plovers are highly vulnerable to beach disturbance, sensitive areas are posted and beach access is often restricted.

Over 50 species of non-ESA-listed coastal and marine birds occur within areas fished for black drum. These include marine waterfowl (e.g., ducks and brant), loons, petrels, shearwaters, storm petrels, cormorants, gannets, jaegers, alcids, and various species of terns and gulls. Someof these bird species breed along the northern and central Atlantic coast during the boreal summer, using inshore, coastal, and offshore waters of the western Atlantic during this period. Several others breed elsewhere, but forage in inshore, coastal, and offshore waters of the western Atlantic during March through September. Many marine bird species spend winter non-breeding periods in inshore, coastal, and offshore waters of the western Atlantic where black drum fisheries occur. All of these birds are protected under the ESA or the most recently amended version of the MBTA (CFC 50, section 10; www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtintro.html).

Accurate abundance and distribution estimates are unavailable for many coastal and marine birds. While data exist for more intensively managed species such as diving ducks (Aythyini)

and seaducks (Mergini), current research programs only monitor select populations, and robust monitoring efforts are lacking for most non-hunted species, such as loons, grebes, gannets, etc.

An unknown, but possibly significant, number of migratory birds are drowned each year by gillnets in inshore, nearshore, and offshore marine waters of the mid- and south-Atlantic regions.While gillnet fishery observer coverage is scarce, a recent study estimated that nearly 1,500 red-throated and common loons are caught annually in commercial mid-Atlantic gillnet fisheries (Warden 2010). Another study, conducted in nearshore coastal waters between New Jersey and Virginia, estimated that over 2,000 marine birds, primarily loons and cormorants, were killed in anchored gillnets within a three-month observation period (Feb-April; Forsell 1999). Such high incidental gillnet mortality is corroborated with data from National Wildlife Health Center in Madison, Wisconsin, which indicates that many thousands of loons and sea ducks are killed each year. Most bird-fisheries interactions occur during January through April from North Carolina to New Jersey. South Carolina banned anchored gillnets in their coastal fishery because of excessive bird mortalities, and other south Atlantic states have limited their usage.

A list of MTBA protected bird species with the greatest potential to interact with black drum fisheries is provided below. Most of the species listed are pursuit or plunge divers which take fish below the surface of the water or feed on benthic invertebrates. Fish eating birds are especially vulnerable to drowning in gillnets because they forage for prey underwater. Additionally, fish eating birds may be attracted to the vicinity of nets, which are sometimes deployed for days at a time, to feed on forage fish feeding near the nets. Most of the birds listed are present along the Atlantic coast from October through April, depending on weather and timing of migration.

I. MBTA protected birds found in coastal and nearshore marine waters that could interact with black drum fisheries:

Long-tailed duck (*Clangulahyemalis*)
Black scoter (*Melanittanigra*)
Surf scoter (*Melanittaperspicillata*)
Red-breasted merganser (*Mergusserrator*)
Common loon (*Gaviaimmer*)
Red-throated loon (*Gaviastellata*)
Horned grebe (*Podicepsauritus*)
Red-necked grebe (*Podicepsgrisegena*)
Northern gannet (*Sula bassanus*)
Double-crested cormorant (*Phalacrocoraxauritus*)
Great cormorant (*Phalacrocoraxcarbo*)
American brown pelican (*Pelicanuserythrorhynchos*)
Gulls (*Larus spp.*)
Least tern (*Sternulaantillarum*)
Gull-billed tern (*Gelochelidonnilotica*)
Common tern (*Sterna hirundo*)
Caspian tern (*Hydroprognecaspia*)
Royal tern (*Thalasseusmaximus*)

Sandwich tern (*Thalasseussandvicensis*)
Forster's tern (*Sterna forsteri*)
Parasitic jaeger (*Stercorariusparasiticus*)
Razorbill (*Alcatorda*)

II. MBTA protected birds found in coastal bays that could interact with black drum fisheries:

Redhead (*Aythyaamericana*)
Canvasback (*Aythyavalisineria*)
Greater scaup (*Aythyamarila*)
Lesser scaup (*Aythyaaffinis*)
Red-breasted merganser (*Mergusserrator*)
Common goldeneye (*Bucephalaclangula*)
Bufflehead (*Bucephalaalbcola*)
Long-tailed duck (*Clangulahyemalis*)
Black scoter (*Melanittanigra*)
White-winged scoter (*Melanittafusca*)
Surf scoter (*Melanittaperspicillata*)
Common loon (*Gaviaimmer*)
Red-throated loon (*Gaviastellata*)
Pied-billed grebe (*Podilymbuspodiceps*)
Horned grebe (*Podicepsauritus*)
Double-crested cormorant (*Phalacrocoraxauritus*)
Great cormorant (*Phalacrocoraxcarbo*)
Gulls (*Larus spp.*)
Tern species (see list I above)

7.5. Population Status Review of Relevant Protected Species

7.5.1. Marine Mammals

Marine mammal species are known to co-occur with or become entangled in gear used by black drum fisheries, such as coastal bottlenose dolphin, humpback whale, and harbor porpoise. These species are classified as strategic stocks under the MMPA. Additionally, the humpback whales are listed as endangered under the ESA.

The status of these and other marine mammal populations inhabiting the Northwest Atlantic has been discussed in great detail in the US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments. Initial assessments were presented in Baylock et al. (1995) and were updated in Waring et al. (2012). The report presents information on stock definition, geographic range, population size, productivity rates, PBR, fishery specific mortality estimates, and compares the PBR to estimated human-caused serious injury and mortality for each stock.

7.5.1.1. Bottlenose Dolphin

The coastal morphotype of bottlenose dolphins is continuously distributed along the Atlantic coast of the United States in both coastal nearshore and inshore estuarine waters. Specifically, the morphotype extends from Florida-New Jersey during the summer months and in waters less than 20 meters deep, including both inshore estuarine and nearshore waters. South of Cape Lookout, North Carolina, there are lower densities of animals over the continental shelf in waters between 20-100 meters deep, and the coastal morphotype overlaps spatially with the offshore morphotype. The coastal and offshore morphotype are morphologically and genetically distinct (Waring et al. 2012).

Scott et al. (1988) hypothesized a single coastal migratory stock (Western North Atlantic coastal stock) that ranged seasonally along the Atlantic coast. Recent studies, however, indicate this single migratory stock hypothesis is incorrect, with instead, a more complex mosaic of stocks. Therefore, re-analysis of stranding data, genetic, and satellite telemetry indicate fourteen stocks comprise the coastal morphotype, five coastal stocks, and nine bay, sound, and estuary stocks. (Waring et al. 2012) The five coastal stocks include: (1) Northern Migratory; (2) Southern Migratory; (3) SC/GA coastal; (4) Northern FL coastal; and (5) Central FL coastal. The nine bay, sound, and estuary stocks include: (1) Northern North Carolina Estuarine System stock; (2) Southern North Carolina Estuarine System stock; (3) Charleston Estuarine System stock; (4) Northern Georgia/Southern South Carolina Estuarine System stock; (4) Southern Georgia System stock; (4) Jacksonville System stock; (4) Indian River Lagoon Estuarine System stock; (8) Biscayne Bay Estuarine System stock; and (9) Florida Bay Estuarine System stock.

Under the MMPA, 13 of the 14 stocks comprising the coastal morphotype of bottlenose dolphins are strategic and listed as depleted. The stock is designated as depleted under the MMPA due to mortality caused during the 1987-88 die-off and high incidental commercial fishery-related mortality relative to PBR. There are data suggesting that the population was at an historically high level immediately prior to a 1987-88 mortality event (Keinath and Musick 1988); however, this mortality event was estimated to have decreased the population by as much as 53%.

Abundance estimates from the 2011 Marine Mammal Stock Assessment for six coastal bottlenose dolphin stocks are outlined in the following chart (Waring et al. 2012).

Best estimates of abundance for six management units of the Western North Atlantic Coastal Bottlenose Dolphins (Waring et al. 2012).

Stock	**Abundance Estimate**
Northern Migratory	9,604
Southern Migratory	12,482
South Carolina/Georgia	7,738
Northern Florida	3,064
Central Florida	6,318
Southern North Carolina Estuarine System	2,454

7.5.1.2. Harbor Porpoise

The Gulf of Maine/Bay of Fundy stock of harbor porpoises were proposed to be listed as threatened under the ESA on January 7, 1993, but in 1999 NMFS determined this listing was not warranted (NMFS 1999). NMFS removed this stock from the ESA candidate species list in 2001. The harbor porpoise is considered a strategic stock under the MMPA because the average annual human-related mortality and serious injury exceeds the stock's PBR level. The PBR for the harbor porpoise is 701 animals (Waring et al. 2012). The total fishery-related mortality and serious injury for this stock is not less than 10% of the calculated PBR, which means the human induced mortality is not approaching zero mortality and serious injury rate. For many years before 1999, the total fishery-related mortality and serious injury exceeded the PBR, and thus it was considered a strategic stock. After implementation of the HPTRP in 1999, serious injuries and mortalities due to fishing interactions fell below the stock's PBR; however, bycatch levels consistently began rising soon after and the 2007 Stock Assessment Report indicated that these levels were again above PBR (Waring et al. 2007). Bycatch continues to occur above the PBR level, with an estimated mean annual mortality rate of 877 animals taken from 2005-2009 in the Northeast sink gillnet and Mid-Atlantic gill net fisheries (Waring et al. 2012).

The harbor porpoise can range from Labrador to North Carolina. The Atlantic stock of harbor porpoise is referred to as the Gulf of Maine/Bay of Fundy stock and generally spends its winters in the Mid-Atlantic region, but also occurs in New England waters during this time. Harbor porpoise are generally found in coastal and inshore waters, but will also travel to deeper, offshore waters. The status of the harbor porpoise stock in US waters is unknown (Waring et al. 2009). There is insufficient data to determine the population trends for this species because they are widely dispersed in small groups, spend little time at the surface, and their distribution varies unpredictably from year to year depending on environmental conditions (NMFS 2002). The best estimate of abundance for the Gulf of Maine/Bay of Fundy harbor porpoise is 89,054 (CV= 0.47). The minimum population estimate is 60,970 individuals (Waring et al. 2012).

7.5.1.3. Humpback Whale

Humpback whales are listed as endangered under the ESA and are also protected by the MMPA. Recent abundance estimates indicate continued population growth of the Gulf of Maine stock. However, there are insufficient data to determine population trends of North Atlantic humpbacks and this particular stock may still be below its optimum sustainable population. Continued human-caused mortality, especially in the Mid-Atlantic region, may be limiting recovery. The Gulf of Maine stock is a strategic stock because the average annual human-related mortality and serious injury exceeds PBR, and because the North Atlantic humpback whale is an endangered species (Waring et al. 2012).

In the western North Atlantic, humpback whales feed during spring, summer and fall over a geographic range encompassing the eastern coast of the United States (including the Gulf of Maine), the Gulf of St. Lawrence, Newfoundland/Labrador, and western Greenland (Katona and Beard 1990). In the winter, most humpbacks migrate to the West Indies to mate and breed, while others have been observed at higher latitudes in the waters off the Mid-Atlantic and southeast U.S. The best estimate of abundance for Gulf of Maine humpback whales is 847 animals

(CV=0.55) and PBR for the Gulf of Maine humpback whale stock is 1.1 whales (Waring et al. 2012).

The major known sources of mortality and injury of humpback whales include entanglement in commercial fishing gear, such as sink gillnet gear, and ship strikes. Based on photographs of the caudal peduncle of Gulf of Maine humpback whales, Robbins and Mattila (1999) estimated that between 48% and 78% of animals exhibit scarring caused by entanglement. Several whales have apparently been entangled on more than one occasion. Glass et al. (2010) note the greater concern of animals never observed. Humpback whale scar evidence suggests that only 3-10% of entanglements are witnessed and reported (Robbins and Mattila 2004). These estimates are based on sightings of free-swimming animals that initially survive the encounter with the gear. Because some whales may drown immediately, or free themselves of the gear before they are observed entangled, the actual number of interactions may be higher. In addition, the actual number of species-gear interactions is contingent on the intensity of observations from aerial and ship surveys. Humpback whales may also be adversely affected by habitat degradation, habitat exclusion, acoustic trauma, harassment, or reduction in prey resources resulting from a variety of activities including the operation of commercial fisheries. Because entanglements and vessel collisions have been documented in both U.S. and Canadian waters, estimated human-caused mortality and serious injury are divided between the U.S. (4.8) and Canada (0.4) for a total of 5.2 per year (Waring et al. 2012). The Atlantic Large Whale Take Reduction Plan (ALWTRP) established measures that attempt to reduce interactions between large whales (right, humpback, and fin whales) and commercial fishing gear in U.S. waters.

During the past several years there has been a fourfold increase in the number of strandings of humpback whales in the mid-Atlantic region, many with indications of fishing gear entanglement. Between 1989 and 1992, 31 humpback whales stranded from New Jersey through Virginia (Wiley et. al. 1994). Significantly more strandings occurred between Chesapeake Bay and Cape Hatteras, North Carolina. Strandings increased from February through April and 25 percent had scars consistent with net entanglement. Between 1990 and 1996, there were 10 humpbacks stranded in Virginia. Three of the animals showed evidence of rope abrasion consistent with entanglement. Between 1996 and 2000 (U.S. and Canada), there were 14 documented humpback whale interactions with fishing gear (two mortalities and 12 serious injuries). Two of the 12 seriously injured humpbacks were observed entangled in gillnet gear in the Bay of Fundy, Canada. For the period 2000 through 2007, there were 11 mortalities attributable to fishery interactions and 19 cases of serious injuries coast-wide (Waring et al. 2009). In 2008 there were 3 humpback whales observed as incidental bycatch, 2 of these in gillnet gear. Unfortunately, most of the records do not contain the detail necessary to assign entanglements to a particular fishery or location because often times a whale is carrying a piece of line that cannot easily be attributed to a specific fishery. More information is needed on fisheries interactions with humpback whales, specifically the location of the interaction and types of gear involved.

7.5.2. Sea Turtles

All sea turtles that occur in US waters are listed as either endangered or threatened under the ESA. The Kemp's ridley (*Lepidochelyskempii*), leatherback (*Dermochelyscoriacea*), and

hawksbill (*Eretmochelysimbricata*) are listed as endangered. The Northwest Atlantic Ocean Distinct Population Segment of loggerhead turtles (*Carettacaretta*) and the green turtle (*Cheloniamydas*) are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific coast of Mexico, which are listed as endangered. All five of these species inhabit the waters of the US Atlantic and Gulf of Mexico.

Atlantic coastal waters provide important developmental, migration, and feeding habitat for sea turtles. The distribution and abundance of sea turtles along the Atlantic coast is related to geographic location, reproductive cycles, food availability, and seasonal variations in water temperatures. Water temperatures dictate how early northward migration begins each year and are a useful factor for assessing when turtles will be found in certain areas. Sea turtles can occur in offshore as well as inshore waters, including sounds and embayments.

7.5.3. Atlantic Sturgeon

There are only two Atlantic sturgeon populations for which size estimates are available - the Hudson River and the Altamaha River populations. In 1995, sampling crews on the Hudson River estimated that there were 9,500 juvenile Atlantic sturgeon in the estuary. Since 4,900 of these were stocked hatchery-raised fish, about 4,600 fish were thought to be of wild origin. The mean annual spawning stock size (spawning adults) was estimated at 870 (600 males and 270 females). The Altamaha River supports one of the healthiest Atlantic sturgeon populations in the Southeast, with over 2,000 subadults captured in research surveys in the past few years, 800 of which were 1 to 2 years of age. The population appears to be stable. (http://www.nmfs.noaa.gov/pr/species/fish/atlanticsturgeon.htm#status)

In February 2012 NMFS determined Atlantic sturgeon in the New York Bight, Chesapeake Bay, Carolina, and South Atlantic distinct population segments (DPSs) should be listed as endangered under the Endangered Species Act (ESA). This listing indicates that NMFS has reviewed the status of the species and conservation efforts being made to protect the species, considered public and peer review comments, and have made their determination that these DPSs are in danger of extinction throughout their ranges, and should be listed as endangered, based on the best available scientific and commercial data. The Gulf of Maine DPS was determined by NMFS to be threatened under the ESA as well. This listing requires NMFS to issue protective regulations under section 4(d) of the ESA. Such protective regulations are ones deemed ‘‘necessary and advisable for the conservation of the species”. The expected result of extending such prohibitions will be to protect the GOM DPS of Atlantic sturgeon from direct forms of take, such as physical injury or killing, and from indirect forms of take, such as harm that results from habitat degradation while still allowing scientific research as well as salvage of dead fish and rescue of injured fish by experienced personnel. These actions are intended to help preserve and recover the GOM DPS of Atlantic sturgeon by addressing the negative effects from stressors impeding recovery of the DPS.

7.5.4. Sea Birds

The ranges of three ESA-listed species of birds, roseate tern (estimated Atlantic population: < 4,000 individuals), Bermuda petrel (estimated world population: < 200 individuals), and

piping plover (estimated world population: < 8,000 individuals) overlap areas fished for black drum. However, the potential for interactions between these fisheries and roseate terns and Bermuda petrels is small, as primary distributions of these endangered birds are largely beyond fishery boundaries. Nevertheless, exceptional efforts to avoid deleterious interactions with roseate terns and Bermuda petrels are warranted as they are rare and highly vulnerable to even minimal levels of mortality. The piping plover could be impacted by shore-based fishing activity if individuals were disturbed or killed by vehicles related to fishing efforts. However, during the nesting season, when plovers are highly vulnerable to beach disturbance, sensitive areas are posted and beach access is often restricted.

The world population of black-capped petrels is thought to be less than 4,000 individuals. While black-capped petrels mostly occur farther offshore than most black drum fisheries, exceptional efforts to avoid deleterious interactions with the species are warranted as it is rare and highly vulnerable to even minimal levels of mortality. Black-capped petrels are protected under the MBTA and are a USFWS species of management concern. In addition, a petition for ESA listing of the species is currently under review by the USFWS.

Several other MBTA-listed bird species have a greater potential to interact with black drum fisheries. Many of these species are also USFWS species of management concern. Based on their distributions, behavior, and documented bycatch in mid- and south-Atlantic fisheries, loons and diving ducks are among avian taxa most likely to interact with black drum fisheries. The red-throated loon is a USFWS species of management concern. While accurate population estimates are unavailable, it is likely that at least 50,000 individuals winter in U.S. Atlantic waters (Lee 2009). This species is threatened by many human activities, particularly gillnet fishing (Warden 2010). Atlantic populations of common loons are more numerous, thus the species is not currently a USFWS species of management concern. However, common loons occur within fishery boundaries and are subject to multiple threats including bycatch, mercury and lead poisoning, poaching, disturbance, and loss of habitat. The cumulative impact of all these sources of mortality combined with bycatch mortality is a concern for these populations. More accurate population estimates exist for intensively managed diving duck and seaduck species, such as scaup and scoters, that could interact with black drum fisheries. While populations of most of these species are thought to be relatively high in U.S. Atlantic waters, current monitoring programs only survey a subsample of areas, and these duck species face numerous threats, including poaching.

Populations of several other MBTA-listed seabirds, including gannets, cormorants, and some gulls, which could interact with black drum fisheries, are large and not declining. However, accurate population and status estimates are unavailable for most of these species and their bycatch rates have not been evaluated in most commercial fisheries.

7.6. Existing and Proposed Federal Regulations/Actions Pertaining to Relevant Protected Species

7.6.1. Bottlenose Dolphins

A Take Reduction Plan is required under the MMPA to reduce dolphin serious injury and mortality below PBR because strategic stocks of the coastal morphotype of bottlenose dolphins interact with Category I and II fisheries. PBR is defined as the maximum number of human-caused deaths per year each stock can withstand and still reach or maintain an optimum sustainable population level. NMFS convened the Bottlenose Dolphin Take Reduction Team (BDTRT) in 2001 to provide consensus recommendations in developing the Bottlenose Dolphin Take Reduction Plan (BDTRP).

NMFS issued a final rule implementing the BDTRP on April 26, 2006 (May 26, 2006 effective date) based on the BDTRT's consensus recommendations. The BDTRP includes regulatory and non-regulatory management measures to reduce the incidental mortality and serious injury (bycatch) of the several stocks comprising the coastal morphotype of bottlenose dolphins in Category I and II commercial fisheries operating within the dolphin′s distributional range. The BDTRP measures implement gillnet effort reduction, gear proximity requirements, gear or gear deployment modifications, and outreach and education measures to reduce dolphin bycatch below the marine mammal stock′s PBR. NMFS amended the BDTRP on December 19, 2008, (January 20, 2009 effective date) based on the BDTRT's 2007 consensus recommendations to extend nighttime medium mesh gillnet prohibitions in North Carolina during the winter that were due to expire. NMFS amended the BDTRP again on July 31, 2012 (August 30, 2012 effective date) based on the BDTRT's 2009 consensus recommendations to permanently include the nighttime medium mesh gillnet prohibitions in North Carolina during the winter.

Based on the 2012 LOF, the BDTRP affects the following fisheries via regulatory or non-regulatory components: the mid-Atlantic gillnet; North Carolina inshore gillnet; Southeast Atlantic gillnet; Virginia pound net; North Carolina long haul seine; mid-Atlantic haul/beach seine; Atlantic blue crab trap/pot; North Carolina roe mullet stop net; Southeastern U.S. Atlantic shark gillnet; mid-Atlantic menhaden purse seine; and Southeastern U.S. Atlantic, Gulf of Mexico stone crab trap/pot.

For additional information, please contact the National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division F/SER3, 263 13th Avenue South, St. Petersburg, FL 33701 or online at: http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm

7.6.2. Harbor Porpoise

On December 2, 1998, NMFS published a final rule to implement the Harbor Porpoise Take Reduction Plan (HPTRP) for the Gulf of Maine and the Mid-Atlantic waters (63 FR 66464). The Northeast sink gillnet and Mid-Atlantic gill-net fisheries are the two fisheries regulated by the HPTRP. Among other measures, the HPTRP uses seasonal time/area closures in combination with the deployment of acoustic deterrent devices (pingers) in Northeast waters (Maine through Rhode Island), as well as seasonal time/area closures along with gear modifications for both small mesh (greater than 5 inches (12.7 cm) to less than 7 inches (17.78 cm)) and large mesh (greater than or equal to 7 inches (17.78 cm) to 18 inches (45.72 cm)) gillnets in Mid-Atlantic

waters (New York through North Carolina). Although the HPTRP predominately impacts multispecies (groundfish), spiny dogfish, and monkfish fisheries due to high rates of porpoise bycatch, other gillnet fisheries are also managed under the HPTRP depending on where these fisheries operate.

In response to increases in harbor porpoise bycatch and non-compliance in the years following the implementation of the HPTRP, NMFS published a final rule on February 19, 2010 (75 FR 7383) amending the HPTRP to include additional conservation measures to reduce harbor porpoise bycatch to levels below the stock's PBR. In New England, these measures included an expansion of seasonal and temporal requirements within existing management areas, the incorporation of two new management areas with seasonal pinger requirements, and the establishment of a consequence closure strategy to encourage compliance with pinger requirements in areas with historically high levels of bycatch. In the Mid-Atlantic, new measures include the establishment of a new management area (which includes a seasonal gillnet closure and more stringent gear modification requirements) and a slight change to a gear modification requirement for the use of tie-downs in large mesh gear. Other technical corrections were made to the HPTRP as well.

Additional information regarding HPTRP regulations, outreach guides, and related information can be accessed at: http://www.nero.noaa.gov/prot_res/porptrp/.

7.6.3. Humpback Whale

The Atlantic Large Whale Take Reduction Plan (ALWTRP; 50 CFR 229.32) addresses the incidental bycatch of large baleen whales, North Atlantic right whales, fin whales and humpback whales, in several trap/pot and gillnet fisheries, including the Mid-Atlantic gill net, Southeast Atlantic gillnet, and Atlantic mixed species trap/pot.

The ALWTRP is an evolving plan that relies on a suite of measures to meet its goals under the MMPA, including modifications to gear and fishing practices, research on fishing gear and whale biology, outreach, and disentanglement. The ALWTRP specifies both universal gear modifications and area- and season-specific gear modifications and closures from Maine through Florida. The Atlantic Large Whale Take Reduction Team continues to identify ways to reduce possible interactions between large whales and commercial gear. In response to the continued serious injury and mortality of large whales from entanglement in commercial fishing gear, the ALWTRP was modified in 2007 to incorporate additional trap/pot and gillnet fisheries, establish new broad-based gear modification requirements such as requiring the use of sinking groundline, establish marking requirements, and implement other regulatory changes. This broad-based gear modification strategy includes expanded weak link and sinking groundline requirements; additional gear marking requirements; changes in boundaries; seasonal restrictions for gear modifications; expanded exempted areas; and regulatory language changes for the purposes of clarification and consistency. NMFS, in conjunction with the ALWTRT, is currently discussing a strategy for further reducing entanglement risk due to vertical lines.

For more information on the ALWTRP and its components, visit the ALWTRP website at http://www.nero.noaa.gov/whaletrp.

7.6.4. Sea Turtles

Under the ESA, and its implementing regulations, taking sea turtles – even incidentally – is prohibited, with exceptions identified in 50 CFR 223.206. The incidental take of endangered species may only legally be authorized by an incidental take statement or an incidental take permit issued pursuant to section 7 or 10 of the ESA, respectively. Incidental take of sea turtles in the North Carolina Pamlico Sound flounder fishery has been authorized via an incidental take permit since 2000. North Carolina is in the process of applying for a new permit to authorize take of sea turtles in all inshore gillnets.
Existing NMFS regulations specify procedures that NMFS may use to determine that unauthorized takings of sea turtles occur during fishing activities, and to impose additional restrictions to conserve sea turtles and to prevent unauthorized takings (50 CFR 223.206(d)(4)). Restrictions may be effective for a period of up to 30 days and may be renewed for additional periods of up to 30 days each. In 2007, NMFS issued a regulation (50 CFR 222.402) to establish procedures through which each year NMFS will identify, pursuant to specified criteria and after notice and opportunity for comment, those fisheries in which the agency intends to place observers (72 FR 43176, August 3, 2007). NMFS may place observers on U.S. fishing vessels, either recreational or commercial, operating in U.S. territorial waters, the U.S. exclusive economic zone (EEZ), or on the high seas, or on vessels that are otherwise subject to the jurisdiction of the U.S. Failure to comply with the requirements under this rule may result in civil or criminal penalties under the ESA.

Sea turtle-related regulations have been implemented since 2001, which impact the use of large mesh gill nets (>8 inches) throughout Virginia and North Carolina. These regulations include one permanent area closure and three seasonal area closures. To protect migrating sea turtles, NMFS published a final rule on December 3, 2002 (67 FR 71895), establishing seasonally-adjusted gear restrictions by closing portions of the mid-Atlantic exclusive economic zone (EEZ) to fishing with gillnets with a mesh size larger than 8–inch (20.3–cm) stretched mesh. In this final rule, NMFS revised the large mesh size restriction from the current greater than 8–inch (20.3–cm) stretched mesh, as defined in the 2002 final rule, to 7–inch (17.8–cm) stretched mesh or greater. NMFS issued a final rule on May 5, 2004 (69 FR 24997), which prohibited the use of offshore pound net leaders in a portion of the Virginia Chesapeake Bay. The 2004 rule also prohibited the use of 12 inches (30.5 cm) and greater stretched mesh and stringers in nearshore pound net leaders in Pound Net Regulated Area I and all pound net leaders employed in the remainder of the Virginia Chesapeake Bay. On July 6, 2004, NMFS implemented additional regulations for the Atlantic pelagic longline fishery to further reduce the mortality of incidentally caught sea turtles (69 FR 40734). These measures include requirements on hook type, hook size, bait type, dipnets, lineclippers, and safe handling guidelines for the release of incidentally caught sea turtles.

http://www.nmfs.noaa.gov/pr/species/turtles/regulations.htm

7.6.5. Atlantic Sturgeon

The Commission and federal government implemented a coastwide moratorium on sturgeon harvest in late 1997 and early 1998 that will go through at least 2038. Bycatch remains an

important issue in the recovery of Atlantic sturgeon populations throughout their range (ASMFC 2007). This issue is also given highest priority by the National Marine Fisheries Service (NMFS) Proactive Program for Atlantic sturgeon restoration. A status review by NMFS has led to an endangered listing for the DPSs within the black drum fishery range.

7.6.6. Seabirds

Under the ESA and its regulations, take of Bermuda petrels, roseate terns, and piping plovers, even incidentally, is prohibited. The incidental take of an ESA listed species may only be legally authorized by an incidental take statement or incidental take permit issued pursuant to section 7 or 10 of the ESA. No incidental takes of ESA listed bird species is currently authorized for black drum fisheries.

Under the MBTA it is unlawful to "pursue, hunt, take, capture, [or] kill" migratory birds except as permitted by regulation (16 USC. 703). Many migratory waterbirds occur within the boundaries of black drum fisheries (see section 7.5.3.). USFWS Policy on Waterbird Bycatch (October 2000) states "It is the policy of the US Fish and Wildlife Service that the Migratory Bird Treaty Act of 1918, as amended, legally mandates the protection and conservation of migratory birds. The USFWS seeks to actively expand partnerships with regional, national, and international organizations, States, tribes, industry, and environmental groups to address seabird bycatch in fisheries, by promoting public awareness of waterbird bycatch issues, and facilitating the collection of scientific information to develop and provide guidelines for management, regulation, and compliance."

Section 116(c) of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (2006) authorizes the Interior and Commerce Departments to undertake projects, in cooperation with industry, to improve outreach about seabird bycatch in commercial fisheries and to reduce seabird-fisheries interactions, through information sharing and technology. USFWS seeks to partner with State, regional, and Federal agencies; industry; tribes; and NGOs to facilitate outreach and improve information and technology to reduce seabird bycatch in fisheries within state and Federal waters.

7.7. Potential Impacts to Atlantic Coastal State and Interstate Fisheries

Regulations under all three take reduction plans for Atlantic large whales (which includes humpback whales), harbor porpoises, and bottlenose dolphins have the potential to impact gill net fisheries that harvest black drum. Effort patterns in the Mid-Atlantic gillnet fishery are heavily influenced by marine mammal time/area closures and /or gear restrictions under the ALWTRP, HPTRP, and BDTRP; and gear restrictions due to fish conservation measures (Waring et al. 2012).

7.8. Identification of Current Data Gaps and Research Needs

7.8.1. Bottlenose Dolphin Research Needs

- Determine the stock identity of bottlenose dolphin observed takes, or strandings, with evidence of fisheries interaction by matching dorsal fin images to Mid-Atlantic Bottlenose Dolphin Catalog or obtaining genetic samples (required to be provided by observers).
- Obtain reliable abundance estimates per stock to ensure PBR is accurately determined and in order to place animals in the correct stock.
- Refine the understanding of the distribution of the NNCES stock in: (1) Pamlico Sound during the summer using genetics; and (2) ocean waters, especially where there is an overlap with other stocks and observed takes can be applied to more than one stock.
- Expand observer coverage. Enhance observer documentation of dorsal fin photos and collection of biopsy samples from observed takes. If possible, collection of the whole carcass should be the priority for observed bottlenose dolphin takes to maximize data collection. The local stranding networks can help coordinate carcass collection. The U.S. Coast Guard may also be an asset to help tow in the carcass if the fisherman's vessel is too small.

7.8.2. Harbor Porpoise Research Needs

The following research needs have been identified by the Harbor Porpoise Take Reduction Team, NMFS, and through suggestions received during NMFS' recent HPTRP outreach meetings. Additional research needs, including those for species covered under the ALWTRP, can be found by visiting the NMFS Northeast Region's Protected Resources Division Research Priorities and Needs website (http://www.nero.noaa.gov/prot_res/research/).

- Research on testing the effectiveness of alternative methods of reducing incidental take of harbor porpoises such as pingers of higher frequencies than are currently required, as well as different gear modifications (e.g., thicker twine, reflective gillnets), and compare the effectiveness of these methods to currently required bycatch reduction methods.

7.8.3. Sea Turtle Research Needs

Research needs for sea turtles can be found in the following report for loggerhead sea turtles, but can be expanded to other sea turtle species with respect to gill net research: http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_loggerhead_atlantic.pdf

7.8.4. Atlantic Sturgeon Research Needs

The following recommendations were formulated at a Sturgeon Bycatch Workshop held in 2007 (ASMFC 2007):

- Highest research priority should be given to evaluation of relative population contributions to regions of high bycatch. Molecular approaches are currently available to estimate these population contribution rates, but such studies should be undertaken through careful sampling designs to insure that genetic samples are representative of intercepted sturgeon.
- Abundance and vital rate estimates are required for populations contributing to coastal bycatch to evaluate whether bycatch rates are sustainable on a population-specific basis.
- The bycatch GENMOD modeling approach developed here should be used for analysis of historical bycatch (the 1989-2000 period). The model will need to be re-parameterized and refit. Also, changes in how data have been recorded by observers and within the vessel trip report (VTR) data prior to 2000 will need to be carefully considered.
- State effort statistics related to sink gillnet and other fisheries that retain sturgeons should be combined with the VTR database to permit improved expansion of observer-based bycatch rates.
- A detailed GIS analysis should be performed on the distribution of observed sturgeon bycatch to compare recent patterns of coastal habitat use by Atlantic sturgeon to historical ones (1989-2000). Although most sturgeon were caught as bycatch in waters <40 meters in gillnet and trawl fisheries, this depth association is expected to vary between New England and Mid-Atlantic regions and deserves additional analysis. The observer database (1989-present) could support habitat suitability mapping for Atlantic sturgeon in coastal waters of New England and the Mid-Atlantic.
- Controlled mesocosm-scale experiments on sink gillnet interactions and retention of sturgeon, such as those recently conducted at VIMS (C. Hager, pers. comm.), should continue to investigate gear factors associated with bycatch. Gear retention studies could be conducted in semi-field systems (large ponds) and permit estimates of catchability applicable to the field.

7.8.5. Seabird Research Needs

- Initiate and expand observer coverage/bycatch monitoring and collection and analysis of bird bycatch data to better understand extent of bird bycatch and identify bycaught bird species within the target fisheries (state waters).
- Collaborate with fishermen to develop and test gear and identify deployment practices that reduce bird bycatch within the target fisheries (state waters).
- Conduct outreach activities to facilitate sharing of bird bycatch information in the target fisheries among agencies, industry and the public.

A Memorandum of Understanding between NMFS and the USFWS (July 2012) describes additional collaborative efforts recommended to better understand and reduce bird bycatch in fisheries (Section VI; http://www.fws.gov/migratorybirds/Partnerships/NMFS%20MOU.pdf).

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MEMORANDUM

May 1, 2013

To: South Atlantic State Federal Management Board
From: Toni Kerns, ISFMP Director
Subject: Public Comment on Draft Black Drum FMP

The following pages represent a summary of all public comment received by ASMFC by April 26, 2013 at 5:00p.m. (closing deadline) on Draft FMP for Black Drum.

A total of 9 comments have been received. Of those comments, 1 letter was from groups or organizations (Cape May County Party and Charter Association), and 8 were personalized individual comment.

Summary of Written Comments

The majority of the written comments were in favor of coastwide measures. One commenter was in favor of allowing states to continue with their current management program. For the commercial fishery one commenter was in favor of a size limit between 8 to 10 inches. In the recreational fishery 5 commenters were in favor of a 16 inch size limit. 3 individuals were in favor of a bag limit of 3 fish, 1 in favor of 1 fish, and 1 in favor of 2 fish. One commenter felt North Carolina should put management measures in place.

5 Public hearings were held in 5 states, North Carolina, Virginia, Maryland, Delaware, and New Jersey. Approximately 33 individuals were estimated to have attended all of the hearings combined.

Summary of Public Hearings

Morehead City, NC
March 27, 2013: 4 attendees (see sign in sheet)

Recreational Fishery Measures

Option 1: Minimum Size

One person was in favor of option 1c and based their recommendation on experience with SC and FL management measures as he was happy with the way their fisheries are managed.

Option 2: Slot Limit

One person was in favor of option 2c.

Option 3: Trophy Fish

One person was in favor of option 3a because black drum are so rare and he sees that the larger fish are discarded because of worms and he does not see a market for a trophy fishery in NC.

Option 4: Bag Limit

If there was a slot limit he would recommend option 4e as the bag limit. If there was no slot limit he recommends a one or two fish bag limit.

Option 5: Vessel Limit

One person recommends option 5d with a slot limit.

Option 6: Maintain Current Measures

One person does not recommend just maintaining the current state recreational fishery regulations, noting there is room for improvement.

Commercial Fishery Measures

Option 1: Minimum Size

One person was in favor of option 1c to mirror recreational measure suggestion.

Option 2: Slot Limit

One person was in favor of option 2c, once again to match the recreational suggestion.

Option 3: Trip Limit

One person found it confusing to go from 15 fish to 500 pounds, with this limited information he was in favor of option 3d, but he would like to see more information in the state of NC to make a better decision based on data analysis.

A person also noted that the fishery will change after you implement a minimum size.

Option 4: Limited Entry

One person was in favor of option 4b to set a precedent in the commercial fishery for black drum.

Option 5: Maintain Current Measures

One person recommended not maintaining the current management measures in place, noting that there is room for improvement.

Virginia Black Drum Public Hearing
April 1, 2013
29 Attendees (see sign in sheet)

Overall Summary of the hearing:

The group was in favor of keeping Virginia regulations the same for black drum. The state has been very proactive in its management of black drum and the regulations are working well. The black

drum fishery is very important to this area of Virginia for both the commercial and recreational fishermen and the businesses supported by the fishery. The community is very concerned that if a slot limit were put in place, like was done in the red drum fishery, the community would be economically harmed because smaller drum are not available in this area. The community felt an economic impact when the red drum slot limit went in place and cannot take another similar cut. The group favored option 5 and 6 to maintain state current measures. The majority of the group felt North Carolina should have measures put in place and all states should have good data collection.

Individual Comments

Commenter 1: If you put in a slot it is will decimate us economically. We do not catch slot limit fish here in Virginia. We do release citations. We do collections. It would slam the whole area, we already have a slot on the red drum that does not make sense. That slot limit wiped out our red drum fishery from an economical point of view we do not get many small puppy drum here.

Commenter 2: In addition to the comments you just herd, putting the slot would be going against what the plan is the arguing for, you say you want to protect the small fish yet a slot would take them. I tend to put back the fish that are under 30 inches.

Commenter 3: Virginia has been very proactive on these fish for a long time. We voluntarily went to a 2 fish bag limit. It is hard to overfish a fish that has such a large spawning population. Cynthia Jones can provide you with a lot of information we have collected.

Commenter 4: 2 fish would be good for recreational fishing measures. We have not had much luck with the ASMFC. We have eliminated the red drum in Virginia with slot limits. I went from all I can keep, then one over and then none. Black Drum is “the fish” on the eastern shore. Mother’s day will not be the same on the eastern shore. This is the bread and butter fishing.

Commenter 5: The whole room agrees that the Virginia is working to help the drum. We did it on our own. We do not need to change our state regulations.

Commenter 6: I agree with the other commenters. I spent many years working with the VCMRC to help collect data to better understand these fish.

Commenter 7: There seems to be little information on the fishery in the document. It seems strange that you would develop a plan that is so important to an area but have to little data on the fishery. Just look at what you did the flounder and red drum fishery here. It would cancel the spring fishery here if you put in a slot limit.

Commenter 8: I fish both commercially and recreationally. We think that a slot regulation will hurt us. This is one of the most import fisheries there is on the eastern shore. The wholesalers do not have a market for them anywhere else other than the eastern shore. The black drum has been the best fishery historically on the shore.

Commenter 9: recreational fisherman. There are no biological concerns for this fish. The state has the right regulations and data collection programs. The fishery supports the tourism and businesses here. Commercially they have done it well. I favor option 6 and 5. I think it is interesting that both the recreational and commercial fishermen agree.

Commenter 10: Commercial fishermen. I echo the comments that have been made here. Virginia has been ahead of the game. I keep thinking about red drum. There has been a prejudice against us with the drum here because we had the larger fish. That has been wiped away from us by a slot regulation. There is a difference for the black drum. It has unique flavor when it gets past 30 pounds. It is not applicable to us. Some people do not eat them because they have worms but they do not have to have them. We are blessed with a market for these fish.

Commenter 11: It looks like to me that Virginia has good regulations for the black drum. Something should be done with North Carolina. What are they doing? They should be stopped from hauling in so many. They should have to put in regulations.

Commenter 12: If something happens to the black drum fishery, it will directly impact us here by at least 5% a year for sales. We only buy for 6-8 weeks. People on come there just to fish for black drum. People tell me that they never see drum on the menu anywhere else but here on the shore. They come here to eat back drum.

Commenter 13: It is very unique to have everyone in the room agree. Restaurateurs, tackle shops, fishermen both commercial and recreational. Things should be status quo until the stock assessment is completed and let us help with the coastwide. If any changes are made, then raise the min size limit to 20-24 inches. Add to the recreational bag limit to allow 2 fish per person. It would add to the viability for the charter boats.

Port Republic, NJ
April 10, 2013
3 Attendees

Meeting Staff: Tom McCloy (NJ DFW), Brandon Muffley (NJ DFW), Russ Allen (NJ DFW), Jason Hearon (NJ DFW), Adam Nowalsky (ASMFC Legislative Proxy)

Meeting Participants: Jim Hutchinson (Recreational Fishing Alliance), Greg Frank (Cape May Party & Charter Boat Association), Ed Holtzhauser

Recreational Measures:

Meeting participants differed in respect to the size of fish they target but agreed that all states should implement all requirements agreed upon by ASMFC.

Option 1: Minimum Size Limit:

One vote each for sub-option 1d and 1f however all participants agreed that a 16 inch limit would work for all should that option be chosen.

Comments included:

- 16" size limit allows for anglers to keep small or large fish.
- Small fish are better eating.
- Surf fishery targets smaller fish therefore a large size limit would eliminate fishery.
- For-hire industry would like a 30" limit but 32" is ok also.
- The 16" limit might be good for anglers but unsure of effects to resource.
- Younger fish are targeted in NY, CT and possibly other states in the North and they may have more impact on resource than is known currently.

Option 2: Slot Limit:

Meeting participants agreed that a slot limit was not a good idea.

Comments included:

- Slot limit will not save fish since hook and release mortality may be high with large fish.
- No maximum size since it will hurt Delaware Bay fishery in spring.
- Not a good fit for the for-hire industry.

Option 3: Trophy Allowance:

Meeting participants determined that this option would not work since a slot limit does not fit New Jersey's fisheries.

Option 4: Bag Limit:

All participants agreed that sub-option 4d (3 fish) was the option of choice. It was noted that most anglers do not keep three fish but the option should be there for those who do.

Option 5: Vessel Limit:

All participants agreed that sub-option 5a (no coastwide vessel limit) was best for New Jersey's fisheries.

Option 6: Maintain Current Measures:

All participants agreed that states should be allowed to liberalize regulations for consistency in coastwide regulations and therefore voted **NO** to forcing states to maintain current management measures.

Commercial Measures:

There was no discussion on the commercial fishery options other than agreement from all participants that commercial fisheries should operate under the same size limit as required by recreational anglers.

De minimus Criteria

All participants agreed that Sub-option 1a (1% with separate recreational and commercial status) would be the best option for states to apply for *de minimus* status.

To Toni Kerns,

I have been involved in commercial fishing for a good number of years. Black Drum 8 to 10 inches is the best to eat. I will not eat them if they are over 2lbs. In my area, black drum get worms in them when they get up in size. They need to leave the larger ones to multiply and harvest the ones 4lbs. or less to eat. Any black drum under 8 inches should not be taken. We have a good stock in my area.

Thank you for your time,

David S.Smith

David S. Smith

Toni Kerns

From: captbob626@comcast.net
Sent: Monday, April 15, 2013 8:18 PM
To: Toni Kerns
Cc: Dick Herb
Subject: Re: Black Drum

From: captbob626@comcast.net
To: "Dick Herb" <fish5271@gmail.com>
Sent: Friday, April 12, 2013 10:32:09 AM
Subject: Black Drum

4/12/2013

Attn: Toni Kerns
ASMFC

Dear Toni:

I am writing this letter on behalf of the Cape May County Party and Charter Boat Assn. in Cape May, NJ. We represent over 100 members in the area.
We had a discussion the other night concerning the Black Drum . We would like to go on record as supporting a coastwide plan. Given a coastwide plan we recommend that the black drum stay as status quo, which is 3 fish at 16".

Sincerely,
Bob Meimbresse
Secretary,
CMCPCBA

609 226 9122

Toni Kerns

From: Mark L Elliott Jr [gonefishinagain2@aol.com]
Sent: Friday, April 12, 2013 4:23 PM
To: Toni Kerns
Subject: Drum Fish

Hello my name is Capt. Mark Elliott Jr on the Gone Fishin' IV out of Cape May, New Jersey I would like to see the coastwise drum fish regulation to be 3 fish per man at 16 inches. Thank you for you time in this matter.

Sent from my iPhone

Toni Kerns

From: Capt. Skip [stalkerfishingcharters@yahoo.com]
Sent: Friday, April 12, 2013 11:36 AM
To: Toni Kerns
Subject: Black Drum regs

This is captain Skip Jastremski from www.stalkerfishingcharters.net. I would like to recommend that the black drum regs remain as they currently are!

Thanks

Capt Skip Jatremski

Stalker fishing Charters

609-972-5218

Sent from my iPad

Toni Kerns

From: Bent Stephan [gotumon@comcast.net]
Sent: Friday, April 12, 2013 11:22 AM
To: Toni Kerns
Subject: Drumfish

I am a charter captain from Cape May nj and depend on the drumfish to make a libing in the Spring. I believe that 3 fish at 16" coastwide would be the best course to protect this fishery and allow all anglers to participate would be the best choice. The large fish often wear themselves out during a fight and if we release them they most often die as I have seen them float away unable to swim down. Thank you for your attention to my message. Kindly keep me informed on this subject if you will.
Stephan Bent
Free spirit fishing llc

Sent from my iPhone

Toni Kerns

From: Bob Cope [captbobjr@yahoo.com]
Sent: Thursday, April 11, 2013 5:52 PM
To: Toni Kerns
Subject: Black Drum

My name is Bob Cope owner,operator of Full Ahead Sport Fishing a full time charter boat operation located in Cape May N.J. After listing to comments from a meeting last evening and understanding that asmfc is heading for a coast wide management plan I believe that our current regulations would be the choice in order. To keep this fishery healthy 3 fish bag limit at 16 inches or greater is what I would like to see for the regulation

Respectively Capt. Bob Cope

Sent from my iPad

Toni Kerns

From: Comments
Sent: Friday, April 05, 2013 3:34 PM
To: Toni Kerns
Subject: FW: Black Drum

Toni Kerns
ISFMP Director
ASMFC
tkerns@asmfc.org
703-842-0740

From: RSEARS7678@aol.com [mailto:RSEARS7678@aol.com]
Sent: Friday, March 29, 2013 6:19 PM
To: Comments
Subject: Black Drum

Please leave the size limit and catch per day as it stands now. Va recreational fishermen are only allowed 1 per day and min of 16" size limit and does not need to be changed. Other states need to come down on their daily catch to 1 per day as ours is, and this should more than make a positive impact.
Thanks
Ricky Sears
5333 Good Hope Rd
Lanexa VA 23089

Toni Kerns

From: Ed Holtzhauser [fishinquest@comcast.net]
Sent: Wednesday, April 17, 2013 3:49 PM
To: Comments
Subject: Black Drum in New Jersey and North Carolina

The state of New Jersey is planning to increase the size limit of Black Drum Fish to 32". A group of charter boat captains from Cape May are taking credit for giving the state this idea in 2007. This size limit has little effect on them because they only fish the Delaware Bay spring spawning run of big Drum. If this law passes guys like me and others who fish for smaller 10 to 20 lb resident Drum in the summer and fall will be the only people in the country who cannot take a 16" Drum. These smaller 16" to 28" Drum are caught surf fishing and in back bays throughout the state. It looks like a special interest group may take control of all of the Drum Fish in the state.

There is a proposed 2 fish limit that I have no problem with. The size limit should stay at 16". I think it makes more sense to take a smaller fish than a big spawner. The smaller fish are better eating as the large fish have course flesh and usually carry spaghetti worm parasites.

The biggest size limit in the country is 16". The 16" size limit was put in place in NJ because South Jersey fish markets were loading up with baby 8" to 12" Drum and calling them Sheepshead or Sergeant Majors. This problem has been fixed by the 16" limit. Why should we be the only state in the nation that cannot keep a 16" Drum??? Why should we have the toughest Drum Fish regulations in the country or maybe the Western Hemisphere? Many of the Drum Fish in the country are spawned in the Delaware Bay and migrate south in the fall. We supply much of the South East with Black Drum and we should have the same access to them as the rest of the country. We are already saddled with too many regulations and this 32" limit is one too many.

The Cape May Charter Boat Captains who are taking credit for coming up with this 32" size limit only fish the spring spawning run of big fish. The rest of the year they fish in the ocean or come in the bay for flounder. This 32" limit does not affect them at all. They do not fish the summer and fall run of smaller Drum and probably do not even know about it. I do not know if they are aware of the Drum Fish laws in other states.

The Black Drum Fish laws in the rest of the states vary greatly to say the least. Here is the short version of the Black Drum Fish laws in other states.

New Jersey---16" , 3 per person per day.

Delaware---16", 3 per person per day.

Maryland---16", 1 per person per day.

Maryland Bay---16", 1 per person per day, 6 per boat.

Virginia---16", 1 per person per day.

North Carolina---UNREGULATED

South Carolina---14" minimum 27" max, 5 per person per day.

Georgia---10", 15 per day.

Florida---14” to 24” with one over 24”, 5 per day total.

Alabama---UNREGULATED

Mississippi---UNREGULATED

Louisiana---16” to 27” with one over 27”, 5 per person per day.

Texas---14” to 30”, 5 per person per day.

In addition North Carolina should protect their Black Drum Fish especially the small 10" to 12" fish that are caught in the surf in the fall. They are caught by the bucket full and are sometimes called Sheepshead by the locals. I have witnessed this on the beaches and Frisco Pier at Hatteras Village.

Captain Ed Holtzhauser,
120 Patterson Ave,
Gibbstown NJ 08027 856-423-3458 fishinquest@comcast.net

Toni Kerns

From: Comments
Sent: Tuesday, April 02, 2013 11:41 AM
To: Toni Kerns
Subject: FW: Black Drum

From: RSEARS7678@aol.com [mailto:RSEARS7678@aol.com]
Sent: Friday, March 29, 2013 6:19 PM
To: Comments
Subject: Black Drum

Please leave the size limit and catch per day as it stands now. Va recreational fishermen are only allowed 1 per day and min of 16" size limit and does not need to be changed. Other states need to come down on their daily catch to 1 per day as ours is, and this should more than make a positive impact.
Thanks
Ricky Sears
5333 Good Hope Rd
Lanexa VA 23089

Black Drum Public Information Document for Public Comment

Atlantic States Marine Fisheries Commission
April 1, 2013
Virginia

-- PLEASE PRINT CLEARLY --

Name	Company/Organization	City, State
George D. Bowden	Comm. Fisherman	Chincoteague, Va.
Chris C Snead	Chris' Bait & Tackle	Capeville VA
Mark Snead	" "	"
Buddy West		Va Beach Va.
Elmer Bowden	ESWWR	Chincoteague, Va
William S. Reynolds	ES WWA	CAPE CHARLES, VA.
C W White		FRANKTOWN, VA.
H M Christ	Bayford	Franktown "
Glen Stem	ESWA	Exmore
Ray Wells	Hand line	Cape Charles VA
Raymond Wilder	Hand line	Cape Charles VA
Wilson Cropp	Hand line	Oyster, VA.
Mel Coates	Hand line	Machipongo, Va
Ray CARL DORIE	CHARTER FISHING	NORTHAMPTON VA
Robert Dorsey	Permit holder	Cape Charles
MIKE WILSON	Rec. Angler	CAPE CHARLES,
JOHN SEAMAN	"	PAINTER VA.
Andrew Sturgis	Permit Holder	Belle Haven VA
Ronnie Lesalletto	Permit Holder	Exmore VA.
Ralph Watts	Com fisherman	Machipongo VA.
Ernest Lewis	Com fisherman	oyster VA
Wayne Schultz		
Sean A Hart	Exmore Diner Inc.	Exmore, VA
J. J. Holland	Hand line	Nassawadox VA

Total 29

Name	Company/Organization	City, State
DAVE GRIFFITH	GRIFFITH SEAFOOD	CAPE CHARLES
David Robberecht	water man	Cheriton
Joe Grist	VMRC	Newport News, VA
Renee Hoover	VMRC	Chesapeake, VA
Laurie Williams	VMRC	Norfolk, VA

Black Drum Public Information Document for Public Comment

Atlantic States Marine Fisheries Commission
March 27, 2013
Morehead City, NC

-- PLEASE PRINT CLEARLY --

Name	Company/Organization	City, State
Michelle A. Duval	NC DMF	MHC, NC
Chris Elkins		Gloucester
Tom Roller		Beaufort
CATHERINE BLUM	NC DMF	MHC, NC

Compliance evaluation for the regional management of red drum in Florida and recent increase in bag limit in Florida's northern region along the Atlantic coast.

Florida Fish and Wildlife Conservation Commission
Fish and Wildlife Research Institute
100 Eighth Ave SE
St. Petersburg, FL 33701

20 January 2012

Introduction

In 2010, a preliminary regional analysis of red drum was conducted in Florida at the request of the Florida Fish and Wildlife Conservation Commission's Division of Marine Fisheries Management. This was motivated by angler reports of high catch rates in the northern parts of the state and by the successful use of regional management for other resources like spotted seatrout. Along the Atlantic coast of Florida, regions were defined as the waters in and adjacent to the area from Miami-Dade through Volusia counties (southern region) and from Flagler County through Nassau County (northern region). A preliminary assessment seemed to confirm angler observations, estimating higher escapement rates in the northern regions than in the south (Murphy 2010). Along Florida's Atlantic coast, estimated escapement averaged 75% in the northern region and 28% in the southern during 2005-2008. A more thorough update of this assessment using data through 2010 also found higher escapement rates in the northern region than in the south and an increasing trend in recent years in the south (M. Murphy, FWC unpublished).

Managers and stakeholders debated whether regional regulations were appropriate for red drum on Florida's Atlantic coast through much of 2010 and 2011. In November 2011, the Commission decided to move forward with regional regulations and created three management zones (northwest, northeast and south); increased the number of red drum that a recreational fisherman can take per day in the two northern regions of the state from one to two red drum; established a statewide vessel limit of eight red drum; and limited the number of red drum that could be transported on land to six red drum per person.

The Atlantic States Marine Fisheries Commission also has authority to cooperatively manage red drum in Florida as an interstate fishery. Their management goal was set at 40% static spawning potential ratio (sSPR) with an overfishing threshold of 30% (ASMFC 2002). State-specific compliance to this goal has been generally judged by the level of sSPR given for particular bag limit / size limits combinations found in Tables 19 and 20 (ASMFC 2002) for the ASMFC's northern (NJ-NC) and southern (SC-FL) regions, respectively. However, with the new regional management in Florida, this report documents our estimation of the static spawning

potential ratio for Florida's Atlantic coast red drum stock through 2010 and the projected sSPR after initiation of regional management and relaxation of the 1-fish bag limit in the northern region. Underlying techniques used in the regional assessment are similar to those used in the SEDAR 18 red drum assessment. For more details on the data used in the regional assessment, see Murphy (2010).

Results

Equilibrium spawning-stock-biomass-per-recruit estimates for red drum in each region along Florida's Atlantic coast show dramatic increases during a series of complete closures to fishing that occurred during 1986-1988 (Fig. 1). Clearly the whole population, with age structure out through at least age 38, did not respond this rapidly to reduced fishing levels but the static (year-specific) does not take this into account; little is known about actual adult red drum abundance levels through time. The static spawning potential ratios estimated from these data show a rapid increase after 1985 with levels maintained after 1990 between 62% and 87% in the northern region. In the southern region, sSPR levels declined rapidly after 1993 from 78% down to 11% in 2005 before rebounding to 33% in 2010 (Fig. 1).

Because the sSPR ratios are year-specific and based on 'per recruit' quantities, the coatwide estimates can be obtained as an average of regional sSPR's weighted by the estimated annual number of recruits in each region. The average coastwide sSPR for red drum along the Atlantic coast of Florida during 2008-2010 was estimated at about 62%.

Beginning in 2012, under the new regulations red drum total kill in the Florida Atlantic northern region is projected to increase by about 24% (FWC-FWRI 2010). This includes a 35% increase in the directed harvest that would be offset somewhat by a reduction (assumed) in the number of live-release-deaths. The new projected total kill (about 75,000 fish yr^{-1} during 2006-2008) was still a small amount relative to the estimated abundance in the northern region during those years (about 2.5 million fish). Therefore, the projected decrease in regional sSPR was fairly small: from a 2005-2008 average of 74% to a projected 71% sSPR after the 2-fish bag limit is implemented. Using the same proportional increase in harvest for 2008-2010, the weighted-average for the projected coastwide sSPR after 2010 was about 58%.

Discussion

It appears from these analyses that the sSPR for red drum in Florida will continue to exceed the threshold and target levels set by the ASMFC (ASMFC 2002) after the effects of the increased bag limit are felt in Florida's northern region. The level of uncertainty around this estimate is probably quite large given the limitations of the regional data, assessment model, and management projection model. Using only the asymptotic standard errors estimated for the annual sSPR estimates from the northern region, the projected sSPRs (+/- 2 SE) would range

from 48-65%. This uncertainty does not include the variability around angler response to the 2-fish limit, uncertainty in the southern region sSPR, and uncertainties associated with various model assumptions (constant age-specific natural mortality, constant maturity and length-weight relationship, constant fishing mortality for ages 7-38 years, retrospective pattern, and others). Based on this it would still appear unlikely that Florida's sSPR dropped below the 3) sSPR threshold. It would be prudent to collect more detailed region-specific data, especially in Florida's northern region, over the next 5-8 years to facilitate an valid evaluation of the bag-limit-change.

References

Atlantic States Marine Fisheries Commission (ASMFC). 2002. Amendment 2 to the Interstate Fishery Management Plan for Red Drum. ASMFC, Washington, DC, FisheryManagement Report No. 38, 141 p.

Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute (FWC-FWRI). 2010. The projected effect of a change to a 2-fish bag limit in the northern regions of Florida. Report to the FWC Division of Marine Fisheries Management, Tallahassee. 5p.

Murphy, M.D. 2010. Regional analysis of Florida's gulf and Atlantic stocks of red drum. Report to the FWC Div. Marine Fisheries Management from FWC-Fish and Wildlife Research Institute. May 10, 2010. 28p.

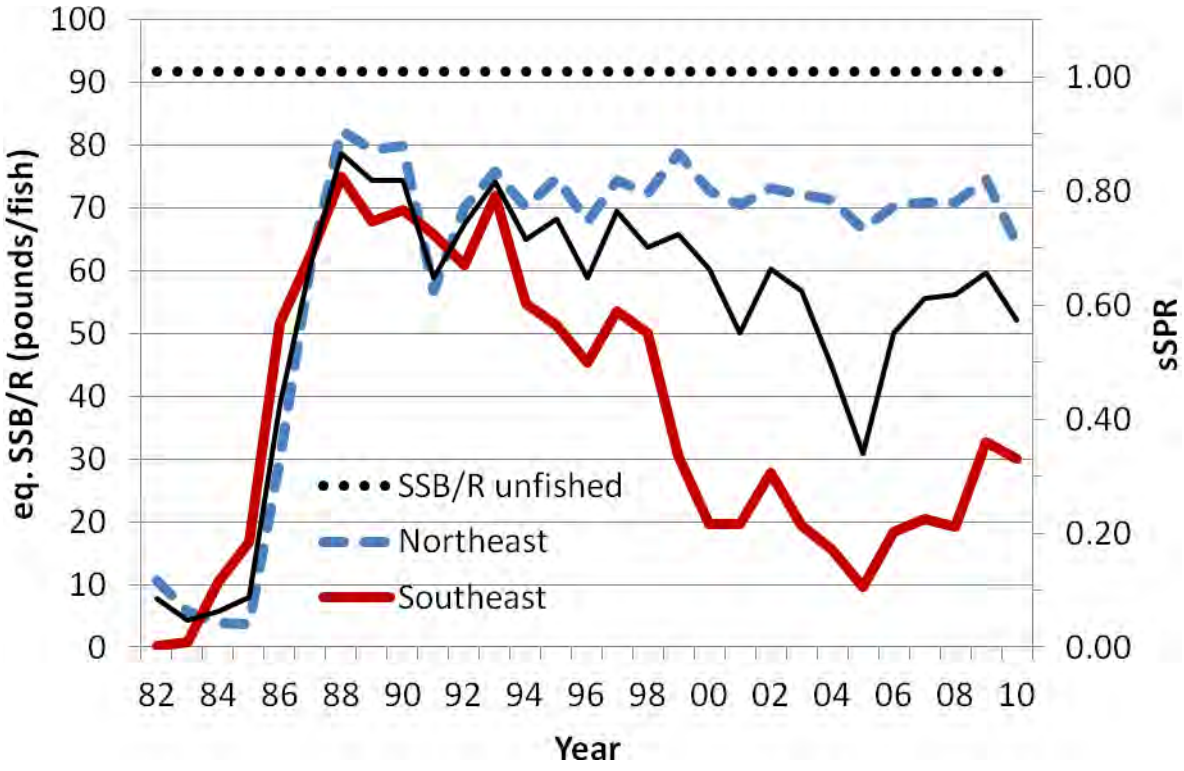

Figure 1. Estimated regional equilibrium spawning stock biomass per recruit (SSB/R) for the northern and southern regions along Florida's Atlantic coast during 1982-2010. The black dotted line shows the estimated unfished level of SSB/R. Corresponding static spawning potential ratios are given along the right vertical axis. The solid black line shows the weighted-average coastwide levels.

Atlantic States Marine Fisheries Commission

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Paul J. Diodati, (MA), Chair *Dr. Louis B. Daniel, III, (NC), Vice-Chair* *Robert E. Beal, Executive Director*

Healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015

April 25, 2013

To: South Atlantic State/Federal Fisheries Management Board
From: Black Drum Technical Committee
RE: Recommended TORs for the Black Drum Benchmark Stock Assessment

The first coastwide black drum stock assessment is scheduled for completion by 2015. The Board will need to approve Terms of Reference at the May 2013 South Atlantic State/Federal Fisheries Management Board Meeting. The Black Drum Technical Committee has recommended the Board consider the following Terms of Reference for the assessment and peer review:

Draft Terms of Reference for Stock Assessment
Black Drum Stock Assessment

1. Characterize precision of fishery-dependent and fishery-independent data used in the assessment, including the following but not limited to:
    a. Provide descriptions of each data source (e.g., geographic location, sampling methodology, potential explanation for outlying or anomalous data, other caveats).
    b. Summarize biological data (e.g., length frequency, age distribution, maturity information) if available.
    c. Describe calculation and potential standardization of abundance indices.
    d. Discuss trends and associated estimates of uncertainty (e.g., standard errors).
    e. Justify inclusion or elimination of all available data sources.
    f. Discuss the effects of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, aging accuracy, sample size) on model inputs and outputs.

2. Review estimates and PSEs of recreational fishing from MRIP. Compare historical and current data collection and estimation procedures and describe data caveats that may affect the assessment.

3. Develop simple, empirical indicators of stock abundance, stock characteristics, and fishery characteristics.

4. Develop models used to estimate population parameters (e.g., F, biomass, abundance) and biological reference points, and analyze model performance.
    a. Describe stability of models (e.g., ability to find a stable solution).
    b. Perform sensitivity analyses for starting parameter values and conduct other model diagnostics as necessary.

c. Clearly and thoroughly explain model strengths and limitations.
d. Briefly describe history of model usage, its theory and framework, and document associated peer-reviewed literature.
e. If multiple models were considered, justify the choice of preferred model and the explanation of any differences in results among models.

5. State assumptions made for all models and explain the likely effects of assumption violations on synthesis of input data and model outputs.

6. Characterize uncertainty of model estimates and biological or empirical reference points.

7. Recommend stock status as related to reference points (if available).

8. Develop detailed short and long-term prioritized lists (high, moderate, or low) of recommendations for future research, data collection, and assessment methodology. Highlight improvements to be made by next benchmark review.

9. Recommend timing of next benchmark assessment and intermediate updates, if necessary, relative to biology and current management of the species.

Draft Terms of Reference for Peer Review Panel
Black Drum Stock Assessment

1. Evaluate the thoroughness of data collection and the presentation and treatment of fishery-dependent and fishery-independent data in the assessment, including the following but not limited to:
    a. Presentation of data source variance (e.g., standard errors).
    b. Justification for inclusion or elimination of available data sources.
    c. Consideration of data strengths and weaknesses (e.g., temporal and spatial scale, gear selectivities, aging accuracy, sample size).
    d. Calculation and/or standardization of abundance indices.

2. Evaluate the methods and models used to estimate population parameters (e.g., F, biomass, abundance) and biological reference points, including but not limited to:
    a. Evaluate the choice and justification of the preferred model(s). Was the most appropriate model (or model averaging approach) chosen given available data and life history of the species?
    b. If multiple models were considered, evaluate the analysts' explanation of any differences in results.
    c. Evaluate model parameterization and specification.

3. Evaluate the diagnostic analyses performed, including but not limited to:
    a. Sensitivity analyses to determine model stability and potential consequences of major model assumptions.

4. Evaluate the methods used to characterize uncertainty in estimated parameters. Ensure that the implications of uncertainty in technical conclusions are clearly stated.

5. Recommend best estimates of stock biomass, abundance, and exploitation from the assessment for use in management, if possible, or specify alternative methods/measures.

6. Evaluate the choice of reference points and the methods used to estimate them. Recommend stock status determination from the assessment, or, if appropriate, specify alternative methods/measures.

7. Review the research, data collection, and assessment methodology recommendations provided by the TC and make any additional recommendations warranted. Clearly prioritize the activities needed to inform and maintain the current assessment, and provide recommendations to improve the reliability of future assessments.

8. Recommend timing of the next benchmark assessment and updates, if necessary, relative to the life history and current management of the species.

9. Prepare an advisory report summarizing the panel's evaluation of the stock assessment and addressing each peer review term of reference. Develop a list of tasks to be completed following the workshop. Complete and submit the report within 4 weeks of workshop conclusion.

FEDERAL REGISTER

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No. 57 March 25, 2013

Part II

Department of the Interior

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northwest Atlantic Ocean Distinct Population Segment of the Loggerhead Sea Turtle (*Caretta caretta*); Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[FWS–R4–ES–2012–0103; 4500030114]

RIN 1018–AY71

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northwest Atlantic Ocean Distinct Population Segment of the Loggerhead Sea Turtle (Caretta caretta)

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service, propose to designate specific areas in the terrestrial environment as critical habitat for the Northwest Atlantic Ocean Distinct Population Segment of the loggerhead sea turtle (*Caretta caretta*) under the Endangered Species Act (Act). The proposed critical habitat is located in coastal counties in North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi. The intended effect of this regulation is to assist with the conservation of the loggerhead sea turtle's habitat under the Act.

DATES: We will accept comments received or postmarked on or before May 24, 2013. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES** section, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in **ADDRESSES** by May 9, 2013.

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Search box, enter Docket No. FWS–R4–ES–2012–0103, which is the docket number for this rulemaking. Then, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rules link to locate this document. You may submit a comment by clicking on ''Comment Now!''

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R4–ES–2012–0103; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We request that you send comments only by the methods described above. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see the Information Requested section below for more information).

The coordinates or plot points or both from which the maps are generated are included in the supporting record for this critical habitat designation and are available at *http://www.fws.gov/northflorida, http://www.regulations.gov* at Docket No. FWS–R4–ES–2012–0103, and at the North Florida Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information that we may develop for this critical habitat designation will also be available at the Fish and Wildlife Service Web site and Field Office set out above, and may also be included in the preamble and/or at *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Dawn P. Jennings, Deputy Field Supervisor, U.S. Fish and Wildlife Service, North Florida Ecological Services Office, 7915 Baymeadows Way, Suite 200, Jacksonville, FL 32256; telephone 904–731–3336. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Endangered Species Act (Act), critical habitat must be designated for any endangered or threatened species, to the maximum extent prudent and determinable. Designations of critical habitat can only be completed through rulemaking. This is a proposed rule by the U.S. Fish and Wildlife Service (USFWS) to designate specific areas in the terrestrial environment as critical habitat for the Northwest Atlantic Ocean Distinct Population Segment (DPS) of the loggerhead sea turtle. The National Marine Fisheries Service (NMFS) is reviewing specific areas in the marine environment as potential critical habitat for the DPS and, consistent with their distinct authority with respect to such areas, may propose to designate such areas in a separate rulemaking. A critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, may continue to be the subject of conservation actions implemented under section 7(a)(1) of the Act, and the species in those areas are subject to the regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species, and section 9 of the Act's prohibitions on taking any individual of the species, including taking caused by actions that affect habitat.

The purpose of this rule. We are proposing to designate specific areas in the terrestrial environment as critical habitat for the Northwest Atlantic Ocean DPS of the loggerhead sea turtle.

The basis for our action. Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude a particular area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species.

Description of Proposed Critical Habitat

- In total, 1,189.9 kilometers (km) (739.3 miles) of loggerhead sea turtle nesting beaches are being proposed for designation as critical habitat in the States of North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi. These beaches account for 48 percent of an estimated 2,464 km (1,531 miles) of coastal beach shoreline, and account for approximately 84 percent of the documented nesting (numbers of nests) within these six States. The proposed critical habitat is located in Brunswick, Carteret, New Hanover, Onslow, and Pender Counties, North Carolina; Beaufort, Charleston, Colleton, and Georgetown Counties, South Carolina; Camden, Chatham, Liberty, and McIntosh Counties, Georgia; Bay, Brevard, Broward, Charlotte, Collier, Duval, Escambia, Flagler, Franklin Gulf, Indian River, Lee, Manatee, Martin, Monroe, Palm Beach, Sarasota, St. Johns, St. Lucie, and Volusia Counties, Florida; Baldwin County, Alabama; and Jackson County, Mississippi.
- The proposed critical habitat has been identified by the recovery unit in which they are located. Recovery units are management subunits of a listed entity that are geographically or otherwise identifiable and essential to

the recovery of the listed entity. Within the United States, four recovery units have been identified for the Northwest Atlantic population of the loggerhead sea turtle. The four recovery units for which we propose to designate terrestrial critical habitat are the Northern Recovery Unit, Peninsular Florida Recovery Unit, Dry Tortugas Recovery Unit, and Northern Gulf of Mexico Recovery Unit.

- For the Northern Recovery Unit, we propose to designate 393.7 km (244.7 miles) of Atlantic Ocean shoreline in North Carolina, South Carolina, and Georgia, encompassing approximately 86 percent of the documented nesting (numbers of nests) within the recovery unit. For the Peninsular Florida Recovery Unit, we propose to designate 364.9 km (226.7 miles) of Atlantic Ocean shoreline and 198.8 km (123.5 miles) of Gulf of Mexico shoreline totaling 563.7 km (350.2 miles) of shoreline in Florida, encompassing approximately 87 percent of the documented nesting (numbers of nests) within the recovery unit. For the Dry Tortugas Recovery Unit, we propose to designate 14.5 km (9.0 miles) of Gulf of Mexico shoreline in Florida, encompassing 100 percent of the nesting (numbers of nests) where loggerhead nesting is known to occur within the recovery unit. For the Northern Gulf of Mexico Recovery Unit, we propose to designate 218.0 km (135.5 miles) of Gulf of Mexico shoreline in Mississippi, Alabama, and the Florida Panhandle, encompassing approximately 75 percent of the documented nesting (numbers of nests) within the recovery unit. We do not propose to designate any critical habitat in Virginia, Louisiana, and Texas because of the very low number of nests (less than 10 annually in each State from 2002 to 2011) known to be laid in these States.
- The proposed designation includes occupied critical habitat that contains the physical and biological features essential to the conservation of the species in the terrestrial environment. No unoccupied habitat is being proposed as critical habitat.
- We are exempting the following Department of Defense installations from critical habitat designation because their Integrated Natural Resources Management Plans (INRMPs) incorporate measures that provide a benefit for the conservation of the loggerhead sea turtle: Marine Corps Base Camp Lejeune (Onslow Beach), Cape Canaveral Air Force Station, Patrick Air Force Base, and Eglin Air Force Base (Cape San Blas).
- Under section 4(b)(2) of the Act, we are considering excluding from critical habitat designation areas in St. Johns, Volusia, and Indian River Counties, Florida, that are covered under habitat conservation plans (HCP), because the HCPs incorporate measures that provide a benefit for the conservation of the loggerhead sea turtle.
- We are not considering for exclusion any additional areas from critical habitat based on economic, national security, or other relevant impacts at this time. However, we are seeking comments on economic, national security, and other relevant impacts, and may decide to exclude additional areas from the final rule based on information received during the public comment period.
- Nesting loggerhead turtles, their nests, eggs, and hatchlings, as well as any of their nesting habitat not designated as critical habitat, are still protected under the Act via section 7 where they may be the subject of conservation actions and regulatory protection ensuring Federal agency actions do not jeopardize their continued existence and section 9 that prohibits the taking of any individual of a species, including taking caused by actions that affect its habitat.

We are preparing an economic analysis of the proposed designations of terrestrial critical habitat. In order to consider economic impacts, we are preparing an economic analysis of the proposed critical habitat designation. We will announce the availability of the draft economic analysis as soon as it is completed, at which time we will seek additional public review and comment.

We will seek peer review during public comment. As part of the public notice, we are seeking comments from independent specialists to ensure that our proposal to designate critical habitat is based on scientifically sound data and analyses. We have invited these peer reviewers to comment on our specific assumptions and conclusions in this critical habitat proposal. Because we will consider all comments and information received during the comment period, our final determinations may differ from this proposal.

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific data available and be as accurate and as effective as possible. Therefore, we request comments or information from other concerned government agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We particularly seek comments concerning:

(1) The reasons whether it would or would not be prudent to designate habitat as ''critical habitat'' under section 4 of the Act, including whether there are threats to the species from human activity, the degree of which can be expected to increase due to the designation, and whether that increase in threat outweighs the benefit of designation such that the designation of critical habitat may not be prudent.

(2) Specific information on:

(a) The amount and distribution of loggerhead sea turtle terrestrial habitat,

(b) Which areas, that were occupied at the time of listing (or are currently occupied) and that contain features essential to the conservation of the species, should be included in the designation and why,

(c) Special management considerations or protection that may be needed for the nesting beach habitat in critical habitat areas we are proposing, including managing for the potential effects of climate change, and

(d) Which areas not occupied at the time of listing are essential for the conservation of the species and why.

(3) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

(4) Information on the projected and reasonably likely impacts of climate change on the loggerhead sea turtle and proposed terrestrial critical habitat.

(5) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation; in particular, any impacts on small entities or families, and the benefits of including or excluding areas that exhibit these impacts.

(6) Whether any of the exemptions we are considering, under section 4(a)(3)(B) of the Act, of land on Department of Defense property at Marine Corps Base Camp Lejeune (Onslow Beach), Cape Canaveral Air Force Station, Patrick Air Force Base, and Eglin Air Force Base (Cape San Blas) are or are not appropriate, and why.

(7) Whether any of the areas we are considering for exclusion under section 4(b)(2) of the Act in St. Johns, Volusia, and Indian River Counties, Florida, because they are covered by an HCP that incorporates measures that provide a benefit for the conservation of the loggerhead sea turtle, are or are not appropriate, and why. The St. Johns County, Florida, Habitat Conservation Plan (''A Plan for the Protection of Sea Turtles and Anastasia Island Beach Mice on the Beaches of St. Johns County, Florida'') is available at *http://www.co.st-johns.fl.us/HCP/*

HabitatConservation.aspx, the Volusia County, Florida, Habitat Conservation Plan (''A Plan for the Protection of Sea Turtles on the Beaches of Volusia County, Florida'') is available at *http://www.volusia.org/core/fileparse.php/4145/urlt/VolusiaHCPDec2007small2.pdf,* and the Indian River County, Florida, Habitat Conservation Plan (''Habitat Conservation Plan for the Protection of Sea Turtles on the Eroding Beaches of Indian River County, Florida'') is available at *http://www.ecological-associates.com/IRC-Final-HCP-July-2003.pdf.*

(8) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES.** We request that you send comments only by the methods described in the **ADDRESSES** section.

We will post your entire comment—including your personal identifying information—on *http://www.regulations.gov.* You may request at the top of your document that we withhold personal information such as your street address, phone number, or email address from public review; however, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov,* or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, North Florida Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**).

Previous Federal Actions

The loggerhead sea turtle was originally listed worldwide under the Act as a threatened species on July 28, 1978 (43 FR 32800). No critical habitat was designated for the loggerhead at that time. Pursuant to a joint memorandum of understanding, USFWS has jurisdiction over sea turtles in the terrestrial environment and NMFS has jurisdiction over sea turtles in the marine environment. On July 16, 2007, USFWS and NMFS (collectively the Services) received a petition to list the North Pacific populations of the loggerhead sea turtle as an endangered species under the Act. NMFS published a notice in the **Federal Register** on November 16, 2007 (72 FR 64585), concluding that the petition presented substantial scientific information indicating that the petitioned action may be warranted. On November 15, 2007, we received a petition to list the Western North Atlantic populations of the loggerhead sea turtle as an endangered species under the Act. NMFS published a notice in the **Federal Register** on March 5, 2008 (73 FR 11849), concluding that the petition presented substantial scientific information indicating that the petitioned action may be warranted.

On March 12, 2009, the petitioners (Center for Biological Diversity (CBD), Turtle Island Restoration Network, and Oceana) sent a 60-day notice of intent to sue to USFWS and NMFS for failure to make 12-month findings on the petitions by the statutory deadlines (July 16, 2008, for the North Pacific petition and November 16, 2008, for the Northwest Atlantic petition). On May 28, 2009, the petitioners filed a Complaint for Declaratory and Injunctive Relief to compel the Services to complete the 12-month findings. On October 8, 2009, the petitioners and the Services reached a settlement in which the Services agreed to submit to the **Federal Register** a 12-month finding on the two petitions on or before February 19, 2010. On February 16, 2010, the United States District Court for the Northern District of California modified the February 19, 2010, deadline to March 8, 2010.

On March 16, 2010 (75 FR 12598), the Services published in the **Federal Register** combined 12-month findings on the petitions to list the North Pacific populations and the Northwest Atlantic populations of the loggerhead sea turtle as endangered DPSs, along with a proposed rule to designate nine loggerhead sea turtle DPSs worldwide and to list two of the DPSs as threatened species and seven as endangered species.

On March 22, 2011 (76 FR 15932), the Services published in the **Federal Register** a notice announcing a 6-month extension of the deadline for a final listing decision to address substantial disagreement on the interpretation of data related to the status and trends for the Northwest Atlantic Ocean DPS of the loggerhead sea turtle and its relevance to the assessment of risk of extinction.

On September 22, 2011 (76 FR 58868), the Services jointly published a final rule revising the loggerhead's listing from a single worldwide threatened species to nine DPSs listed as either endangered or threatened species (50 CFR 17.11(h)). At that time, we lacked the comprehensive data and information necessary to identify and describe physical and biological features of the terrestrial and marine habitats of the loggerhead and found critical habitat to be ''not determinable.'' However, we stated that we would later propose to designate critical habitat for the two DPSs (Northwest Atlantic Ocean and North Pacific Ocean) in which loggerheads occur within the United States' jurisdiction. USFWS has jurisdiction over sea turtles on the land, and loggerheads come on land only to nest; therefore, the only terrestrial habitat they use is for nesting. Since no loggerhead nesting occurs within U.S. jurisdiction for the North Pacific Ocean DPS, no critical habitat is being proposed for that DPS in the terrestrial environment. Because critical habitat can only be designated in areas under U.S. jurisdiction (50 CFR 424.12(h)) and because loggerhead sea turtle nesting in the United States occurs only within the Northwest Atlantic Ocean DPS, we are only proposing to designate specific areas in the terrestrial environment as critical habitat for this one DPS. The petitioners filed a notice of intent to sue on October 11, 2012, and a complaint for declaratory and injunctive relief on January 8, 2013, to both USFWS and NMFS for failure to designate critical habitat.

Background

It is our intent to discuss only those topics directly relevant to the designation of terrestrial critical habitat for the loggerhead sea turtle in this proposed rule. For more information on the taxonomy, biology, and ecology of the loggerhead sea turtle, refer to the final listing rule published in the **Federal Register** on September 22, 2011 (76 FR 58868), and the Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*) finalized on December 31, 2008 (NMFS and USFWS 2008, entire), which are available from the North Florida Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**).

Species Description

The loggerhead sea turtle belongs to the family Cheloniidae along with all other sea turtle species except the leatherback (*Dermochelys coriacea*). The genus *Caretta* is monotypic (one representative in the group). The loggerhead sea turtle is characterized by a large head with blunt jaws. The carapace (shell) of adult and juvenile loggerheads is reddish-brown. Dorsal (top) and lateral (side) head scales and dorsal scales of the flippers are also reddish-brown, but with light to medium yellow margins. Mean straight carapace length (SCL) of nesting females

in the southeastern United States, the location where the vast majority of loggerheads nest in the United States, is approximately 92 centimeters (cm) (36 inches (in)); corresponding weight is approximately 116 kilograms (kg) (256 pounds (lb)) (Ehrhart and Yoder 1978, p. 29). Hatchlings vary from light to dark brown to dark gray dorsally and lack the reddish-brown coloration of adults and juveniles. Flippers are dark gray to brown above with distinct white margins. At emergence, hatchlings average 45 millimeters (mm) (1.8 in) SCL and weigh approximately 20 grams (g) (0.7 ounces (oz)) (Dodd 1988, pp. 50, 52).

Life History and Habitat

Loggerheads are long-lived, slow-growing animals that use multiple habitats across entire ocean basins throughout their life history. This complex life history encompasses terrestrial, nearshore, and open ocean habitats. The three basic ecosystems in which loggerheads live are the following:

1. Terrestrial zone (supralittoral [area above the spring high tide line that is regularly splashed, but not submerged by ocean water])—the nesting beach where both oviposition (egg laying) and embryonic development and hatching occur.

2. Neritic zone—the nearshore marine environment (from the surface to the sea floor) where water depths do not exceed 200 meters (m) (656 feet (ft)). The neritic zone generally includes the continental shelf (the sea bed surrounding a continent), but in areas where the continental shelf is very narrow or nonexistent, the neritic zone conventionally extends from the shore to areas where water depths reach 200 m (656 ft).

3. Oceanic zone—the vast open ocean environment (from the surface to the sea floor) where water depths are greater than 200 m (656 ft).

The loggerhead occurs throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans (Dodd 1988, p. 16). However, the majority of loggerhead nesting is at the western rims of the Atlantic and Indian Oceans. The most recent reviews show that only two loggerhead nesting aggregations have greater than 10,000 females nesting per year: Peninsular Florida, United States, and Masirah Island, Oman (Baldwin *et al.* 2003, p. 219; Ehrhart *et al.* 2003, p. 169; Kamezaki *et al.* 2003, pp. 213–214; Limpus and Limpus, 2003, p. 200; Margaritoulis *et al.* 2003, p. 177). Thus, loggerhead nesting within the Peninsular Florida Recovery Unit of the Northwest Atlantic Ocean DPS is significant for the conservation of loggerheads worldwide. From a global perspective, this U.S. nesting aggregation is of paramount importance to the survival of the species as is the population that nests on islands in the Arabian Sea off Oman. The loggerhead nesting aggregations in Oman and the United States account for the majority of nesting worldwide.

Nesting aggregations with 1,000 to 9,999 females nesting annually include Georgia through North Carolina (United States), Quintana Roo and Yucatan (Mexico), Brazil, Cape Verde Islands (Cape Verde), Western Australia (Australia), and Japan. Smaller nesting aggregations with 100 to 999 nesting females annually occur in the Northern Gulf of Mexico (United States), Dry Tortugas (United States), Cay Sal Bank (The Bahamas), Tongaland (South Africa), Mozambique, Arabian Sea Coast (Oman), Halaniyat Islands (Oman), Cyprus, Peloponnesus (Greece), Zakynthos (Greece), Crete (Greece), Turkey, and Queensland (Australia) (NMFS and USFWS 2008, p. I–3).

In the Northwest Atlantic, the majority of loggerhead nesting is concentrated along the coast of the United States from North Carolina through Mississippi, although a small amount of nesting also occurs regularly in Virginia, Louisiana, Texas, and the U.S. Virgin Islands. Additional nesting beaches are found along the eastern Mexico coast, particularly the eastern Yucatan Peninsula coast; in The Bahamas; in Cuba; and along the coasts of Central America, Colombia, Venezuela, and some of the eastern Caribbean Islands (Addison and Morford 1996, pp. 32–35; Addison 1997, entire; Ehrhart *et al.* 2003, p. 160). As post-hatchlings, Northwest Atlantic loggerheads use the North Atlantic Gyre and enter Northeast Atlantic waters (Carr 1987, pp. 111–118). They are also found in the Mediterranean Sea (Carreras *et al.* 2006, p. 1274; Eckert *et al.* 2008, pp. 305–306). In these areas, they overlap with other loggerheads originating from the Northeast Atlantic and the Mediterranean Sea (Laurent *et al.* 1993, p. 1234; Bolten *et al.* 1998, pp. 3–5; Laurent *et al.* 1998, pp. 1535–1537; LaCasella *et al.* 2005, entire; Carreras *et al.* 2006, p. 1274; Monzón-Argüello *et al.* 2006, entire; Revelles *et al.* 2007, pp. 268–269; Eckert *et al.* 2008, pp. 305–306; Monzón-Argüello *et al.* 2010, p. 1878).

Sea turtles spend the majority of their lives in the ocean. However, they are intimately tied to the land where they must lay their nests. Loggerheads nest on ocean beaches and occasionally on estuarine shorelines. Sea turtle eggs require a high-humidity substrate that allows for sufficient gas exchange and temperatures conducive to egg development (Miller 1997, pp. 67–68; Miller *et al.* 2003, pp. 129–130). Loggerhead nests incubate for variable periods of time depending on sand temperatures (Mrosovsky and Yntema 1980, p. 272). Hatchlings emerge from their nests en masse almost exclusively at night (Hendrickson 1958, pp. 513–514; Mrosovsky 1968, entire; Witherington *et al.* 1990, pp. 1166–1167; Moran *et al.* 1999, p. 260), although secondary emergences from nests may occur on subsequent nights (Carr and Ogren 1960, p. 23; Witherington 1986, p. 36; Ernest and Martin 1993, pp.10–11; Houghton and Hays 2001, p. 134). Hatchlings then use a progression of seafinding orientation cues to guide their movement from the nest to the marine environments where they spend their early years (Lohmann and Lohmann 2003, entire).

In the Northwest Atlantic, the nesting season extends from about late April through early September with nesting occurring primarily at night. Clutch frequency for loggerheads has been reported as 3 to 5.5 nests per female per season (Murphy and Hopkins 1984, p. 10; Frazer and Richardson 1985, p. 248; Hawkes *et al.* 2005, pp. 68, 70; Scott 2006, pp. 51, 70; Tucker 2008, pers. comm.; L. Ehrhart, University of Central Florida, unpublished data). Nests are laid at intervals of approximately 12 to 15 days (Caldwell 1962, pp. 294–295; Dodd 1988, p. 36). Mean clutch size varies from about 100 to 126 eggs (Dodd 1988, p. 40). Egg incubation duration varies depending on time of year and latitude but typically ranges from about 42 to 75 days (Dodd and Mackinnon 2006, pp. 7, 19; Witherington 2006, pers. comm.; Dodd and Mackinnon 2007, pp. 7, 17; Dodd and Mackinnon 2008, pp. 7, 17; Dodd and Mackinnon 2009, p. 14; Dodd and Mackinnon 2010, p. 15; Dodd 2011, p. 15). Remigration intervals (number of years between successive nesting migrations) typically range from 2.5 to 3.7 years (Richardson *et al.* 1978, pp. 40–42; Bjorndal *et al.* 1983, pp. 68–70; L. Ehrhart, University of Central Florida, unpublished data). Age at sexual maturity is believed to be about 32 to 35 years (NMFS and USFWS 2008, pp. I–18, V–13).

Immediately after hatchlings emerge from the nest, they begin a period of frenzied activity. During this active period, hatchlings move from their nest to the surf, swim and are swept through the surf zone, and continue swimming away from land for approximately 20 to 30 hours (Carr and Ogren 1960, pp. 23–

24; Carr 1962, pp. 364–365; Carr 1982, p. 22; Wyneken and Salmon 1992, p. 482; Witherington 1995, p. 154). Hatchlings swimming from land rely on an approximately 5-day store of energy and nutrients within their retained yolk sac (Kraemer and Bennett 1981, pp. 407–409). Orientation cues used by hatchlings as they crawl, swim through the surf, and migrate offshore are discussed in detail by Lohmann and Lohmann (2003, entire) and include visual cues on the beach, wave orientation in the nearshore, and later magnetic field orientation as they proceed further toward open water.

Post-hatchling sea turtles are young turtles that have matured to the point beyond the period of frenzied swimming (Wyneken and Salmon 1992, p. 478). Post-hatchling loggerheads are largely inactive, exhibit infrequent low-energy swimming, and have begun to feed, no longer relying on their retained yolk (Witherington 2002, p. 850). As post-hatchlings, loggerheads are pelagic (spend time more at the surface than sea bottom) and are best known from neritic waters along the continental shelf. They often inhabit areas where surface waters converge to form downwellings, which are associated with linear accumulations of floating material like *Sargassum* (Witherington 2002, p. 844). This neritic post-hatchling stage is weeks or months long and may be a transition to the oceanic stage that loggerheads enter as they grow and are carried by ocean currents (Witherington 2002, p. 850; Bolten 2003, p. 65). Bolten (2003, p. 65) notes that the post-hatchling transition stage occurs in the neritic environment, and ends when the small turtles enter the oceanic zone.

The oceanic juvenile stage begins when loggerheads first enter the oceanic zone (Bolten 2003, p. 66). Juvenile loggerheads originating from nesting beaches in the Northwest Atlantic appear to use oceanic developmental habitats and move with the predominant ocean gyres for several years before returning to their neritic foraging and nesting habitats (Musick and Limpus 1997, pp. 140–142; Bolten 2003, p. 66). The presence of *Sargassum* is also important for the oceanic juvenile life stage, as it offers a concentrated, protected foraging area, with facilitated dispersal by the associated oceanic currents. Turtles in this stage use active and passive movements relative to oceanic currents and winds, with 75 percent of their time spent in the top 5 m (16 ft) of the water column (Archie Carr Center for Sea Turtle Research, unpublished data, as cited in NMFS and USFWS 2008, p. I–24).

The actual duration of the oceanic juvenile stage varies, with the size of loggerheads leaving the oceanic zone varying widely (Bjorndal *et al.* 2000, pp. 270–271). In the Atlantic, Bjorndal and colleagues (Bjorndal *et al.* 2000, p. 270; Bjorndal *et al.* 2003, p. 1246) estimated the duration of the oceanic juvenile stage to be between 7 and 11.5 years, with juveniles recruiting to neritic habitats in the western Atlantic over a size range of 46–64 cm (18–25 in) CCL (Bolten *et al.* 1993, p. 50; Turtle Expert Working Group 2009, p. 2). However, Snover (2002, p. 66) suggests a much longer oceanic juvenile stage duration for Northwest Atlantic loggerheads with a range of 9–24 years and a mean of 14.8 years over similar size classes.

The neritic juvenile stage begins when loggerheads exit the oceanic zone and enter the neritic zone (Bolten 2003, p. 66). After migrating to the neritic zone, juvenile loggerheads continue maturing until they reach adulthood. Some juveniles may periodically move between neritic and oceanic zones (Witzell 2002, p. 267; Bolten 2003, p. 66; Morreale and Standora 2005, p. 874; Mansfield 2006, p. 124; McClellan and Read 2007, pp. 592–593; Eckert *et al.* 2008, p. 306).

The neritic zone also provides important foraging habitat, internesting (between nest-laying events) habitat, breeding habitat, overwintering habitat, and migratory habitat for adult loggerheads. Some adults may also periodically move between neritic and oceanic zones (Harrison and Bjorndal 2006, pp. 220–221). See Schroeder *et al.* (2003, pp. 119–122) for a review of the neritic adult life stage for the Atlantic Ocean.

The duration of the adult stage can be estimated for females from tag return data at nesting beaches. For the Northwest Atlantic nesting assemblages, data from Little Cumberland Island, Georgia, show reproductive longevity, and hence duration of the adult female stage, as long as 25 years (Dahlen *et al.* 2000, p. 62). This is likely an underestimate of the average reproductive life span given tag loss and incomplete surveys of nesting beaches at night. Comparable data for adult males do not exist.

In both oceanic and neritic zones, loggerheads are primarily carnivorous, although they do consume some plant matter as well (see Bjorndal 1997, pp. 202–204, and Dodd 1988, pp. 60–66, for reviews). Loggerheads feed on a wide variety of food items with ontogenetic (developmental) and regional differences in diet. Loggerhead diets have been described from just a few coastal regions, and little information is available about differences or similarities in diet at various life stages.

Recovery Units

Five recovery units (management subunits of a listed entity that are geographically or otherwise identifiable and essential to the recovery of the listed entity) have been identified for the Northwest Atlantic population of the loggerhead sea turtle (NMFS and USFWS 2008, pp. II–2–II–6). Four of these recovery units represent nesting assemblages in the southeastern United States and were delineated based on genetic differences and a combination of geographic distribution of nesting densities, geographic separation, and geopolitical boundaries. The fifth recovery unit includes all other nesting assemblages within the Northwest Atlantic.

The five recovery units for Northwest Atlantic loggerheads are:

Northern Recovery Unit: The Northern Recovery Unit is defined as loggerheads originating from nesting beaches from southern Virginia (the northern extent of the U.S. nesting range) south through the Florida-Georgia border.

Peninsular Florida Recovery Unit: The Peninsular Florida Recovery Unit is defined as loggerheads originating from nesting beaches from the Florida-Georgia border south through Pinellas County on the west coast of Florida, excluding the islands west of Key West, Florida.

Dry Tortugas Recovery Unit: The Dry Tortugas Recovery Unit is defined as loggerheads originating from nesting beaches throughout the islands located west of Key West, Florida, because these islands are geographically separated from other recovery units.

Northern Gulf of Mexico Recovery Unit: The Northern Gulf of Mexico Recovery Unit is defined as loggerheads originating from nesting beaches from Franklin County on the northwest Gulf coast of Florida through Texas (the western extent of the U.S. nesting range).

Greater Caribbean Recovery Unit: The Greater Caribbean Recovery Unit is composed of loggerheads originating from all other nesting assemblages within the Greater Caribbean (Mexico through French Guiana, The Bahamas, Lesser Antilles, and Greater Antilles).

Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in

accordance with the Act, on which are found those physical or biological features

(a) Essential to the conservation of the species and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with USFWS or NMFS, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

Prudency Determination

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12), require that, to the maximum extent prudent and determinable, the Secretary shall designate critical habitat at the time the species is determined to be an endangered or threatened species. Our regulations (50 CFR 424.12(a)(1)) state that the designation of critical habitat is not prudent when one or both of the following situations exist:

(1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or

(2) such designation of critical habitat would not be beneficial to the species.

On September 22, 2011 (76 FR 58868), the Services jointly published a final rule revising the loggerhead's listing from a single worldwide threatened species to nine DPSs listed as either endangered or threatened species. While we did not publish a prudency determination, we did find that critical habitat was not determinable and stated that we would propose to designate critical habitat for the two DPSs (Northwest Atlantic Ocean DPS and North Pacific Ocean DPS) in which loggerheads occur within the United States' jurisdiction in a future rulemaking.

There is currently no identified imminent threat of take attributed to collection or vandalism of nesting beaches within the Northwest Atlantic Ocean DPS, and identification and mapping of specific areas in the terrestrial environment as critical habitat is not expected to create or increase any such threat. In the absence of finding that the designation of critical habitat would increase threats to a species, a prudent finding is warranted if there are any benefits to a critical habitat designation. Here, the potential benefits of designation include: (1) Focusing conservation activities on the most essential features and areas; (2) providing educational benefits to State or county governments or private entities; and (3) preventing people from causing inadvertent harm to the species and beaches with active nesting. In short, because we have determined that the designation of critical habitat is not likely to increase the degree of threat to the species and may provide some benefit, we find that designation of terrestrial critical habitat is prudent for the Northwest Atlantic Ocean DPS.

Critical Habitat Determinability

Having determined that designation is prudent, under section 4(a)(3) of the Act we must find whether critical habitat for the species is determinable. Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist:

(i) Information sufficient to perform required analyses of the impacts of the designation is lacking, or

(ii) The biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat.

When critical habitat is not determinable, the Act allows the Services an additional year to publish a critical habitat designation (section 4(b)(6)(C)(ii)).

When the Services jointly published a final rule revising the loggerhead's listing from a single worldwide threatened species to nine DPSs, we lacked the comprehensive data and information necessary to identify and describe physical and biological features of the terrestrial and marine habitats of the loggerhead. Thus, we found designation of critical habitat to be ''not determinable.'' Accordingly, USFWS has reviewed the available information pertaining to the biological needs of the species and habitat characteristics where the loggerheads in the Northwest Atlantic Ocean DPS nest on U.S. beaches. This and other information represent the best scientific data available and have led us to conclude that the designation of terrestrial critical habitat is determinable for the Northwest Atlantic Ocean DPS.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat). In identifying those physical and biological features within an area, we focus on the principal biological or physical constituent elements (primary constituent elements such as roost sites, nesting grounds, seasonal wetlands, water quality, tide, soil type) that are essential to the conservation of the species. Primary constituent elements are those specific elements of the physical or biological features that provide for a species' life-history processes and are essential to the conservation of the species.

Under the second prong of the Act's definition of critical habitat, we can

designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For example, an area currently occupied by the species but that was not occupied at the time of listing may be essential to the conservation of the species and may be included in the critical habitat designation. Pursuant to our regulations, we designate critical habitat in areas outside the geographical area presently occupied by a species only when a designation limited to its present range would be inadequate to ensure the conservation of the species (50 CFR 424.12(e)).

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information developed during the listing process for the species. Additional information sources may include the recovery plan for the species, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, other unpublished materials, or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, may continue to be the subject of: (1) Conservation actions implemented under section 7(a)(1) of the Act, (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species, and (3) section 9 of the Act's prohibitions on taking any individual of the species, including taking caused by actions that affect habitat. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of this species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, HCPs, or other species conservation planning efforts if new information available at the time of these planning efforts calls for a different outcome.

Physical or Biological Features

In accordance with section 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied by the species at the time of listing to designate as critical habitat, we consider the physical or biological features (PBFs) that are essential to the conservation of the species and which may require special management considerations or protection. These include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, or rearing (or development) of offspring; and

(5) Habitats that are protected from disturbance or are representative of the historical, geographic, and ecological distributions of a species.

We derive the specific physical or biological features essential for the loggerhead sea turtle from studies of this species' habitat, ecology, and life history as described below. Additional information can be found in the final listing rule published in the **Federal Register** on September 22, 2011 (76 FR 58868), and the Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*) (NMFS and USFWS 2008, entire).

Shaffer and Stein (2000, pp. 307–314) identify a methodology for conserving imperiled species known as the ''three Rs'': Representation, resiliency, and redundancy. Representation, or preserving some of everything, means conserving not just a species but its associated habitats. Resiliency and redundancy ensure there is enough of a species so it can survive into the future. Resiliency means ensuring that the habitat is adequate for a species and its representative components. Redundancy ensures an adequate number of sites and individuals. This methodology has been widely accepted as a reasonable conservation strategy (Tear *et al.* 2005, p. 841). In applying this strategy to terrestrial critical habitat for loggerheads, we have determined that it is important to conserve: (1) Beaches that have the highest nesting densities (representation); (2) beaches that have a good geographic spatial distribution to ensure protection of genetic diversity (resiliency and redundancy); (3) beaches that collectively provide a good representation of total nesting (representation); and (4) beaches adjacent to the high density nesting beaches that can serve as expansion areas and provide sufficient habitat to accommodate and provide a rescue effect for nesting females whose primary nesting beach has been lost (resiliency and redundancy). Therefore, we have determined that the following physical or biological features are essential for the loggerhead sea turtle:

Physical or Biological Feature 1—Sites for Breeding, Reproduction, or Rearing (or Development) of Offspring

The production of the next generation of loggerhead sea turtles results from a synergism of the effects of the ecological conditions in the foraging area on the energetics of the female and of the beach environmental conditions on development of the embryos. To be successful, reproduction must occur when environmental conditions support adult activity (e.g., sufficient quality and quantity of food in the foraging area, suitable beach structure for digging, nearby internesting habitat) (Georges *et al.* 1993, p. 2). The environmental conditions of the nesting beach must favor embryonic development and survival (i.e., modest temperature fluctuation, low salinity, high humidity, well drained, well aerated) (Mortimer 1982, p. 49; Mortimer 1990, pp. 809, 811). Additionally, the hatchlings must emerge to onshore and offshore conditions that enhance their chances of survival (e.g., less than 100 percent depredation, appropriate offshore

currents for dispersal) (Georges *et al.* 1993, p. 2).

Terrestrial nesting habitat is the supralittoral zone of the beach where oviposition (egg laying), embryonic development, and hatching occur. Loggerheads nest on ocean beaches and occasionally on estuarine shorelines with suitable sand. For a beach to serve as nesting habitat, a nesting turtle must be able to access it. However, anthropogenic structures (e.g., groins, jetties, breakwaters), as well as natural features (e.g., offshore sand bars), can act as barriers or deterrents to adult females attempting to access a beach. Adult females approaching the nesting beach may encounter these structures and either crawl around them, abort nesting for that night, or move to another section of beach to nest. Nests are typically laid between the high tide line and the dune front (Routa 1968, p. 293; Witherington 1986, pp. 16, 27; Hailman and Elowson 1992, p. 5).

Wood and Bjorndal (2000, entire) evaluated four environmental factors (slope, temperature, moisture, and salinity) and found that slope had the greatest influence on loggerhead nest-site selection on a beach in Florida. Loggerheads appear to prefer relatively narrow, steeply sloped, coarse-grained beaches, although nearshore contours may also play a role in nesting beach site selection (Provancha and Ehrhart 1987, p. 42).

Nest sites typically have steeper slopes than other sites on the beach, and steeper slopes usually indicate an area of the beach with a higher elevation (Wood and Bjorndal 2000, p. 126). Wood and Bjorndal (2000, p. 126) speculated that a higher slope could be a signal to turtles that they have reached an elevation where there is an increased probability of hatching success of nests. This is related to the nests being laid high enough on the beach to be less susceptible to repeated and prolonged tidal inundation and erosion. Nests laid at lower beach elevations are subject to a greater risk of repeated and prolonged tidal inundation and erosion, which can cause mortality of incubating egg clutches (Foley *et al.* 2006, pp. 38–39). Regardless, loggerheads will use a variety of different nesting substrates and beach slopes for nesting. They will also scatter their nests over the beach, likely to ensure that at least some nest sites will be successful as ''placement of nests close to the sea increases the likelihood of inundation and egg loss to erosion whereas placement of nests farther inland increases the likelihood of desiccation, hatchling misorientation, and predation on nesting females, eggs, and hatchlings'' (Wood and Bjorndal 2000).

Loggerhead sea turtles spread their reproductive effort both temporally and spatially. Spatial clumping occurs because loggerheads concentrate their nesting to a few primary locations that are augmented by lower density, satellite sites. In addition, a few isolated, low-density sites are known (Miller *et al.* 2003, p. 126). Loggerheads show a high degree of nesting site fidelity (Miller *et al.* 2003, p. 127). Once an adult female has returned to the region where it hatched and selected a nesting beach, she will tend to renest in relatively close proximity (0–5 km (0–3 miles)) during successive nesting attempts within the same and subsequent nesting seasons, although a small percentage of turtles will utilize more distant nesting sites in the general area (Miller *et al.* 2003, pp. 127–128). Thus, a high-density nesting beach is the product of site fidelity and nesting success. A high-density nesting beach produces a large number of hatchlings that are recruited to the population resulting in a relatively higher number of females that will return to nest on those same beaches.

Sea turtles must have ''deep, clean, relatively loose sand above the high-tide level'' for successful nest construction (Hendrickson 1982, p. 54). Sand is classified as material predominately composed of carbonate, quartz, or similar material with a particle size distribution ranging between 0.062 mm and 4.76 mm (0.002 in and 0.187 in) (Wentworth and ASTM classification systems). Sea turtle eggs require a high-humidity substrate that allows for sufficient gas exchange for development (Mortimer 1990, p. 811; Miller 1997, pp. 67–68; Miller *et al.* 2003, pp. 129–130). Ackerman (1980, p. 575) found that the rate of growth and mortality of sea turtle embryos is related to respiratory gas exchange with embryonic growth slowing and mortality increasing in environments where gas exchange is reduced below naturally occurring levels.

Moisture conditions in the nest influence incubation period, hatching success, and hatchling size (McGehee 1990, pp. 254–257; Mortimer 1990, p. 811; Carthy *et al.* 2003, pp. 147–149). Laboratory experiments have shown that hatching success can be affected by unusually wet or dry hydric conditions (McGehee 1990, pp. 254–255). Proper moisture conditions are necessary for maximum hatching success (McGehee 1990, p. 251). In addition, water availability is known to influence the incubation environment of the embryos of turtles with flexible-shelled eggs by affecting nitrogen excretion (Packard *et al.* 1984, pp. 198–201), mobilization of calcium (Packard and Packard 1986, p. 404), mobilization of yolk nutrients (Packard *et al.* 1985, p. 571), and energy reserves in the yolk at hatching (Packard *et al.* 1988, p. 122).

Loggerhead nests incubate for variable periods of time depending on sand temperatures (Mrosovsky and Yntema 1980, p. 272). The length of the incubation period (commonly measured from the time of egg deposition to hatchling emergence) is inversely related to nest temperature, such that between 26.0 °C and 32.0 °C (78.8 °F and 89.6 °F), a change of 1 °C (33.8 °F) adds or subtracts approximately 5 days (Mrosovsky 1980, p. 531). The warmer the sand surrounding the egg chamber, the faster the embryos develop (Mrosovsky and Yntema 1980, p. 272).

Sand temperatures prevailing during the middle third of the incubation period also determine the gender of hatchling sea turtles (Mrosovsky and Yntema 1980, p. 276; Yntema and Mrosovsky 1982, pp. 1014–1015). The pivotal temperature (i.e., the incubation temperature that produces equal numbers of males and females) in loggerheads is approximately 29.0 °C (84.2 °F) (Limpus *et al.* 1983, p. 3; Mrosovsky 1988, pp. 664–666; Marcovaldi *et al.* 1997, pp. 758–759). Incubation temperatures near the upper end of the tolerable range produce only female hatchlings while incubation temperatures near the lower end of the tolerable range produce only male hatchlings.

Loggerhead hatchlings pip (break through the egg shell) and escape from their eggs over a 1- to 3-day interval and move upward and out of the nest over a 2- to 4-day interval (Christens 1990, p. 400). The time from pipping to emergence ranges from 4 to 7 days with an average of 4.1 days (Godfrey and Mrosovsky 1997, p. 583). Hatchlings emerge from their nests en masse almost exclusively at night, likely using decreasing sand temperature as a cue (Hendrickson 1958, pp. 513–514; Mrosovsky 1968, entire; Witherington *et al.* 1990, pp. 1166–1167; Moran *et al.* 1999, p. 260). After an initial emergence, there may be secondary emergences on subsequent nights (Carr and Ogren 1960, p. 23; Witherington 1986, p. 36; Ernest and Martin 1993, pp. 10–11; Houghton and Hays 2001, p. 134).

Hatchlings use a progression of seafinding orientation cues to guide their movement from the nest to the marine environments (Lohmann and Lohmann 2003, entire). Hatchlings first use light cues to find the ocean. On

natural beaches without artificial lighting, ambient light from the open sky creates a relatively bright horizon compared to the dark silhouette of the dune and vegetation landward of the nest. This contrast guides the hatchlings to the ocean (Daniel and Smith 1947, pp. 414–415; Limpus 1971, p. 387; Salmon *et al.* 1992, pp. 72–75; Witherington and Martin 1996, pp. 5–12; Witherington 1997, pp. 311–319). After reaching the surf, hatchlings swim and are swept through the surf zone, after which wave orientation occurs in the nearshore area and later magnetic field orientation as they proceed further toward open water (Lohmann and Lohmann 2003, entire).

Both nesting and hatchling sea turtles are adversely affected by the presence of artificial lighting on or near the beach (Witherington and Martin 1996, pp. 2–5, 12–13). Artificial lighting deters adult female loggerheads from emerging from the ocean to nest, and loggerheads emerging onto a beach abort nesting attempts at a greater frequency in lighted areas (Witherington 1992, pp. 34–37). Because adult females rely on visual brightness cues to find their way back to the ocean after nesting, those turtles that nest on artificially lighted beaches may become disoriented by artificial lighting and have difficulty finding their way back to the ocean (Witherington 1992, p. 38). Hatchling sea turtles have a robust seafinding behavior guided by visual cues (Mrosovsky and Carr 1967, pp. 228–230; Mrosovsky and Shettleworth 1968, pp. 214–218; Dickerson and Nelson 1989, entire; Witherington and Bjorndal 1991, pp. 146–148; Salmon *et al.* 1992, pp. 72–75; Witherington and Martin 1996, pp. 6–12; Lohmann *et al.* 1997, pp. 110–116; Lohmann and Lohmann 2003, pp. 45–47). Hatchlings unable to find the ocean, or delayed in reaching it, due to the presence of artificial beachfront lighting are likely to incur high mortality from dehydration, exhaustion, or predation (Carr and Ogren 1960, pp. 33–46; Ehrhart and Witherington 1987, pp. 97–98; Witherington and Martin 1996, pp. 12–13).

For loggerheads, it is important to conserve: (1) Beaches that have the highest nesting densities (by State or region within a State); (2) beaches that have a good geographic spatial distribution to ensure protection of genetic diversity; (3) beaches that collectively provide a good representation of total nesting; and (4) beaches adjacent to the high-density nesting beaches that can serve as expansion areas. Since loggerheads nest on dynamic ocean beaches that may be significantly degraded or lost through natural processes (e.g., erosion) or upland development (e.g., armoring, lighting), the designation of occupied beaches adjacent to the highest density nesting beaches as critical habitat will help ensure the availability of nesting habitat if the primary high-density nesting beaches are temporarily or permanently lost.

Therefore, based on the information above, we identify extra-tidal or dry sandy beaches from the mean high water (MHW) (see definition at *http://tidesandcurrents.noaa.gov/datum_options.html*) line to the toe of the secondary dune that are capable of supporting a high density of nests or serving as an expansion area for beaches with a high density of nests and that are well distributed within each State or region within a State and representative of total nesting to be a physical or biological feature for the species.

Physical or Biological Feature 2—*Habitats Protected From Disturbance or Representative of the Historical, Geographic, and Ecological Distributions of the Species*

Sea turtle nesting habitat is part of the highly dynamic and continually shifting coastal system, which includes oceanfront beaches, barrier islands, and inlets. These geologically dynamic coastal regions are controlled by natural coastal processes or activities that mimic these natural processes, including littoral or longshore drift (the process by which sediments move along the shoreline), onshore and offshore sand transport (natural erosion or accretion cycle), and tides and storm surge. The integrity of the habitat components depends upon daily tidal events; these processes are associated with the formation and movement of barrier islands, inlets, and other coastal landforms throughout the landscape.

There has been considerable loss or degradation of such habitats by humans from development, armoring, sand placement, and other activities to prevent or forestall erosion or inundation from shifting shorelines, as well as coastal storms and sea level rise resulting from climate change. Coastal dynamic processes are anticipated to accelerate due to sea level rise and an increase in frequency and intensity of coastal storms as a result of climate change.

Since sea turtles evolved in this dynamic system, they are dependent upon these ever-changing features for their continued survival and recovery. Sea turtles require nesting beaches where natural coastal processes or activities that mimic these natural processes will be able to continue well into the future to allow the formation of suitable beaches for nesting.

These physical processes benefit sea turtles by maintaining the nesting beaches through repeated cycles of destruction, alteration, and recovery of the beach and adjacent dune habitats. Coastal processes happen over a wide range of spatial and temporal scales. Wind, waves, tides, storms, and stream discharge are important driving forces in the coastal zone (Dingler 2005, p. 163). Thus, it is important that, where it can be allowed, the natural processes be maintained or any projects that address erosion or shoreline protection contain measures to reduce negative effects or are temporary in nature.

Therefore, based on the information above, we identify natural coastal processes or activities that mimic these natural processes to be a physical or biological feature for this species. It is important that loggerhead nesting beaches are allowed to respond naturally to coastal dynamic processes of erosion and accretion or mimic these processes.

Primary Constituent Elements for the Northwest Atlantic Ocean DPS of the Loggerhead Sea Turtle

Under the Act and its implementing regulations, we are required to identify the physical or biological features essential to the conservation of the loggerhead sea turtle in areas occupied at the time of listing, focusing on the features' primary constituent elements (PCEs). We consider primary constituent elements to be those specific elements of the physical or biological features that provide for a species' life-history processes and are essential to the conservation of the species.

Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, we determine that the terrestrial primary constituent elements specific to the Northwest Atlantic Ocean DPS of the loggerhead sea turtle are:

(1) Primary Constituent Element 1—*Suitable nesting beach habitat that has (a) relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings and (b) is located above mean high water to avoid being inundated frequently by high tides.*

(2) Primary Constituent Element 2—*Sand that (a) allows for suitable nest construction, (b) is suitable for facilitating gas diffusion conducive to embryo development, and (c) is able to develop and maintain temperatures and*

a moisture content conducive to embryo development.

(3) Primary Constituent Element 3—*Suitable nesting beach habitat with sufficient darkness to ensure nesting turtles are not deterred from emerging onto the beach and hatchlings and post-nesting females orient to the sea.*

Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features essential to the conservation of the species which may require special management considerations or protection. We have determined not only that special management considerations or protection may be required, but that they are required within critical habitat areas to address these threats to the essential features of loggerhead sea turtle terrestrial habitat.

For loggerhead sea turtle terrestrial habitat, we have grouped the primary threats that may impact the habitat, thus necessitating special management or protection, into 12 categories:

(1) Recreational beach use (beach cleaning, human presence (e.g., dog beach, special events, piers, and recreational beach equipment));

(2) Beach driving (essential and nonessential off-road vehicles, all-terrain vehicles, and recreational access and use);

(3) Predation (depredation of eggs and hatchlings by native and nonnative predators);

(4) Beach sand placement activities (beach nourishment, beach restoration, inlet sand bypassing, dredge material disposal, dune construction, emergency sand placement after natural disaster, berm construction, and dune and berm planting);

(5) In-water and shoreline alterations (artificial in-water and shoreline stabilization measures (e.g., in-water erosion control structures, such as groins, breakwaters, jetties), inlet relocation, inlet dredging, nearshore dredging, and dredging and deepening channels);

(6) Coastal development (residential and commercial development and associated activities including beach armoring (e.g., sea walls, geotextile tubes, rock revetments, sandbags, emergency temporary armoring); and activities associated with construction, repair, and maintenance of upland structures, stormwater outfalls, and piers);

(7) Artificial lighting (direct and indirect lighting, skyglow, and bonfires);

(8) Beach erosion (erosion due to aperiodic, short-term weather-related erosion events, such as atmospheric fronts, northeasters, tropical storms, and hurricanes);

(9) Climate change (includes sea level rise);

(10) Habitat obstructions (tree stumps, fallen trees, and other debris on the beach; nearshore sand bars; and ponding along beachfront seaward of dry beach);

(11) Human-caused disasters and response to natural and human-caused disasters (oil spills, oil spill response including beach cleaning and berm construction, and debris cleanup after natural disasters); and

(12) Military testing and training activities (troop presence, pyrotechnics and nighttime lighting, vehicles and amphibious watercraft usage on the beach, helicopter drops and extractions, live fire exercises, and placement and removal of objects on the beach).

Recreational Beach Use

Beach cleaning: There is increasing demand in the southeastern United States, especially in Florida, for beach communities to carry out beach cleaning operations to improve the appearance of beaches for visitors and residents. Beach cleaning occurs on private beaches and on some municipal or county beaches that are used for nesting by loggerhead sea turtles. Beach cleaning activities effectively remove ''seaweed, fish, glass, syringes, plastic, cans, cigarettes, shells, stone, wood, and virtually any unwanted debris'' (H. Barber and Sons 2012, entire). This can include wrack material (organic material that is washed up onto the beach by surf, tides, and wind), the removal of which reduces the natural sand-trapping abilities of beaches and contributes to their destabilization. As beach cleaning vehicles and equipment move over the sand, sand is displaced downward, lowering the substrate. Although the amount of sand lost due to single sweeping actions may be small, it adds up considerably over a period of years (Neal *et al.* 2007, p. 219). In addition, since the beach cleaning vehicles and equipment also inhibit plant growth and open the area to wind erosion, the beach and dunes may become unstable. Beach cleaning ''can result in abnormally broad unvegetated zones that are inhospitable to dune formation or plant colonization, thereby enhancing the likelihood of erosion'' (Defeo *et al.* 2009, p. 4). This is also a concern because dunes and vegetation play an important role in minimizing the impacts of artificial beachfront lighting, which causes disorientation of sea turtle hatchlings and nesting turtles, by creating a barrier that prevents residential and commercial business lighting from being visible on the beach.

Beach cleaning occurs in a few locations in South Carolina and Alabama, but the most extensive beach cleaning activities occur in Florida, particularly southern Florida. However, a Florida Department of Environmental Protection permit, which includes conditions to protect sea turtles, is required. These permit conditions restrict the timing and nature of beach cleaning to ensure these activities avoid or minimize the potential for impacts to sea turtles and their nesting habitat.

Human presence: Human presence on the beach at night during the nesting season can reduce the quality of nesting habitat by deterring or disturbing nesting turtles and causing them to avoid otherwise suitable habitat. In addition, human foot traffic can make a beach less suitable for nesting and hatchling emergence by increasing sand compaction and creating obstacles to hatchlings attempting to reach the ocean (Hosier *et al.* 1981, p. 160).

Some beach communities, local governments, and State and Federal lands have management plans or agreements that include addressing human disturbance to minimize impacts to nesting and hatchling loggerhead sea turtles. Other beach communities and Federal, State, and local governments have best addressed human disturbance and presence on the beach with generally successful ''Share the Beach'' educational campaigns. The educational message in the campaigns focuses on beach user behavior when encountering a turtle on the beach—enjoy the experience but do not disturb the turtle.

Recreational beach equipment: The use and storage of lounge chairs, cabanas, umbrellas, catamarans, and other types of recreational equipment on the beach at night can also make otherwise suitable nesting habitat unsuitable by hampering or deterring nesting by adult females and trapping or impeding hatchlings during their nest-to-sea migration. The documentation of nonnesting emergences (also referred to as false crawls) at these obstacles is becoming increasingly common as more recreational beach equipment is left on the beach at night. Sobel (2002, p. 311) describes nesting turtles being deterred by wooden lounge chairs that prevented access to the upper beach.

Some beach communities, local governments, and State and Federal lands have management plans, agreements, or ordinances that address recreational equipment on the beach to minimize impacts to nesting and

hatchling loggerhead sea turtles. Other beach communities and Federal, State, and local governments address recreational beach equipment with generally successful ''Leave No Trace'' and ''Share the Beach'' educational campaigns. The educational message in the campaigns focuses on removing recreational equipment from the nesting beach each night during the nesting season.

Beach Driving

Beach driving has been found to reduce the quality of loggerhead nesting habitat in several ways. In the southeastern United States, vehicle ruts on the beach have been found to prevent or impede hatchlings from reaching the ocean following emergence from the nest (Hosier *et al.* 1981, p. 160; Cox *et al.* 1994, p. 27; Hughes and Caine 1994, p. 237). Sand compaction by vehicles has been found to hinder nest construction and hatchling emergence from nests (Mann 1977, p. 96). Vehicle lights and vehicle movement on the beach after dark results in reduced habitat suitability, which can deter females from nesting and disorient hatchlings. If driving occurs at night, sea turtles could be run over and injured. Additionally, vehicle traffic on nesting beaches contributes to erosion, especially during high tides or on narrow beaches where driving is concentrated on the high beach and foredune.

Beach driving is prohibited on the majority of nesting beaches in the southeastern United States by law, regulation, management plan, or agreement. However, some vehicular driving is still allowed on private, local, State, and Federal beaches for recreation, commercial, or beach and natural resource management activities. In 1985, the Florida Legislature severely restricted vehicular driving on Florida's beaches, except for cleanup, repair, or public safety. Five counties were exempted from the legislation and are allowed to continue vehicular access on coastal beaches due to the availability of less than 50 percent of its peak user demand for off-beach parking. The counties affected by this exception are Volusia, St. Johns, Gulf, Nassau, and Flagler Counties, as well as limited vehicular access on Walton County beaches for boat launching. Volusia and St. Johns Counties, Florida, developed HCPs that minimize and mitigate the impacts of County-regulated driving and USFWS issued incidental take permits under section 10(a)(1)(B) of the Act. Gulf County has submitted an HCP to the Service in conjunction with an application for a section 10(a)(1)(B) permit that minimizes and mitigates the impacts of County-regulated driving on the beach.

Predation

Predation of sea turtle eggs and hatchlings by native and nonnative species occurs on almost all nesting beaches. Predation by a variety of predators can considerably decrease sea turtle nest hatching success. The most common predators in the southeastern United States are ghost crabs (*Ocypode quadrata*), raccoons (*Procyon lotor*), feral hogs (*Sus scrofa*), foxes (*Urocyon cinereoargenteus* and *Vulpes vulpes*), coyotes (*Canis latrans*), armadillos (*Dasypus novemcinctus*), and fire ants (*Solenopsis invicta*) (Stancyk 1982, p. 145; Dodd 1988, p. 48). In the absence of nest protection programs in a number of locations throughout the southeastern United States, raccoons may depredate up to 96 percent of all nests deposited on a beach (Davis and Whiting 1977, p. 20; Stancyk *et al.* 1980, p. 290; Talbert *et al.* 1980, p. 712; Hopkins and Murphy 1981, p. 67; Schroeder 1981, p. 35; Labisky *et al.* 1986, pp. 14–15). In addition, nesting turtles harassed by predators (e.g., coyotes, red foxes) on the beach may abort nesting attempts (Hope 2012, pers. comm.). Thus, the presence of predators can affect the suitability of nesting habitat.

The most longstanding beach management program in the southeastern United States has been to reduce the destruction of nests by natural and introduced predators. Most major nesting beaches in the southeastern United States employ some type of lethal (trapping, hunting) or nonlethal (screen, cage) control of mammalian predators to reduce nest loss. Overall, nest protection activities have substantially reduced loggerhead nest depredations, although the magnitude of the reduction has not been quantified.

Beach Sand Placement Activities

Substantial amounts of sand are deposited along Gulf of Mexico and Atlantic Ocean beaches to protect coastal properties in anticipation of preventing erosion and what otherwise would be considered natural processes of overwash and island migration. Constructed beaches tend to differ from natural beaches in several important ways for sea turtles. They are typically wider, flatter, and more compact, and the sediments are moister than those on natural beaches (Nelson *et al.* 1987, p. 51; Ackerman *et al.* 1991, p. 22; Ernest and Martin 1999, pp. 8–9). On severely eroded sections of beach, where little or no suitable nesting habitat previously existed, sand placement can result in increased nesting (Ernest and Martin 1999, p. 37). The placement of sand on a beach with reduced dry foredune habitat may increase sea turtle nesting habitat if the placed sand is highly compatible (i.e., grain size, shape, color, etc.) with naturally occurring beach sediments in the area, and compaction and escarpment remediation measures are incorporated into the project. In addition, a nourished beach that is designed and constructed to mimic a natural beach system may benefit sea turtles more than an eroding beach it replaces. However, beach sand placement projects conducted under the USFWS's Statewide Programmatic Biological Opinion for the U.S. Army Corps of Engineers planning and regulatory sand placement activities (including post-disaster sand placement activities) in Florida and other individual biological opinions throughout the loggerhead's nesting range include required terms and conditions that minimize incidental take of turtles.

There are, however, a few important ephemeral impacts associated with beach sand placement activities. In most cases, a significantly larger proportion of turtles emerging on engineered beaches abandon their nesting attempts than turtles emerging on natural or prenourished beaches, even though more nesting habitat is available (Trindell *et al.* 1998, p. 82; Ernest and Martin 1999, pp. 47–49; Herren 1999, p. 44), with nesting success approximately 10 to 34 percent lower on nourished beaches than on control beaches during the first year post-nourishment. This reduction in nesting success is most pronounced during the first year following project construction and is most likely the result of changes in physical beach characteristics (beach profile, sediment grain size, beach compaction, frequency and extent of escarpments) associated with the nourishment project (Ernest and Martin 1999, p. 48). During the first postconstruction year, the time required for turtles to excavate an egg chamber on untilled, hard-packed sands increases significantly relative to natural beach conditions. Also during the first postconstruction year, nests on nourished beaches are deposited significantly more seaward of the toe of the dune than nests on natural beaches. More nests are washed out on the wide, flat beaches of the nourished treatments than on the narrower steeply sloped natural beaches. This phenomenon may persist through the second postconstruction year and result from

the placement of nests near the seaward edge of the beach berm where dramatic profile changes, caused by erosion and scarping, occur as the beach equilibrates to a more natural contour.

In-Water and Shoreline Alterations

Many navigable mainland or barrier island tidal inlets along the Atlantic and Gulf of Mexico coasts are stabilized with jetties or groins. Jetties are built perpendicular to the shoreline and extend through the entire nearshore zone and past the breaker zone to prevent or decrease sand deposition in the channel (Kaufman and Pilkey 1979, pp. 193–195). Groins are also shore-perpendicular structures that are designed to trap sand that would otherwise be transported by longshore currents and can cause downdrift erosion (Kaufman and Pilkey 1979, pp. 193–195).

These in-water structures have profound effects on adjacent beaches (Kaufman and Pilkey 1979, p. 194). Jetties and groins placed to stabilize a beach or inlet prevent normal sand transport, resulting in accretion of sand on updrift beaches and acceleration of beach erosion downdrift of the structures (Komar 1983, pp. 203–204; Pilkey *et al.* 1984, p. 44). Witherington *et al.* (2005, p. 356) found a significant negative relationship between loggerhead nesting density and distance from the nearest of 17 ocean inlets on the Atlantic coast of Florida. The effect of inlets in lowering nesting density was observed both updrift and downdrift of the inlets, leading researchers to propose that beach instability from both erosion and accretion may discourage loggerhead nesting.

Following construction, the presence of groins and jetties may interfere with nesting turtle access to the beach, result in a change in beach profile and width (downdrift erosion, loss of sandy berms, and escarpment formation), trap hatchlings, and concentrate predatory fishes, resulting in higher probabilities of hatchling predation. In addition to decreasing nesting habitat suitability, construction or repair of groins and jetties during the nesting season may result in the destruction of nests, disturbance of females attempting to nest, and disorientation of emerging hatchlings from project lighting.

However, groins and jetties constructed in appropriate high erosion areas, or to offset the effects of shoreline armoring, may reestablish a beach where none currently exists, stabilize the beach in rapidly eroding areas and reduce the potential for escarpment formation, reduce destruction of nests from erosion, and reduce the need for future sand placement events by extending the interval between sand placement events. USFWS includes terms and conditions in its biological opinions for groin and jetty construction projects to eliminate or reduce impacts to nesting and hatchling sea turtles, sea turtle nests, and sea turtle nesting habitat.

Coastal Development

Coastal development not only causes the loss and degradation of suitable nesting habitat, but can result in the disruption of powerful coastal processes accelerating erosion and interrupting the natural shoreline migration. This may in turn cause the need to protect upland structures and infrastructure by armoring, which causes changes in, additional loss of, or impact to the remaining sea turtle habitat.

In the southeastern United States, numerous armoring or erosion control structures (e.g., bulkheads, seawalls, soil retaining walls, rock revetments, sandbags, geotextile tubes) that create barriers to nesting have been constructed to protect upland residential and commercial development. Armoring is any rigid structure placed parallel to the shoreline on the upper beach to prevent both landward retreat of the shoreline and inundation or loss of upland property by flooding and wave action (Kraus and McDougal 1996, p. 692). Although armoring structures may provide short-term protection to beachfront property, they do little to promote or maintain sandy beaches used by loggerhead sea turtles for nesting. These structures influence natural shoreline processes and the physical beach environment, but the effects are not well understood. However, it is clear that armoring structures prevent long-term recovery of the beach and dune system (i.e., building of the back beach) by physically prohibiting dune formation from wave uprush and wind-blown sand. The proportion of coastline that is armored is approximately 3 percent (9 km (5.6 miles)) in North Carolina (Godfrey 2009, pers. comm.), 12 percent (29 km (18.0 miles)) in South Carolina (Griffin 2009, pers. comm.), 9 percent (14 km (8.7 miles)) in Georgia (Dodd 2009, pers. comm.), 18 percent (239 km (148.4 miles)) in Florida (Schroeder and Mosier 2000, p. 291), 6 percent (7.5 km (4.7 miles)) in Alabama (Morton and Peterson 2005, entire), and 0 percent along the Mississippi barrier islands (Morton and Peterson 2005, entire).

In addition to coastal armoring, there are a variety of other coastal construction activities that may affect sea turtles and their nesting habitat. These include construction, repair, and maintenance of upland structures and dune crossovers; installation of utility cables; installation and repair of public infrastructure (such as coastal highways and emergency evacuation routes); and construction equipment and lighting associated with any of these activities. Many of these activities alter nesting habitat, as well as directly harm adults, nests, and hatchlings. Most direct construction-related impacts can be avoided by requiring that nonemergency activities be performed outside of the nesting and hatching season. However, indirect effects can also result from the postconstruction presence of structures on the beach. The presence of these structures may cause adult females to return to the ocean without nesting, deposit their nests lower on the beach where they are more susceptible to frequent and prolonged tidal inundation, or select less suitable nesting sites.

Coastal development also contributes to habitat degradation by increasing light pollution. Both nesting and hatchling sea turtles are adversely affected by the presence of artificial lighting on or near the beach (Witherington and Martin 1996, pp. 2–5). See the threat category for *Artificial lighting* below for additional information.

Stormwater and other water source runoff from coastal development, including beachfront parking lots, building rooftops, roads, decks, and draining swimming pools adjacent to the beach, is frequently discharged directly onto Northwest Atlantic beaches and dunes either by sheet flow, through stormwater collection system outfalls, or through small diameter pipes. These outfalls create localized erosion channels, prevent natural dune establishment, and wash out sea turtle nests (Florida Fish and Wildlife Conservation Commission, unpublished data).

Artificial Lighting

Experimental studies have shown that artificial lighting deters adult female turtles from emerging from the ocean to nest (Witherington 1992, pp. 36–38). Witherington (1986, p. 71) also found that loggerheads aborted nesting attempts at a greater frequency in lighted areas. In addition, because adult females rely on visual brightness cues to find their way back to the ocean after nesting, those turtles that nest on lighted beaches may become disoriented by artificial lighting and have difficulty finding their way back to the ocean. Although loggerhead turtles prefer dark beaches for nesting, many do nest in

lighted areas. In doing so, they place the lives of their offspring at risk as artificial lighting can impair the ability of hatchlings to properly orient to the ocean once they leave their nests (Witherington and Martin 1996, pp. 7–13). Hatchlings, unable to find the ocean or delayed in reaching it, are likely to incur high mortality from dehydration, exhaustion, or predation (Carr and Ogren 1960, p. 23; Ehrhart and Witherington 1987, pp. 66–67; Witherington and Martin 1996, p. 11).

Based on hatchling orientation index surveys at nests located at 23 representative beaches in six counties around Florida in 1993 and 1994, Witherington *et al.* (1996, entire) found that, by county, approximately 10 to 30 percent of nests showed evidence of hatchlings disoriented by lighting. From this survey and from measures of hatchling production (Florida Fish and Wildlife Conservation Commission, unpublished data), the actual number of hatchlings disoriented by lighting in Florida is likely in the hundreds of thousands per year. Mortality of disoriented hatchlings is likely very high (NMFS and USFWS 2008, p. I–43).

Efforts are underway to reduce light pollution on sea turtle nesting beaches. In the southeastern United States, the effects of light pollution on sea turtles are most extensive in Florida due to dense coastal development. Enforcement of mandatory lighting ordinances in Florida and other States has increased. In addition, the Florida Fish and Wildlife Conservation Commission, working in close coordination with USFWS, has developed a sea turtle lighting certification program that involves conducting workshops to educate all interested parties about the effects of lighting on sea turtles, the best lighting options to use near sea turtle nesting beaches, and the wide variety of light fixtures and bulbs available to manage lighting on their properties without negatively impacting sea turtles. In addition, sand placement projects typically include dune construction and these created dunes help minimize the effects of landward artificial lighting by blocking some of the light and creating a dark silhouette for nesting and hatchling turtle crawling to the ocean.

Beach Erosion

Natural beach erosion events may influence the quality of nesting habitat. Short-term erosion events (e.g., atmospheric fronts, northeasters, tropical storms, and hurricanes) are common phenomena throughout the Northwest Atlantic loggerhead nesting range and may vary considerably from year to year. Although these erosion events may affect loggerhead hatchling production, the results are generally localized and they rarely result in whole-scale losses over multiple nesting seasons. The negative effects of hurricanes on low-lying and developed shorelines used for nesting by loggerheads may be longer-lasting and a greater threat overall.

Hurricanes and other storm events can result in the direct loss of sea turtle nests, either by erosion or washing away of the nests by wave action and inundation or ''drowning'' of the eggs or preemergent hatchlings within the nest, or indirectly affect sea turtles by causing the loss of nesting habitat. Depending on their frequency, storms can affect sea turtles on either a short-term basis (nests lost for one season and temporary loss of nesting habitat) or a long-term basis (habitat unable to recover due to frequent storm events). The manner in which hurricanes affect sea turtle nesting also depends on their characteristics (winds, storm surge, rainfall), the time of year (within or outside of the nesting season), and where the northeast edge of the hurricane crosses land.

Climate change studies have indicated a trend toward increasing hurricane intensity (Emanuel 2005, p. 686; Webster *et al.* 2005, p. 1846; Karl *et al.* 2009, p. 114). When combined with the effects of sea level rise (see the threat category for *Climate change* below for additional information), there may be increased cumulative impacts from future storms.

USFWS acknowledges that we cannot fully address the threat of natural beach erosion facing loggerheads. However, we can determine how we respond to beach erosion events working with the States, local governments, and Federal agencies such as the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers. Emergency beach sand placement activities conducted under the USFWS's Statewide Programmatic Biological Opinion for the U.S. Army Corps of Engineers planning and regulatory sand placement activities include requirements for post-disaster sand placement activities in Florida. In addition, USFWS and FEMA have two programmatic consultations for post-disaster response in Florida that cover replacement of pre-existing facilities and berm construction. These consultations have enabled a faster response to complete shore protection activities and protect sea turtle nesting.

Climate Change

Climate change has the potential to impact loggerhead sea turtles in the Northwest Atlantic. The decline in loggerhead nesting in Florida from 1998 to 2007, as well as the recent increase, appears to be tied to climatic conditions (Van Houtan and Halley 2011, p. 3). Global sea level during the 20th century rose at an estimated rate of about 1.7 millimeters (mm) (0.7 in) per year or an estimated 17 cm (6.7 in) over the entire 100-year period, a rate that is an order of magnitude greater than that seen during the several millennia that followed the end of the last ice age (Bindoff *et al.* 2007, p. 409). Global sea level is projected to rise in the 21st century at an even greater rate. In the southeastern United States, the U.S. Global Change Research Program stated that sea level is likely to increase on average up to 0.61 m (2 ft) or more by the end of the 21st century (Karl *et al.* 2009, p. 114). Although rapid changes in sea level are predicted, estimated timeframes and resulting water levels vary due to the uncertainty about global temperature projections and the rate of ice sheets melting and slipping into the ocean (Bindoff *et al.* 2007, pp. 409, 421).

Potential impacts of climate change to Northwest Atlantic loggerheads include beach erosion from rising sea levels, repeated inundation of nests, skewed hatchling sex ratios from rising incubation temperatures, and abrupt disruption of ocean currents used for natural dispersal during the complex life cycle (Fish *et al.* 2005, pp. 489–490; Fish *et al.* 2008, p. 336; Hawkes *et al.* 2009, pp. 139–141; Poloczanska *et al.* 2009, pp. 164–175). Along developed coastlines, and especially in areas where shoreline protection structures have been constructed to limit shoreline movement, rising sea levels will cause severe effects on loggerhead nesting habitat and nesting females and their eggs. The loss of habitat as a result of climate change could be accelerated due to a combination of other environmental and oceanographic changes such as an increase in the intensity of storms and/or changes in prevailing currents, both of which could lead to increased beach loss via erosion (Kennedy *et al.* 2002, pp. 7, 14, 23, 40; Meehl *et al.* 2007, pp. 783, 788). Thus, climate change impacts could have profound long-term impacts on loggerhead nesting populations in the Northwest Atlantic Ocean, but it is not possible to project the impacts at this point in time.

USFWS acknowledges that we cannot fully address the significant, long-term threat of climate change to loggerhead sea turtles. However, we can determine

how we respond to the threat of climate change by providing protection to the known nesting sites of the turtle. We can also identify measures to protect nesting habitat from the actions (e.g., coastal armoring, sand placement) undertaken to respond to climate change that may potentially impact the Northwest Atlantic Ocean loggerhead DPS.

Habitat Obstructions

Both natural and anthropogenic features (e.g., offshore sand bars, ponding along the beachfront) can act as barriers or deterrents to adult females attempting to access a beach. In addition, hatchlings often must navigate through a variety of obstacles before reaching the ocean. These include natural (e.g., tree stumps, fallen trees) and human-made debris. Debris on the beach may interfere with a hatchling's progress toward the ocean. Research has shown that travel times of hatchlings from the nest to the water may be extended when traversing areas of heavy foot traffic or vehicular ruts (Hosier *et al.* 1981); the same is true of debris on the beach. Hatchlings may be upended and spend both time and energy in righting themselves. Some beach debris may have the potential to trap hatchlings and prevent them from successfully reaching the ocean. In addition, debris over the tops of nests may impede or prevent hatchling emergence.

Human-Caused Disasters and Response to Natural and Human-Caused Disasters

Oil spills threaten loggerhead sea turtles in the Northwest Atlantic. Oil spills in the vicinity of nesting beaches just prior to or during the nesting season place nesting females, incubating egg clutches, and hatchlings at significant risk from direct exposure to contaminants (Fritts and McGehee 1982, p. 38; Lutcavage *et al.* 1997, p. 395; Witherington 1999, p. 5), as well as negative impacts on nesting habitat. Annually about 1 percent of all sea turtle strandings along the U.S. east coast have been associated with oil, but higher rates of 3 to 6 percent have been observed in South Florida and Texas (Rabalais and Rabalais 1980, p. 126; Plotkin and Amos 1990, p. 742; Teas 1994, p. 9). Oil cleanup activities can also be harmful. Earth-moving equipment can dissuade females from nesting and destroy nests, containment booms can entrap hatchlings, and lighting from nighttime activities can misdirect turtles (Witherington 1999, p. 5).

Deepwater Horizon (Mississippi Canyon 252) Oil Spill: The Deepwater Horizon (Mississippi Canyon 252) oil spill, which started April 20, 2010, discharged oil into the Gulf of Mexico through July 15, 2010. According to government estimates, between 379 and 757 million liters (100 and 200 million gallons) of oil were released into the Gulf of Mexico during this time. The U.S. Coast Guard estimates that more than 189 million liters (50 million gallons) of oil have been removed from the Gulf, or roughly a quarter of the spill amount. Additional impacts to natural resources may be attributed to the 7 million liters (1.84 million gallons) of dispersant that were applied to the spill. The U.S. Coast Guard, the States, and Responsible Parties that formed the Unified Area Command (with advice from Federal and State natural resource agencies) initiated protective measures and cleanup efforts by preparing contingency plans to deal with petroleum and other hazardous chemical spills for each State's coastline. These plans identified sensitive habitats, including all federally listed species' habitats, which received a higher priority for response actions and allowed for immediate habitat protective measures coinciding with cleanup activities.

Throughout the Deepwater Horizon oil spill response, the U.S. Coast Guard was responsible for and continues to oversee implementation and documentation of avoidance and minimization measures to protect trust resources, including sea turtles. Though containment of the well was completed in September 2010, other countermeasures, cleanup, and waste disposal are continuing and, therefore, a detailed analysis of the success of the avoidance and minimization measures has not been conducted. In addition, Natural Resource Damage Assessment studies regarding potential effects to fish and wildlife resources are currently being conducted along the northern Gulf of Mexico coast.

It is not yet clear what the immediate and long-term impacts of the Deepwater Horizon oil well blowout and uncontrolled release has had, and will have, on loggerhead sea turtles in the Gulf of Mexico.

Military Mission, Testing, and Training Activities

Troop presence: The presence of soldiers and other personnel on the beach, particularly at night during nesting and hatching season, could result in harm or death to individual nesting turtles or hatchlings, as well as deter females from nesting. Training exercises require concentration and often involve inherently dangerous activities. A nesting sea turtle or emerging hatchling could be overlooked and injured or killed by training activities on the beach. Training activities also may require the use of pyrotechnics and lighting, and both nesting and hatchling sea turtles are adversely affected by the presence of artificial lighting on or near the beach (Witherington and Martin 1996, pp. 2–5). See the threat category for *Artificial lighting* above for additional information.

Vehicles: The use of vehicles for amphibious assault training, troop transport, helicopter landing drops and extraction, search and rescue, and unmanned aerial vehicle use all have the potential to injure or kill nesting females and emerging hatchlings. In addition, heavy vehicles have the potential to compact sand that may affect the ability of hatchlings to climb out of nests or create ruts that entrap hatchlings after emergence. See the threat category for *Beach driving* above for additional information.

Live fire exercises: Live fire exercises are inherently dangerous, and spent ammunition could injure or kill sea turtles and hatchlings, particularly at night. A nesting sea turtle or emerging hatchling could approach the beach area during an exercise and be harmed or killed.

Placement or removal of objects on the beach: Digging into the sand to place or remove objects (e.g., mine placement and extraction) could result in direct mortality of developing embryos in nests within the training area for those nests that are missed during daily nesting surveys and thus not marked for avoidance. The exact number of these missed nests is not known. However, in two separate monitoring programs on the east coast of Florida where hand digging was performed to confirm the presence of nests and thus reduce the chance of missing nests through misinterpretation, trained observers still missed about 6 to 8 percent of the nests because of natural elements (Martin 1992, p. 3; Ernest and Martin 1993, pp. 23–24). This must be considered a conservative number, because missed nests are not always accounted for. In another study, Schroeder (1994, p. 133) found that, even under the best of conditions, about 7 percent of nests can be misidentified as false crawls by highly experienced sea turtle nest surveyors. Signs of hatchling emergence are very easily obliterated by the same elements that interfere with detection of nests.

USFWS consults with the Department of Defense under section 7 of the Act on their Integrated Natural Resources

Management Plans, military mission, testing, and training activities that may affect nesting and hatchling sea turtles, sea turtle nests, and sea turtle nesting habitat. Efforts to minimize the effects of these activities including natural resource management have focused on adjusting the activity timing to minimize encounters with loggerheads and adjusting locations of activities to reduce overlap with sea turtle habitats.

Criteria Used To Identify Critical Habitat

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. We review available information pertaining to the habitat requirements of the species. In accordance with the Act and its implementing regulation at 50 CFR 424.12(e), we consider whether designating additional areas—outside those currently occupied as well as those occupied at the time of listing—is necessary to ensure the conservation of the species. Here, we are proposing to designate critical habitat in areas within the geographical area occupied by the species at the time of listing in 2011 (50 CFR 17.11(h)). We are not currently proposing to designate any areas outside the geographical area occupied by the species because occupied areas are sufficient for the conservation of the species.

Although the loggerhead sea turtle occurs throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans (Dodd 1988, p. 16), under our regulations, critical habitat can only be designated in areas under U.S. jurisdiction (50 CFR 424.12(h)). Because loggerhead sea turtle nesting in the United States only occurs within the Northwest Atlantic Ocean DPS, we have defined the terrestrial portion of the geographical area occupied for the loggerhead sea turtle as those U.S. areas in the Northwest Atlantic Ocean DPS where nesting has been documented for the most part annually for the 10-year period from 2002 to 2011 as this time period represents the most consistent and standardized nest count surveys (Florida Fish and Wildlife Conservation Commission 2012, entire; Georgia Department of Natural Resources 2012, entire; Gulf Islands National Seashore 2012a, entire; Gulf Islands National Seashore 2012b, entire; North Carolina Wildlife Resources Commission 2012, entire; Share the Beach 2012, entire; South Carolina Department of Natural Resources (SCDNR) 2012, entire).

As described in the Background section above, five recovery units have been identified for the Northwest Atlantic population of the loggerhead sea turtle (NMFS and USFWS 2008, pp. II–2–II–6). Four of these recovery units represent nesting assemblages in the southeastern United States and were delineated based on genetic differences and a combination of geographic distribution of nesting densities, geographic separation, and geopolitical boundaries. The fifth recovery unit (Greater Caribbean Recovery Unit) includes all nesting assemblages within the Greater Caribbean, which includes Puerto Rico and the U.S. Virgin Islands. No loggerhead sea turtle nesting has ever been documented in Puerto Rico (Diez 2012, pers. comm.). Only two loggerhead sea turtles have been documented as nesting in the U.S. Virgin Islands, both on Buck Island Reef National Monument off the north coast of St. Croix (Pollock *et al.* 2009, entire) where nesting has been documented since 2003. Therefore, although some loggerhead sea turtle nesting has been documented on beaches under U.S. jurisdiction within the Greater Caribbean Recovery Unit, we do not propose to designate any critical habitat there due to the very low number of nests laid there. The four recovery units for which we propose to designate terrestrial critical habitat are the Northern Recovery Unit, Peninsular Florida Recovery Unit, Dry Tortugas Recovery Unit, and Northern Gulf of Mexico Recovery Unit.

All terrestrial units proposed for designation as critical habitat are currently occupied by the loggerhead sea turtle and contain the physical and biological features, occur within the species' geographical range, and contain one or more of the PCEs sufficient to support the terrestrial life-history processes of the species.

The selected primary beaches have the highest nesting densities within each of the four recovery units, have a good geographic spatial distribution that will help ensure the protection of genetic diversity, and collectively provide a good representation of total nesting. The selected beaches adjacent to the primary high-density nesting beaches currently support loggerhead nesting and can serve as expansion areas should the high-density nesting beaches be significantly degraded or temporarily or permanently lost through natural processes or upland development. Thus, the amount and distribution of critical habitat being proposed for designation for terrestrial habitat will conserve recovery units of the Northwest Atlantic Ocean DPS of the loggerhead sea turtle by:

(1) Maintaining their existing nesting distribution;

(2) Allowing for movement between beach areas depending on habitat availability (response to changing nature of coastal beach habitat) and supporting genetic interchange;

(3) Allowing for an increase in the size of each recovery unit to a level where the threats of genetic, demographic, and normal environmental uncertainties are diminished; and

(4) Maintaining their ability to withstand local or unit level environmental fluctuations or catastrophes.

We used the following process to select specific areas in the terrestrial environment as critical habitat units for the Northwest Atlantic Ocean DPS of the loggerhead sea turtle that contain the PBFs and PCEs. For each recovery unit, we looked at nesting densities by State or regions within a State (PBF #1) to ensure a good spatial distribution of critical habitat. This approach was relatively straightforward for the Northern Recovery Unit and the Northern Gulf of Mexico Recovery Unit, and for the Dry Tortugas Recovery Unit where we propose to designate all islands west of Key West where loggerhead nesting has been documented as terrestrial critical habitat based on the unit's small size. However, the approach used for the Peninsular Florida Recovery Unit was more complex. The methodology used for identifying critical habitat was developed with the assistance of five State agency technical consultants with sea turtle expertise in North Carolina, South Carolina, Georgia, and Florida. The methodology is described by recovery unit below.

Northern Recovery Unit

For the Northern Recovery Unit, we used loggerhead nest counts from 2006–2011 to calculate mean nesting density for each beach. We defined beach segments as islands or mainland beaches separated by creeks, inlets, or sounds. However, in some cases, for long contiguous stretches of habitat with no natural features, we used political boundaries to delineate beaches (e.g., Myrtle Beach).

We divided beach nesting densities into four equal groups by State and selected beaches that were within the top 25 percent (highest nesting densities) for designation as critical habitat. These high nesting density beaches along with the beaches adjacent to them as described below encompassed the majority of nesting within the recovery unit. The reason we determined high-density nesting beaches within each State, rather than

the entire Northern Recovery Unit, was that doing so allowed for the inclusion of beaches near the northern extent of the range (North Carolina) that would otherwise be considered low density when compared with beaches further south (Georgia and South Carolina), ensuring a good spatial distribution. Although some loggerhead sea turtle nesting regularly occurs in Virginia, we do not propose to designate any critical habitat there due to the very low number of nests (less than 10 annually from 2002 to 2011) laid in the State.

We also identified adjacent beaches for each of the high-density nesting beaches based on current knowledge about nest site fidelity. Loggerheads are known to exhibit high site fidelity to individual nesting beaches. In a study in Georgia, 55 percent (12 of 22) of nesting females tracked during the internesting period used a single island for nesting, while 40 percent (9 of 22) used two islands (Scott 2006, p. 51). Protecting beaches adjacent to high-density nesting beaches should provide sufficient habitat to accommodate and provide a rescue effect for nesting females whose primary nesting beach has been lost. Although these areas currently support nesting, they will facilitate recovery by providing additional nesting habitat for population expansion. Therefore, in the Northern Recovery Unit, we selected one island to the north and one island to the south, where appropriate, of each of the high-density nesting beaches identified for inclusion as critical habitat. Islands were selected because nesting occurs on the islands and not the mainland beaches.

We identified 39 units in the Northern Recovery Unit for designation as terrestrial critical habitat for the loggerhead sea turtle. However, we have exempted one of the identified units (Marine Corps Base Camp Lejeune (Onslow Beach)) from critical habitat designation under section 4(a)(3) of the Act (see Exemptions section below). The remaining 38 units encompass 393.7 km (244.7 miles) of Atlantic Ocean shoreline: 8 units occur in North Carolina, 22 in South Carolina, and 8 in Georgia. These 38 areas encompass approximately 86 percent of the documented nesting (numbers of nests) within the recovery unit.

Peninsular Florida Recovery Unit

For the Peninsular Florida Recovery Unit, we took a similar approach to the one used for the Northern Recovery Unit. However, we used recent information on loggerhead genetics within the recovery unit (Shamblin *et al.* 2011, entire) to break the unit into smaller regions for the purpose of assessing beach nesting densities (analogous to assessing nesting densities by State for the Northern Recovery Unit).

Within the southeastern United States, Shamblin *et al.* (2011, p. 585) supported recognition of a minimum of six distinct units based solely on genetics. Four of these genetic units occur fully or partially within the Peninsular Florida Recovery Unit: (1) Northern, (2) central eastern Florida, (3) southern Florida (southeastern and southwestern), and (4) central western Florida. We used these four regions identified by Shamblin *et al.* (2011, p. 585) for our assessment, but split southern Florida into southeastern and southwestern regions based on additional genetic analyses (Shamblin 2012, pers. comm.). We included the Florida Keys in Monroe County from Key West and east in the southeastern region because, even though the sample sizes for loggerhead genetics on these islands are too small to make any definitive determinations, they do indicate that loggerheads nesting in this area are least likely to group out with those in the southwestern region (Shamblin 2012, pers. comm.).

Therefore, we split the Peninsular Florida Recovery Unit into the following five regions for an assessment of nesting densities based on recovery unit boundaries (NMFS and USFWS 2008, pp. II–2–II–6) and recent genetic analyses (Shamblin *et al.* 2011, p. 585; Shamblin 2012, pers. comm.):

(1) Northern Florida—Florida-Georgia border to Ponce Inlet;

(2) Central Eastern Florida—Ponce Inlet to Fort Pierce Inlet;

(3) Southeastern Florida—Fort Pierce Inlet to Key West in Monroe County;

(4) Central Western Florida—Pinellas County to San Carlos Bay off Lee County; and

(5) Southwestern Florida—San Carlos Bay off Lee County to Sandy Key in northwest Monroe County.

The next step for the Peninsular Florida Recovery Unit was to delineate beaches within these five regions. For the Florida Atlantic Coast from the Florida-Georgia border through central eastern Monroe County, and for the Florida Gulf Coast from the Pinellas County-Pasco County border through northwestern Monroe County, we first defined beach segments as islands or mainland beaches separated by inlets, cuts, rivers, creeks, bays, sounds, passes, and channels. Note that, for the Miami Beaches area, we did not use the Haulover Cut to delineate beaches north and south of this water feature. The reason for this is that the permit holder survey area for the Miami Beaches occurs both north and south of the Haulover Cut, and the nesting data could not readily be separated. In this situation, the nesting density analysis included data that covered the entire survey area from the south end of Golden Beach to Government Cut.

After breaking out beach segments using inlets and other water features, we determined that the identified beach segments were overly large in some areas for an accurate assessment of nesting densities. Calculating nesting densities for overly large areas could result in some high-density nesting beaches not being identified because they would be averaged in with adjacent lower density nesting beaches. To address this issue, we next used information available on turtle nest site fidelity to further separate beach segments. Nest site fidelity varies among females, with some females laying multiple nests on a relatively small section of beach and some laying their nests over a much larger section of beach. Schroeder *et al.* (2003, p. 119) compiled reported information on mean distances between the nest sites of individual loggerheads, with the reported averages of females nesting on the Florida Atlantic coast varying from 3.0 to 17.48 km (1.9 to 10.9 miles). In Southwest Florida, Tucker (2010, p. 51) reported a mean nest site fidelity of 28.1 km (17.5 miles) for all nests, but 16.9 km (10.5 miles) if the first nests were omitted to account for each turtle's navigational correction. Based on this information, we decided to use distances of approximately 20.0 km (12.4 miles) to further separate out beach segments. We used this 20.0-km (12.4-mile) target in concert with sea turtle permit holder nesting survey area boundaries to delineate beaches for the nesting density analysis.

For the Florida Keys in Monroe County, we grouped the islands from Key West and east where loggerhead nesting has been documented into three separate segments: (1) Upper segment consisting of Lower Matecumbe Key and Long Key; (2) Middle segment consisting of Little Crawl Key, Fat Deer Key, Key Colony Beach (formerly called Shelter Key), and Vaca Key; and (3) Lower segment consisting of Bahia Honda Key, Big Pine Key, and Key West. Note that Sandy Key in northwestern Monroe County was grouped with the Southwestern Florida Region.

Once we defined the beaches by region within the Peninsular Florida Recovery Unit, we used the same approach described above for the Northern Recovery Unit. We divided beach nesting densities into four equal

groups by region and selected beaches that were within the top 25 percent (highest nesting densities) for designation as critical habitat. These high density nesting beaches along with the beaches adjacent to them as described below encompassed the majority of nesting within the recovery unit. The reason we determined high-density nesting beaches within each region (rather than the entire Peninsular Florida Recovery Unit) was to ensure the inclusion of beaches that would otherwise be considered low density when compared with beaches along the southeastern Florida coast and thus ensure a good spatial distribution of critical habitat units within the recovery unit.

We also identified adjacent areas for each of the high-density nesting beaches based on current knowledge about nest site fidelity. Protecting beaches adjacent to high-density nesting beaches should provide sufficient habitat to accommodate and provide a rescue effect for nesting females whose primary nesting beach has been lost. To identify adjacent beaches, we again used information available on turtle nest site fidelity. Therefore, for the Peninsular Florida Recovery Unit, we selected adjacent beaches approximately 20.0 km (12.4 miles) to the north and 20.0 km (12.4 miles) to the south, where appropriate, of each of the high-density nesting beaches identified for inclusion as critical habitat. The selected adjacent beaches were based on permit holder survey area boundaries with one or more permit holder survey areas being included depending on the length of the survey areas. Within these adjacent areas for each of the high-density nesting beaches, we did not include segments that were highly urbanized, highly erosional, or prone to repeated flooding.

Although no beaches in the Florida Keys east of Key West were selected using the above process, we decided to include beaches on two Keys to ensure good spatial distribution of loggerhead nesting in the southern portion of the range for this recovery unit. The Keys (Long Key and Bahia Honda Key) we are proposing to designate as terrestrial critical habitat address this need for good spatial distribution of nesting. In addition, these beaches are unique from the other beaches we are proposing to designate in that they are limestone islands with narrow, low-energy beaches (beaches where waves are not powerful); they have carbonate sands; and they are relatively close to the major offshore currents that are known to facilitate the dispersal of post-hatchling loggerheads.

We identified 37 units in the Peninsular Florida Recovery Unit for designation as terrestrial critical habitat for the loggerhead sea turtle. However, we have exempted two of the identified units (Cape Canaveral Air Force Station and Patrick Air Force Base) from critical habitat designation under section 4(a)(3) of the Act (see Exemptions section below). The remaining 35 units encompass 364.9 km (226.7 miles) of Atlantic Ocean shoreline and 198.8 km (123.5 miles) of Gulf of Mexico shoreline totaling 563.7 km (350.2 miles) of shoreline in this recovery unit: 18 units occur along the Atlantic Ocean coast, and 17 units occur along the Gulf of Mexico coast. These 35 units encompass approximately 87 percent of the documented nesting (numbers of nests) within the recovery unit.

Dry Tortugas Recovery Unit

For the Dry Tortugas Recovery Unit, we propose to designate all islands west of Key West, Florida, where loggerhead nesting has been documented, as terrestrial critical habitat due to the extremely small size of this recovery unit. We identified four units in the Dry Tortugas Recovery Unit for designation as terrestrial critical habitat for the loggerhead sea turtle. These four units encompass 14.5 km (9.0 miles) of Gulf of Mexico shoreline. These four units encompass 100 percent of the nesting (numbers of nests) where loggerhead nesting is known to occur within the recovery unit.

Northern Gulf of Mexico Recovery Unit

For the Northern Gulf of Mexico Recovery Unit, we used loggerhead nest counts from 2006–2011 to calculate mean nesting density for each beach. We defined beach segments as islands or mainland beaches separated by cuts, bays, sounds, or passes. Note that we did not use Crooked Island Sound, St. Andrews Bay Entrance Channel, and Destin Pass to delineate beaches west and east of these water features. The reason for this is that the permit holder survey areas for these three locations occur both west and east of the water feature, and the nesting data could not readily be separated. In these situations, the nesting density analysis included data that covered the entire survey areas on both sides of the water feature.

After breaking out beach segments using cuts and other water features, we determined that the identified beach segments were overly large in some areas for an accurate assessment of nesting densities. Calculating nesting densities for overly large areas could result in some high-density nesting beaches not being identified because they would be averaged in with adjacent lower density nesting beaches. To address this issue, we used political boundaries and information available on turtle nest site fidelity to further separate beach segments. Although some preliminary information on nest site fidelity is available for the Northern Gulf of Mexico Recovery Unit, it was not sufficient to determine average distances between nest sites within a season for nesting females in this recovery unit. Therefore, as described in the Peninsular Florida Recovery Unit section above, we decided to use distances of approximately 20.0 km (12.4 miles) to further separate out beach segments based on available information on nest site fidelity. We used this 20.0-km (12.4-mile) target in concert with sea turtle permit holder nesting survey area boundaries to delineate beaches for the nesting density analysis.

Once we defined the beaches by State within the Northern Gulf of Mexico Recovery Unit, we used a similar approach as the one described above for the Northern Recovery Unit. For Mississippi, nesting data are not collected regularly or in a standardized manner. Prior to 2006, the National Park Service annually conducted aerial sea turtle nesting surveys once a week during the nesting season on the Mississippi District of Gulf Islands National Seashore. Aerial surveys were conducted over Cat, West Ship, East Ship, Horn, and Petit Bois Islands. All nests sighted during aerial surveys appeared to be loggerhead nests. The total number of nests for a season ranged from 0 to approximately 15, although aerial survey methods and frequency may have missed nests. Although regular surveys have not been conducted since 2005, loggerhead nesting was documented in 2010 and 2011 during the Deepwater Horizon event response efforts. Horn and Petit Bois Islands have had the most nests; the other islands have had occasional nests. For Alabama and the Florida Panhandle, we divided beach nesting densities into four equal groups by State and selected beaches that were within the top 25 percent (highest nesting densities) for designation as critical habitat. These high density nesting beaches along with the beaches adjacent to them as described below encompassed the majority of nesting within the recovery unit. The reason we determined high-density nesting beaches within each State (rather than the entire Northern Gulf of Mexico Recovery Unit) was that it allowed consideration for the inclusion of

beaches near the western extent of the range that would otherwise be considered low density when compared with beaches in Alabama and the Florida Panhandle, thus ensuring a good spatial distribution. While nesting in Mississippi may be considered low density compared to Alabama and the Florida Panhandle, the nesting numbers were much higher than those in Louisiana and Texas. Thus, although some loggerhead sea turtle nesting likely regularly occurs in Louisiana and Texas, we do not propose to designate any critical habitat there due to the very low number of nests (less than 10 annually in each State from 2002 to 2011) known to be laid in these States.

We also identified adjacent areas for each of the high-density nesting beaches in Alabama and the Florida Panhandle based on current knowledge about nest site fidelity. Protecting beaches adjacent to high-density nesting beaches should provide sufficient habitat to accommodate and provide a rescue effect for nesting females whose primary nesting beach has been lost. To identify adjacent beaches, we again used information available on turtle nest site fidelity. Although some preliminary information on nest site fidelity is available for the Northern Gulf of Mexico Recovery Unit, it was not sufficient to determine average distances between nest sites within a season for nesting females in this recovery unit. Therefore, we used available information on nest site fidelity for the Peninsular Florida Recovery Unit and selected adjacent beaches approximately 20.0 km (12.4 miles) to the west and 20.0 km (12.4 miles) to the east, where appropriate, of each of the high-density nesting beaches identified for inclusion as critical habitat. The selected adjacent beaches were based on permit holder survey area boundaries with one or more permit holder survey areas being included depending on the length of the survey areas. Within these adjacent areas for each of the high-density nesting beaches, we did not include segments that were highly urbanized, highly erosional, or prone to repeated flooding.

We identified 14 units in the Northern Gulf of Mexico Recovery Unit for designation as terrestrial critical habitat for the loggerhead sea turtle. However, we have exempted one of the identified units (Eglin Air Force Base (Cape San Blas)) from critical habitat designation under section 4(a)(3) of the Act (see Exemptions section below). The remaining 13 units encompass 218.0 km (135.5 miles) of Gulf of Mexico shoreline: 2 units occur in Mississippi, 3 in Alabama, and 8 in the Florida Panhandle. These 13 units encompass approximately 75 percent of the documented nesting (numbers of nests) within the recovery unit. The percentage of nesting is based on data from the Florida Panhandle and Alabama only.

When determining proposed critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for the loggerhead sea turtle. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. Therefore, if the critical habitat is finalized as proposed, a Federal action involving these lands would not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

The critical habitat designation is defined by the maps, as modified by any accompanying regulatory text, presented at the end of this document in the rule portion. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates or plot points or both on which each map is based available to the public on *http://www.regulations.gov* at Docket No. FWS–R4–ES–2012–0103, on our Internet site *http://www.fws.gov/northflorida,* and at the field office responsible for the designation (see **FOR FURTHER INFORMATION CONTACT** above).

In order to translate the selection process above to the areas on the ground, we used the following methodology to identify the mapped boundaries of critical habitat for the Northwest Atlantic Ocean loggerhead DPS:

(1) Each unit was digitally mapped in Google Earth imagery using the unit boundary descriptions.

(2) Where feasible, natural or artificial features (inlets, channels, creeks, bays and sounds), political boundaries (County or City), or map-depicted land ownership (Federal, State, or local) were used as unit boundaries.

(3) Where features to be used as boundaries were highly dynamic, such as inlets, boundaries were distinguished using records of the sea turtle nesting in that area.

(4) Where natural, artificial, or political features, or land ownership could not be used for unit boundaries, boundaries were delineated by geographic means (latitude and longitude, decimal degree points).

(5) Data layers defining map units were created using Google Earth imagery, then refined using Bing imagery. Unit descriptions were then mapped using North America Lambert Conformal Conic coordinates.

Proposed Critical Habitat Designation

We are proposing 1,189.9 km (739.3 miles) in 90 units in the terrestrial environment as critical habitat for the loggerhead sea turtle. Under section 4(a)(3) of the Act, we have exempted four additional units that were identified for inclusion as critical habitat (see Exemptions section below). The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat in the terrestrial environment for the Northwest Atlantic Ocean DPS of the loggerhead sea turtle. The 90 areas we propose as critical habitat and the approximate shoreline length and Federal, State, and private and other (counties and municipalities) ownership of each proposed critical habitat unit are shown in Table 1.

TABLE 1—PROPOSED CRITICAL HABITAT UNITS FOR THE LOGGERHEAD SEA TURTLE BY RECOVERY UNIT

[Beach length estimates reflect the linear distance along the nesting beach shoreline within critical habitat unit boundaries. All units are occupied]

Critical habitat unit	Length of unit in kilometers (miles)	Federal	State	Private and other (counties and municipalities)
Northern Recovery Unit				
North Carolina				
LOGG–T–NC–01: Bogue Banks, Carteret County	38.9 (24.2)	0 (0)	4.6 (2.9)	34.3 (21.3)
LOGG–T–NC–02: Bear Island, Onslow County	6.6 (4.1)	0 (0)	6.6 (4.1)	0 (0)
LOGG–T–NC–03: Topsail Island, Onslow and Pender Counties	35.0 (21.8)	0 (0)	0 (0)	35.0 (21.8)
LOGG–T–NC–04: Lea-Hutaff Island, Pender County	6.1 (3.8)	0 (0)	0.5 (0.3)	5.6 (3.5)
LOGG–T–NC–05: Pleasure Island, New Hanover County	18.6 (11.5)	0 (0)	6.8 (4.2)	11.8 (7.3)
LOGG–T–NC–06: Bald Head Island, Brunswick County	15.1 (9.4)	0 (0)	5.8 (3.6)	9.3 (5.8)
LOGG–T–NC–07: Oak Island, Brunswick County	20.9 (13.0)	0 (0)	0 (0)	20.9 (13.0)
LOGG–T–NC–08: Holden Beach, Brunswick County	13.4 (8.3)	0 (0)	0 (0)	13.4 (8.3)
North Carolina State Totals	154.6 (96.1)	0 (0)	24.3 (15.1)	130.3 (81.0)
South Carolina				
LOGG–T–SC–01: North Island, Georgetown County	13.2 (8.2)	0 (0)	13.2 (8.2)	0 (0)
LOGG–T–SC–02: Sand Island, Georgetown County	4.7 (2.9)	0 (0)	4.7 (2.9)	0 (0)
LOGG–T–SC–03: South Island, Georgetown County	6.7 (4.2)	0 (0)	6.7 (4.2)	0 (0)
LOGG–T–SC–04: Cedar Island, Georgetown County	4.1 (2.5)	0 (0)	4.1 (2.5)	0 (0)
LOGG–T–SC–05: Murphy Island, Charleston County	8.0 (5.0)	0 (0)	8.0 (5.0)	0 (0)
LOGG–T–SC–06: Cape Island, Charleston County	8.3 (5.1)	8.3 (5.1)	0 (0)	0 (0)
LOGG–T–SC–07: Lighthouse Island, Charleston County	5.3 (3.3)	5.3 (3.3)	0 (0)	0 (0)
LOGG–T–SC–08: Raccoon Key, Charleston County	4.8 (3.0)	4.8 (3.0)	0 (0)	0 (0)
LOGG–T–SC–09: Folly Island, Charleston County	11.2 (7.0)	0 (0)	0 (0)	11.2 (7.0)
LOGG–T–SC–10: Kiawah Island, Charleston County	17.0 (10.6)	0 (0)	0 (0)	17.0 (10.6)
LOGG–T–SC–11: Seabrook Island, Charleston County	5.8 (3.6)	0 (0)	0 (0)	5.8 (3.6)
LOGG–T–SC–12: Botany Bay Island and Botany Bay Plantation, Charleston County	6.6 (4.1)	0 (0)	4.0 (2.5)	2.6 (1.6)
LOGG–T–SC–13: Interlude Beach, Charleston County	0.9 (0.6)	0 (0)	0.9 (0.6)	0 (0)
LOGG–T–SC–14: Edingsville Beach, Charleston County	2.7 (1.7)	0 (0)	0 (0)	2.7 (1.7)
LOGG–T–SC–15: Edisto Beach State Park, Colleton County	2.2 (1.4)	0 (0)	2.2 (1.4)	0 (0)
LOGG–T–SC–16: Edisto Beach, Colleton County	6.8 (4.2)	0 (0)	0 (0)	6.8 (4.2)
LOGG–T–SC–17: Pine Island, Colleton County	1.2 (0.7)	0 (0)	1.2 (0.7)	0 (0)
LOGG–T–SC–18: Otter Island, Colleton County	4.1 (2.5)	0 (0)	4.1 (2.5)	0 (0)
LOGG–T–SC–19: Harbor Island, Beaufort County	2.9 (1.8)	0 (0)	0 (0)	2.9 (1.8)
LOGG–T–SC–20: Little Capers Island, Beaufort County	4.6 (2.9)	0 (0)	0 (0)	4.6 (2.9)
LOGG–T–SC–21: St. Phillips Island, Beaufort County	2.3 (1.4)	0 (0)	0 (0)	2.3 (1.4)
LOGG–T–SC–22: Bay Point Island, Beaufort County	4.3 (2.7)	0 (0)	0 (0)	4.3 (2.7)
South Carolina State Totals	127.7 (79.3)	18.4 (11.4)	48.9 (30.4)	60.4 (37.5)
Georgia				
LOGG–T–GA–01: Little Tybee Island, Chatham County	8.6 (5.3)	0 (0)	8.6 (5.3)	0 (0)
LOGG–T–GA–02: Wassaw Island, Chatham County	10.1 (6.3)	9.8 (6.1)	0 (0)	0.3 (0.2)
LOGG–T–GA–03: Ossabaw Island, Chatham County	17.1 (10.6)	0 (0)	17.1 (10.6)	0 (0)
LOGG–T–GA–04: St. Catherines Island, Liberty County	18.4 (11.5)	0 (0)	0 (0)	18.4 (11.5)
LOGG–T–GA–05: Blackbeard Island, McIntosh County	13.5 (8.4)	13.5 (8.4)	0 (0)	0 (0)
LOGG–T–GA–06: Sapelo Island, McIntosh County	9.3 (5.8)	0 (0)	9.3 (5.8)	0 (0)
LOGG–T–GA–07: Little Cumberland Island, Camden County	4.9 (3.0)	0 (0)	0 (0)	4.9 (3.0)
LOGG–T–GA–08: Cumberland Island, Camden County	29.7 (18.4)	25.2 (15.7)	0 (0)	4.5 (2.8)
Georgia State Totals	111.5 (69.3)	48.4 (30.1)	34.9 (21.7)	28.1 (17.5)
Northern Recovery Unit Totals	393.7 (244.7)	66.8 (41.5)	109.2 (67.9)	217.7 (135.3)
Peninsular Florida Recovery Unit				
Florida				
LOGG–T–FL–01: South Duval County Beaches–Old Ponte Vedra, Duval and St. Johns Counties	25.2 (15.6)	0 (0)	0 (0)	25.2 (15.6)
LOGG–T–FL–02: Guana Tolomato Matanzas NERR–St. Augustine Inlet, St. Johns County	24.1 (15.0)	0 (0)	7.2 (4.4)	17.0 (10.6)
LOGG–T–FL–03: St. Augustine Inlet–Matanzas Inlet, St. Johns County	22.4 (14.0)	1.4 (0.9)	5.6 (3.5)	15.4 (9.6)
LOGG–T–FL–04: River to Sea Preserve at Marineland–North Peninsula State Park, Flagler and Volusia Counties	31.8 (19.8)	0 (0)	6.1 (3.8)	25.7 (16.0)
LOGG–T–FL–05: Ormond-by-the-Sea–Granada Blvd, Volusia County	11.1 (6.9)	0 (0)	0 (0)	11.1 (6.9)

TABLE 1—PROPOSED CRITICAL HABITAT UNITS FOR THE LOGGERHEAD SEA TURTLE BY RECOVERY UNIT—Continued

[Beach length estimates reflect the linear distance along the nesting beach shoreline within critical habitat unit boundaries. All units are occupied]

Critical habitat unit	Length of unit in kilometers (miles)	Federal	State	Private and other (counties and municipalities)
LOGG–T–FL–06: Canaveral National Seashore North, Volusia County	18.2 (11.3)	18.2 (11.3)	0 (0)	0 (0)
LOGG–T–FL–07: Canaveral National Seashore South–Merritt Island National Wildlife Refuge (NWR)-Kennedy Space, Brevard County	28.4 (17.6)	28.4 (17.6)	0 (0)	0 (0)
LOGG–T–FL–08: Central Brevard Beaches, Brevard County	19.5 (12.1)	0 (0)	0 (0)	19.5 (12.1)
LOGG–T–FL–09: South Brevard Beaches, Brevard County	20.8 (12.9)	4.2 (2.6)	1.5 (1.0)	15.0 (9.3)
LOGG–T–FL–10: Sebastian Inlet–Indian River Shores, Indian River County	21.4 (13.3)	0.9 (0.6)	3.2 (2.0)	17.4 (10.8)
LOGG–T–FL–11: Fort Pierce Inlet–St. Lucie Inlet, St. Lucie and Martin Counties	35.2 (21.9)	0 (0)	0 (0)	35.2 (21.9)
LOGG–T–FL–12: St. Lucie Inlet–Jupiter Inlet, Martin and Palm Beach Counties	24.9 (15.5)	4.8 (3.0)	3.7 (2.3)	16.4 (10.2)
LOGG–T–FL–13: Jupiter Inlet–Lake Worth Inlet, Palm Beach County	18.8 (11.7)	0 (0)	2.5 (1.5)	16.3 (10.1)
LOGG–T–FL–14: Lake Worth Inlet–Boynton Inlet, Palm Beach County	24.3 (15.1)	0 (0)	0 (0)	24.3 (15.1)
LOGG–T–FL–15: Boynton Inlet–Boca Raton Inlet, Palm Beach County	22.6 (14.1)	0 (0)	0 (0)	22.6 (14.1)
LOGG–T–FL–16: Boca Raton Inlet–Hillsboro Inlet, Palm Beach and Broward Counties	8.3 (5.2)	0 (0)	0 (0)	8.3 (5.2)
LOGG–T–FL–17: Long Key, Monroe County	4.2 (2.6)	0 (0)	4.2 (2.6)	0 (0)
LOGG–T–FL–18: Bahia Honda Key, Monroe County	3.7 (2.3)	0 (0)	3.7 (2.3)	0 (0)
LOGG–T–FL–19: Longboat Key, Manatee and Sarasota Counties	16.0 (9.9)	0 (0)	0 (0)	16.0 (9.9)
LOGG–T–FL–20: Siesta and Casey Keys, Sarasota County	20.8 (13.0)	0 (0)	0 (0)	20.8 (13.0)
LOGG–T–FL–21: Venice Beaches and Manasota Key, Sarasota and Charlotte Counties	26.0 (16.1)	0 (0)	1.9 (1.2)	24.1 (15.0)
LOGG–T–FL–22: Knight, Don Pedro, and Little Gasparilla Islands, Charlotte County	10.8 (6.7)	0 (0)	1.9 (1.2)	8.9 (5.5)
LOGG–T–FL–23: Gasparilla Island, Charlotte and Lee Counties	11.2 (6.9)	0 (0)	1.5 (1.0)	9.6 (6.0)
LOGG–T–FL–24: Cayo Costa, Lee County	13.5 (8.4)	0 (0)	13.2 (8.2)	0.3 (0.2)
LOGG–T–FL–25: Captiva Island, Lee County	7.6 (4.7)	0 (0)	0 (0)	7.6 (4.7)
LOGG–T–FL–26: Sanibel Island West, Lee County	12.2 (7.6)	0 (0)	0 (0)	12.2 (7.6)
LOGG–T–FL–27: Little Hickory Island, Lee and Collier Counties	8.7 (5.4)	0 (0)	0 (0)	8.7 (5.4)
LOGG–T–FL–28: Wiggins Pass–Clam Pass, Collier County	7.7 (4.8)	0 (0)	2.0 (1.2)	5.7 (3.6)
LOGG–T–FL–29: Clam Pass—Doctors Pass, Collier County	4.9 (3.0)	0 (0)	0 (0)	4.9 (3.0)
LOGG–T–FL–30: Keewaydin Island and Sea Oat Island, Collier County	13.1 (8.1)	0 (0)	12.4 (7.7)	0.7 (0.5)
LOGG–T–FL–31: Cape Romano, Collier County	9.2 (5.7)	0 (0)	7.2 (4.5)	2.0 (1.2)
LOGG–T–FL–32: Ten Thousand Islands North, Collier County	7.8 (4.9)	2.9 (1.8)	4.9 (3.1)	0 (0)
LOGG–T–FL–33: Highland Beach, Monroe County	7.2 (4.5)	7.2 (4.5)	0 (0)	0 (0)
LOGG–T–FL–34: Graveyard Creek– Shark Point, Monroe County	0.9 (0.6)	0.9 (0.6)	0 (0)	0 (0)
LOGG–T–FL–35: Cape Sable, Monroe County	21.3 (13.2)	21.3 (13.2)	0 (0)	0 (0)
Florida State Totals	563.7 (350.2)	90.3 (56.1)	82.6 (51.3)	390.9 (242.9)
Peninsular Florida Recovery Unit Totals	563.7 (350.2)	90.3 (56.1)	82.6 (51.3)	390.9 (242.9)
Dry Tortugas Recovery Unit				
Florida				
LOGG–T–FL–36: Dry Tortugas, Monroe County	6.3 (3.9)	6.3 (3.9)	0 (0)	0 (0)
LOGG–T–FL–37: Marquesas Keys, Monroe County	5.6 (3.5)	5.6 (3.5)	0 (0)	0 (0)
LOGG–T–FL–38: Boca Grande Key, Monroe County	1.3 (0.8)	1.3 (0.8)	0 (0)	0 (0)
LOGG–T–FL–39: Woman Key, Monroe County	1.3 (0.8)	1.3 (0.8)	0 (0)	0 (0)
Florida State Totals	14.5 (9.0)	14.5 (9.0)	0 (0)	0 (0)
Dry Tortugas Recovery Unit Totals	14.5 (9.0)	14.5 (9.0)	0 (0)	0 (0)
Northern Gulf of Mexico Recovery Unit				
Mississippi				
LOGG–T–MS–01: Horn Island, Jackson County	18.6 (11.5)	17.7 (11.0)	0 (0)	0.8 (0.5)
LOGG–T–MS–02: Petit Bois Island, Jackson County	9.8 (6.1)	9.8 (6.1)	0 (0)	0 (0)
Mississippi State Totals	28.4 (17.6)	27.5 (17.1)	0 (0)	0.8 (0.5)
Alabama				
LOGG–T–AL–01: Mobile Bay–Little Lagoon Pass, Baldwin County	28.0 (17.4)	5.4 (3.4)	3.1 (1.9)	19.5 (12.1)
LOGG–T–AL–02: Gulf State Park–Perdido Pass, Baldwin County	10.7 (6.7)	0 (0)	3.5 (2.2)	7.3 (4.5)
LOGG–T–AL–03: Perdido Pass–Florida-Alabama line, Baldwin County	3.3 (2.0)	0 (0)	1.7 (1.0)	1.6 (1.0)

TABLE 1—PROPOSED CRITICAL HABITAT UNITS FOR THE LOGGERHEAD SEA TURTLE BY RECOVERY UNIT—Continued

[Beach length estimates reflect the linear distance along the nesting beach shoreline within critical habitat unit boundaries. All units are occupied]

Critical habitat unit	Length of unit in kilometers (miles)	Federal	State	Private and other (counties and municipalities)
Alabama State Totals	42.0 (26.1)	5.4 (3.4)	8.2 (5.1)	28.3 (17.6)
Florida				
LOGG–T–FL–40: Perdido Key, Escambia County	20.2 (12.6)	11.0 (6.8)	2.5 (1.6)	6.7 (4.2)
LOGG–T–FL–41: Mexico Beach and St. Joe Beach, Bay and Gulf Counties	18.7 (11.7)	0 (0)	0 (0)	18.7 (11.7)
LOGG–T–FL–42: St. Joseph Peninsula, Gulf County	23.5 (14.6)	0 (0)	15.5 (9.7)	8.0 (4.9)
LOGG–T–FL–43: Cape San Blas, Gulf County	11.0 (6.8)	0 (0)	0.1 (0.1)	10.8 (6.7)
LOGG–T–FL–44: St. Vincent Island, Franklin County	15.1 (9.4)	15.1 (9.4)	0 (0)	0 (0)
LOGG–T–FL–45: Little St. George Island, Franklin County	15.4 (9.6)	0 (0)	15.4 (9.6)	0 (0)
LOGG–T–FL–46: St. George Island, Franklin County:	30.7 (19.1)	0 (0)	14.0 (8.7)	16.7 (10.4)
LOGG–T–FL–47: Dog Island, Franklin County	13.1 (8.1)	0 (0)	0 (0)	13.1 (8.1)
Florida State Totals	147.7 (91.8)	26.1 (16.2)	47.5 (29.5)	74.0 (46.0)
Northern Gulf of Mexico Recovery Unit Totals	218.0 (135.5)	59.0 (36.7)	55.8 (34.7)	103.2 (64.2)

Note: Linear distances may not sum due to rounding.

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for the loggerhead sea turtle, below.

Northern Recovery Unit

North Carolina

LOGG–T–NC–01—Bogue Banks, Carteret County: This unit consists of 38.9 km (24.2 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway and Bogue Sound. The unit extends from Beaufort Inlet to Bogue Inlet. The unit includes lands from the MHW line landward to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is Fort Macon State Park, which is managed by the North Carolina Division of Parks and Recreation. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–NC–02) that has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–NC–02—Bear Island, Onslow County: This unit consists of 6.6 km (4.1 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway and salt marsh. The unit extends from Bogue Inlet to Bear Inlet. The unit includes lands from the MHW line landward to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). The island is managed by the North Carolina Division of Parks and Recreation as Hammocks Beach State Park. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–NC–03—Topsail Island, Onslow and Pender Counties: This unit consists of 35.0 km (21.8 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Chadwick Bay, Alligator Bay, Goose Bay, Rogers Bay, Everett Bay, Spicer Bay, Waters Bay, Stump Sound, Banks Channel, and salt marsh. The unit extends from New River Inlet to New Topsail Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The local municipality portion is the North Topsail Beach Park, which is managed by the Town of North Topsail Beach. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–NC–04—Lea-Hutaff Island, Pender County: This unit consists of 6.1 km (3.8 miles) of island shoreline along the Atlantic Ocean. Following the closure of Old Topsail Inlet in 1998, two islands, Lea Island and Hutaff Island, joined to form what is now a single island referred to as Lea-Hutaff Island. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Topsail Sound, Eddy Sound, Long Point Channel, Green Channel, and salt marsh. The unit extends from New Topsail Inlet to Rich Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is part of the

Lea Island State Natural Area, which includes most of the original Lea Island, and is owned by the North Carolina Division of Parks and Recreation and managed by Audubon North Carolina. The remainder of the original Lea Island is privately owned. The original Hutaff Island is entirely privately owned. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–NC–03) that has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, climate change, beach erosion, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–NC–05—Pleasure Island, New Hanover County: This unit consists of 18.6 km (11.5 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Cape Fear River, Upper Midnight Channel Range, Lower Midnight Channel Range, Reaves Point Channel Range, Horseshoe Shoal Channel Range, Snow Marsh Channel Range, and The Basin (bay). The unit extends from Carolina Beach Inlet to 33.91433 N, 77.94408 W (historic location of Corncake Inlet). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, private, and other ownership (see Table 1). The State portion is Fort Fisher State Recreation Area, which is managed by the North Carolina Division of Parks and Recreation. The local municipality portion includes half of Freeman Park Recreation Area, which is managed by the Town of Carolina Beach. The County portion includes the other half of Freeman Park Recreation Area, which is also managed by the Town of Carolina Beach under an interlocal agreement with New Hanover County. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–NC–06) that has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–NC–06—Bald Head Island, Brunswick County: This unit consists of 15.1 km (9.4 miles) of island shoreline along the Atlantic Ocean. The island is part of the Smith Island Complex, which is a barrier spit that includes Bald Head, Middle, and Bluff Islands. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Cape Fear River, Battery Island Channel, Lower Swash Channel Range, Buzzard Bay, Smith Island Range, Southport Channel, and salt marsh. The unit extends from 33.91433 N, 77.94408 W (historic location of Corncake Inlet) to the mouth of the Cape Fear River. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private and other ownership (see Table 1). The State portion is Bald Head State Natural Area. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–NC–07—Oak Island, Brunswick County: This unit consists of 20.9 km (13.0 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Cape Fear River, Eastern Channel, and salt marsh. The unit extends from the mouth of the Cape Fear River to Lockwoods Folly Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–NC–08—Holden Beach, Brunswick County: This unit consists of 13.4 km (8.3 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Elizabeth River, Montgomery Slough, Boone Channel, and salt marsh. The unit extends from Lockwoods Folly Inlet to Shallotte Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–NC–07) that has high-density nesting by loggerhead sea turtles in North Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

South Carolina

LOGG–T–SC–01—North Island, Georgetown County: This unit consists of 13.2 km (8.2 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Winyah Bay, Mud Bay, Oyster Bay, and salt marsh. The unit extends from North Inlet to Winyah Bay. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is part of the Tom Yawkey Wildlife Center Heritage Preserve, which is managed by the South Carolina Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–02) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational

use, predation, beach erosion, climate change, artificial lighting, habitat obstructions, human-caused disasters, and response to disasters. The Tom Yawkey Wildlife Center has a management plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, feral hog removal, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Dozier 2006, pp. 31, 64–65).

LOGG–T–SC–02—Sand Island, Georgetown County: This unit consists of 4.7 km (2.9 miles) of island shoreline along the Atlantic Ocean and Winyah Bay. The island is separated from the mainland by the Atlantic Intracoastal Waterway and salt marsh. The unit extends from Winyah Bay to 33.17534 N, 79.19206 W (northern boundary of an unnamed inlet separating Sand Island and South Island). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is part of the Tom Yawkey Wildlife Center Heritage Preserve, which is managed by the South Carolina Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, in-water and shoreline alterations, beach erosion, climate change, artificial lighting, human-caused disasters, and response to disasters. The Tom Yawkey Wildlife Center has a management plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, feral hog removal, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Dozier 2006, pp. 31, 64–65).

LOGG–T–SC–03—South Island, Georgetown County: This unit consists of 6.7 km (4.2 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, North Santee Bay, and salt marsh. The unit extends from 33.17242 N, 79.19366 W (southern boundary of an unnamed inlet separating Sand Island and South Island) to North Santee Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is part of the Tom Yawkey Wildlife Center Heritage Preserve, which is managed by the South Carolina Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, beach erosion, climate change, artificial lighting, human-caused disasters, and response to disasters. The Tom Yawkey Wildlife Center has a management plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, feral hog removal, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Dozier 2006, pp. 31, 64–65).

LOGG–T–SC–04—Cedar Island, Georgetown County: This unit consists of 4.1 km (2.5 miles) of island shoreline along the Atlantic Ocean and North Santee Inlet. The island is separated from the mainland by the Atlantic Intracoastal Waterway and salt marsh. The unit extends from North Santee Inlet to South Santee Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is part of the Santee Coastal Reserve Wildlife Management Area, which is managed by the South Carolina Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–03) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters. The Santee Coastal Reserve Wildlife Management Area has a draft management plan that includes recommendations to reduce sea turtle nest depredation by raccoons (South Carolina Department of Natural Resources 2002, p. 21), but there is currently no other management for protection of loggerhead sea turtle nests.

LOGG–T–SC–05—Murphy Island, Charleston County: This unit consists of 8.0 km (5.0 miles) of island shoreline along the Atlantic Ocean and South Santee Inlet. The island is separated from the mainland by the Atlantic Intracoastal Waterway and inland marsh. The unit extends from South Santee Inlet to 33.08335 N, 79.34285 W. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is part of the Santee Coastal Reserve Wildlife Management Area, which is managed by the South Carolina Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–06) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters. The Santee Coastal Reserve Wildlife Management Area has a draft management plan that includes recommendations to reduce sea turtle nest depredation by raccoons (South Carolina Department of Natural Resources 2002, p. 21), but there is currently no other management for protection of loggerhead sea turtle nests.

LOGG–T–SC–06—Cape Island, Charleston County: This unit consists of 8.3 km (5.1 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Cape Romain Harbor, coastal islands, and salt marsh. The unit extends from Cape Romain Inlet to 33.00988 N, 79.36529 W (northern boundary of an unnamed inlet between Cape Island and Lighthouse Island). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is the northernmost island in the Cape Romain National Wildlife Refuge (NWR), which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. It is the highest nesting density beach in the Northern Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, in-water and shoreline alterations, beach erosion, climate change, human-caused disasters, and response to disasters. Cape Romain NWR has a Comprehensive Conservation Plan that

includes working with partners on the implementation of sea turtle nesting surveys, nest marking, minimizing human disturbance, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2010a, pp. 45–46).

LOGG–T–SC–07—Lighthouse Island, Charleston County: This unit consists of 5.3 km (3.3 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from 33.01306 N, 79.36659 W (southern boundary of an unnamed inlet between Cape Island and Lighthouse Island) to Key Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is part of the Cape Romain NWR, which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, in-water and shoreline alterations, beach erosion, climate change, human-caused disasters, and response to disasters. Cape Romain NWR has a Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, minimizing human disturbance, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2010a, pp. 45–46).

LOGG–T–SC–08—Raccoon Key, Charleston County: This unit consists of 4.8 km (3.0 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from Raccoon Creek Inlet to Five Fathom Creek Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is part of the Cape Romain NWR, which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–07) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, in-water and shoreline alterations, beach erosion, climate change, human-caused disasters, and response to disasters. Cape Romain NWR has a Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, minimizing human disturbance, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2010a, pp. 45–46).

LOGG–T–SC–09—Folly Island, Charleston County: This unit consists of 11.2 km (7.0 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Folly River, a network of coastal islands, and salt marsh. The unit extends from Lighthouse Inlet to Folly River Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, and private and other ownership (see Table 1). The Lighthouse Inlet Heritage Preserve, is owned by the County, with a 10 percent undivided interest from the South Carolina Department of Natural Resource. The Folly Beach County Park is owned by the County. Both are managed by the Charleston County Park and Recreation Commission. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–10) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBF in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach sand placement activities, in-water and shoreline alterations, coastal development, beach erosion, climate change, artificial lighting, human-caused disasters, and response to disasters. The City of Folly Beach has a beach management plan that includes measures to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (City of Folly Beach 1991, pp. 32–35). These measures apply to both the private and other lands within this critical habitat unit.

LOGG–T–SC–10—Kiawah Island, Charleston County: This unit consists of 17.0 km (10.6 miles) of island shoreline along the Atlantic Ocean and Stono Inlet. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Wadmalaw Island, Johns Island, Kiawah River, and salt marsh. The unit extends from Stono Inlet to Captain Sam's Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The County portion includes Kiawah Beachwalker Park and Isle of Palms County Park, which are managed by the Charleston County Park and Recreation Commission. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, beach erosion, climate change, human-caused disasters, and response to disasters. The Town of Kiawah Island has a Local Comprehensive Beach Management Plan that describes actions, such as nest monitoring, education, pet and vehicular restrictions, and a lighting ordinance, taken by the Town to minimize impacts to nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Town of Kiawah Island 2006, pp. 4–11–4–13). These measures apply to both the private and other lands within this critical habitat unit although the degree of implementation is uncertain.

LOGG–T–SC–11—Seabrook Island, Charleston County: This unit consists of 5.8 km (3.6 miles) of island shoreline along the Atlantic Ocean and North Edisto Inlet. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Wadmalaw Island, Johns Island, and salt marsh. The unit extends from Captain Sam's Inlet to North Edisto Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from adjacent units (LOGG–T–SC–10 and LOGG–T–SC–12) that have high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, coastal development, beach erosion, climate change, artificial lighting, human-caused disasters, and response to disasters. The Town of Seabrook Island has a beach management plan that includes the implementation of sea turtle nesting

surveys, nest marking, and actions to minimize human disturbance impacts to nesting and hatchling loggerhead sea turtles (Town Council of Seabrook 1991, p. 15). These measures apply to the private lands within this critical habitat unit although the degree of implementation is uncertain.

LOGG–T–SC–12—Botany Bay Island and Botany Bay Plantation, Charleston County: This unit consists of 6.6 km (4.1 miles) of island shoreline along the Atlantic Ocean and North Edisto Inlet. It includes the shoreline of Botany Bay Island and Botany Bay Plantation, which is located on the north end of Edisto Island. Botany Bay Island and Botany Bay Plantation were originally separated by South Creek Inlet. However, due to beach accretion on the south end of Botany Bay Island, it is now continuous with Botany Bay Plantation. This unit is separated from the mainland by the Atlantic Intracoastal Waterway, Ocella Creek, Townsend River, South Creek Inlet, a network of coastal islands, and salt marsh. The unit extends from North Edisto Inlet to 32.53710 N, 80.24614 W (northern boundary of an unnamed inlet separating Botany Bay Plantation and Interlude Beach). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private and other ownership (see Table 1). The Botany Bay Island portion is privately owned; however, the owner has placed a conservation easement on the property with The Nature Conservancy. The State portion is part of the Botany Bay Plantation Wildlife Management Area Heritage Preserve, which is managed by the South Carolina Department of Natural Resources.

This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters. The Botany Bay Plantation Wildlife Management Area Heritage Preserve has a management plan that includes the implementation of sea turtle nesting surveys, nest marking, actions to minimize human disturbance, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (South Carolina Department of Natural Resources 2009, p. 12).

LOGG–T–SC–13—Interlude Beach, Charleston County: This unit consists of 0.9 km (0.6 mile) of island shoreline along the Atlantic Ocean. This unit includes a section of Edisto Island, which is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from 32.53636 N, 80.24647 W (southern boundary of an unnamed inlet separating Interlude Beach and Botany Bay Plantation) to Frampton Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is part of the Botany Bay Plantation Wildlife Management Area Heritage Preserve, which is managed by the South Carolina Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from adjacent units (LOGG–T–SC–12 and LOGG–T–SC–14) that have high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, beach erosion, climate change, human-caused disasters, and response to disasters. The Botany Bay Plantation Wildlife Management Area Heritage Preserve has a management plan that includes the implementation of sea turtle nesting surveys, nest marking, actions to minimize human disturbance, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (South Carolina Department of Natural Resources 2009, p. 12).

LOGG–T–SC–14—Edingsville Beach, Charleston County: This unit consists of 2.7 km (1.7 miles) of island shoreline along the Atlantic Ocean. This unit includes a section of Edisto Island, which is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from Frampton Inlet to Jeremy Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, beach erosion, climate change, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–SC–15—Edisto Beach State Park, Colleton County: This unit consists of 2.2 km (1.4 miles) of island shoreline along the Atlantic Ocean. This unit includes a section of Edisto Island, which is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from Jeremy Inlet to 32.50307 N, 80.29625 W (State Park boundary separating Edisto Beach State Park and the Town of Edisto Beach). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is managed by the South Carolina Department of Parks, Recreation, and Tourism as the Edisto Beach State Park. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, artificial lighting, human-caused disasters, and response to disasters. The Edisto Beach State Park has a General Management Plan that includes the implementation of sea turtle nesting surveys, nest marking, and education intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Edisto Beach State Park 2010, pp. 17–18, 21–22).

LOGG–T–SC–16—Edisto Beach, Colleton County: This unit consists of 6.8 km (4.2 miles) of island shoreline along the Atlantic Ocean and South Edisto River. This unit includes a section of Edisto Island, which is separated from the mainland by the Atlantic Intracoastal Waterway, Big Bay Creek, a network of coastal islands, and salt marsh. The unit extends from 32.50307 N, 80.29625 W (State Park boundary separating Edisto Beach State Park and the Town of Edisto Beach) to South Edisto Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. The unit occurs within the town limits of Edisto Beach. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–16) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management

considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, beach erosion, climate change, artificial lighting, human-caused disasters, and response to disasters. The Town of Edisto Beach has a Local Comprehensive Beach Management Plan that includes the implementation of sea turtle nesting surveys, nest marking, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Town of Edisto Beach 2011, p. 25). These measures apply to the private lands within this critical habitat unit although the degree of implementation is uncertain.

LOGG–T–SC–17—Pine Island, Colleton County: This unit consists of 1.2 km (0.7 mile) of island shoreline along the South Edisto Inlet. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Fish Creek, a network of coastal islands, and salt marsh. The unit extends from South Edisto River to 32.49266 N, 80.36846 W (northern boundary of an unnamed inlet to Fish Creek). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is managed by the South Carolina Department of Natural Resources as part of the Ashepoo-Combahee-Edisto (ACE) Basin National Estuarine Research Reserve (NERR). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–18) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–SC–18—Otter Island, Colleton County: This unit consists of 4.1 km (2.5 miles) of island shoreline along the Atlantic Ocean and Saint Helena Sound. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Ashepoo River, a network of coastal islands, and salt marsh. The unit extends from Fish Creek Inlet to Saint Helena Sound. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). It is part of the St. Helena Sound Heritage Preserve and the ACE Basin Estuarine Research Reserve, which are managed by the South Carolina Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–SC–19—Harbor Island, Beaufort County: This unit consists of 2.9 km (1.8 miles) of island shoreline along the Atlantic Ocean and Saint Helena Sound. The island is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from Harbor Inlet to Johnson Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–18) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, artificial lighting, habitat obstructions, human-caused disasters, and response to disasters. Beaufort County has a Comprehensive Beach Management Plan that includes the implementation of sea turtle nesting surveys, nest marking, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Beaufort County Planning Board 2010, p. 5–19). These measures apply to the private lands within this critical habitat unit.

LOGG–T–SC–20—Little Capers Island, Beaufort County: This unit consists of 4.6 km (2.9 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from ''Pritchards Inlet'' (there is some uncertainty about the true name of this water feature) located at 32.29009 N, 80.54459 W to Trenchards Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–21) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, artificial lighting, habitat obstructions, human-caused disasters, and response to disasters. Beaufort County has a Comprehensive Beach Management Plan that includes the implementation of sea turtle nesting surveys, nest marking, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Beaufort County Planning Board 2010, p. 5–19). These measures apply to the private lands within this critical habitat unit.

LOGG–T–SC–21—St. Phillips Island, Beaufort County: This unit consists of 2.3 km (1.4 miles) of island shoreline along the Atlantic Ocean and Trenchards Inlet. The island is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands, and salt marsh. The unit extends from Trenchards Inlet to Morse Island Creek Inlet East. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). Although privately owned, the island is protected in perpetuity by a conservation easement with The Nature Conservancy. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–SC–22—Bay Point Island, Beaufort County: This unit consists of 4.3 km (2.7 miles) of island shoreline along the Atlantic Ocean and Port Royal Sound. The island is separated from the mainland by the Atlantic Intracoastal Waterway, a network of coastal islands,

and salt marsh. The unit extends from Morse Island Creek Inlet East along the Atlantic Ocean shoreline to Morse Island Creek Inlet West along the Port Royal Sound shoreline. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–SC–21) that has high-density nesting by loggerhead sea turtles in South Carolina. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, beach driving, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

Georgia

LOGG–T–GA–01—Little Tybee Island, Chatham County: This unit consists of 8.6 km (5.3 miles) of island shoreline along the Atlantic Ocean. Little Tybee Island is not a specific island, rather it is a complex of several small, low-lying islands, including Myrtle and Williamson Islands, that are separated by tidal flows, creeks, or sloughs. The island complex is separated from the mainland by the Atlantic Intracoastal Waterway, Tybee Creek, Bull River, a network of coastal islands, and salt marsh. The unit extends from Tybee Creek Inlet to Wassaw Sound. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). The island is owned by the Georgia Department of Natural Resources and managed by The Nature Conservancy as the Little Tybee Island Natural Heritage Preserve. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–GA–02) that has high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, beach erosion, climate change, human-caused disasters, and response to disasters. The Georgia Department of Natural Resources signed a Memorandum of Agreement with the U.S. Fish and Wildlife Service, National Park Service, St. Catherines Island Foundation, Jekyll Island Authority, City of Tybee Island, Glynn County, Little Cumberland Island Homeowners Association, and Little St. Simons Island, Ltd. mandating that land owned by the State adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

LOGG–T–GA–02—Wassaw Island, Chatham County: This unit consists of 10.1 km (6.3 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Romerly Marshes, Odingsell River, and a network of coastal islands. The unit extends from Wassaw Sound to Ossabaw Sound. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal and private ownership (see Table 1). The majority of the island is managed by USFWS as the Wassaw NWR. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, habitat obstructions, human-caused disasters, and response to disasters.

Wassaw NWR is part of the Savannah Coastal Refuges Complex, which has a draft Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2010b, pp. 37, 104). USFWS signed a Memorandum of Agreement with the Georgia Department of Natural Resources, National Park Service, St. Catherines Island Foundation, Jekyll Island Authority, City of Tybee Island, Glynn County, Little Cumberland Island Homeowners Association, and Little St. Simons Island, Ltd. mandating that land owned by the Refuge adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

LOGG–T–GA–03—Ossabaw Island, Chatham County: This unit consists of 17.1 km (10.6 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Bear River, a network of coastal islands, and extensive salt marshes. Ossabaw Island is divided into four contiguous sections of beach: Bradley (North), North Middle, South Middle, and South beaches. The unit extends from Ogeechee River to St. Catherines Sound. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). The island is managed by the Georgia Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach erosion, climate change, human-caused disasters, and response to disasters.

A Comprehensive Management Plan for Ossabaw Island includes actions to minimize human disturbance and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 2001, pp. 37, 40, 43). The Georgia Department of Natural Resources signed a Memorandum of Agreement with the U.S. Fish and Wildlife Service, National Park Service, St. Catherines Island Foundation, Jekyll Island Authority, City of Tybee Island, Glynn County, Little Cumberland Island Homeowners Association, and Little St. Simons Island, Ltd. mandating that land owned by the State adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

LOGG–T–GA–04—St. Catherines Island, Liberty County: This unit consists of 18.4 km (11.5 miles) of island shoreline along the Atlantic

Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, North Newport River, South Newport River, a network of coastal islands, and extensive salt marshes. The unit extends from St. Catherines Sound to Sapelo Sound. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from adjacent units (LOGG–T–GA–03 and LOGG–T–GA–05) that have high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, habitat obstructions, beach erosion, climate change, human-caused disasters, and response to disasters. The St. Catherines Island Foundation signed a Memorandum of Agreement with the Georgia Department of Natural Resources, U.S. Fish and Wildlife Service, National Park Service, Jekyll Island Authority, City of Tybee Island, Glynn County, Little Cumberland Island Homeowners Association, and Little St. Simons Island, Ltd. mandating that land owned by the Foundation adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

LOGG–T–GA–05—Blackbeard Island, McIntosh County: This unit consists of 13.5 km (8.4 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Blackbeard Creek, Mud River, a network of coastal islands, and extensive salt marshes. The unit extends from Sapelo Sound to Cabretta Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). The island is managed by USFWS as the Blackbeard Island NWR. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, habitat obstructions, beach erosion, climate change, human-caused disasters, and response to disasters. Blackbeard Island NWR is part of the Savannah Coastal Refuges Complex, which has a draft Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2010b, pp. 125, 136).

USFWS signed a Memorandum of Agreement with the Georgia Department of Natural Resources, National Park Service, St. Catherines Island Foundation, Jekyll Island Authority, City of Tybee Island, Glynn County, Little Cumberland Island Homeowners Association, and Little St. Simons Island, Ltd. mandating that land owned by the Refuge adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

LOGG–T–GA–06—Sapelo Island, McIntosh County: This unit consists of 9.3 km (5.8 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Doboy Sound, Mud Creek, Teakettle Creek, a network of coastal islands, and extensive salt marshes. Sapelo Island is divided into two contiguous sections of beach: Nannygoat and Cabretta beaches. The unit extends from Cabretta Inlet to Doboy Sound. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). The island is managed by the Georgia Department of Natural Resources. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–GA–05) that has high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, poaching, beach driving, predation, beach erosion, climate change, human-caused disasters, and response to disasters.

A Comprehensive Management Plan for Sapelo Island includes actions to minimize human disturbance and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1998, pp. 5, 36, 55). The Georgia Department of Natural Resources signed a Memorandum of Agreement with the U.S. Fish and Wildlife Service, National Park Service, St. Catherines Island Foundation, Jekyll Island Authority, City of Tybee Island, Glynn County, Little Cumberland Island Homeowners Association, and Little St. Simons Island, Ltd. mandating that land owned by the State adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

LOGG–T–GA–07—Little Cumberland Island, Camden County: This unit consists of 4.9 km (3.0 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Cumberland River, and salt marsh. The unit extends from St. Andrew Sound to Christmas Creek. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). Although Little Cumberland Island is privately owned, it lies within the boundaries of Cumberland Island National Seashore and is recognized as a Special Use Zone where private property owners have entered into an agreement with the National Park Service. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–GA–08) that has high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach erosion, climate change, human-caused disasters, and response to disasters.

The Little Cumberland Island Homeowners Association signed a Memorandum of Agreement with the Georgia Department of Natural Resources, U.S. Fish and Wildlife Service, National Park Service, St. Catherines Island Foundation, Jekyll

Island Authority, City of Tybee Island, Glynn County, and Little St. Simons Island, Ltd. mandating that land owned by the Association adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

LOGG–T–GA–08—Cumberland Island, Camden County: This unit consists of 29.7 km (18.4 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Cumberland River, Cumberland Sound, Brickhill River, a network of coastal islands, and extensive salt marsh. The unit extends from Christmas Creek to St. Marys River. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal and private ownership (see Table 1). The Federal portion is part of Cumberland Island National Seashore, which is managed by the National Park Service. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in Georgia. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach erosion, climate change, human-caused disasters, and response to disasters.

Cumberland Island National Seashore has a General Management Plan that includes predator removal and dune preservation intended to minimize impacts to nesting and hatchling loggerhead sea turtles (National Park Service 1984, pp. 22–23). The National Park Service signed a Memorandum of Agreement with the Georgia Department of Natural Resources, U.S. Fish and Wildlife Service, St. Catherines Island Foundation, Jekyll Island Authority, City of Tybee Island, Glynn County, and Little St. Simons Island, Ltd. mandating that land owned by the Cumberland Island National Seashore adhere to actions listed in the Management Plan for the Protection of Nesting Loggerhead Sea Turtles and their Habitat in Georgia. This includes working with partners on the implementation of sea turtle nesting surveys, nest marking and protection, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (Georgia Department of Natural Resources 1994, pp. 6–9).

Peninsular Florida Recovery Unit

Northern Florida Region

LOGG–T–FL–01—South Duval County Beaches-Old Ponte Vedra, Duval and St. Johns Counties: This unit consists of 25.2 km (15.6 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Pablo Creek, and Lake Ponte Vedra. The unit extends from the south boundary of Kathryn Abbey Hanna Park in Duval County to the north boundary of the Guana Tolomato Matanzas National Estuarine Research Reserve in St. Johns County. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–02) that has high-density nesting by loggerhead sea turtles in the Northern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

St. Johns County has an HCP titled ''A Plan for the Protection of Sea Turtles and Anastasia Island Beach Mice on the Beaches of St. Johns County, Florida'' that includes sea turtle monitoring, nest protection from vehicles on the beach, a beach lighting management plan, beach horseback riding registration and education, and reestablishment of a dune at Porpoise Point (St. Johns County Planning Division 2003, p. 32). These measures apply to the private lands within this critical habitat unit and are intended to minimize and mitigate impacts to nesting and hatchling loggerhead sea turtles as a result of the County-authorized beach driving.

LOGG–T–FL–02—Guana Tolomato Matanzas National Estuarine Research Reserve-St. Augustine Inlet, St. Johns County: This unit consists of 24.1 km (15.0 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway. The unit extends from the north boundary of the Guana Tolomato Matanzas NERR to St. Augustine Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, private, and other ownership (see Table 1). The State portion is part of the Guana Tolomato Matanzas NERR, which is managed by the Florida Department of Environmental Protection (FDEP) Coastal and Aquatic Managed Areas. The County portion is Vilano Oceanfront Park, which is managed by the St. Johns County Recreation and Parks Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Northern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

The Guana Tolomato Matanzas National Estuarine Research Reserve has a management plan that includes the implementation of nesting surveys, nest marking, education, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (FDEP 2009a, pp. 81, 162). St. Johns County has an HCP titled ''A Plan for the Protection of Sea Turtles and Anastasia Island Beach Mice on the Beaches of St. Johns County, Florida'' that covers the remainder of the unit. The HCP includes sea turtle monitoring, nest protection from vehicles on the beach, a beach lighting management plan, beach horseback riding registration and education, and reestablishment of a dune at Porpoise Point (St. Johns County Planning Division 2003, p. 32). These measures apply to both the private and other lands within this critical habitat unit and are intended to minimize and mitigate impacts to nesting and hatchling loggerhead sea turtles as a result of the County-authorized beach driving.

LOGG–T–FL–03—St. Augustine Inlet-Matanzas Inlet, St. Johns County: This unit consists of 22.4 km (14.0 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Matanzas River, which is part of the Atlantic Intracoastal Waterway. The unit extends from St. Augustine Inlet to Matanzas Inlet. The unit includes lands from the MHW line

to the toe of the secondary dune or developed structures. Land in this unit is in Federal, State, and private ownership (see Table 1). The Federal portion is Fort Matanzas National Monument, which is managed by the National Park Service. The State portion is Anastasia State Park, which is managed by FDEP. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from adjacent units (LOGG–T–FL–02 and LOGG–T–FL–04) that have high-density nesting by loggerhead sea turtles in the Northern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

St. Johns County has an HCP titled ''A Plan for the Protection of Sea Turtles and Anastasia Island Beach Mice on the Beaches of St. Johns County, Florida'' that includes sea turtle monitoring, nest protection from vehicles on the beach, a beach lighting management plan, beach horseback riding registration and education, and reestablishment of the dune at Porpoise Point (St. Johns County Planning Division 2003, p. 32). These measures apply to the private lands within this critical habitat unit and are intended to minimize and mitigate impacts to nesting and hatchling loggerhead sea turtles as a result of the County-authorized beach driving. The Anastasia State Park Unit Management Plan addresses the species in the State portion of the unit. The Unit Management Plan includes procedures for the implementation of sea turtle nesting surveys, nest marking, removal of nonnative species (feral cats, feral hogs, and nine-banded armadillos) when encountered and native species (raccoons) when excessive depredation is documented, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2004a, pp. 5, 17–19). Fort Matanzas National Monument has a General Management Plan that includes exotic organism removal if necessary and possible, which may protect nesting and hatchling loggerhead sea turtles (National Park Service 1982a, p. 27). This Management Plan is being revised.

LOGG–T–FL–04—River to Sea Preserve at Marineland-North Peninsula State Park, Flagler and Volusia Counties: This unit consists of 31.8 km (19.8 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Matanzas River, which is part of the Atlantic Intracoastal Waterway, and Smith Creek. The unit extends from the north boundary of the River to Sea Preserve at Marineland to the south boundary of North Peninsula State Park. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, private, and other ownership (see Table 1). The State portion is North Peninsula State Park, which is managed by FDEP. The County portion includes the River to Sea Preserve at Marineland and Varn Park, which are managed by the Flagler County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Northern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

The North Peninsula State Park Unit Management Plan addresses the species in the State portion of the unit. The Unit Management Plan includes procedures for the implementation of sea turtle nesting surveys, nest marking, removal of nonnative species (feral cats, feral hogs, and nine-banded armadillos) when encountered, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2006a, pp. 15–16). Volusia County has an HCP titled ''A Plan for the Protection of Sea Turtles on the Beaches of Volusia County, Florida'' that includes sea turtle nest monitoring, nest protection from vehicles on the beach, the operation of a rehabilitation center, public education, dune restoration, artificial light management, and a washback watchers program (Volusia County Environmental Management 2008, pp. 164–170). Although no public beach driving occurs within the North Peninsula State Park in northern Volusia County, the HCP addresses potential incidental take of loggerhead sea turtles by county emergency vehicles. These measures apply to the private lands within this critical habitat unit and are intended to minimize and mitigate impacts to nesting and hatchling loggerhead sea turtles as a result of the County-authorized beach driving.

LOGG–T–FL–05—Ormond-by-the-Sea–Granada Blvd., Volusia County: This unit consists of 11.1 km (6.9 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway. The unit extends from the south boundary of North Peninsula State Park to Granada Boulevard in Ormond Beach. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Northern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, beach sand placement activities, coastal development, climate change, beach erosion, coastal development, artificial lighting, human-caused disasters, and response to disasters.

Volusia County has an HCP titled ''A Plan for the Protection for Sea Turtles on the Beaches of Volusia County, Florida'' that includes sea turtle nest monitoring, nest protection from vehicles on the beach, the operation of a rehabilitation center, public education, dune restoration, artificial light management, and a washback watchers program (Volusia County Environmental Management 2008, pp. 164–170). These measures apply to the private lands within this critical habitat unit and are intended to minimize and mitigate impacts to nesting and hatchling loggerhead sea turtles as a result of the County-authorized beach driving.

Central Eastern Florida Region

LOGG–T–FL–06—Canaveral National Seashore North, Volusia County: This unit consists of 18.2 km (11.3 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Mosquito Lagoon, and a network of coastal islands. The unit extends from the north boundary of Canaveral National Seashore to the Volusia-Brevard County line. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit

is in Federal ownership (see Table 1). It is part of the Canaveral National Seashore, which is managed by the National Park Service. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–07) that has high-density nesting by loggerhead sea turtles in the Central Eastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. Canaveral National Seashore has a General Management Plan that includes beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 1982b, p. 52).

LOGG–T–FL–07—Canaveral National Seashore South-Merritt Island NWR-Kennedy Space Center, Brevard County: This unit consists of 28.4 km (17.6 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Mosquito Lagoon, Indian River Lagoon, Merritt Island, and scattered coastal islands. The unit extends from the Volusia-Brevard County line to the south boundary of Merritt Island NWR-Kennedy Space Center (Merritt Island NWR was established in 1963 as an overlay of the National Aeronautics and Space Administration's (NASA) John F. Kennedy Space Center). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). The northern portion is part of the Canaveral National Seashore in Brevard County, which is managed by the National Park Service. The southern portion is part of Merritt Island NWR-Kennedy Space Center, which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Eastern Florida Region of the Peninsular Florida Recovery Unit. (Note: Although the mean nesting densities in this unit were not in the top 25 percent of nesting for the Central Eastern Florida Region, the unit was included because of the still high nesting density that occurs here and to ensure a good spatial distribution of nesting within this region.)

This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of predation, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Canaveral National Seashore has a General Management Plan that includes beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 1982b, p. 52). Merritt Island NWR has a Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2008a, pp. 82, 93–94).

LOGG–T–FL–08—Central Brevard Beaches, Brevard County: This unit consists of 19.5 km (12.1 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Indian River Lagoon, Banana River, and Merritt Island. The unit extends from the south boundary of Patrick Air Force Base to the north boundary of Archie Carr NWR. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The County portion includes Paradise Beach North, Spessard Holland North Beach Park, Spessard Holland South Beach Park, and Ocean Ridge Sanctuary, which are managed by the Brevard County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Eastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, coastal development, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–09—South Brevard Beaches, Brevard County: This unit consists of 20.8 km (12.9 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Indian River Lagoon, and scattered coastal islands. The unit extends from the north boundary of Archie Carr NWR to Sebastian Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal, State, private, and other ownership (see Table 1). The Federal portion is part of Archie Carr NWR, which is managed by USFWS. The State portion is part of Sebastian Inlet State Park, which is managed by FDEP. The Brevard County portion includes Sea Oats Park, Coconut Point Park, Ponce Landing and Coconut Point Sanctuary, Twin Shores Park, Hog Point Sanctuary, Apollo Eleven Park, Martine Hammock Sanctuary, Judith Resnick Memorial Park, Barrier Island Ecosystem Center, and Louis Bonsteel III Memorial Park, which are managed by the Brevard County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Eastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

Archie Carr NWR has a Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, minimizing human disturbance, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2008b, pp. 74–76). Sebastian Inlet State Park has a Unit Management Plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, nonnative species removal when encountered (feral cats, feral hogs, and nine-banded armadillos), problem native species removal (raccoons), and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2008a, pp. 39–41).

LOGG–T–FL–10—Sebastian Inlet-Indian River Shores, Indian River County: This unit consists of 21.4 km (13.3 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Indian River Lagoon, Indian River Narrows, a network of coastal islands, and salt marsh. The unit extends from Sebastian Inlet to the Indian River Shores southern city limits. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal, State, private, and other ownership (see Table 1). The Federal

portion is part of Archie Carr NWR, which is managed by USFWS. The State portion is part of Sebastian Inlet State Park, which is managed by the Florida Department of Environmental Protection. The County portion includes Treasure Shores Park, Golden Sands Park, and Captain Forster Hammock Preserve, which are managed by the Indian River County Public Works Division. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–09) that has high-density nesting by loggerhead sea turtles in the Central Eastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

The Archie Carr NWR has a Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, minimizing human disturbance, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2008b, pp. 74–76). The Sebastian Inlet State Park has a Unit Management Plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, removal of nonnative species (feral cats, feral hogs, and nine-banded armadillos) when encountered and problem native species (raccoons), and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2008a, pp. 39–41). Indian River County has an HCP titled ''Habitat Conservation Plan for the Protection of Sea Turtles on the Eroding Beaches of Indian River County, Florida'' that covers the beaches outside of the State Park and Refuge, and includes sea turtle nest monitoring, nest protection from armoring construction, artificial light management, education, land management, and predator control (Indian River County Public Works Department 2003, pp. 105–108, 113–117, 123–126). These measures apply to both the private and other lands within this proposed critical habitat unit and are intended to minimize and mitigate impacts to nesting and hatchling loggerhead sea turtles as a result of the County-authorized emergency beach armoring.

Southeastern Florida Region

LOGG–T–FL–11—Fort Pierce Inlet-St. Lucie Inlet, St. Lucie and Martin Counties: This unit consists of 35.2 km (21.9 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway and the Indian River Lagoon. The unit extends from Fort Pierce Inlet to St. Lucie Inlet. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The St. Lucie County portion includes Blind Creek Natural Area and John Brooks Park, which are managed by the St. Lucie County Environmental Resources Department. The St. Lucie County portion also includes Fredrick Douglas Memorial Park, Ocean Bay, Blind Creek Beach, and Dollman Tract, which are managed by the St. Lucie Parks, Recreation, and Facility Department. The Martin County portion includes Glasscock Beach Park, Sea Turtle Park, Jensen Beach Park, Muscara, Bob Graham Beach Park, Curtis Beach Park, Beachwalk Pasley, Bryn Mawr Beach, Virginia Forrest Beach Park, Tiger Shores Beach, Stuart Beach Park and Addition, Santa Lucea, Olsen Property, Clifton S. Perry Beach, House of Refuge Park, Chastain Beach Park, and Bathtub Beach Park, which are managed by the Martin County Parks and Recreation Department.

This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southeastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. John Brooks Park has a management plan that includes protection of nests and nonnative species removal to minimize impacts to nesting and hatchling loggerhead sea turtles (St. Lucie County Environmental Resources Department 2008, p. 29). Blind Creek Natural Area has a draft management plan that includes nonnative plant (*Casuarina equisetifolia* (Australian pine)) removal to minimize impacts to nesting and hatchling loggerhead sea turtles (St. Lucie County Environmental Resources Department 2011, p. 26).

LOGG–T–FL–12—St. Lucie Inlet-Jupiter Inlet, Martin and Palm Beach Counties: This unit consists of 24.9 km (15.5 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Great Pocket, Peck Lake, Hobe Sound, South Jupiter Narrows, Jupiter Sound, and a network of coastal islands. The unit extends from St. Lucie Inlet to Jupiter Inlet. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal, State, private, and other ownership (see Table 1). The Federal portion is Hobe Sound NWR, which is managed by USFWS. The State portion is St. Lucie Inlet Preserve State Park, which is managed by FDEP. The County portion is Coral Cove Park, which is managed by the Palm Beach County Parks and Recreation Department. A portion of the private lands includes Blowing Rocks Preserve, which is owned and managed by The Nature Conservancy. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southeastern Florida Region of the Peninsular Florida Recovery Unit.

This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Hobe Sound NWR has a Comprehensive Conservation Plan that includes working with partners on the implementation of sea turtle nesting surveys, nest marking, education, nonnative species removal, and minimizing human disturbance intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2006, pp. 81–86). St. Lucie Inlet Preserve State Park has a Unit Management Plan that includes maintaining a long-term data set of sea turtle nests, removal of nonnative species (feral cats) when encountered and problem native species (raccoons), and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2002a, pp. 20–21).

LOGG–T–FL–13—Jupiter Inlet-Lake Worth Inlet, Palm Beach County: This unit consists of 18.8 km (11.7 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Lake Worth Creek, Lake Worth, Munyon Island, Little Munyon

Island, Singer Island, and Peanut Island. The unit extends from Jupiter Inlet to Lake Worth Inlet. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, private, and other ownership (see Table 1). The State portion is John D. MacArthur Beach State Park, which is managed by FDEP. The County portion includes Jupiter Beach Park, Carlin Park, Radnor, Juno Dunes Natural Area, and Loggerhead Park, which are managed by the Palm Beach County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southeastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach placement activities, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. John D. MacArthur Beach State Park has a Unit Management Plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, artificial lighting management, problem species removal, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2005a, pp. 20–21).

LOGG–T–FL–14—Lake Worth Inlet-Boynton Inlet, Palm Beach County: This unit consists of 24.3 km (15.1 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Lake Worth, and scattered coastal islands. The unit extends from Lake Worth Inlet to Boynton Inlet. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southeastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–15—Boynton Inlet-Boca Raton Inlet, Palm Beach County: This unit consists of 22.6 km (14.1 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Lake Rogers, Lake Wyman, and Lake Boca Raton. The unit extends from Boynton Inlet to Boca Raton Inlet. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The County portion is Ocean Ridge Hammock Park, which is managed by the Palm Beach County Parks and Recreation Department. The municipality portion includes Spanish River Park, Red Reef Park, and South Beach Park, which are managed by the City of Boca Raton. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from adjacent units (LOGG–T–FL–14 and LOGG–T–FL–16) that have high-density nesting by loggerhead sea turtles in the Southeastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–16—Boca Raton Inlet-Hillsboro Inlet, Palm Beach and Broward Counties: This unit consists of 8.3 km (5.2 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway and the Hillsboro River. The unit extends from Boca Raton Inlet to Hillsboro Inlet. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The County portion is South Inlet Park, which is managed by the Palm Beach County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southeastern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–17—Long Key, Monroe County: This unit consists of 4.2 km (2.6 miles) of island shoreline along the Atlantic Ocean. The island is bordered on the east by the Atlantic Ocean, on the west by Florida Bay, and on the north and south by natural channels between Keys (Fiesta Key to the north and Conch Key to the south). This unit extends from the natural channel between Fiesta Key and Long Key to the natural channel between Long Key and Conch Key. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). The island is managed by FDEP as Long Key State Park. This unit was occupied at the time of listing and is currently occupied. This unit was included to ensure conservation of the unique nesting habitat in the Florida Keys. Nesting beaches in the Florida Keys are unique from the other beaches in the Peninsular Florida Recovery Unit in that they are limestone islands with narrow, low-energy beaches (beaches where waves are not powerful); they have carbonate sands; and they are relatively close to the major offshore currents that facilitate the dispersal of post-hatchling loggerheads. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, sand beach placement activities, climate change, beach erosion, human-caused disasters, and response to disasters. Long Key State Park has a Unit Management Plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, problem species removal, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2004b, pp. 18–19).

LOGG–T–FL–18—Bahia Honda Key, Monroe County: This unit consists of 3.7 km (2.3 miles) of island shoreline along the Atlantic Ocean. The island is bordered on the east by the Atlantic Ocean, on the west by Florida Bay, and on the north and south by natural channels between Keys (Ohio Key to the

north and Spanish Harbor Key to the south). This unit extends from the natural channel between Ohio Key and Bahia Honda Key to the natural channel between Bahia Honda Key and Spanish Harbor Key. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). The island is managed by FDEP as Bahia Honda State Park. This unit was occupied at the time of listing and is currently occupied. This unit was included to ensure conservation of the unique nesting habitat in this Florida Keys. Nesting beaches in the Florida Keys are unique from the other beaches in the Peninsular Florida Recovery Unit in that they are limestone islands with narrow, low-energy beaches; they have carbonate sands; and they are relatively close to the major offshore currents that are known to facilitate the dispersal of post-hatchling loggerheads. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. Bahia Honda State Park has a Unit Management Plan that includes procedures for the implementation of sea turtle nesting surveys and nest marking intended to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2003a, pp. 18–20).

Central Western Florida Region

LOGG–T–FL–19—Longboat Key, Manatee and Sarasota Counties: This unit consists of 16.0 km (9.9 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by Sarasota Pass. The unit extends from Longboat Pass to New Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–20) that has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–20—Siesta and Casey Keys, Sarasota County: This unit consists of 20.8 km (13.0 miles) of island shoreline along the Gulf of Mexico. It includes the shoreline of Siesta Key and Casey Key, which were originally two separate islands divided by Midnight Pass. When Midnight Pass was closed in 1983, the two islands were combined into a single island. The island is separated from the mainland by the Intracoastal Waterway, Roberts Bay, Little Sarasota Bay, Dryman Bay, Blackburn Bay, and scattered coastal islands. The unit extends from Big Sarasota Pass to Venice Inlet. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The County portion includes Turtle Beach County Park and Palmer Point County Park, which are managed by the Sarasota County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–21—Venice Beaches and Manasota Key, Sarasota and Charlotte Counties: This unit consists of 26.0 km (16.1 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Intracoastal Waterway, Roberts Bay, Red Lake, Lemon Bay, and scattered coastal islands. The unit extends from Venice Inlet to Stump Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, private, and other ownership (see Table 1). The State portion is Stump Pass Beach State Park, which is managed by FDEP. The Sarasota County portion includes Service Club Park, Brohard Beach, Paw Beach, Caspersen Beach County Park, and Blind Pass Park, which are managed by the Sarasota County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Stump Pass Beach State Park has a Unit Management Plan that includes procedures for the implementation of sea turtle nesting surveys, nest marking, education, problem species (raccoons) removal, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2003b, pp. 4–5).

LOGG–T–FL–22—Knight, Don Pedro, and Little Gasparilla Islands, Charlotte County: This unit consists of 10.8 km (6.7 miles) of island shoreline along the Gulf of Mexico. It includes the shoreline of Knight Island, Don Pedro Island, and Little Gasparilla Island, which were originally three separate islands divided by passes. When the passes closed during the 1960s, the three islands were combined into a single island. The island is separated from the mainland by the Intracoastal Waterway, Lemon Bay, Placida Harbor, and scattered keys and islands. The unit extends from Stump Pass to Gasparilla Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is Don Pedro Island State Park, which is managed by FDEP. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Don Pedro Island State Park has a Unit Management Plan that includes procedures for the implementation of nesting surveys, nest marking, education, problem species removal, and beach management to protect nesting and hatchling loggerhead sea turtles from

anthropogenic disturbances (FDEP 2001a, pp. 16–20).

LOGG–T–FL–23—Gasparilla Island, Charlotte and Lee Counties: This unit consists of 11.2 km (6.9 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Intracoastal Waterway, Gasparilla Sound, Charlotte Harbor, Turtle Bay, Bull Bay, and a network of keys. The unit extends from Gasparilla Pass to Boca Grande Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is Gasparilla Island State Park, which is managed by FDEP. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Gasparilla Island State Park has a Unit Management Plan that includes procedures for the implementation of nesting surveys, nest marking, terrestrial predator control, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2002b, p. 4).

LOGG–T–FL–24—Cayo Costa, Lee County: This unit consists of 13.5 km (8.4 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Intracoastal Waterway, Pine Island Sound, Matlacha Pass, Pelican Bay, Primo Bay, Pine Island, Little Pine Island, and numerous smaller keys and islands. The unit extends from Boca Grande Pass to Captiva Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is Cayo Costa State Park, which is managed by FDEP. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–23) that has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, climate change, beach erosion, human-caused disasters, and response to disasters. Cayo Costa State Park has a Unit Management Plan that includes procedures for the implementation of nesting surveys, nest marking, terrestrial predator control, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2005b, pp. 14, 30).

LOGG–T–FL–25—Captiva Island, Lee County: This unit consists of 7.6 km (4.7 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Intracoastal Waterway, Pine Island Sound, Matlacha Pass, San Carlos Bay, Pine Island, and scattered keys and islands. The unit extends from Redfish Pass to Blind Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–26) that has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–26—Sanibel Island West, Lee County: This unit consists of 12.2 km (7.6 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Intracoastal Waterway, San Carlos Bay, Pine Island Sound, Matlacha Pass, Pine Island, and numerous keys and islands. The unit extends from Blind Pass to Tarpon Bay Road. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The municipality portion includes Silver Key and Bowman's Beach Regional Park, which are managed by the City of Sanibel Natural Resources Department. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Central Western Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

Southwestern Florida Region

LOGG–T–FL–27—Little Hickory Island, Lee and Collier Counties: This unit consists of 8.7 km (5.4 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by Estero Bay, Hogue Channel, Fish Trap Bay, Little Hickory Bay, Big Hickory Island, and extensive mangroves and mangrove islands. The unit extends from Big Hickory Pass to Wiggins Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private and other ownership (see Table 1). The Collier County portion is Barefoot Beach County Preserve Park, which is managed by the Collier County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–26) that has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, habitat obstructions, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–28—Wiggins Pass-Clam Pass, Collier County: This unit consists of 7.7 km (4.8 miles) of mainland shoreline along the Gulf of Mexico. This section of the mainland is bounded on the west by Vanderbilt Channel, Vanderbilt Lagoon, Inner Clam Bay, and extensive mangrove vegetative shorelines. The unit extends from Wiggins Pass to Clam Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, private, and other ownership

(see Table 1). The State portion is Delnor–Wiggins Pass State Park, which is managed by FDEP. The County portion is Vanderbilt Beach County Park, which is managed by the Collier County Parks and Recreation Department. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–30) that has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Delnor–Wiggins Pass State Park has a Unit Management Plan that includes procedures for the implementation of nesting surveys, nest marking, terrestrial predator control, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2009b, pp. 16–23).

LOGG–T–FL–29—Clam Pass-Doctors Pass, Collier County: This unit consists of 4.9 km (3.0 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by Moorings Bay, Outer Doctors Bay, Inner Doctors Bay, Venetian Bay, and Outer Clam Bay. The unit extends from Clam Pass to Doctors Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–30) that has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–30—Keewaydin Island and Sea Oat Island, Collier County: This unit consists of 13.1 km (8.1 miles) of island shoreline along the Gulf of Mexico. These islands are separated from the mainland by Dollar Bay, Bartell Bay, Periwinkle Bay, Rookery Bay, Hall Bay, Nature Conservancy Bay, Johnson Bay, Shell Bay, Sand Hill Bay, Hall Bay, Little Marco Pass, and a network of mangroves, coastal islands, and salt marsh. The unit extends from Gordon Pass to Big Marco Pass. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State and part of the private ownership (National Audubon Society) portions are part of the Rookery Bay National Estuarine Research Reserve (NERR), which is managed by FDEP's Office of Coastal and Aquatic Managed Areas. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, beach sand placement activities, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Rookery Bay NERR has a management plan that includes working with partners for the implementation of nesting surveys, nest marking, terrestrial predator control, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2012a, pp. 62–77, 223, 269).

LOGG–T–FL–31—Cape Romano, Collier County: This unit consists of 9.2 km (5.7 miles) of island shoreline along the Gulf of Mexico and Gullivan Bay. Cape Romano is a coastal island complex within the Rookery Bay National Estuarine Research Reserve (NERR) and is located off the southwest coast of Florida in Collier County. Loggerhead sea turtle nesting has been regularly monitored and documented within this island complex. This island complex is separated from the mainland by Caxambas Bay, Grassy Bay, Barfield Bay, Goodland Bay, Gullivan Bay, and a network of other keys and islands. From north to south, the islands and keys included in this unit are: Kice Island, Big Morgan Island, Morgan Keys, Carr Island, and Cape Romano Island. Kice Island is in State ownership and is part of Rookery Bay NERR. It has 3.9 km (2.4 miles) of shoreline. Big Morgan Island is in State ownership (as part of Rookery Bay NERR) and other ownership. It has 1.4 km (0.9 miles) of shoreline. Morgan Key is in State ownership (as part of Rookery Bay NERR) and other ownership. It has 0.7 km (0.4 miles) of shoreline. Carr Island is in State ownership and is part of Rookery Bay NERR. It has 0.3 km (0.2 miles) of shoreline. Cape Romano is in State ownership (as part of Rookery Bay NERR) and other ownership. It has 2.9 km (1.8 miles) of shoreline. The unit extends from Caxambas Pass to Gullivan Bay. This unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and other ownership (see Table 1). The State portion is part of the Rookery Bay NERR, which is owned by the State of Florida and managed by FDEP's Office of Coastal and Aquatic Managed Areas.

This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. Rookery Bay NERR has a management plan that includes working with partners for the implementation of nesting surveys, nest marking, terrestrial predator control, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2012a, pp. 62–77, 223, 269).

LOGG–T–FL–32—Ten Thousand Islands North, Collier County: This unit consists of 7.8 km (4.9 miles) of island shoreline along the Gulf of Mexico. The Ten Thousand Islands are a chain of islands and mangrove islets off the southwest coast of Florida in Collier and Monroe Counties. This unit includes nine keys where loggerhead sea turtle nesting has been documented within the northern part of the Ten Thousand Islands in Collier County in both the Ten Thousand Islands NWR and the Rookery Bay National Estuarine Research Reserve (NERR). These keys are separated from the mainland by Sugar Bay, Palm Bay, Blackwater Bay, Buttonwood Bay, Pumpkin Bay, Santina Bay, and a network of keys and islands. From west to east and north to south, these nine keys are: Coon Key, Brush Island, B Key, Turtle Key, Gullivan Key, White Horse Key, Hog Key, Panther Key, and Round Key.

Coon Key is part of Ten Thousand Islands NWR and has 0.4 km (0.2 mile) of shoreline. Brush Island is in State

ownership and is part of Rookery Bay NERR. It has 0.6 km (0.4 mile) of shoreline. B Key (25.89055 N, 81.59641 W) is in Federal and State ownership and is part of both Ten Thousand Islands NWR and Rookery Bay NERR. It has 0.5 km (0.3 mile) of shoreline. Turtle Key is in State ownership and is part of Rookery Bay NERR. It has 0.5 km (0.3 mile) of shoreline. Gullivan Key is in State ownership and is part of Rookery Bay NERR. It has 1.1 km (0.7 mile) of shoreline. White Horse Key is in State ownership and is part of Rookery Bay NERR. It has 1.6 km (1.0 mile) of shoreline. Hog Key is in Federal and State ownership and is part of both Ten Thousand Islands NWR and Rookery Bay NERR. It has 0.9 km (0.6 mile) of shoreline. Panther Key is in Federal ownership and is part of Ten Thousand Islands NWR. It has 2.0 km (1.3 miles) of shoreline. Round Key is in Federal ownership and is part Ten Thousand Islands NWR. It has 0.3 km (0.2 mile) of shoreline.

The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal and State ownership (see Table 1). The Ten Thousand Islands NWR portion is managed by USFWS. The Rookery Bay NERR portion is managed by FDEP's Office of Coastal and Aquatic Managed Areas. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–31) that has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. Rookery Bay NERR has a management plan that includes working with partners for the implementation of nesting surveys, nest marking, terrestrial predator control, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2012a, pp. 62–77, 223, 269). Thousand Islands NWR has a Comprehensive Conservation Plan that includes implementation of nesting surveys, nest marking, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2001, pp. 12, 20–22).

LOGG–T–FL–33—Highland Beach, Monroe County: This unit consists of 7.2 km (4.5 miles) of island (Key McLaughlin) shoreline along the Gulf of Mexico. The island is separated from the mainland by Rogers River Bay, Big Bay, Big Lostmans Bay, extensive salt marsh, and a network of keys and islands. The unit extends from First Bay to Rogers River Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is part of the Everglades National Park, which is managed by the National Park Service. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–34) that has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, climate change, beach erosion, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–34—Graveyard Creek–Shark Point, Monroe County: This unit consists of 0.9 km (0.6 mile) of mainland shoreline along the Gulf of Mexico. The unit extends from Shark Point (25.38796 N, 81.14933 W) to Graveyard Creek Inlet. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is part of the Everglades National Park, which is managed by the National Park Service. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–FL–35—Cape Sable, Monroe County: This unit consists of 21.3 km (13.2 miles) of mainland shoreline along the Gulf of Mexico. The unit extends from the north boundary of Cape Sable at 25.25924 N, 81.16687 W to the south boundary of Cape Sable at 25.12470 N, 81.06681 W. Land in this unit is in Federal ownership (see Table 1). It is part of the Everglades National Park, which is managed by the National Park Service. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Southwestern Florida Region of the Peninsular Florida Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

Dry Tortugas Recovery Unit

LOGG–T–FL–36—Dry Tortugas, Monroe County: This unit consists of 6.3 km (3.9 miles) of shoreline along the Gulf of Mexico. The Dry Tortugas are a small group of seven islands located at the end of the Florida Keys about 108 km (67 miles) west of Key West. This unit includes six islands where loggerhead sea turtle nesting has been documented within the Dry Tortugas. From west to east, these six islands are: Loggerhead Key, Garden Key, Bush Key, Long Key, Hospital Key, and East Key. Loggerhead Key is the largest island in the chain and has 2.4 km (1.5 miles) of beach. Garden Key, the second largest island in the chain, is 4.0 km (2.5 miles) east of Loggerhead Key and has 0.8 km (0.5 mile) of beach. Bush Key is located 0.1 km (0.1 mile) east of Garden Key and has 2.0 km (1.3 mile) of beach; Bush Key is occasionally connected to Garden Key by a sand bar. Long Key is located 0.1 km (0.1 mile) south of the eastern end of Bush Key and has 0.3 km (0.2 mile) of beach; Long Key is occasionally connected to Bush Key by a sand bar. Hospital Key is located 2.5 km (1.6 miles) northeast of Garden Key and Bush Key and has 0.2 km (0.1 mile) of beach. East Key is located 0.6 km (0.3 miles) east of Middle Key (Middle Key is not included in the unit) and has 0.6 km (0.3 mile) of beach.

The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is part of the Dry Tortugas National Park, which is managed by the National Park Service. This unit was occupied at the time of listing and is currently occupied. This unit was included because of the extremely small size of the Dry Tortugas Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require

special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, habitat obstructions, human-caused disasters, and response to disasters. Dry Tortugas National Park has a General Management Plan that includes special protection zones intended to manage the beach to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 2000, p. 38).

LOGG–T–FL–37—Marquesas Keys, Monroe County: This unit consists of 5.6 km (3.5 miles) of shoreline along the Gulf of Mexico. The Marquesas Keys are a small group of eight islands located at the end of the Florida Keys about 29.3 km (18.2 miles) west of Key West. This unit includes four islands where loggerhead sea turtle nesting has been documented within the Marquesas Keys: Marquesas Key, Unnamed Key 1, Unnamed Key 2, and Unnamed Key 3. Marquesas Key is the largest key in the northeastern region of the island group and has 3.8 km (2.4 miles) of shoreline. Unnamed Keys 1, 2, and 3 are at the far westernmost side of the island group. Unnamed Key 1 is the northernmost key of the three and has 0.4 km (0.2 mile) of shoreline. Unnamed Key 2 is just south of Unnamed Key 1 and has 1.0 km (0.6 mile) of shoreline. Unnamed Key 3 is southwest of Unnamed Key 2 and has 0.5 km (0.3 mile) of shoreline.

The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). The Marquesas Keys are part of the Key West NWR, which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit was included because of the extremely small size of the Dry Tortugas Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, climate change, beach erosion, human-caused disasters, and response to disasters. Key West NWR is included within the Lower Florida Keys National Wildlife Refuges Comprehensive Conservation Plan, which includes implementation of nesting surveys, nest marking, debris removal, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2009, pp. 67–68).

LOGG–T–FL–38—Boca Grande Key, Monroe County: This unit consists of 1.3 km (0.8 mile) of island shoreline along the Gulf of Mexico. Boca Grande Key is one of the outlying islands of the Florida Keys and is located about 18.9 km (11.7 miles) west of Key West. The unit extends from 24.53767 N, 82.00763 W (at the northern end of the key) to 24.52757 N, 82.00581 W (at the southern end of the key). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is part of the Key West NWR, which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit was included because of the extremely small size of the Dry Tortugas Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, climate change, beach erosion, human-caused disasters, and response to disasters. Key West NWR is included within the Lower Florida Keys National Wildlife Refuges Comprehensive Conservation Plan, which includes implementation of nesting surveys, nest marking, debris removal, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2009, pp. 67–68).

LOGG–T–FL–39—Woman Key, Monroe County: This unit consists of 1.3 km (0.8 mile) of island shoreline along the Gulf of Mexico. Woman Key is one of the outlying islands of the Florida Keys and is located about 15.9 km (9.9 miles) west of Key West. The unit extends from 24.52452 N, 81.97893 W (at the western end of the key) to 24.52385 N, 81.96680 W (at the eastern end of the key). The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). It is part of the Key West NWR, which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit was included because of the extremely small size of the Dry Tortugas Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, climate change, beach erosion, human-caused disasters, and response to disasters. Key West NWR is included within the Lower Florida Keys National Wildlife Refuges Comprehensive Conservation Plan, which includes implementation of nesting surveys, nest marking, debris removal, and predator removal intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2009, pp. 67–68).

Northern Gulf of Mexico Recovery Unit

Mississippi

LOGG–T–MS–01—Horn Island, Jackson County: This unit consists of 18.6 km (11.5 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Gulf Intracoastal Waterway, Mississippi Sound, Pascagoula Bay, and scattered coastal islands. The unit extends from Dog Keys Pass to the easternmost point of the ocean facing island shore. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal and private ownership (see Table 1). The Federal portion is part of the Gulf Islands National Seashore, Mississippi District, which is managed by the National Park Service. This unit was occupied at the time of listing and is currently occupied. Nesting was confirmed by weekly aerial surveys prior to 2006. Although regular surveys have not been conducted since 2005, loggerhead nesting was documented in 2010 and 2011 during the Deepwater Horizon event response efforts. This unit was included because Horn Island has been documented as one of two islands in Mississippi with the greatest number of nests.

This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. The existing Gulf Islands National Seashore General Management Plan includes controlling nonnative species to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 1978, p. 46). The management plan is being revised and a draft is under review. The draft Gulf Islands National Seashore General Management Plan includes management efforts that would emphasize sea turtle nest monitoring and closure areas around nests intended to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 2011, p. 85).

LOGG–T–MS–02—Petit Bois Island, Jackson County: This unit consists of 9.8 km (6.1 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Gulf Intracoastal Waterway, Mississippi Sound, Point Aux Chenes Bay, scattered coastal islands, and salt marsh. The unit extends from Horn Island Pass to Petit Bois Pass. The unit includes lands from

the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). Petit Bois Island is part of the Gulf Islands National Seashore, Mississippi District, which is managed by the National Park Service. This unit was occupied at the time of listing and is currently occupied. Nesting was confirmed by weekly aerial surveys prior to 2006. Although regular surveys have not been conducted since 2005, loggerhead nesting was documented in 2010 and 2011 during Deepwater Horizon event response efforts. This unit was included because Petit Bois Island has been documented as one of two islands in Mississippi with the greatest number of nests.

This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, human-caused disasters, and response to disasters. The existing Gulf Islands National Seashore General Management Plan includes controlling nonnative species to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 1978, p. 46). The management plan is being revised, and a draft is under review. The draft Gulf Islands National Seashore General Management Plan includes management efforts that would emphasize sea turtle nest monitoring and closure areas around nests intended to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 2011, p. 85).

Alabama

LOGG–T–AL–01—Mobile Bay-Little Lagoon Pass, Baldwin County: This unit consists of 28.0 km (17.4 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Gulf Intracoastal Waterway, Bon Secour Bay, and Little Lagoon. The unit extends from Mobile Bay Inlet to Little Lagoon Pass. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal, State, and private ownership (see Table 1). The Federal portion includes part of the Bon Secour NWR and four Bureau of Land Management (BLM) parcels, which are managed by USFWS. The State portion includes Fort Morgan State Park, which is managed by USFWS. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in Alabama. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. Bon Secour NWR has a Comprehensive Conservation Plan that includes working with partners for the implementation of nesting surveys, nest marking, education, minimizing human disturbance, predator removal, and other conservation efforts intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2005, pp. 54–55).

LOGG–T–AL–02—Gulf State Park-Perdido Pass, Baldwin County: This unit consists of 10.7 km (6.7 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Gulf Intracoastal Coastal Waterway, Shelby Lakes, Little Lake, Portage Creek, Wolf Bay, Bay La Launch, Cotton Bayou, and Terry Cove. The unit extends from the west boundary of Gulf State Park to Perdido Pass. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is part of Gulf State Park, which is managed by the Alabama State Parks. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in Alabama. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, coastal development, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

LOGG–T–AL–03—Perdido Pass-Florida-Alabama line, Baldwin County: This unit consists of 3.3 km (2.0 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Gulf Intracoastal Waterway, Old River, Bayou St. John, Terry Cover, Amica Bay, and coastal islands. The unit extends from Perdido Pass to the Alabama-Florida border. This area is referred to as Alabama Point. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is part of Gulf State Park, which is managed by the Alabama State Parks. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–AL–02) that has high-density nesting by loggerhead sea turtles in Alabama. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, beach sand placement activities, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

Florida

LOGG–T–FL–40—Perdido Key, Escambia County: This unit consists of 20.2 km (12.6 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Gulf Intracoastal Waterway, Old River, Perdido Bay, Big Lagoon, and coastal islands. The unit extends from the Alabama-Florida border to Pensacola Pass. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal, State, and private ownership (see Table 1). The Federal portion is part of Gulf Islands National Seashore, Florida District, which is managed by the National Park Service. The State portion is Perdido Key State Park, which is managed by FDEP. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–AL–02) that has high-density nesting by loggerhead sea turtles in the Alabama portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, beach sand placement activities, in-water and shoreline alterations, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

The existing Gulf Islands National Seashore General Management Plan includes controlling nonnative species to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 1978, p. 46). The management plan is being revised, and a draft is under review. The draft Gulf Islands National Seashore General Management Plan includes management efforts that would emphasize sea turtle nest monitoring and closure areas

around nests intended to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (National Park Service 2011, p. 77). Perdido Key State Park has a Unit Management Plan that includes procedures for the implementation of nesting surveys, nest marking, terrestrial predator control, debris removal, artificial light reduction in adjacent developed areas, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2006b, p. 5).

LOGG–T–FL–41—Mexico Beach and St. Joe Beach, Bay and Gulf Counties: This unit consists of 18.7 km (11.7 miles) of mainland shoreline along the Gulf of Mexico. The unit extends from the eastern boundary of Tyndall Air Force Base to Gulf County Canal in St. Joseph Bay. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private ownership (see Table 1). This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–42) that has high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, in-water and shoreline alterations, beach sand placement activities, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this unit.

LOGG–T–FL–42—St. Joseph Peninsula, Gulf County: This unit consists of 23.5 km (14.6 miles) of a spit shoreline along the Gulf of Mexico. The spit is separated from the mainland by St. Joseph Bay. The unit extends from St. Joseph Bay to the west boundary of Eglin Air Force Base. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion includes T.H. Stone Memorial St. Joseph Peninsula State Park and part of the St. Joseph Bay Aquatic Preserve, which are managed by FDEP. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach sand placement activities, beach driving, predation, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters.

T.H. Stone Memorial St. Joseph Peninsula State Park has a Unit Management Plan that includes procedures for the implementation of nesting surveys, nest marking, terrestrial predator control, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2001b, pp. 4–5, 18). The St. Joseph Bay Aquatic Preserve Management Plan includes working with partners on the implementation of nesting surveys, nest marking, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2008b, pp. 50–51, 77). Gulf County has a draft HCP that could include sea turtle nest monitoring, nest protection from vehicles on the beach, public education, artificial light management, land acquisition, beach horseback riding ordinance enforcement, and predator control. These measures apply to the private lands within this critical habitat unit and are intended to minimize and mitigate impacts to nesting and hatchling loggerhead sea turtles as a result of the County-authorized beach driving (Gulf County Board of County Commissioners 2004, pp. 5–6–5–10).

LOGG–T–FL–43—Cape San Blas, Gulf County: This unit consists of 11.0 km (6.8 miles) of mainland and spit shoreline along the Gulf of Mexico. The unit extends from the east boundary of Eglin Air Force Base to Indian Pass. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State, private, and other ownership (see Table 1). The State portion is part of St. Joseph Bay State Buffer Preserve, which is managed by FDEP. The County portion is Salinas Park, which is managed by Gulf County. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from adjacent units (LOGG–T–FL–42 and LOGG–T–FL–44) that have high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, coastal development, climate change, beach erosion, artificial lighting, habitat obstructions, human-caused disasters, and response to disasters. The draft St. Joseph Bay State Buffer Preserve Management Plan includes predator control (FDEP 2012b, p. 33).

LOGG–T–FL–44—St. Vincent Island, Franklin County: This unit consists of 15.1 km (9.4 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by St. Vincent Sound. The unit extends from Indian Pass to West Pass. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in Federal ownership (see Table 1). This unit is managed by USFWS as the St. Vincent NWR. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. St. Vincent NWR has a draft Comprehensive Conservation Plan that includes the implementation of nesting surveys, nest marking, education, minimizing human disturbance, predator removal, and other conservation efforts intended to minimize impacts to nesting and hatchling loggerhead sea turtles (USFWS 2012, pp. 64–65).

LOGG–T–FL–45—Little St. George Island, Franklin County: This unit consists of 15.4 km (9.6 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by Apalachicola Bay and St. Vincent Sound. The unit extends from West Pass to Bob Sikes Cut. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State ownership (see Table 1). This unit is managed by FDEP as the Apalachicola NERR. This unit was occupied at the time of listing and is currently occupied. This unit has high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. The existing Apalachicola NERR Management Plan includes

working with partners on the implementation of nesting surveys and controlling nonnative species to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 1998, pp. 78, 126, 161). The management plan is being revised, and a draft is under review. The draft management plan includes working with partners on the implementation of nesting surveys, nest marking, predator removal, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2011, pp. 48–49, 73–76).

LOGG–T–FL–46—St. George Island, Franklin County: This unit consists of 30.7 km (19.1 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by the Intracoastal Waterway, Apalachicola Bay, and East Bay. The unit extends from Bob Sikes Cut to East Pass. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in State and private ownership (see Table 1). The State portion is Dr. Julian G. Bruce St. George Island State Park, which is managed by FDEP. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–45) that has high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, predation, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. The Dr. Julian G. Bruce St. George Island State Park has a Unit Management Plan that includes procedures for the implementation of nesting surveys, nest marking, terrestrial predator control, debris removal, artificial light reduction in adjacent developed areas, education, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (FDEP 2003c, pp. 16–18).

LOGG–T–FL–47—Dog Island, Franklin County: This unit consists of 13.1 km (8.1 miles) of island shoreline along the Gulf of Mexico. The island is separated from the mainland by St. George Sound. The unit extends from East Pass to St. George Sound. The unit includes lands from the MHW line to the toe of the secondary dune or developed structures. Land in this unit is in private conservation ownership (The Nature Conservancy) (see Table 1). The unit includes the Jeff Lewis Wilderness Preserve, which is owned and managed by The Nature Conservancy. This unit was occupied at the time of listing and is currently occupied. This unit supports expansion of nesting from an adjacent unit (LOGG–T–FL–45) that has high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit. This unit contains all of the PBFs and PCEs. The PBFs in this unit may require special management considerations or protections to ameliorate the threats of recreational use, beach driving, predation, climate change, beach erosion, artificial lighting, human-caused disasters, and response to disasters. At this time, we are not aware of any management plans that address this species in this area.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including USFWS, to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with USFWS on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

Decisions by the 5th and 9th Circuit Courts of Appeals have invalidated our regulatory definition of ''destruction or adverse modification'' (50 CFR 402.02) (see *Gifford Pinchot Task Force* v. *U.S. Fish and Wildlife Service,* 378 F. 3d 1059 (9th Cir. 2004) and *Sierra Club* v. *U.S. Fish and Wildlife Service et al.,* 245 F.3d 434, 442 (5th Cir. 2001)), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are actions on State, tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from USFWS under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat, and actions on State, tribal, local, or private lands that are not federally funded or authorized, do not require section 7 consultation.

As a result of section 7 consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, or are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define ''reasonable and prudent alternatives'' (at 50 CFR 402.02) as alternative actions identified during consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action;

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction;

(3) Are economically and technologically feasible; and

(4) Would, in the Director's opinion, avoid the likelihood of jeopardizing the continued existence of the listed species and/or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have listed a new species or subsequently

designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies sometimes may need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

Application of the ''Adverse Modification'' Standard

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species. Activities that may destroy or adversely modify critical habitat are those that alter the physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for the loggerhead sea turtle. As discussed above, the role of critical habitat is to support life-history needs of the species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may destroy or adversely modify such habitat, or that may be affected by such designation.

Activities that may affect critical habitat, when carried out, funded, or authorized by a Federal agency, should result in consultation for the loggerhead sea turtle. These activities include, but are not limited to:

(1) Actions that would significantly alter beach sand characteristics. Such activities could include, but are not limited to, beach sand placement and beach driving. These activities may lead to changes to the nest incubation environment by altering gas exchange, moisture content, temperature, and hardness of the nesting substrate to levels that eliminate or reduce the suitability of habitat necessary for successful reproduction of the loggerhead sea turtle. However, beach sand placement projects conducted under the FWS's Statewide Programmatic Biological Opinion for the U.S. Army Corps of Engineers planning and regulatory sand placement activities (including post-disaster sand placement activities) in Florida and other individual biological opinions throughout the loggerhead's nesting range include required terms and conditions that minimize incidental take of turtles and, if incorporated, the sand placement projects are not expected to result in adverse modification of critical habitat.

(2) Actions that would significantly decrease adult female access to nesting habitat or hinder hatchling sea turtles emerging from the nest from reaching the ocean. Such activities could include, but are not limited to, coastal residential and commercial development, beach armoring, groin construction, and construction of other erosion control devices. These structures could act as barriers or deterrents to adult females attempting to access a beach to levels that eliminate or reduce the suitability of habitat necessary for successful reproduction of the loggerhead sea turtle.

(3) Actions that would significantly alter natural lighting levels. Such activities could include, but are not limited to, lighting of coastal residential and commercial structures, street lighting, bridge lighting, and other development or road infrastructure. These activities could increase the levels of artificial lighting visible from the beach and act as a deterrent to adult females attempting to access a beach or disorient hatchlings emerging from the nest and crawling to the ocean. Increased levels may eliminate or reduce the suitability of habitat necessary for successful reproduction of the loggerhead sea turtle.

Exemptions

Application of Section 4(a)(3) of the Act

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of natural resources to complete an integrated natural resources management plan (INRMP) by November 17, 2001. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found on the base. Each INRMP includes:

(1) An assessment of the ecological needs on the installation, including the need to provide for the conservation of listed species;

(2) A statement of goals and priorities;

(3) A detailed description of management actions to be implemented to provide for these ecological needs; and

(4) A monitoring and adaptive management plan.

Among other things, each INRMP must, to the extent appropriate and applicable, provide for fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108–136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) now provides: ''The Secretary shall not designate as critical habitat any lands or other geographic areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.''

We consult with the military on the development and implementation of INRMPs for installations with listed species. We analyzed INRMPs developed by military installations located within the range of the proposed critical habitat designation for the loggerhead sea turtle to determine if they are exempt under section 4(a)(3) of the Act. The following areas are Department of Defense lands with completed, USFWS-approved INRMPs within the proposed critical habitat designation.

Approved INRMPs

Marine Corps Base Camp Lejeune (Onslow Beach), NC, 12.4 km (7.7 Miles)

Marine Corps Base Camp Lejeune is the Marine Corps' largest amphibious training base and is home to 47,000 marines and sailors, the largest single concentration of marines in the world. The mission of Camp Lejeune is to train and maintain combat-ready units for expeditionary deployment anywhere in the world. Onslow Beach, one of two stretches of beach on the base, is used to support amphibious operations. Operations at the beach range from daily exercises by 2nd Amphibious Assault Battalion and Joint Armed Services training to periodic, large-scale training such as the quarterly Capability Exercises, which include explosives on the beach, inland artillery fire, and three Landing Craft Air Cushioned and 10 to 12 Amphibious Assault Vehicle landings (Marine Corps Base Camp Lejeune 2006, p. 1–10 and Appendix E).

Camp Lejeune encompasses an estimated 57,870 hectares (143,000 acres), including the onshore, nearshore, and surf areas in and adjacent to the Atlantic Ocean and the New River, in Onslow County, North Carolina. Onslow Beach consists of 12.4 km (7.7 miles) of island shoreline along the Atlantic Ocean. The island on which Onslow Beach is located is separated from the mainland by the Atlantic Intracoastal Waterway, Banks Channel, Salliers Bay, Wards Channel, and salt marsh. The boundaries of the island are from Browns Inlet to New River Inlet. Onslow Beach, which has been monitored for sea turtle nesting since 1979, has high-density nesting by loggerhead sea turtles in North Carolina.

The Marine Corps Base Camp Lejeune INRMP is a planning document that guides the management and conservation of natural resources under the installation's control. The INRMP was prepared to assist installation staff and users in managing natural resources more effectively so as to ensure that installation lands remain available and in good condition to support the installation's military mission. Camp Lejeune published its first INRMP in 2001 to guide resources management on the installation for the years 2002–2006. A revised INRMP was prepared in 2006 for the years 2007–2011. The existing INRMP will remain in use until its next revision, which the installation is preparing to initiate.

The 2006 INRMP includes the implementation of sea turtle nesting surveys, nest marking, and beach management to protect nesting and hatchling loggerhead sea turtles from anthropogenic disturbances (Marine Corps Base Camp Lejeune 2006, pp. 4–14–4–15). The INRMP identifies the goal of contributing to the recovery of the loggerhead sea turtle through development of ecosystem management-based strategies. The INRMP identifies the following management and protective measures to achieve this goal:

(1) Conduct nightly or morning ground sea turtle nest surveys on Onslow Beach during the nesting season;

(2) Conduct aerial surveys for sea turtle nests on Brown's Island and North Onslow Beach;

(3) Protect sea turtle nest sites with cages and restrictive signage;

(4) Move sea turtle nests that are in the amphibious training beach;

(5) Impose driving restrictions on Onslow Beach during the sea turtle nesting season, including restrictions to protect sensitive habitat south of Onslow South Tower;

(6) Rake ruts in front of sea turtle nests;

(7) Reduce sources of artificial lighting on Onslow Beach; and

(8) Monitor recreational or training impacts to Onslow Beach during the sea turtle nesting season.

In a letter dated October 25, 2012, Marine Corps Base Camp Lejeune provided information detailing its commitments to conduct additional activities that will benefit loggerhead sea turtles on Onslow Beach and Brown's Island. The commitments listed above will continue and will be added to the base's next INRMP. In addition, the following activities will be conducted and added to the next INRMP:

(1) Control sea turtle nest predators by implementing trapping to ensure that the annual rate of mammalian predator rate is 10 percent or lower; and

(2) Manage lighting by ensuring that all fixtures and bulbs conform to the guidelines in the technical report titled ''Understanding, Assessing, and Resolving Light Pollution Problems on Sea Turtle Nesting Beaches'' (Witherington and Martin 1996, pp. 20–27). Marine Corps Base Camp Lejeune will conduct a sea turtle lighting survey and submit a plan to retrofit any lights visible from the nesting beach. The plan will be reviewed and approved by USFWS prior to installation or replacement of lights.

Based on the above considerations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that the identified lands are subject to the Marine Corps Base Camp Lejeune INRMP and that conservation efforts identified in the INRMP will provide a benefit to the loggerhead sea turtle. Therefore, lands within this installation are exempt from critical habitat designation under section 4(a)(3) of the Act. We are not including 12.4 km (7.7 miles) of habitat in this proposed critical habitat designation because of this exemption.

Cape Canaveral Air Force Station, Brevard County, FL, 21.0 km (13.0 Miles)

Cape Canaveral Air Force Station is part of the 45th Space Wing, a unit of Air Force Space Command, whose mission is to assure access to the high frontier and to support global operations. The 45th Space Wing currently operates a number of rockets and missiles, including the Delta IV and Atlas V, and provides support for the Department of Defense, NASA, and commercial manned and unmanned space programs.

Cape Canaveral Air Force Station is situated on the Canaveral Peninsula along the Atlantic Coast in Brevard County, Florida, and occupies 6,394 hectares (15,800 acres). The installation's beach consists of 21.0 km (13.0 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, the Barge Channel, Banana River, Indian River Lagoon, Merritt Island, and Harrison Island. The boundaries of the installation are from the south boundary of Merritt Island NWR–Kennedy Space Center (Merritt Island NWR was established in 1963 as an overlay of NASA's John F. Kennedy Space Center) to Port Canaveral. Cape Canaveral Air Force Station is adjacent to a critical habitat unit (LOGG–T–FL–07) that has high-density nesting by loggerhead sea turtles in the Central Eastern Florida Region of the Peninsular Florida Recovery Unit.

Cape Canaveral Air Force Station (CCAFS) is covered by the 45th Space Wing 2008 INRMP, a planning document that guides the management and conservation of natural resources under the Space Wing's control. The INRMP was prepared to manage natural resources in compliance with relevant statutes, executive orders, Presidential memoranda, regulations, and Air Force-specific requirements. The INRMP integrates the 45th Space Wing's natural resources management program with ongoing mission activities for sustainability while conserving and protecting natural resources. The 45th Space Wing is committed to a proactive, interdisciplinary management strategy focused on an ecosystem-based approach to natural resources management. This strategy includes the Air Force objective of sustaining and restoring natural resources to uphold operational capabilities while complying with Federal, State, and local standards that protect and conserve wildlife, habitat, and the surrounding watershed.

The 2008 INRMP includes the implementation of sea turtle nesting surveys, nest marking, predator control, and exterior lighting management to conserve loggerhead sea turtles and their habitat (45th Space Wing 2008, pp. 64–71 and Tab A). The INRMP identifies the need to develop and implement programs to protect and conserve federally listed threatened and endangered plants and wildlife, including the loggerhead sea turtle. The INRMP identifies the following management and protective measures to achieve this goal:

(1) Monitor sea turtle nesting activities;

(2) Manage lighting (i.e., use of sea turtle friendly low pressure sodium and amber light-emitting diode (LED) shielded lighting in compliance with the Endangered Species Act for facilities that require illumination); and

(3) Control sea turtle nest predators.

In a letter dated October 10, 2012, the 45th Space Wing provided information detailing its commitments to conduct activities that benefit loggerheads on the beaches of Cape Canaveral Air Force Station and Patrick Air Force Base. These commitments will be added to their next INRMP and include:

(1) Monitor sea turtle nesting activities by participating in the Statewide Nesting Beach Survey and Index Nesting Beach Survey programs and conducting hatchling productivity assessments;

(2) Control sea turtle nest predators by implementing trapping at the first sign of tracks on the beach at PAFB; controlling raccoons, coyotes, and feral hogs within 0.8 km (0.5 mile) of the beach at CCAFS; and installing predator-proof trash receptacles if needed; and

(3) Manage lighting by ensuring that all fixtures and bulbs follow the Space Wing Instruction (SWI) 32–7001, which has been reviewed and approved by USFWS, prior to installation or replacement. Any lights that do not follow the SWI 32–7001 require a USFWS-approved Light Management Plan.

Based on the above considerations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that the identified lands are subject to the 45th Space Wing INRMP and that conservation efforts identified in the INRMP will provide a benefit to the loggerhead sea turtle. Therefore, lands within this installation are exempt from critical habitat designation under section 4(a)(3) of the Act. We are not including 21.0 km (13.0 miles) of habitat in this proposed critical habitat designation because of this exemption.

Patrick Air Force Base, Brevard County, FL, 6.6 km (4.1 Miles)

Patrick Air Force Base is also part of the 45th Space Wing (see discussion for Cape Canaveral above) and is presently the home of Headquarters, 45th Space Wing. Patrick Air Force Base is located on a barrier island on the central east coast of Florida in Brevard County and covers 810 hectares (2,002 acres) of developed land and some coastal dune and estuarine habitat. The installation's beach consists of 6.6 km (4.1 miles) of island shoreline along the Atlantic Ocean. The island is separated from the mainland by the Atlantic Intracoastal Waterway, Indian River Lagoon, Banana River, and Merritt Island. The boundaries of the installation are from the south boundary of the city of Cocoa Beach (28.2720 N, 80.6055 W) to the north boundary of the town of Satellite Beach (28.2127 N, 80.5973 W). Patrick Air Force Base has high-density nesting by loggerhead sea turtles in the Central Eastern Florida Region of the Peninsular Florida Recovery Unit.

Like Cape Canaveral Air Force Station, Patrick Air Force Base is governed by the 45th Space Wing 2008 INRMP. As with Cape Canaveral Air Force Station, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that the identified lands are subject to the 45th Space Wing INRMP and that conservation efforts identified in the INRMP will provide a benefit to the loggerhead sea turtle. Therefore, lands within this installation are exempt from critical habitat designation under section 4(a)(3) of the Act. We are not including 6.6 km (4.1 miles) of habitat in this proposed critical habitat designation because of this exemption.

Eglin Air Force Base (Cape San Blas), Gulf County, FL, 4.8 km (3.0 Miles)

Eglin Air Force Base is the largest forested military reservation in the United States and supports a multitude of military testing and training operations, as well as many diverse species and habitats. Eglin's missions include the 7th Special Forces Group (Airborne) beddown, Amphibious Ready Group/Marine Expeditionary Unit, Stand-off Precision Guided Missile, and Massive Ordnance Air Blast.

Eglin Air Force Base, also known as the Eglin Military Complex, is located in Santa Rosa, Okaloosa, Walton, and Gulf Counties in Northwest Florida and the Gulf of Mexico and occupies 261,428 hectares (464,000 acres). The Eglin Military Complex includes the mainland Reservation located in Santa Rosa, Okaloosa, and Walton Counties, as well as a small parcel (389 hectares (962 acres)) on Cape San Blas in Gulf County, Florida. Eglin's Cape San Blas parcel consists of 4.8 km (3.0 miles) of spit shoreline along the Gulf of Mexico. The spit is separated from the mainland by St. Joseph Bay. The boundaries of Eglin's Cape San Blas parcel are from 29.67680 N 85.36351 W to 29.67608 N 85.33394 W. Eglin's Cape San Blas parcel also contains U.S. Federal Reserve property, but the entire parcel is under Eglin's management. Eglin's Cape San Blas parcel has high-density nesting by loggerhead sea turtles in the Florida portion of the Northern Gulf of Mexico Recovery Unit.

The 2012 Eglin Air Force Base INRMP is a planning document that guides the management and conservation of natural resources under the installation's control. It provides interdisciplinary strategic guidance for the management of natural resources in support of the military mission within the land and water ranges of the Eglin Military Complex. The Eglin Air Force Base INRMP integrates and prioritizes wildlife, fire, and forest management activities to protect and effectively manage the Complex's aquatic and terrestrial environments, and ensure ''no net loss'' in the operational capability of these resources to support Eglin test and training missions.

The 2012 INRMP has a revised sea turtle chapter that includes the implementation of sea turtle nesting surveys, nest marking, predator control, and exterior lighting management to conserve loggerhead sea turtles and their habitat (Eglin Air Force Base 2012, pp. 8–7–8–16). The INRMP identifies the need to develop and implement programs to protect and conserve federally listed endangered and threatened plants and wildlife, including the loggerhead sea turtle. The INRMP identifies the following management and protective measures to achieve this goal:

(1) Monitor sea turtle nesting activities;

(2) Manage lighting (i.e., using sea turtle friendly, low-pressure sodium lighting at all test sites, turning off lights not necessary for safety, lowering lights, or properly shielding lights);

(3) Implement dune protection as needed; and

(4) Control sea turtle nest predators by implementing trapping either as soon as a nest is found to have been depredated or if deemed necessary by biologists.

Based on the above considerations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that the identified lands are subject to the Eglin Air Force Base INRMP and that conservation efforts identified in the INRMP will provide a benefit to the loggerhead sea turtle. Therefore, lands within this installation are exempt from critical habitat designation under section 4(a)(3) of the Act. We are not including 4.8 km (3.0 miles) of habitat in this proposed critical habitat designation because of this exemption.

Exclusions

Application of Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary shall designate and make

revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. In making that determination, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor.

Under section 4(b)(2) of the Act, we may exclude an area from designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. In considering whether to exclude a particular area from the designation, we identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If the analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, the Secretary may exercise his discretion to exclude the area only if such exclusion would not result in the extinction of the species. We will consider whether to exclude from critical habitat designation areas in St. Johns, Volusia, and Indian River Counties, Florida, that are covered under habitat conservation plans that include the loggerhead sea turtle as a covered species.

Economic Impacts

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. In order to consider economic impacts, we are preparing an analysis of the economic impacts of the proposed critical habitat designation.

The proposed critical habitat areas include Federal, State, private, and other (local government) lands, where shoreline protection activities (e.g., sand placement, coastal armoring, groin installation) and recreational activities may occur and may be affected by the designation. In addition, activities, such as bridge and highway construction and beachfront lighting projects, on lands adjacent to proposed critical habitat areas may be affected. Other land uses that may be affected will be identified as we develop the draft economic analysis for the proposed designation.

We will announce the availability of the draft economic analysis as soon as it is completed, at which time we will seek public review and comment. At that time, copies of the draft economic analysis will be available for downloading from the Internet at *http://www.regulations.gov,* or by contacting the North Florida Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**). During the development of a final designation, we will consider economic impacts based on information in our economic analysis, public comments, and other new information, and areas may be excluded from the final critical habitat designation under section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19.

National Security Impacts

Under section 4(b)(2) of the Act, we consider whether there are lands owned or managed by the Department of Defense where a national security impact might exist. As discussed above, we have exempted from the proposed designation of critical habitat under section 4(a)(3) of the Act those Department of Defense lands with completed INRMPs determined to provide a benefit to the loggerhead sea turtle but where a national security impact may exist. We have not identified any other lands owned or managed by the Department of Defense within the lands proposed for critical habitat designation. Accordingly, we are not proposing to exclude any lands based on national security impacts under section 4(b)(2) of the Act in this proposed critical habitat rule.

Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security. We consider a number of factors, including whether the landowners have developed any HCPs or other management plans for the area, or whether there are conservation partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at any tribal issues, and consider the government-to-government relationship of the United States with tribal entities. We also consider any social impacts that might occur because of the designation.

We are considering for exclusion from critical habitat areas (all or portions of LOGG–T–FL–01, LOGG–T–FL–02, LOGG–T–FL–03, LOGG–T–FL–04, LOGG–T–FL–05, and LOGG–T–FL–10) in St. Johns, Volusia, and Indian River Counties, Florida, that are covered under an HCP, because the HCPs incorporate measures that provide a benefit for the conservation of the loggerhead sea turtle. We are not considering any additional exclusions at this time from the proposed designation under section 4(b)(2) of the Act based on partnerships, management, or protection afforded by cooperative management efforts. In this proposed rule, we are seeking input from the public as to whether or not the Secretary should exercise his discretion to exclude the HCP areas or other such areas under management that benefit the loggerhead sea turtle from the final critical habitat designation. (Please see the **Information Requested** section of this proposed rule for instructions on how to submit comments.)

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of peer review is to ensure that our critical habitat designation is based on scientifically sound data, assumptions, and analyses. We have invited these peer reviewers to comment during this public comment period.

We will consider all comments and information received during this comment period on this proposed rule during our preparation of a final determination. Accordingly, the final decision may differ from this proposal.

Public Hearings

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the **Federal Register**. Such requests must be sent to the address shown in the **ADDRESSES** section. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Required Determinations

Regulatory Planning and Review—Executive Order 12866

Regulatory Planning and Review (Executive Orders 12866 and 13563)

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) will review all significant

rules. The Office of Information and Regulatory Affairs has determined that this rule is not significant.

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; 5 U.S.C 801 *et seq.*), whenever an agency must publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

According to the Small Business Administration, small entities include small organizations such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include such businesses as manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and forestry and logging operations with fewer than 500 employees and annual business less than $7 million. To determine if potential economic impacts on these small entities are significant, we will consider the types of activities that might trigger regulatory impacts under this designation as well as types of project modifications that may result. In general, the term ''significant economic impact'' is meant to apply to a typical small business firm's business operations.

Importantly, the incremental impacts of a rule must be *both* significant and substantial to prevent certification of the rule under the RFA and to require the preparation of an initial regulatory flexibility analysis. If a substantial number of small entities are affected by the proposed critical habitat designation, but the per-entity economic impact is not significant, USFWS may certify. Likewise, if the per-entity economic impact is likely to be significant, but the number of affected entities is not substantial, USFWS may also certify.

The USFWS's current understanding of recent case law is that Federal agencies are only required to evaluate the potential impacts of rulemaking on those entities directly regulated by the rulemaking; therefore, they are not required to evaluate the potential impacts to those entities not directly regulated. The designation of critical habitat for an endangered or threatened species only has a regulatory effect where a Federal action agency is involved in a particular action that may affect the designated critical habitat. Under these circumstances, only the Federal action agency is directly regulated by this designation, and, therefore, USFWS may limit its evaluation of the potential impacts to those identified for Federal action agencies. Under this interpretation, there is no requirement under the RFA to evaluate the potential impacts to entities not directly regulated, such as small businesses. However, Executive Orders 12866 and 13563 direct Federal agencies to assess costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consequently, it is the current practice of USFWS to assess to the extent practicable these potential impacts if sufficient data are available, whether or not this analysis is believed by USFWS to be strictly required by the RFA. In other words, while the effects analysis required under the RFA is limited to entities directly regulated by the rulemaking, the effects analysis under the Act, consistent with the Executive Order regulatory analysis requirements, can take into consideration impacts to both directly and indirectly impacted entities, where practicable and reasonable.

We acknowledge, however, that in some cases, third-party proponents of the action subject to permitting or funding may participate in a section 7 consultation, and thus may be indirectly affected. We believe it is good policy to assess these impacts if we have sufficient data before us to complete the necessary analysis, whether or not this analysis is strictly required by the RFA. While this regulation does not directly regulate these entities, in our draft economic analysis we will conduct a brief evaluation of the potential number of third parties participating in consultations on an annual basis in order to ensure a more complete examination of the incremental effects of this proposed rule in the context of the RFA.

In conclusion, we believe that, based on our interpretation of directly regulated entities under the RFA and relevant case law, this designation of critical habitat will only directly regulate Federal agencies, which are not by definition small business entities. And as such, we certify that, if promulgated, this designation of critical habitat would not have a significant economic impact on a substantial number of small business entities. Therefore, an initial regulatory flexibility analysis is not required. However, though not necessarily required by the RFA, in our draft economic analysis for this proposal we will consider and evaluate the potential effects to third parties that may be involved with consultations with Federal action agencies related to this action.

Energy Supply, Distribution, or Use—Executive Order 13211

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects when undertaking certain actions. Natural gas and oil activities in State and Federal waters occur offshore of the States of Alabama, Mississippi, and Florida in the Gulf of Mexico (GOM) where critical habitat is proposed for the species. Potential direct and indirect affects to proposed critical habitat could result from associated oil and gas activities, including but not limited to pipeline installation and maintenance, coastal based facilities, boat vessel

traffic, and spills. USFWS and the Bureau of Ocean Energy and Management (BOEM) have a long history of intra-agency coordination and consultation under the Act on offshore outer continental shelf (OCS) oil and gas since the 1970s. Consultation occurs on the Five-year Multi-lease Sale Program and then on each individual lease sale in the Program as they occur. As a result, regulations and other measures are in place to minimize impacts of natural gas and oil exploration, development, production, and abandonment in the GOM OCS. The regulations and measures are generally not considered a substantial cost compared with overall project costs and are already being implemented by oil and gas companies.

The most recent consultation completed was for the GOM OCS 2007–2012 Program and Supplemental Lease Sales 2009–2012 and the initial coordination on the proposed 2012–2017 Programs. Individual lease sales consultations have been completed for the 2007–2012 and 2009–2012 Programs. Most of the eastern GOM, including the Straits of Florida (Alabama and Florida), remains under a Congressionally mandated moratorium and is not proposed for new leasing in either the 2007–2012 or 2012–2017 Programs. BOEM will move forward with an environmental analysis for potential seismic studies in the Mid- and South Atlantic planning areas (Florida Atlantic coast, Georgia, South Carolina, and North Carolina), but no lease sales will be scheduled in the Atlantic until at least mid-2017.

The States of Mississippi and Alabama have oil and gas programs in their respective State waters. USFWS only conducts consultation in accordance with the Act on oil and gas activities within State waters where there is a Federal nexus (discharge, wetland impacts, or navigation permits).

No other activities associated with energy supply, distribution, or use are anticipated within the proposed critical habitat. We do not expect the designation of this proposed critical habitat to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment as warranted.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), we make the following findings:

(1) This rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or tribal governments, or the private sector, and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding,'' and the State, local, or tribal governments ''lack authority'' to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.''

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule will significantly or uniquely affect small governments. A portion of the lands being proposed for critical habitat designation are owned by State, County, or local municipalities. Small governments will be affected only to the extent that any programs having Federal funds, permits, or other authorized activities must ensure that their actions will not adversely affect the critical habitat. Therefore, a Small Government Agency Plan is not required. However, we will further evaluate this issue as we conduct our economic analysis, and review and revise this assessment if appropriate.

Takings—Executive Order 12630

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), this rule is not anticipated to have significant takings implications. As discussed above, the designation of critical habitat affects only Federal actions. Critical habitat designation does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. Due to current public knowledge of the species protections and the prohibition against take of the species both within and outside of the proposed areas we do not anticipate that property values will be affected by the critical habitat designation. However, we have not yet completed the economic analysis for this proposed rule. Once the economic analysis is available, we will review and revise this preliminary assessment as warranted, and prepare a Takings Implication Assessment.

Federalism—Executive Order 13132

In accordance with Executive Order 13132 (Federalism), this proposed rule does not have significant Federalism effects. A Federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and

coordinated development of, this proposed critical habitat designation with appropriate State resource agencies in North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi. The designation of critical habitat in areas currently occupied by the loggerhead sea turtle may impose nominal additional regulatory restrictions to those currently in place and, therefore, may have little incremental impact on State and local governments and their activities. The designation may have some benefit to these governments because the areas that contain the physical or biological features essential to the conservation of the species are more clearly defined, and the elements of the features necessary to the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist local governments in long-range planning (rather than having them wait for case-by-case section 7 consultations to occur).

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

Civil Justice Reform—Executive Order 12988

In accordance with Executive Order 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the applicable standards set forth in sections 3(a) and 3(b)(2) of the Order. To assist the public in understanding the habitat needs of the species, the rule identifies the elements of physical or biological features essential to the conservation of the species. The designated areas of critical habitat are presented on maps, and the rule provides several options for the interested parties to obtain more detailed location information, if desired.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes. We determined that there are no tribal lands that were occupied by the loggerhead sea turtle at the time of listing that contain the features essential for conservation of the species. Therefore, we are not proposing to designate critical habitat for the loggerhead sea turtle on tribal lands.

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(1) Be logically organized;

(2) Use the active voice to address readers directly;

(3) Use clear language rather than jargon;

(4) Be divided into short sections and sentences; and

(5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

References Cited

A complete list of references cited in this rulemaking is available on the Internet at *http://www.regulations.gov* and upon request from the North Florida Ecological Services Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this package are the staff members of the North Florida Ecological Services Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

■ 2. In § 17.11(h), revise the entry for ''Sea turtle, loggerhead, Northwest Atlantic Ocean'' under ''Reptiles'' in the List of Endangered and Threatened Wildlife to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
REPTILES							
*	*	*	*	*	*		*
Sea turtle, loggerhead, Northwest Atlantic Ocean.	*Caretta caretta*	Northwest Atlantic Ocean Basin.	Northwest Atlantic Ocean north of the equator, south of 60° N. Lat., and west of 40° W. Long.	T	794	17.95(c)	NA
*	*	*	*	*	*		*

■ 3. In § 17.95, amend paragraph (c) by adding an entry for ''Loggerhead Sea Turtle, Northwest Atlantic Ocean (*Caretta caretta*),'' in the same alphabetical order that the species appears in the table at § 17.11(h), to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(c) *Reptiles.*

* * * * *

Loggerhead Sea Turtle, Northwest Atlantic Ocean (*Caretta caretta*)

(1) Critical habitat units are depicted for the following areas on the maps below:

(i) North Carolina—Brunswick, Carteret, New Hanover, Onslow, and Pender Counties;

(ii) South Carolina—Beaufort, Charleston, Colleton, and Georgetown Counties;

(iii) Georgia—Camden, Chatham, Liberty, and McIntosh Counties;

(iv) Florida—Bay, Brevard, Broward, Charlotte, Collier, Duval, Escambia, Flagler, Franklin, Gulf, Indian River, Lee, Manatee, Martin, Monroe, Palm Beach, Sarasota, St. Johns, St. Lucie, and Volusia Counties;

(v) Alabama—Baldwin County; and

(vi) Mississippi—Jackson County.

(2) Within these areas, the primary constituent elements of the physical or biological features essential to the conservation of the Northwest Atlantic Ocean distinct population segment of the loggerhead sea turtle are the extratidal or dry sandy beaches from the mean high-water line to the toe of the secondary dune, which are capable of supporting a high density of nests or serving as an expansion area for beaches with a high density of nests and that are well distributed within each State, or region within a State, and representative of total nesting, consisting of three components:

(i) Primary Constituent Element 1—Suitable nesting beach habitat that (A) Has relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both postnesting females and hatchlings and (B) Is located above mean high water to avoid being inundated frequently by high tides.

(ii) Primary Constituent Element 2—Sand that (A) Allows for suitable nest construction, (B) Is suitable for facilitating gas diffusion conducive to embryo development, and (C) Is able to develop and maintain temperatures and a moisture content conducive to embryo development.

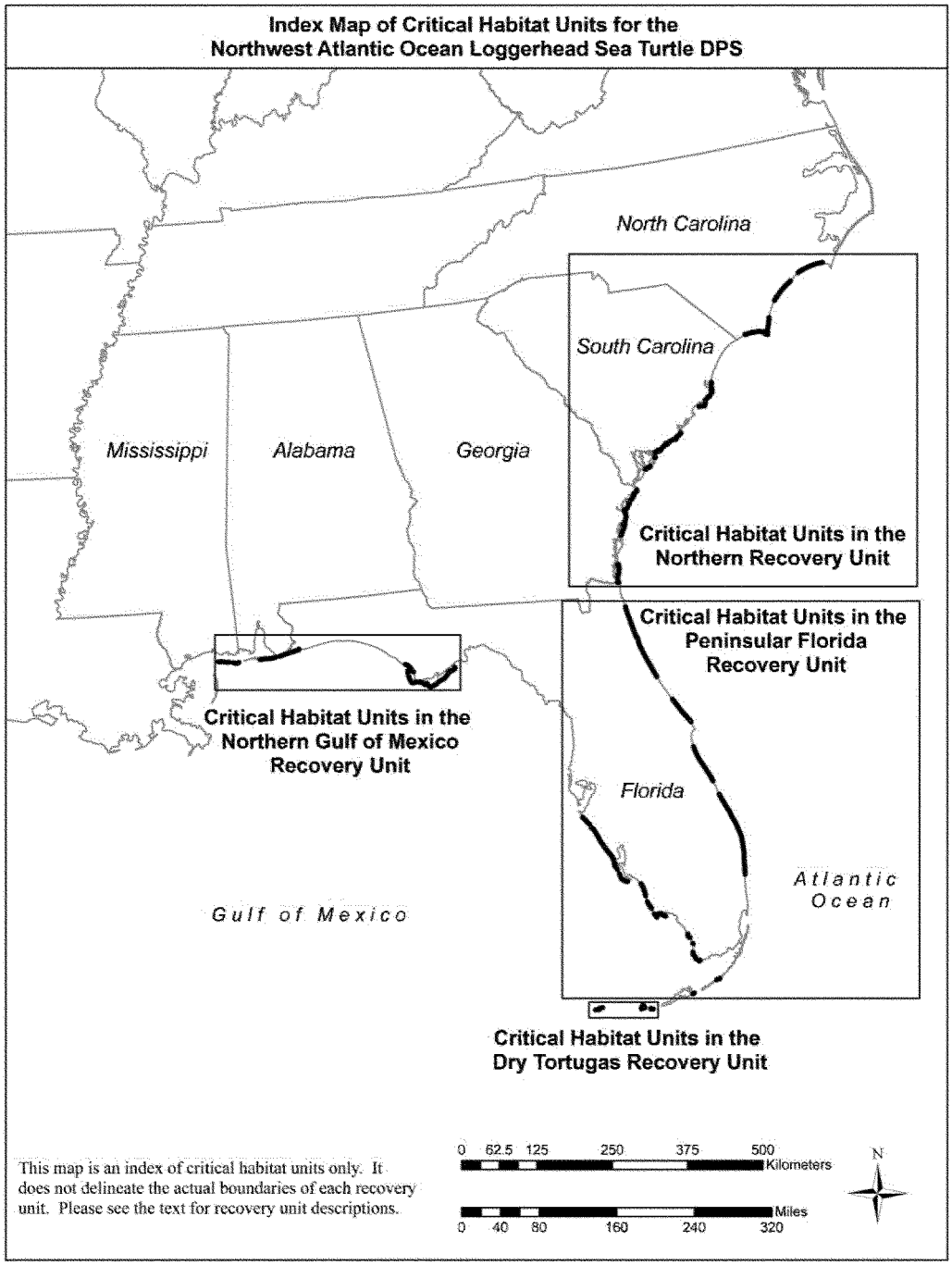
(iii) Primary Constituent Element 3—Suitable nesting beach habitat with sufficient darkness to ensure that nesting turtles are not deterred from emerging onto the beach and hatchlings and postnesting females orient to the sea.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on [INSERT DATE 30 DAYS AFTER PUBLICATION DATE FOR THE FINAL RULE].

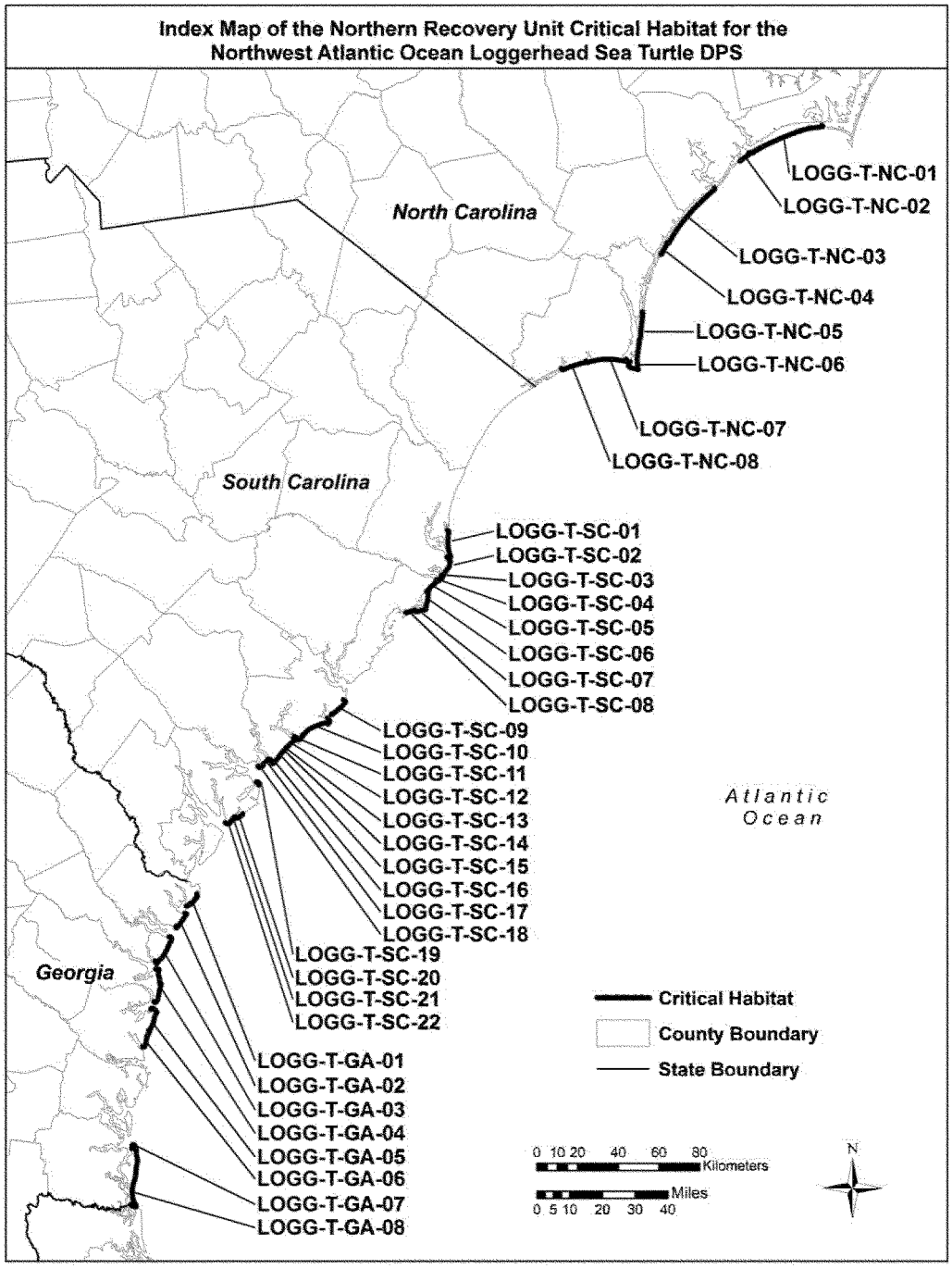
(4) *Critical habitat map units.* Data layers defining map units were created using Google Earth imagery, then refined using Bing imagery. Unit descriptions were then mapped using North America Lambert Conformal Conic coordinates. The maps in this entry, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's Internet site (*http://www.fws.gov/northflorida*), *http://www.regulations.gov* at Docket No. FWS–R4–ES–2012–0103, and at the field office responsible for this designation. You may obtain field office location information by contacting one of the USFWS regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) *Note:* Index Map follows:

BILLING CODE 4310–22–P



(6) Index Map of Critical Habitat Units in the Northern Recovery Unit:



(7) Units:

(i) LOGG–T–NC–01—Boque Banks, Carteret County, North Carolina.

(ii) LOGG–T–NC–02—Bear Island, Onslow County, North Carolina.

(iii) LOGG–T–NC–03—Topsail Island, Onslow and Pender Counties, North Carolina.

(iv) LOGG–T–NC–04—Lea-Hutaff Island, Pender County, North Carolina.

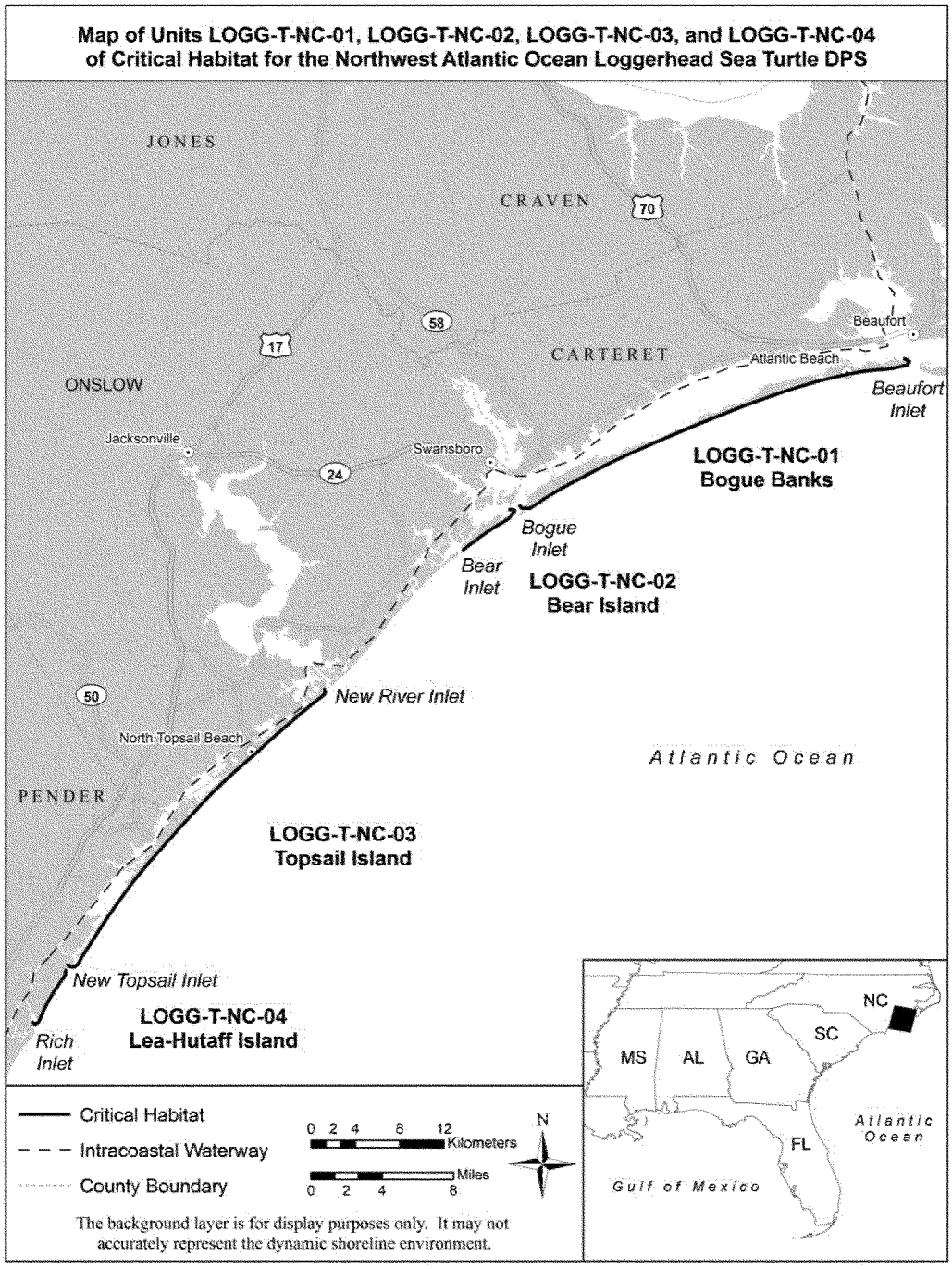
(A) (1) LOGG–T–NC–01—Boque Banks: This unit consists of 38.9 km (24.2 miles) of island shoreline along the Atlantic Ocean and extends from Beaufort Inlet to Bogue Inlet.

(2) LOGG–T–NC–02—Bear Island: This unit consists of 6.6 km (4.1 miles) of island shoreline along the Atlantic Ocean and extends from Bogue Inlet to Bear Inlet.

(3) LOGG–T–NC–03—Topsail Island: This unit consists of 35.0 km (21.8 miles) of island shoreline along the Atlantic Ocean and extends from New River Inlet to New Topsail Inlet.

(4) LOGG–T–NC–04—Lea-Hutaff Island: This unit consists of 6.1 km (3.8 miles) of island shoreline along the Atlantic Ocean and extends from New Topsail Inlet to Rich Inlet.

(B) *Note:* Map of Units LOGG–T–NC–01, LOGG–T–NC–02, LOGG–T–NC–03, and LOGG–T–NC–04: North Carolina Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle: Boque Banks, Bear Island, Topsail Island, and Lea-Hutaff Island, follows:



(8) Units:

(i) LOGG–T–NC–05—Pleasure Island, New Hanover County, North Carolina.

(ii) LOGG–T–NC–06—Bald Head Island, Brunswick County, North Carolina.

(iii) LOGG–T–NC–07—Oak Island, Brunswick County, North Carolina.

(iv) LOGG–T–NC–08—Holden Beach, Brunswick County, North Carolina.

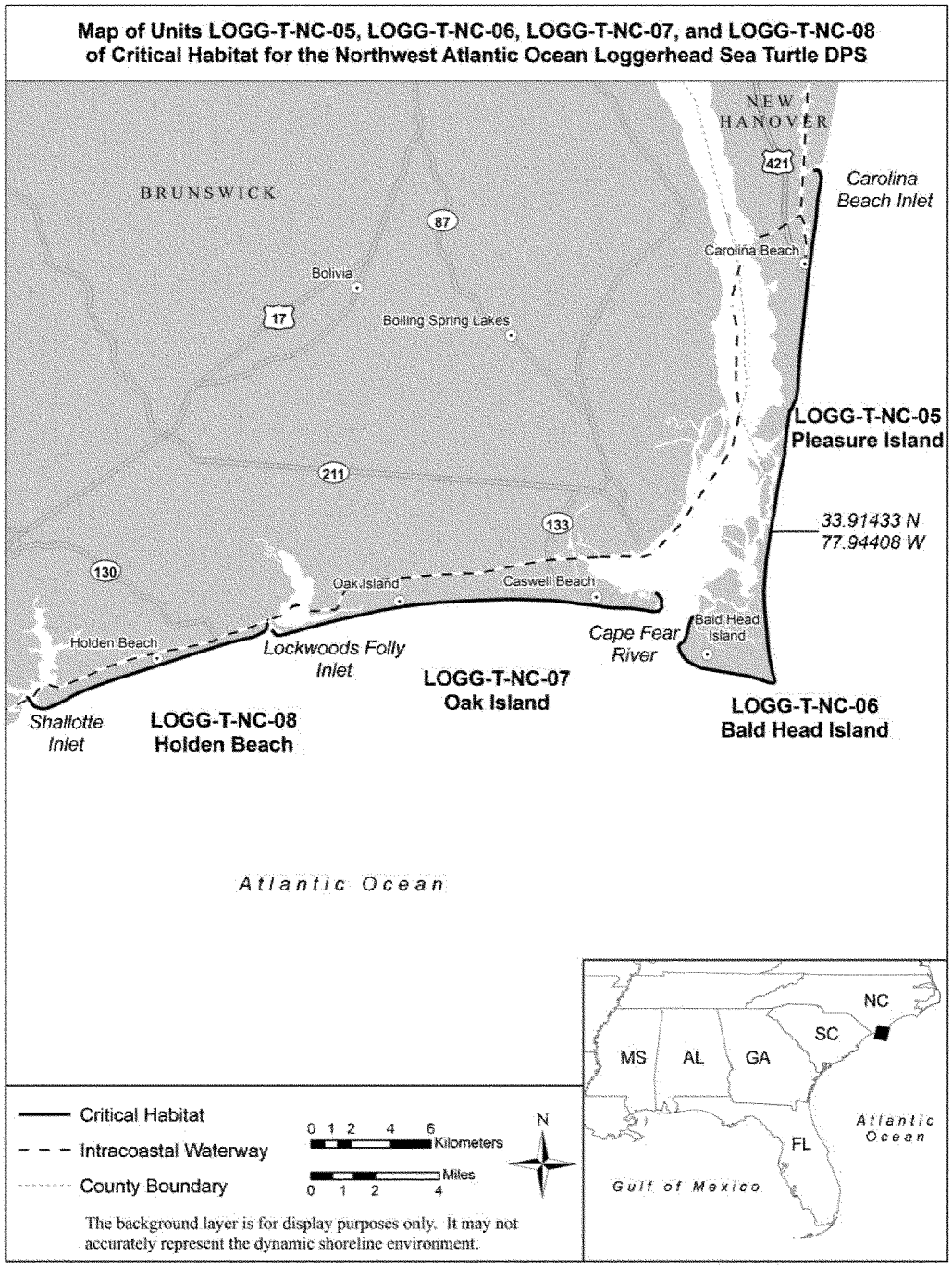
(A) (1) LOGG–T–NC–05—Pleasure Island: This unit consists of 18.6 km (11.5 miles) of island shoreline along the Atlantic Ocean and extends from Carolina Beach Inlet to 33.91433 N, 77.94408 W (historic location of Corncake Inlet).

(2) LOGG–T–NC–06—Bald Head Island: This unit consists of 15.1 km (9.4 miles) of island shoreline along the Atlantic Ocean and extends from 33.91433 N, –77.94408 W (historic location of Corncake Inlet) to the mouth of the Cape Fear River.

(3) LOGG–T–NC–07—Oak Island: This unit consists of 20.9 km (13.0 miles) of island shoreline along the Atlantic Ocean and extends from the mouth of the Cape Fear River to Lockwoods Folly Inlet.

(4) LOGG–T–NC–08—Holden Beach: This unit consists of 13.4 km (8.3 miles) of island shoreline along the Atlantic Ocean and extends from Lockwoods Folly Inlet to Shallotte Inlet.

(B) *Note:* Map of Units LOGG–T–NC–05, LOGG–T–NC–06, LOGG–T–NC–07, and LOGG–T–NC–08: North Carolina Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(9) Units:

(i) LOGG–T–SC–01—North Island, Georgetown County, South Carolina.

(ii) LOGG–T–SC–02—Sand Island, Georgetown County, South Carolina.

(iii) LOGG–T–SC–03—South Island, Georgetown County, South Carolina.

(iv) LOGG–T–SC–04—Cedar Island, Georgetown County, South Carolina.

(v) LOGG–T–SC–05—Murphy Island, Charleston County, South Carolina.

(A) (1) LOGG–T–SC–01—North Island: This unit consists of 13.2 km (8.2 miles) of island shoreline along the Atlantic Ocean and extends from North Inlet to Winyah Bay.

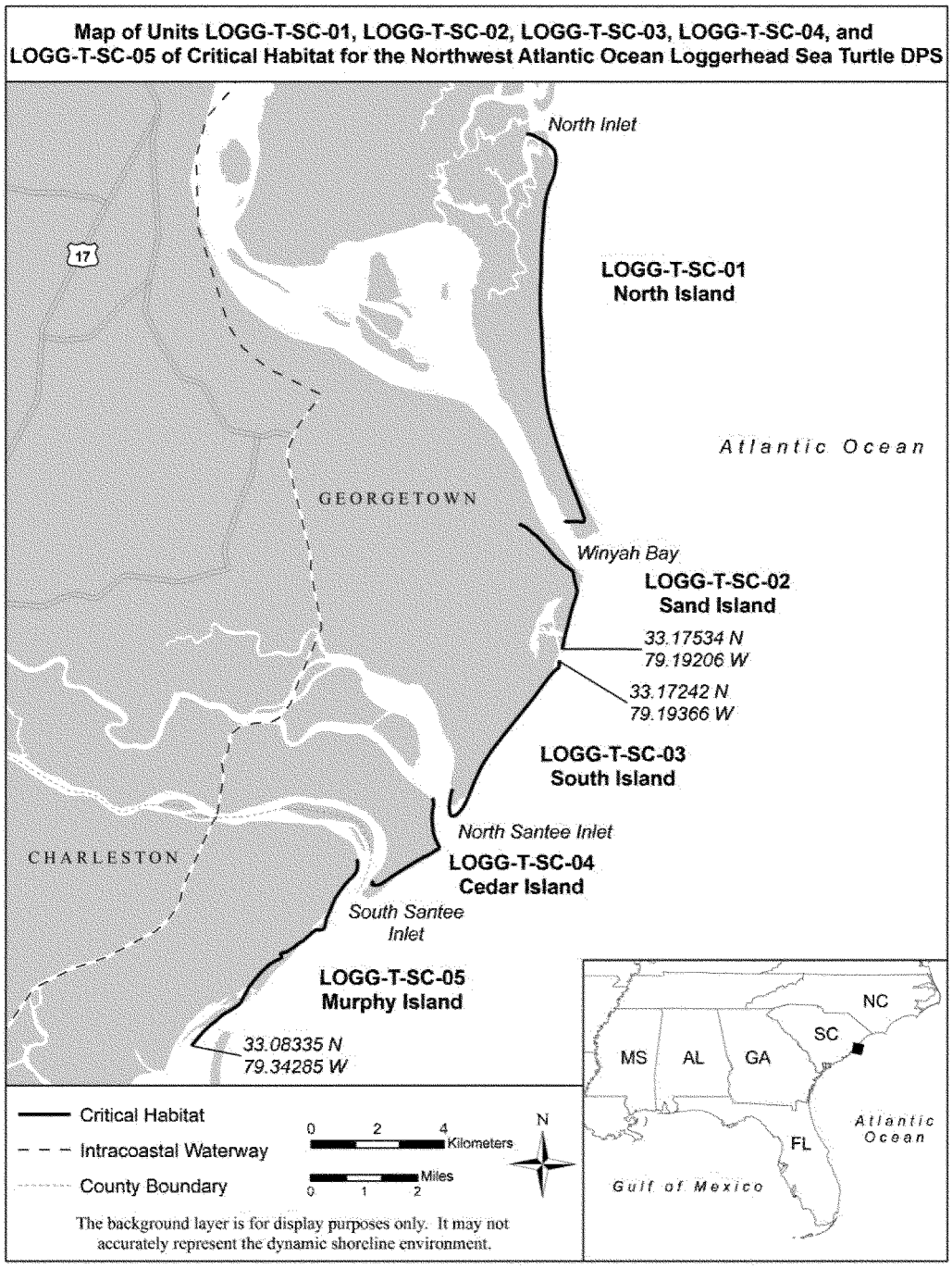
(2) LOGG–T–SC–02—Sand Island: This unit consists of 4.7 km (2.9 miles) of island shoreline along the Atlantic Ocean and Winyah Bay and extends from Winyah Bay to 33.17534 N, 79.19206 W (northern boundary of an unnamed inlet separating Sand Island and South Island).

(3) LOGG–T–SC–03—South Island: This unit consists of 6.7 km (4.2 miles) of island shoreline along the Atlantic Ocean and extends from 33.17242 N, 79.19366 W (southern boundary of an unnamed inlet separating Sand Island and South Island) to North Santee Inlet.

(4) LOGG–T–SC–04—Cedar Island: This unit consists of 4.1 km (2.5 miles) of island shoreline along the Atlantic Ocean and North Santee Inlet and extends from North Santee Inlet to South Santee Inlet.

(5) LOGG–T–SC–05—Murphy Island: This unit consists of 8.0 km (5.0 miles) of island shoreline along the Atlantic Ocean and South Santee Inlet and extends from South Santee Inlet to 33.08335 N, 79.34285 W.

(B) *Note:* Map of Units LOGG–T–SC–01, LOGG–T–SC–02, LOGG–T–SC–03, LOGG–T–SC–04, and LOGG–T–SC–05: South Carolina Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(10) Units:

(i) LOGG–T–SC–06—Cape Island, Charleston County, South Carolina.

(ii) LOGG–T–SC–07—Lighthouse Island, Charleston County, South Carolina.

(iii) LOGG–T–SC–08—Raccoon Key, Charleston County, South Carolina.

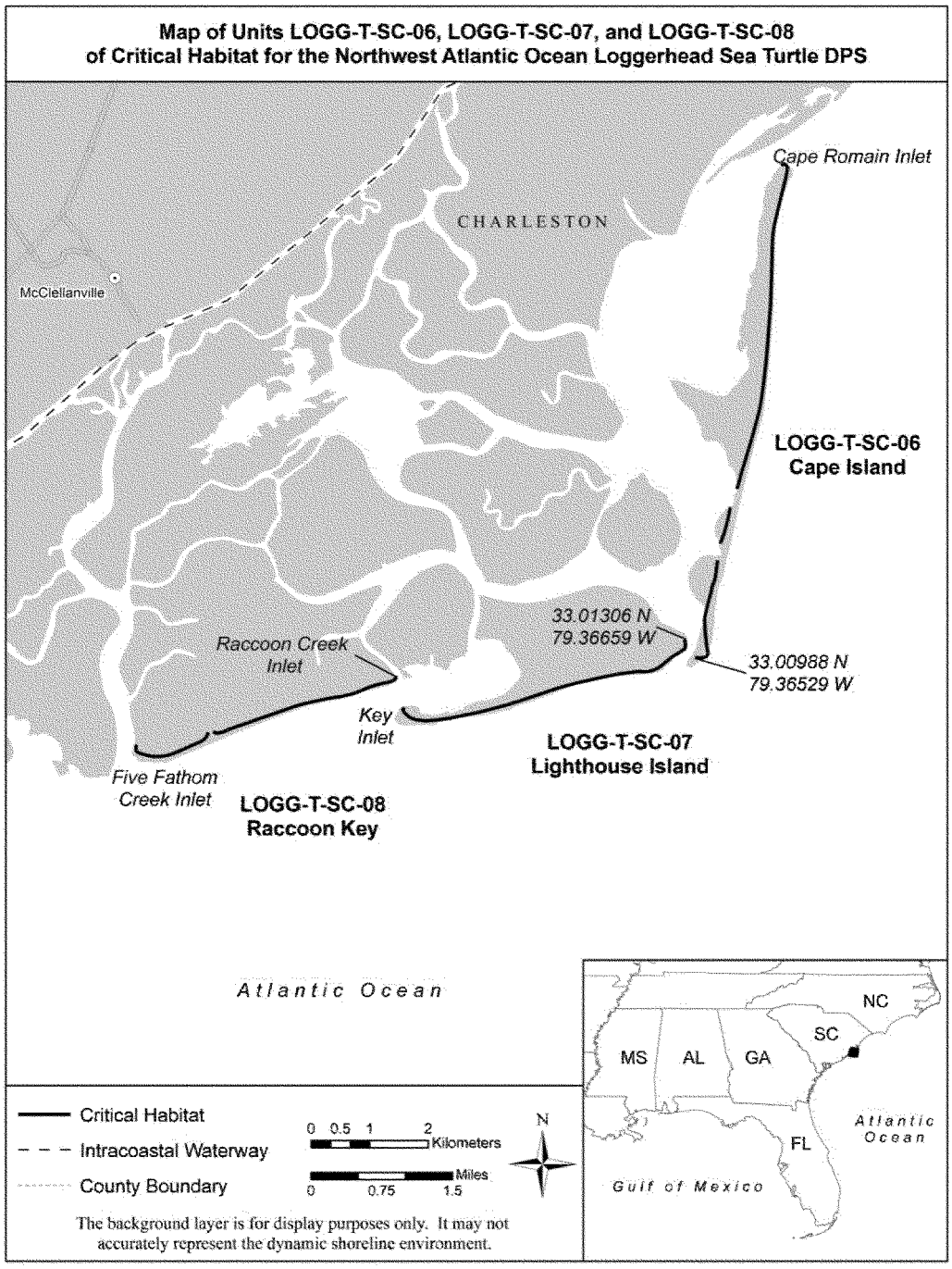
(A) (1) LOGG–T–SC–06—Cape Island: This unit consists of 8.3 km (5.1 miles) of island shoreline along the Atlantic Ocean and extends from Cape Romain Inlet to 33.00988 N, 79.36529 W (northern boundary of an unnamed inlet between Cape Island and Lighthouse Island).

(2) LOGG–T–SC–07—Lighthouse Island: This unit consists of 5.3 km (3.3 miles) of island shoreline along the Atlantic Ocean and extends from 33.01306 N, 79.36659 W (southern boundary of an unnamed inlet between Cape Island and Lighthouse Island) to Key Inlet.

(3) LOGG–T–SC–08—Raccoon Key: This unit consists of 4.8 km (3.0 miles) of island shoreline along the Atlantic Ocean and extends from Raccoon Creek Inlet to Five Fathom Creek Inlet.

(B) *Note:* Map of Units LOGG–T–SC–06, LOGG–T–SC–07, and LOGG–T–SC–08: South Carolina Terrestrial Critical

Habitat Units for the Loggerhead Sea Turtle follows:



(11) Units:

(i) LOGG–T–SC–09—Folly Island, Charleston County, South Carolina.

(ii) LOGG–T–SC–10—Kiawah Island, Charleston County, South Carolina.

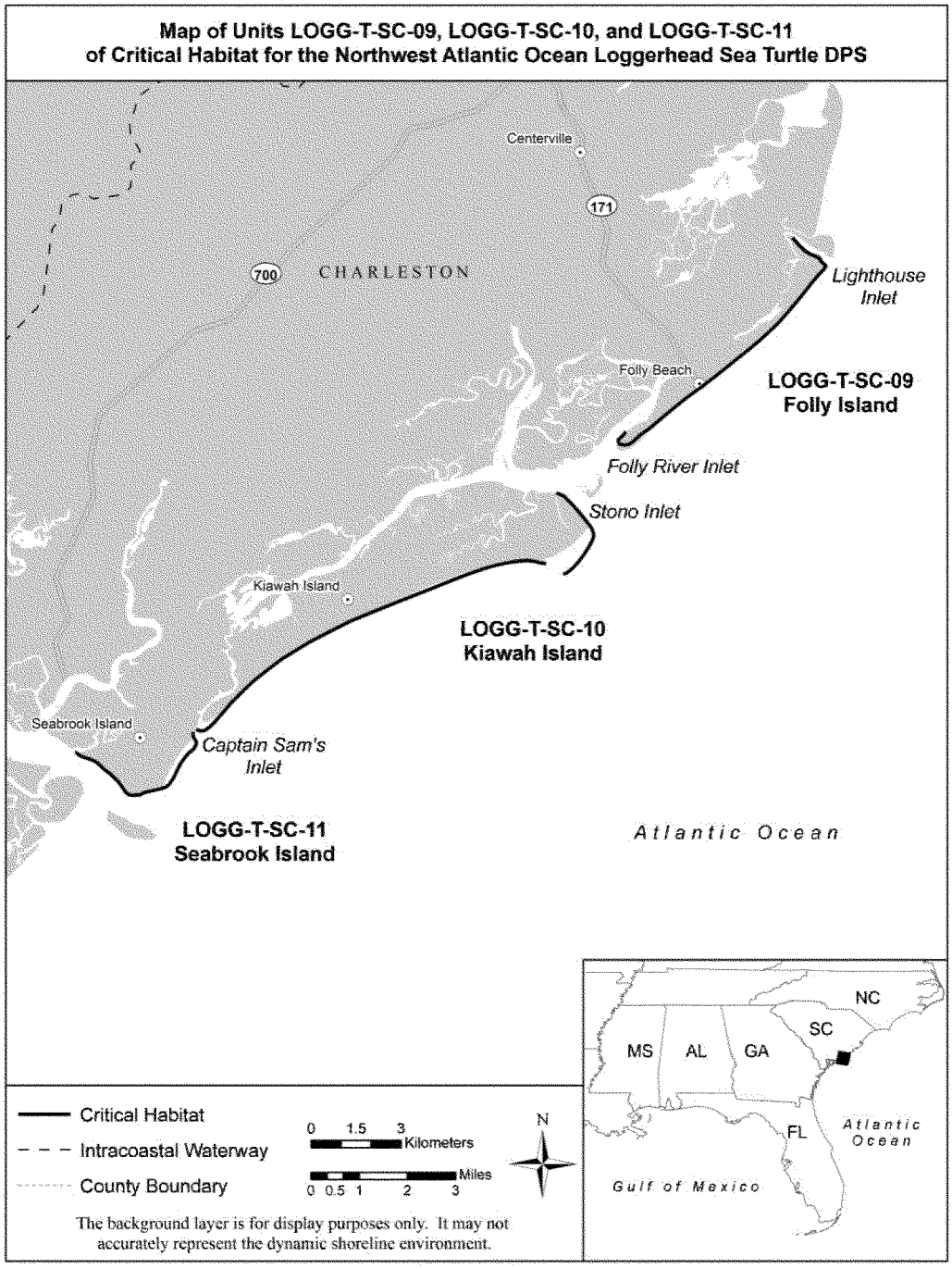
(iii) LOGG–T–SC–11—Seabrook Island, Charleston County, South Carolina.

(A) (1) LOGG–T–SC–09—Folly Island: This unit consists of 11.2 km (7.0 miles) of island shoreline along the Atlantic Ocean and extends from Lighthouse Inlet to Folly River Inlet.

(2) LOGG–T–SC–10—Kiawah Island: This unit consists of 17.0 km (10.6 miles) of island shoreline along the Atlantic Ocean and Stono Inlet and extends from Stono Inlet to Captain Sam's Inlet.

(3) LOGG–T–SC–11—Seabrook Island: This unit consists of 5.8 km (3.6 miles) of island shoreline along the Atlantic Ocean and North Edisto Inlet and extends from Captain Sam's Inlet to North Edisto Inlet.

(B) *Note:* Map of Units LOGG–T–SC–09, LOGG–T–SC–10, and LOGG–T–SC–11: South Carolina Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(12) Units:

(i) LOGG–T–SC–12—Botany Bay Island and Botany Bay Plantation, Charleston County, South Carolina.

(ii) LOGG–T–SC–13—Interlude Beach, Charleston County, South Carolina.

(iii) LOGG–T–SC–14—Edingsville Beach, Charleston County, South Carolina.

(iv) LOGG–T–SC–15—Edisto Beach State Park, Colleton County, South Carolina.

(v) LOGG–T–SC–16—Edisto Beach, Colleton County, South Carolina.

(A) (1) LOGG–T–SC–12—Botany Bay Island and Botany Bay Plantation: This unit consists of 6.6 km (4.1 miles) of island shoreline along the Atlantic Ocean and North Edisto Inlet and extends from North Edisto Inlet to 32.53710 N, 80.24614 W (northern boundary of an unnamed inlet separating Botany Bay Plantation and Interlude Beach).

(2) LOGG–T–SC–13—Interlude Beach: This unit consists of 0.9 km (0.6 mile) of island shoreline along the Atlantic Ocean and extends from 32.53636 N, 80.24647 W (southern boundary of an unnamed inlet separating Interlude Beach and Botany Bay Plantation) to Frampton Inlet.

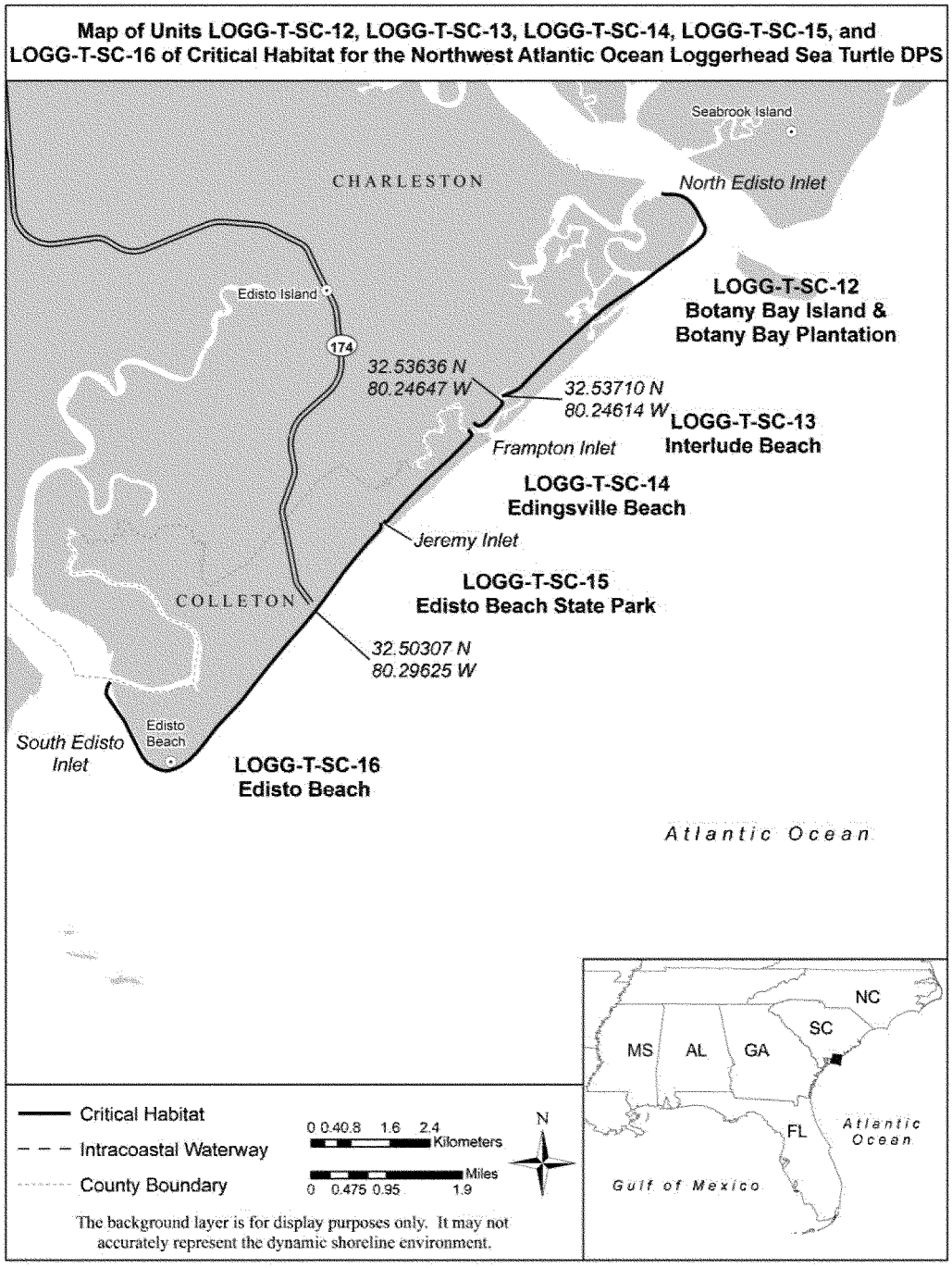
(3) LOGG–T–SC–14—Edingsville Beach: This unit consists of 2.7 km (1.7 miles) of island shoreline along the Atlantic Ocean and extends from Frampton Inlet to Jeremy Inlet.

(4) LOGG–T–SC–15—Edisto Beach State Park: This unit consists of 2.2 km (1.4 miles) of island shoreline along the Atlantic Ocean and extends from Jeremy Inlet to 32.50307 N, 80.29625 W (State Park boundary separating Edisto Beach

State Park and the Town of Edisto Beach).

(5) LOGG–T–SC–16—Edisto Beach: This unit consists of 6.8 km (4.2 miles) of island shoreline along the Atlantic Ocean and South Edisto River and extends from 32.50307 N, 80.29625 W (State Park boundary separating Edisto Beach State Park and the Town of Edisto Beach) to South Edisto Inlet.

(B) *Note:* Map of Units LOGG–T–SC–12, LOGG–T–SC–13, LOGG–T–SC–14, LOGG–T–SC–15, and LOGG–T–SC–16: South Carolina Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(13) Units:

(i) LOGG–T–SC–17—Pine Island, Colleton County, South Carolina.

(ii) LOGG–T–SC–18—Otter Island, Colleton County, South Carolina.

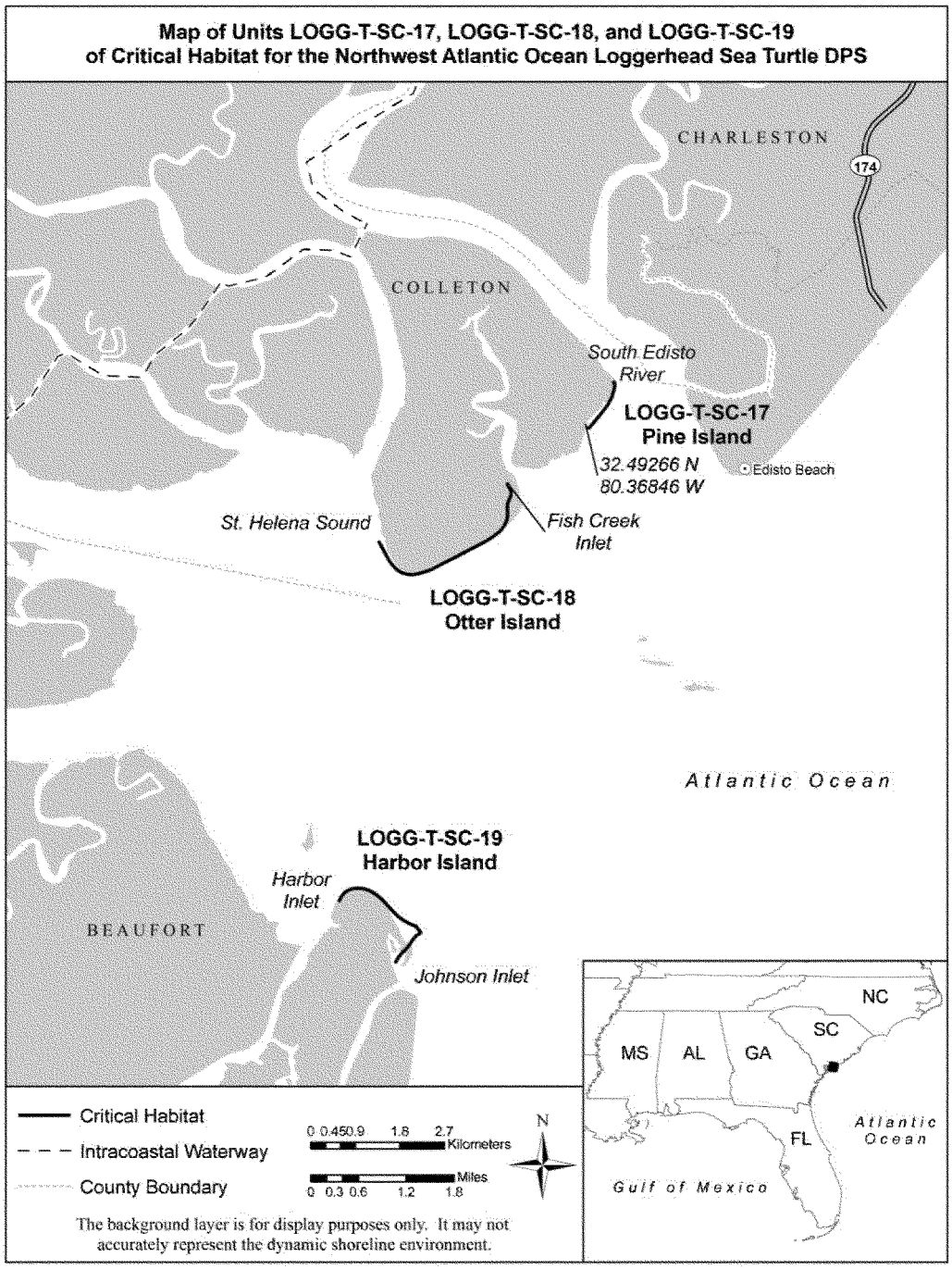
(iii) LOGG–T–SC–19—Harbor Island, Beaufort County, South Carolina.

(A) (1) LOGG–T–SC–17—Pine Island: This unit consists of 1.2 km (0.7 mile) of island shoreline along the South Edisto Inlet and extends from South Edisto River to 32.49266 N, 80.36846 W (northern boundary of an unnamed inlet to Fish Creek).

(2) LOGG–T–SC–18—Otter Island: This unit consists of 4.1 km (2.5 miles) of island shoreline along the Atlantic Ocean and Saint Helena Sound and extends from Fish Creek Inlet to Saint Helena Sound.

(3) LOGG–T–SC–19—Harbor Island: This unit consists of 2.9 km (1.8 miles) of island shoreline along the Atlantic Ocean and Saint Helena Sound and extends from Harbor Inlet to Johnson Inlet.

(B) *Note:* Map of Units LOGG–T–SC–17, LOGG–T–SC–18, and LOGG–T–SC–19: South Carolina Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(14) Units:

(i) LOGG–T–SC–20—Little Capers Island, Beaufort County, South Carolina.

(ii) LOGG–T–SC–21—St. Phillips Island, Beaufort County, South Carolina.

(iii) LOGG–T–SC–22—Bay Point Island, Beaufort County, South Carolina.

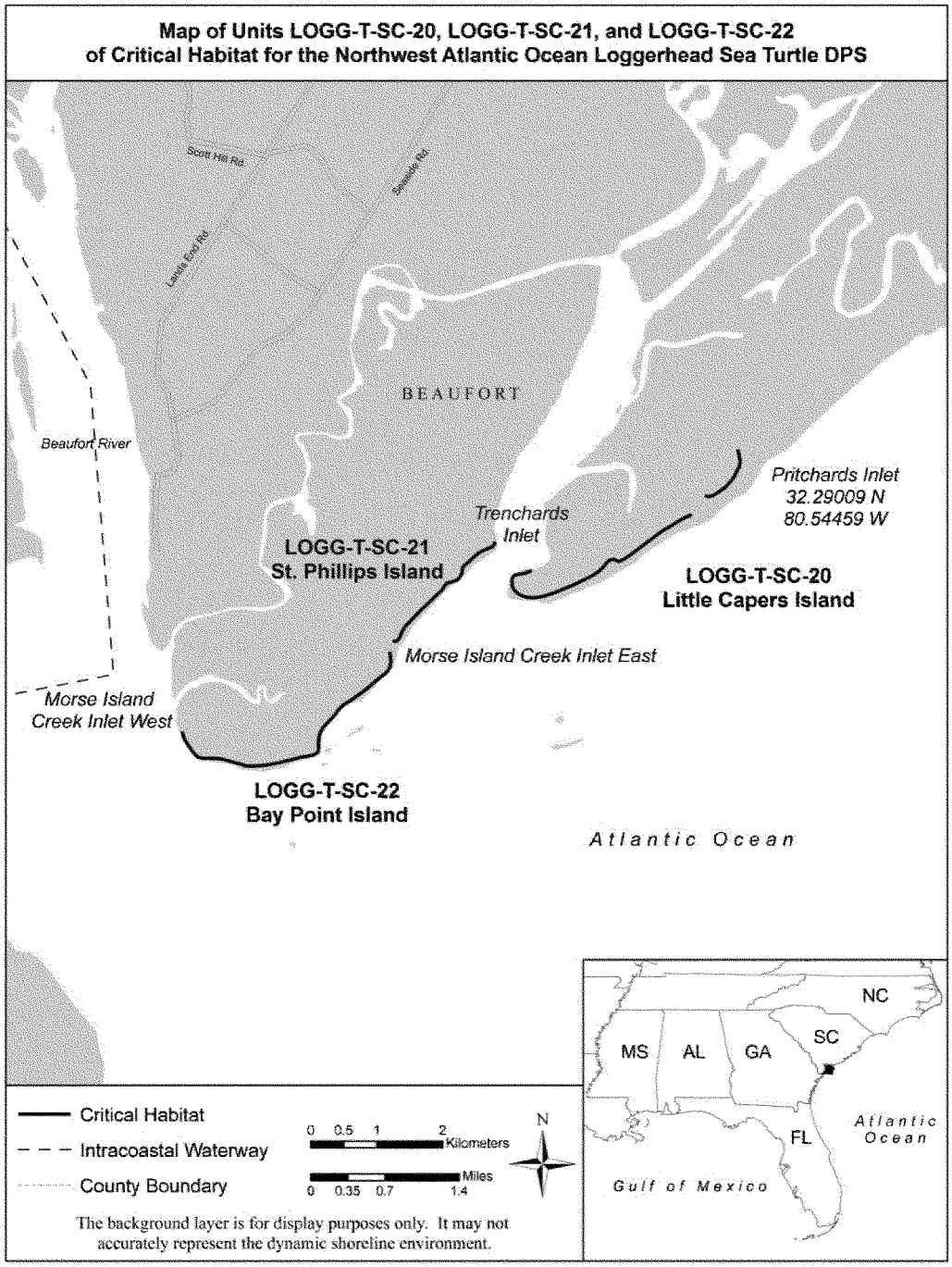
(A) (1) LOGG–T–SC–20—Little Capers Island: This unit consists of 4.6 km (2.9 miles) of island shoreline along the Atlantic Ocean and extends from ''Pritchards Inlet'' (there is some uncertainty about the true name of this water feature) located at 32.29009 N, 80.54459 W to Trenchards Inlet.

(2) LOGG–T–SC–21—St. Phillips Island: This unit consists of 2.3 km (1.4 miles) of island shoreline along the Atlantic Ocean and Trenchards Inlet and extends from Trenchards Inlet to Morse Island Creek Inlet East.

(3) LOGG–T–SC–22—Bay Point Island: This unit consists of 4.3 km (2.7 miles) of island shoreline along the Atlantic Ocean and Port Royal Sound and extends from Morse Island Creek Inlet East along the Atlantic Ocean

shoreline to Morse Island Creek Inlet West along the Port Royal Sound shoreline.

(B) *Note:* Map of Units LOGG–T–SC–20, LOGG–T–SC–21, and LOGG–T–SC–22: South Carolina Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(15) Units:

(i) LOGG–T–GA–01—Little Tybee Island, Chatham County, Georgia.

(ii) LOGG–T–GA–02—Wassaw Island, Chatham County, Georgia.

(iii) LOGG–T–GA–03—Ossabaw Island, Chatham County, Georgia.

(iv) LOGG–T–GA–04—St. Catherines Island, Liberty County, Georgia.

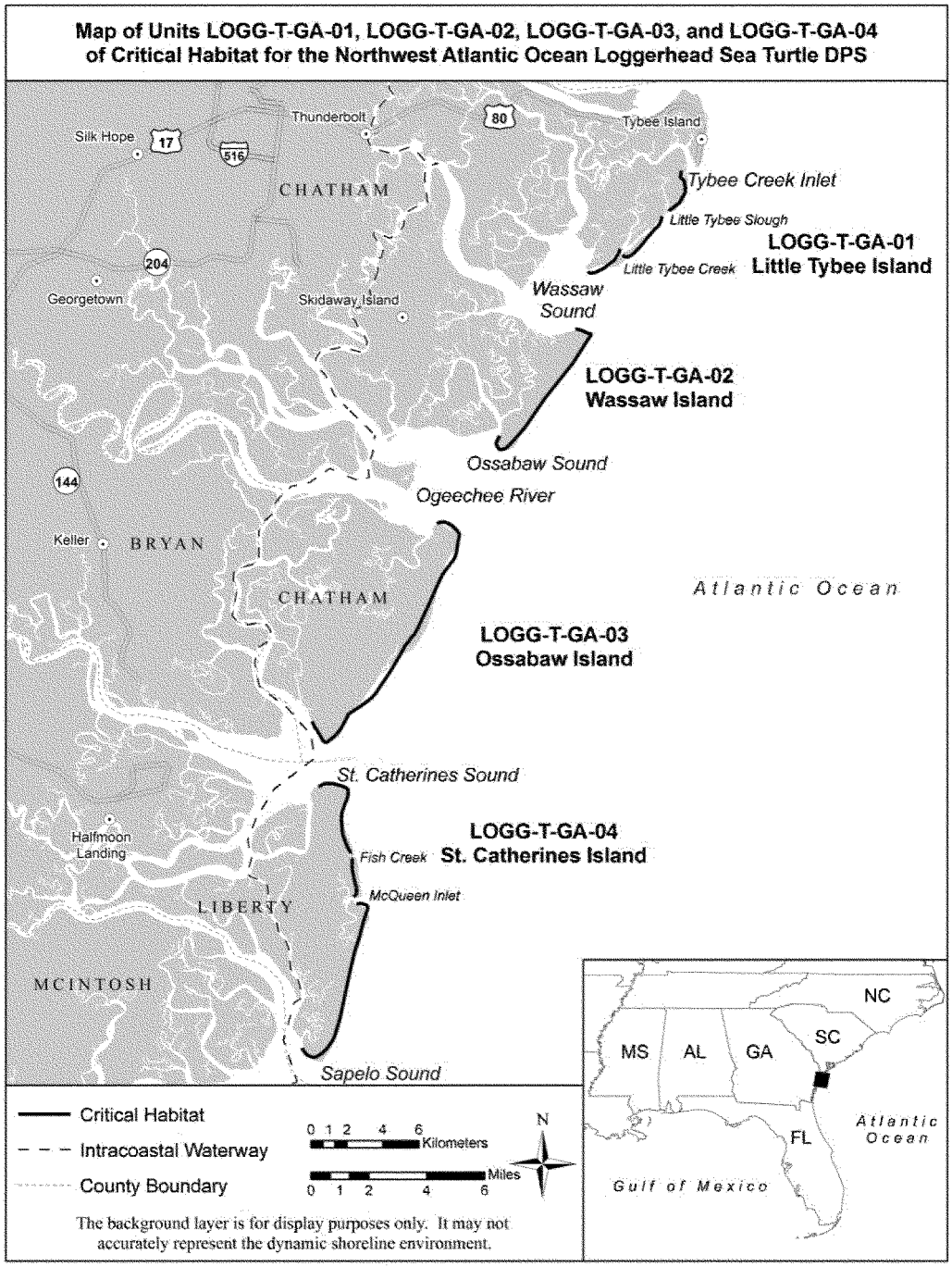
(A) (1) LOGG–T–GA–01—Little Tybee Island: This unit consists of 8.6 km (5.3 miles) of island shoreline along the Atlantic Ocean and extends from Tybee Creek Inlet to Wassaw Sound.

(2) LOGG–T–GA–02—Wassaw Island: This unit consists of 10.1 km (6.3 miles) of island shoreline along the Atlantic Ocean and extends from Wassaw Sound to Ossabaw Sound.

(3) LOGG–T–GA–03—Ossabaw Island: This unit consists of 17.1 km (10.6 miles) of island shoreline along the Atlantic Ocean and extends from Ogeechee River to St. Catherines Sound.

(4) LOGG–T–GA–04—St. Catherines Island: This unit consists of 18.4 km (11.5 miles) of island shoreline along the Atlantic Ocean and extends from St. Catherines Sound to Sapelo Sound.

(B) *Note:* Map of Units LOGG–T–GA–01, LOGG–T–GA–02, LOGG–T–GA–03, and LOGG–T–GA–04: Georgia Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(16) Units:

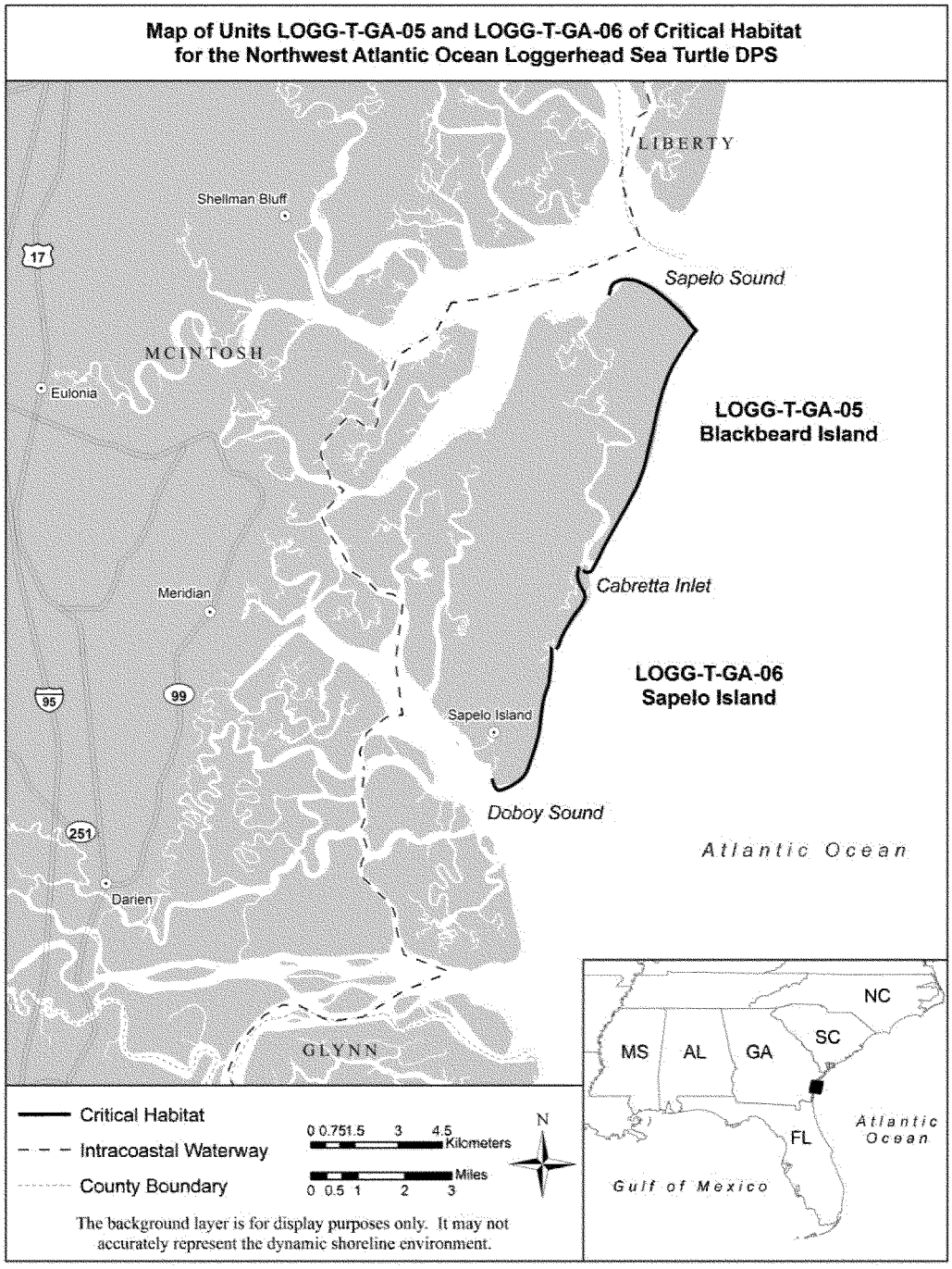
(i) LOGG–T–GA–05—Blackbeard Island, McIntosh County, Georgia.

(ii) LOGG–T–GA–06—Sapelo Island, McIntosh County, Georgia.

(A) (1) LOGG–T–GA–05—Blackbeard Island: This unit consists of 13.5 km (8.4 miles) of island shoreline along the Atlantic Ocean and extends from Sapelo Sound to Cabretta Inlet.

(2) LOGG–T–GA–06—Sapelo Island: This unit consists of 9.3 km (5.8 miles) of island shoreline along the Atlantic Ocean and extends from Cabretta Inlet to Doboy Sound.

(B) *Note:* Map of Units LOGG–T–GA–05 and LOGG–T–GA–06: Georgia Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(17) Units:

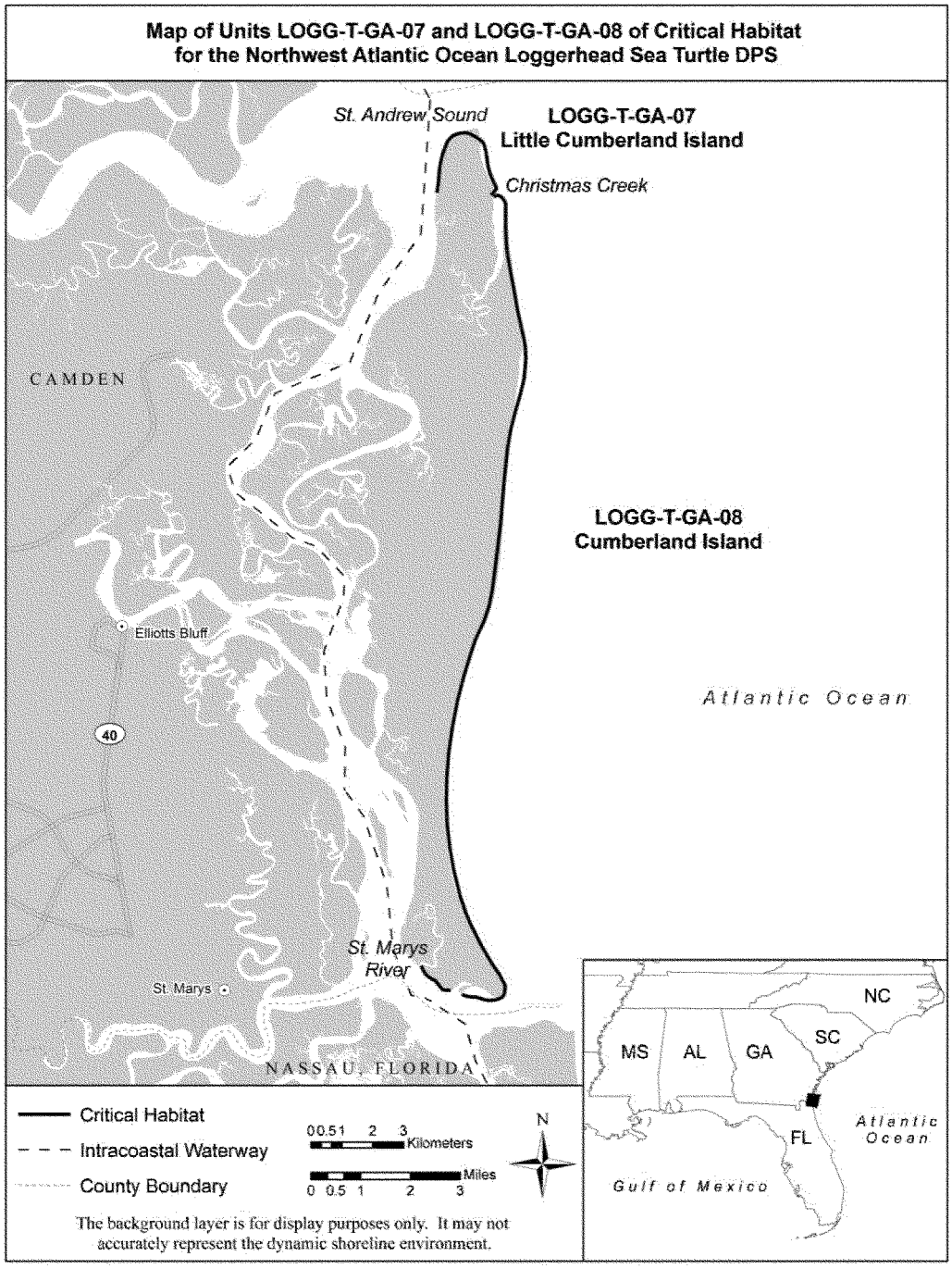
(i) LOGG–T–GA–07—Little Cumberland Island, Camden County, Georgia.

(ii) LOGG–T–GA–08—Cumberland Island, Camden County, Georgia.

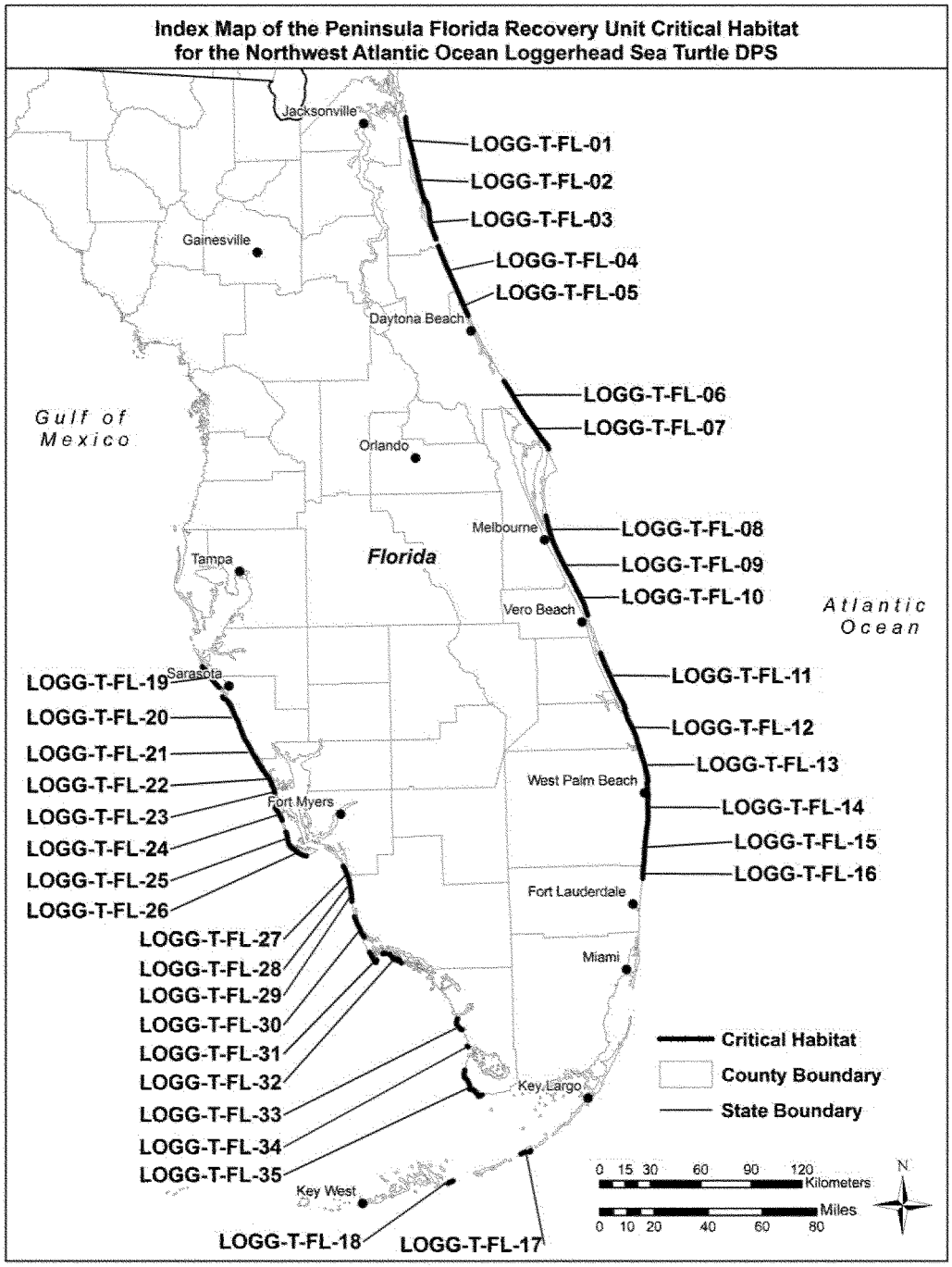
(A) (1) LOGG–T–GA–07—Little Cumberland Island: This unit consists of 4.9 km (3.0 miles) of island shoreline along the Atlantic Ocean and extends from St. Andrew Sound to Christmas Creek.

(2) LOGG–T–GA–08—Cumberland Island: This unit consists of 29.7 km (18.4 miles) of island shoreline along the Atlantic Ocean and extends from Christmas Creek to St. Marys River.

(B) *Note:* Map of Units LOGG–T–GA–07 and LOGG–T–GA–08: Georgia Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(18) Index Map of Critical Habitat Units in the Peninsular Florida Recovery Unit.



(19) Units:

(i) LOGG–T–FL–01—South Duval County-Old Ponte Vedra, Duval and St. Johns Counties, Florida.

(ii) LOGG–T–FL–02—Guana Tolomato Matanzas NERR-St. Augustine Inlet, St. Johns County, Florida.

(iii) LOGG–T–FL–03—St. Augustine Inlet-Matanzas Inlet, St. Johns County, Florida.

(iv) LOGG–T–FL–04—River to Sea Preserve at Marineland—North Peninsula State Park, Flagler and Volusia Counties, Florida.

(v) LOGG–T–FL–05—Ormond-by-the-Sea–Granada Blvd., Volusia County, Florida.

(A)(1) LOGG–T–FL–01—South Duval County-Old Ponte Vedra: This unit consists of 25.2 km (15.6 miles) of island shoreline along the Atlantic Ocean and extends from the south boundary of Kathryn Abbey Hanna Park in Duval County to the north boundary of the Guana Tolomato Matanzas National Estuarine Research Reserve in St. Johns County.

(2) LOGG–T–FL–02—Guana Tolomato Matanzas National Estuarine Research Reserve-St. Augustine Inlet: This unit consists of 24.1 km (15.0 miles) of island shoreline along the Atlantic Ocean and extends from the north boundary of the Guana Tolomato Matanzas National Estuarine Research Reserve to St. Augustine Inlet.

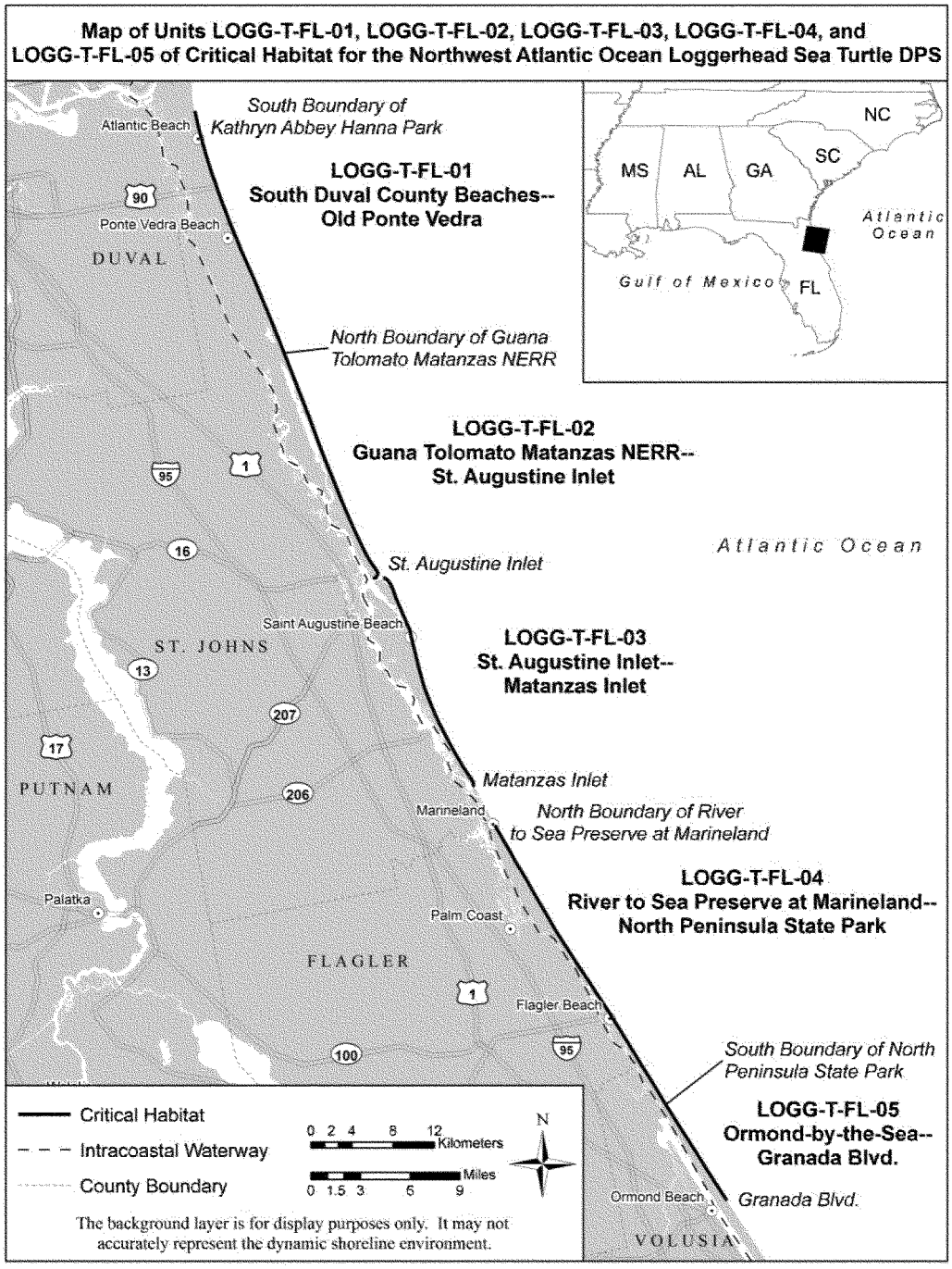
(3) LOGG–T–FL–03—St. Augustine Inlet-Matanzas Inlet: This unit consists of 22.4 km (14.0 miles) of island shoreline along the Atlantic Ocean and extends from St. Augustine Inlet to Matanzas Inlet.

(4) LOGG–T–FL–04—River to Sea Preserve at Marineland-North Peninsula

State Park: This unit consists of 31.8 km (19.8 miles) of island shoreline along the Atlantic Ocean and extends from the north boundary of the River to Sea Preserve at Marineland to the south boundary of North Peninsula State Park.

(5) LOGG–T–FL–05—Ormond-by-the-Sea–Granada: This unit consists of 11.1 km (6.9 miles) of island shoreline along the Atlantic Ocean and extends from the south boundary of North Peninsula State Park to Granada Boulevard in Ormond Beach.

(B) *Note:* Map of Units LOGG–T–FL–01, LOGG–T–FL–02, LOGG–T–FL–03, LOGG–T–FL–04, and LOGG–T–FL–05: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(20) Units:

(i) LOGG–T–FL–06—Canaveral National Seashore North, Volusia County, Florida.

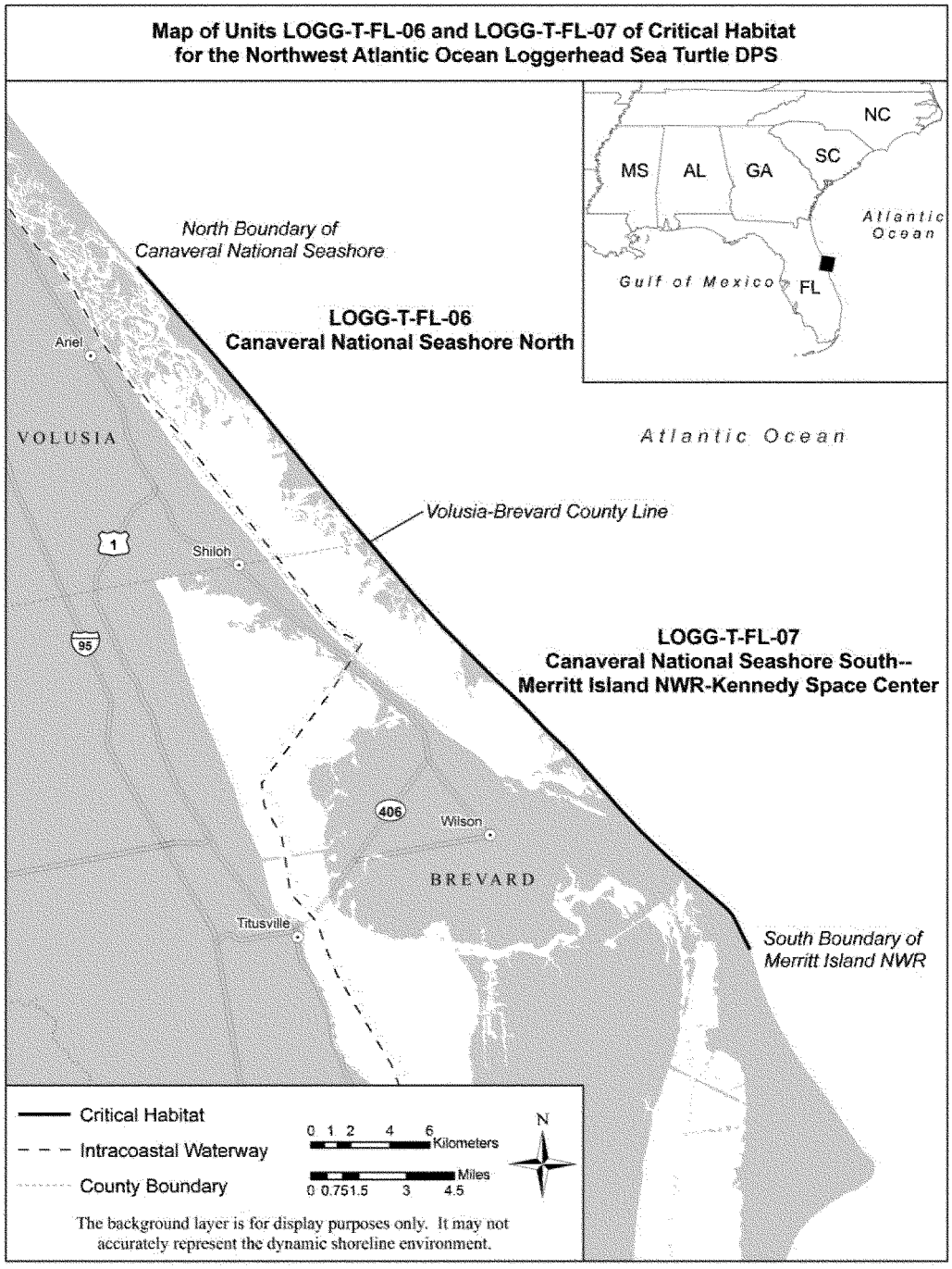
(ii) LOGG–T–FL–07—Canaveral National Seashore South-Merritt Island NWR-Kennedy Space Center, Brevard County, Florida.

(A)(1) LOGG–T–FL–06—Canaveral National Seashore North: This unit consists of 18.2 km (11.3 miles) of island shoreline along the Atlantic Ocean and extends from the north boundary of Canaveral National Seashore to the Volusia-Brevard County line.

(2) LOGG–T–FL–07—Canaveral National Seashore South-Merritt Island

NWR-Kennedy Space Center: This unit consists of 28.4 km (17.6 miles) of island shoreline along the Atlantic Ocean and extends from the Volusia-Brevard County line to the south boundary of Merritt Island NWR-Kennedy Space Center (Merritt Island NWR was established in 1963 as an overlay of the National Aeronautics and Space Administration's (NASA) John F. Kennedy Space Center).

(B) *Note:* Map of Units LOGG–T–FL–06 and LOGG–T–FL–07: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(21) Units:

(i) LOGG–T–FL–08—Central Brevard Beaches, Brevard County, Florida.

(ii) LOGG–T–FL–09—South Brevard Beaches, Brevard County, Florida.

(iii) LOGG–T–FL–10—Sebastian Inlet-Indian River Shores, Indian River County, Florida.

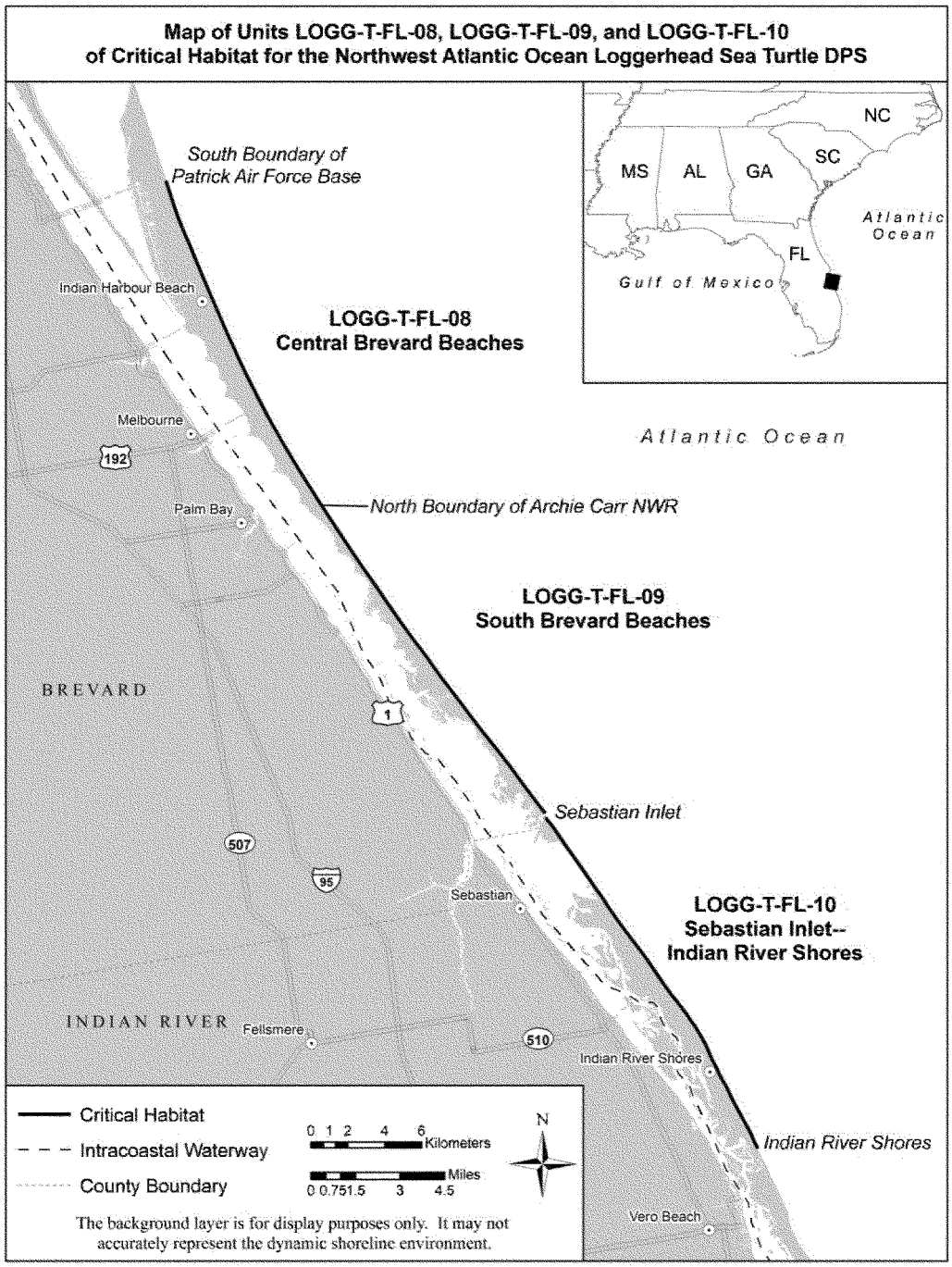
(A) (1) LOGG–T–FL–08—Central Brevard Beaches: This unit consists of 19.5 km (12.1 miles) of island shoreline along the Atlantic Ocean and extends from the south boundary of Patrick Air Force Base to the north boundary of Archie Carr National Wildlife Refuge (NWR).

(2) LOGG–T–FL–09—South Brevard: This unit consists of 20.8 km (12.9 miles) of island shoreline along the

Atlantic Ocean and extends from the north boundary of Archie Carr NWR to Sebastian Inlet.

(3) LOGG–T–FL–10—Sebastian Inlet-Indian River Shores: This unit consists of 21.4 km (13.3 miles) of island shoreline along the Atlantic Ocean and extends from Sebastian Inlet to the Indian River Shores southern city limits.

(B) *Note:* Map of Units LOGG–T–FL–08, LOGG–T–FL–09, and LOGG–T–FL–10: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(22) Units:

(i) LOGG–T–FL–11—Fort Pierce Inlet-St. Lucie Inlet, St. Lucie and Martin Counties, Florida.

(ii) LOGG–T–FL–12—St. Lucie Inlet-Jupiter Inlet, Martin and Palm Beach Counties, Florida.

(iii) LOGG–T–FL–13—Jupiter Inlet-Lake Worth Inlet, Palm Beach County, Florida.

(iv) LOGG–T–FL–14—Lake Worth Inlet-Boynton Inlet, Palm Beach County, Florida.

(v) LOGG–T–FL–15—Boynton Inlet-Boca Raton Inlet, Palm Beach County, Florida.

(vi) LOGG–T–FL–16—Boca Raton Inlet-Hillsboro Inlet, Palm Beach and Broward Counties, Florida.

(A)(1) LOGG–T–FL–11—Fort Pierce Inlet-St. Lucie Inlet: This unit consists

of 35.2 km (21.9 miles) of island shoreline along the Atlantic Ocean and extends from Fort Pierce Inlet to St. Lucie Inlet.

(2) LOGG–T–FL–12—St. Lucie Inlet-Jupiter Inlet: This unit consists of 24.9 km (15.5 miles) of island shoreline along the Atlantic Ocean and extends from St. Lucie Inlet to Jupiter Inlet.

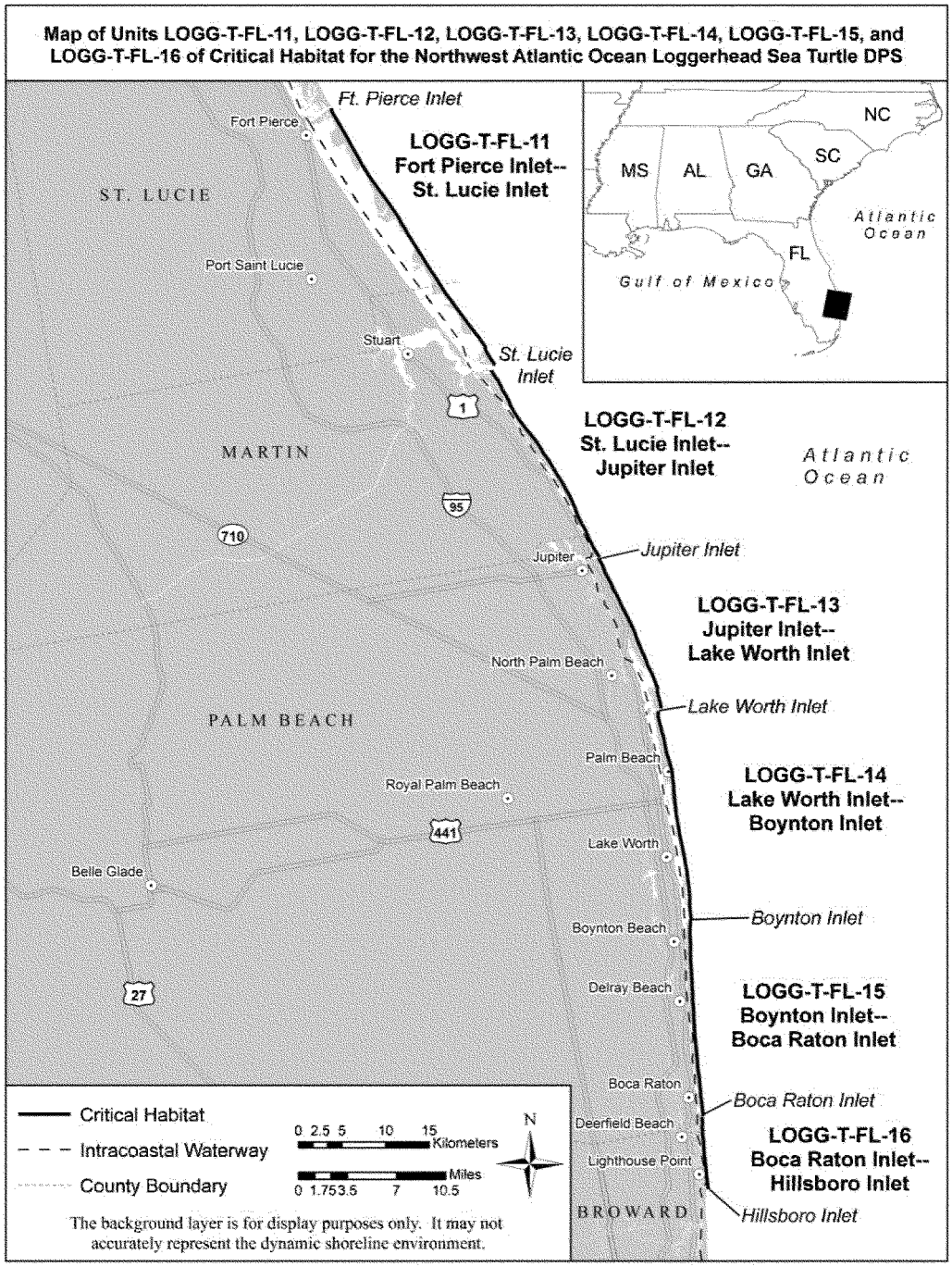
(3) LOGG–T–FL–13—Jupiter Inlet-Lake Worth Inlet: This unit consists of 18.8 km (11.7 miles) of island shoreline along the Atlantic Ocean and extends from Jupiter Inlet to Lake Worth Inlet.

(4) LOGG–T–FL–14—Lake Worth Inlet-Boynton Inlet: This unit consists of 24.3 km (15.1 miles) of island shoreline along the Atlantic Ocean and extends from Lake Worth Inlet to Boynton Inlet.

(5) LOGG–T–FL–15—Boynton Inlet-Boca Raton Inlet: This unit consists of 22.6 km (14.1 miles) of island shoreline along the Atlantic Ocean and extends from Boynton Inlet to Boca Raton Inlet.

(6) LOGG–T–FL–16—Boca Raton Inlet-Hillsboro Inlet: This unit consists of 8.3 km (5.2 miles) of island shoreline along the Atlantic Ocean and extends from Boca Raton Inlet to Hillsboro Inlet.

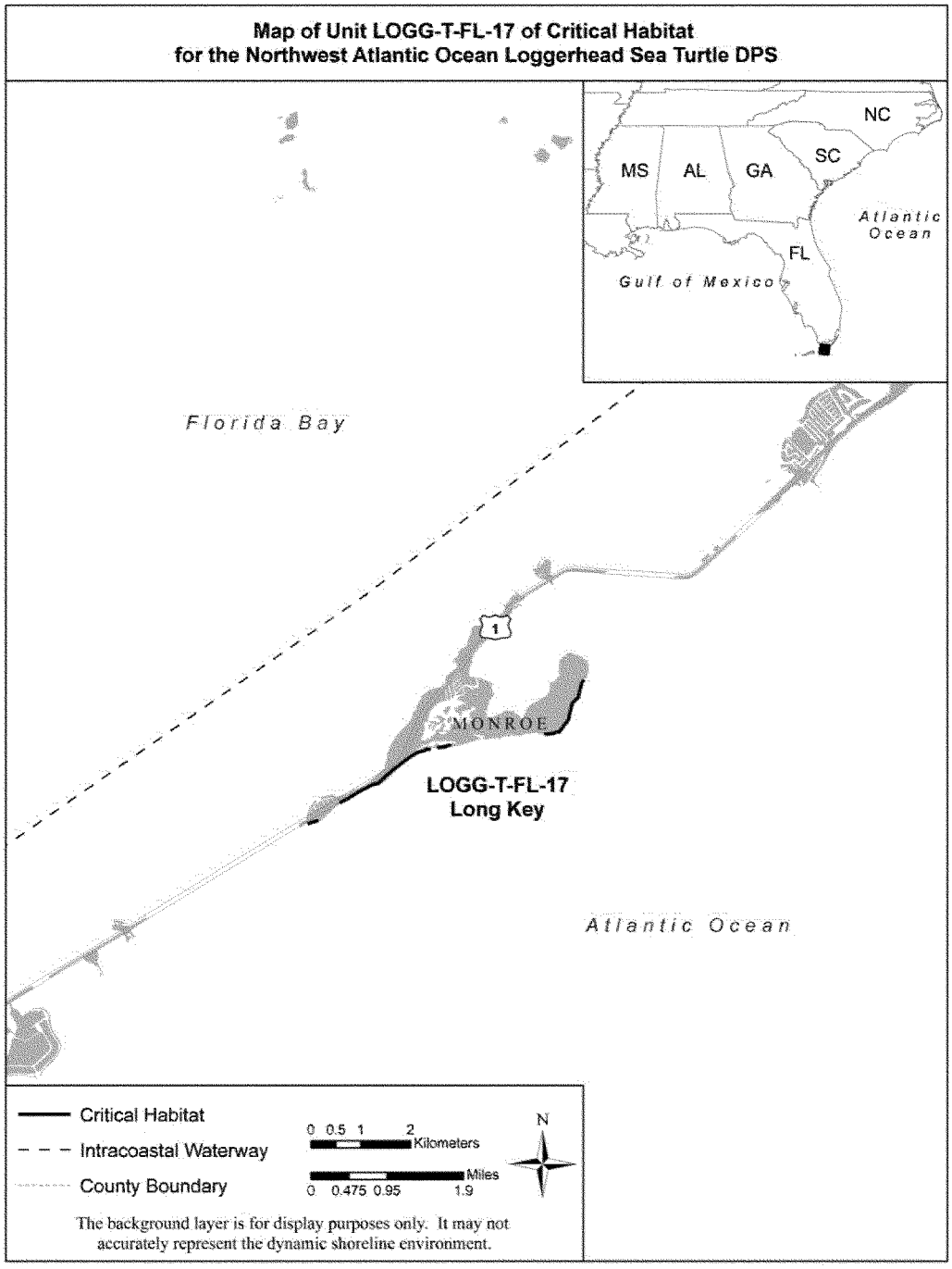
(B) *Note:* Map of Units LOGG–T–FL–11, LOGG–T–FL–12, LOGG–T–FL–13, LOGG–T–FL–14, LOGG–T–FL–15, and LOGG–T–FL–16: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(23) Unit LOGG–T–FL–17—Long Key, Monroe County, Florida.

(i) LOGG–T–FL–17—Long Key, Monroe: This unit consists of 4.2 km (2.6 miles) of island shoreline along the Atlantic Ocean and extends from the natural channel between Fiesta Key and Long Key to the natural channel between Long Key and Conch Key.

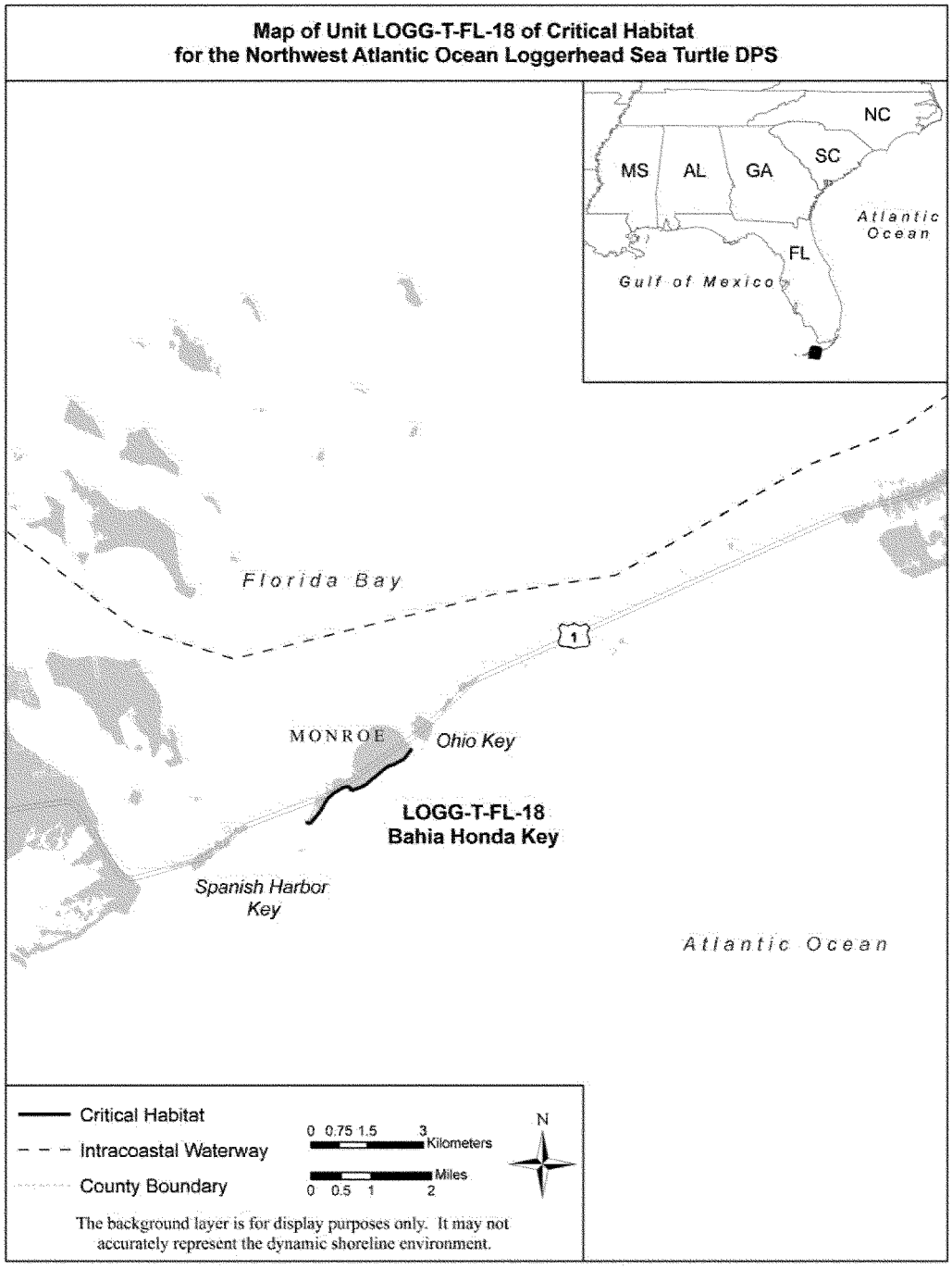
(ii) *Note:* Map of Unit LOGG–T–FL–17: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(24) Unit LOGG–T–FL–18—Bahia Honda Key, Monroe County, Florida.

(i) LOGG–T–FL–18—Bahia Honda Key, Monroe: This unit consists of 3.7 km (2.3 miles) of island shoreline along the Atlantic Ocean and extends from the natural channel between Ohio Key and Bahia Honda Key to the natural channel between Bahia Honda Key and Spanish Harbor Key.

(ii) *Note:* Map of Unit LOGG–T–FL–18: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(25) Units:

(i) LOGG–T–FL–19—Longboat Key, Manatee and Sarasota Counties, Florida.

(ii) LOGG–T–FL–20—Siesta and Casey Keys, Sarasota County, Florida.

(iii) LOGG–T–FL–21—Venice Beaches and Manasota Key, Sarasota and Charlotte Counties, Florida.

(iv) LOGG–T–FL–22—Knight, Don Pedro, and Little Gasparilla Islands, Charlotte County, Florida.

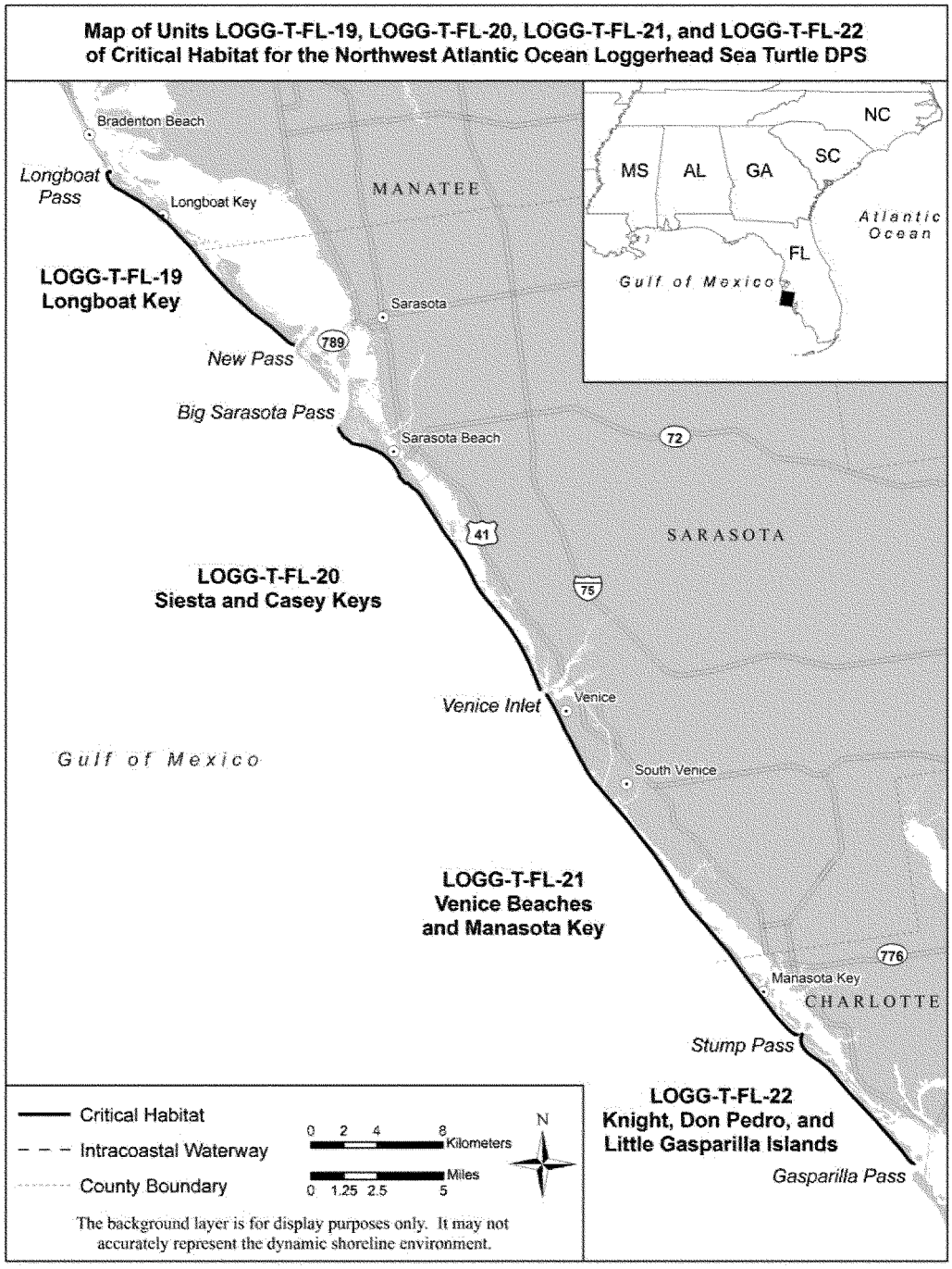
(A)(1) LOGG–T–FL–19—Longboat Key: This unit consists of 16.0 km (9.9 miles) of island shoreline along the Gulf of Mexico and extends from Longboat Pass to New Pass.

(2) LOGG–T–FL–20—Siesta and Casey Keys: This unit consists of 20.8 km (13.0 miles) of island shoreline along the Gulf of Mexico and extends from Big Sarasota Pass to Venice Inlet.

(3) LOGG–T–FL–21—Venice Beaches and Manasota Key: This unit consists of 26.0 km (16.1 miles) of island shoreline along the Gulf of Mexico and extends from Venice Inlet to Stump Pass.

(4) LOGG–T–FL–22—Knight, Don Pedro, and Little Gasparilla Islands: This unit consists of 10.8 km (6.7 miles) of island shoreline along the Gulf of Mexico and extends from Stump Pass to Gasparilla Pass.

(B) *Note:* Map of Units LOGG–T–FL–19, LOGG–T–FL–20, LOGG–T–FL–21, and LOGG–T–FL–22: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(26) Units:

(i) LOGG–T–FL–23—Gasparilla Island, Charlotte and Lee Counties, Florida.

(ii) LOGG–T–FL–24—Cayo Costa, Lee County, Florida.

(iii) LOGG–T–FL–25—Captiva Island, Lee County, Florida.

(iv) LOGG–T–FL–26—Sanibel Island West, Lee County, Florida.

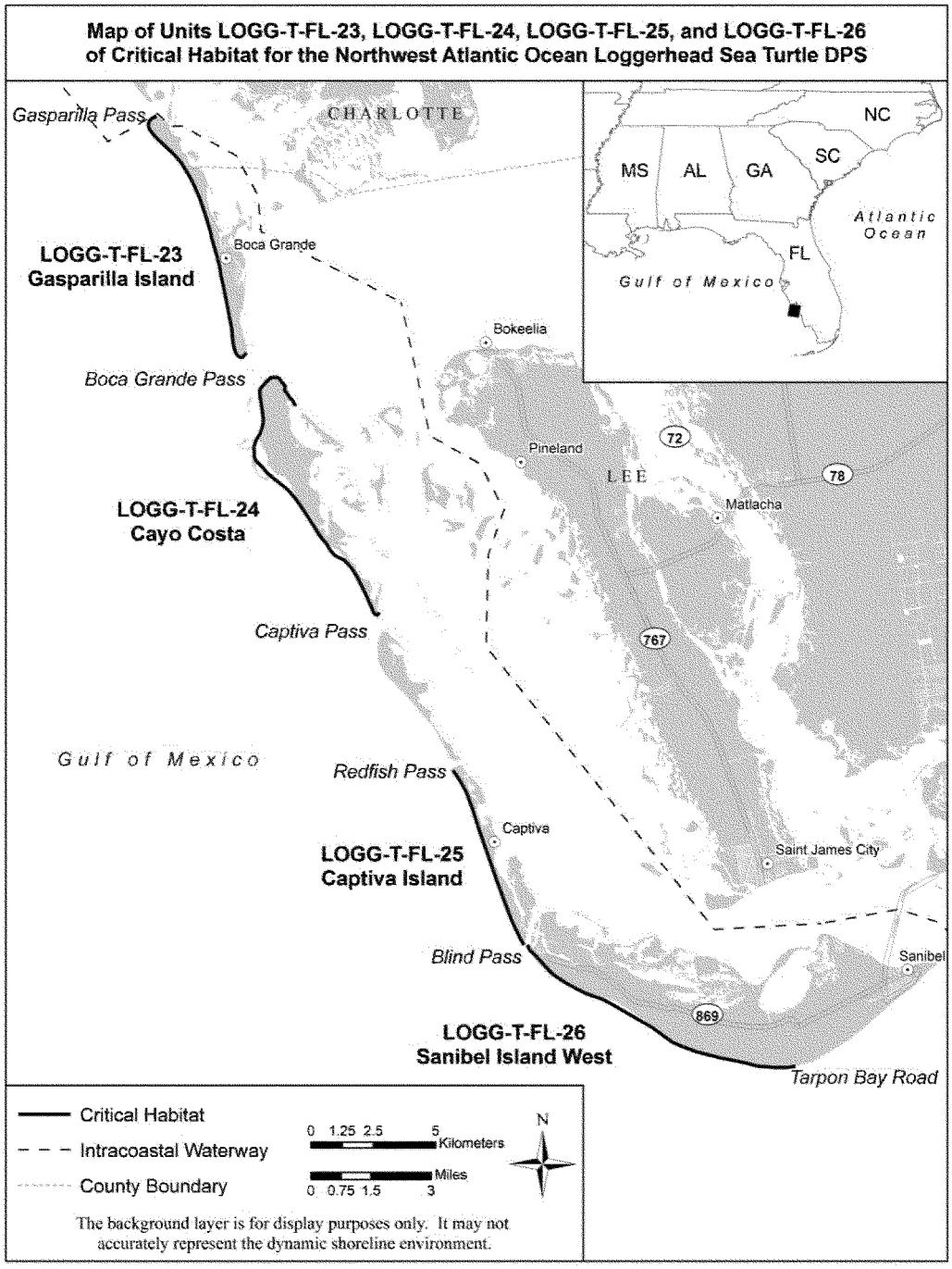
(A)(1) LOGG–T–FL–23—Gasparilla Island: This unit consists of 11.2 km (6.9 miles) of island shoreline along the Gulf of Mexico and extends from Gasparilla Pass to Boca Grande Pass.

(2) LOGG–T–FL–24—Cayo Costa: This unit consists of 13.5 km (8.4 miles) of island shoreline along the Gulf of Mexico and extends from Boca Grande Pass to Captiva Pass.

(3) LOGG–T–FL–25—Captiva Island: This unit consists of 7.6 km (4.7 miles) of island shoreline along the Gulf of Mexico and extends from Redfish Pass to Blind Pass.

(4) LOGG–T–FL–26—Sanibel Island West: This unit consists of 12.2 km (7.6 miles) of island shoreline along the Gulf of Mexico and extends from Blind Pass to Tarpon Bay Road.

(B) *Note:* Map of Units LOGG–T–FL–23, LOGG–T–FL–24, LOGG–T–FL–25, and LOGG–T–FL–26: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(27) Units:

(i) LOGG–T–FL–27—Little Hickory Island, Lee and Collier Counties, Florida.

(ii) LOGG–T–FL–28—Wiggins Pass-Clam Pass, Collier County, Florida.

(iii) LOGG–T–FL–29—Clam Pass-Doctors Pass, Collier County, Florida.

(iv) LOGG–T–FL–30—Keewaydin Island and Sea Oat Island, Collier County, Florida.

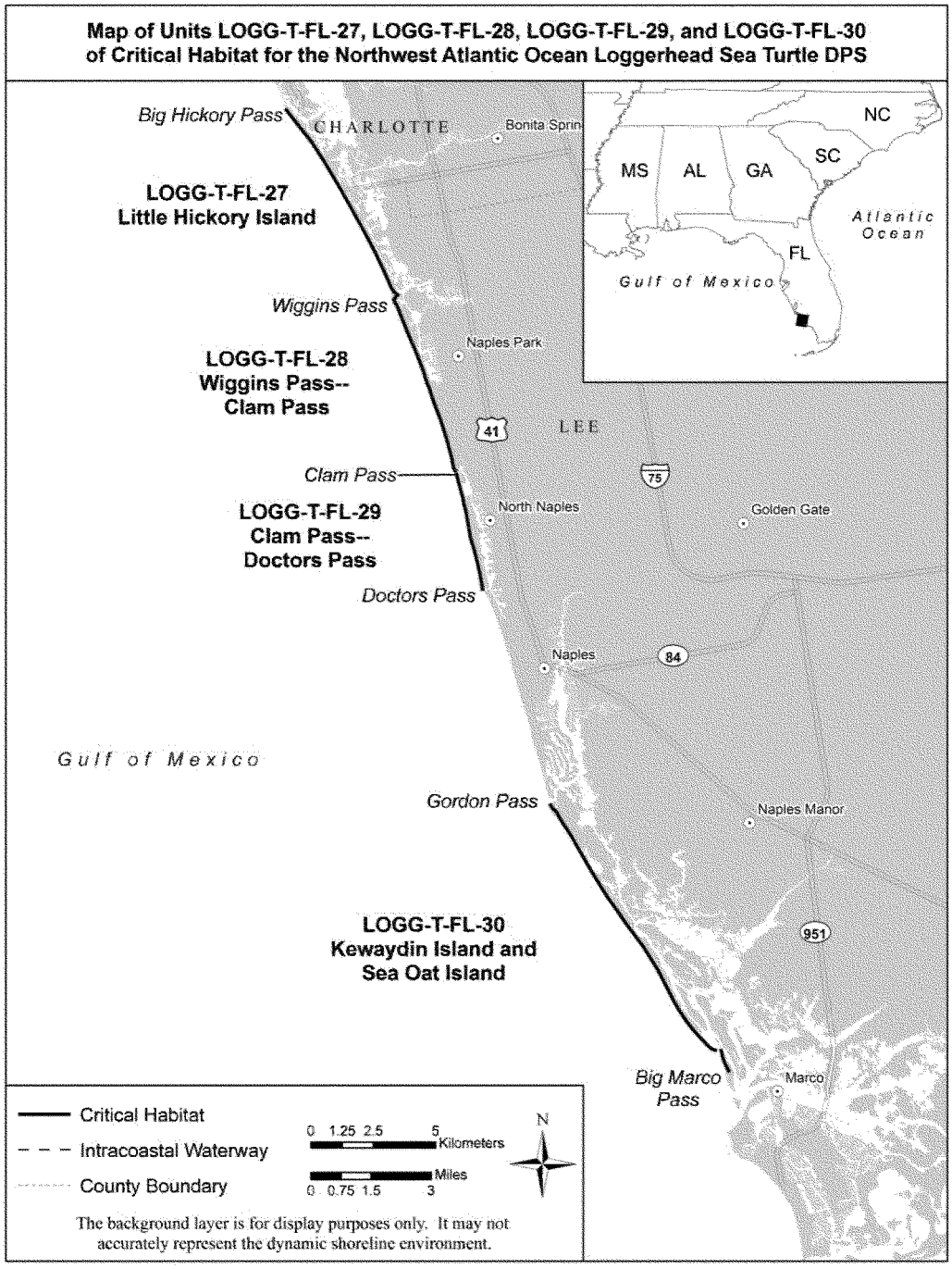
(A)(1) LOGG–T–FL–27—Little Hickory Island: This unit consists of 8.7 km (5.4 miles) of island shoreline along the Gulf of Mexico and extends from Big Hickory Pass to Wiggins Pass.

(2) LOGG–T–FL–28—Wiggins Pass-Clam Pass: This unit consists of 7.7 km (4.8 miles) of mainland shoreline along the Gulf of Mexico and extends from Wiggins Pass to Clam Pass.

(3) LOGG–T–FL–29—Clam Pass-Doctors Pass: This unit consists of 4.9 km (3.0 miles) of island shoreline along the Gulf of Mexico and extends from Clam Pass to Doctors Pass.

(4) LOGG–T–FL–30—Keewaydin Island and Sea Oat Island: This unit consists of 13.1 km (8.1 miles) of island shoreline along the Gulf of Mexico and extends from Gordon Pass to Big Marco Pass.

(B) *Note:* Map of Units LOGG–T–FL–27, LOGG–T–FL–28, LOGG–T–FL–29, and LOGG–T–FL–30: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(28) Units:

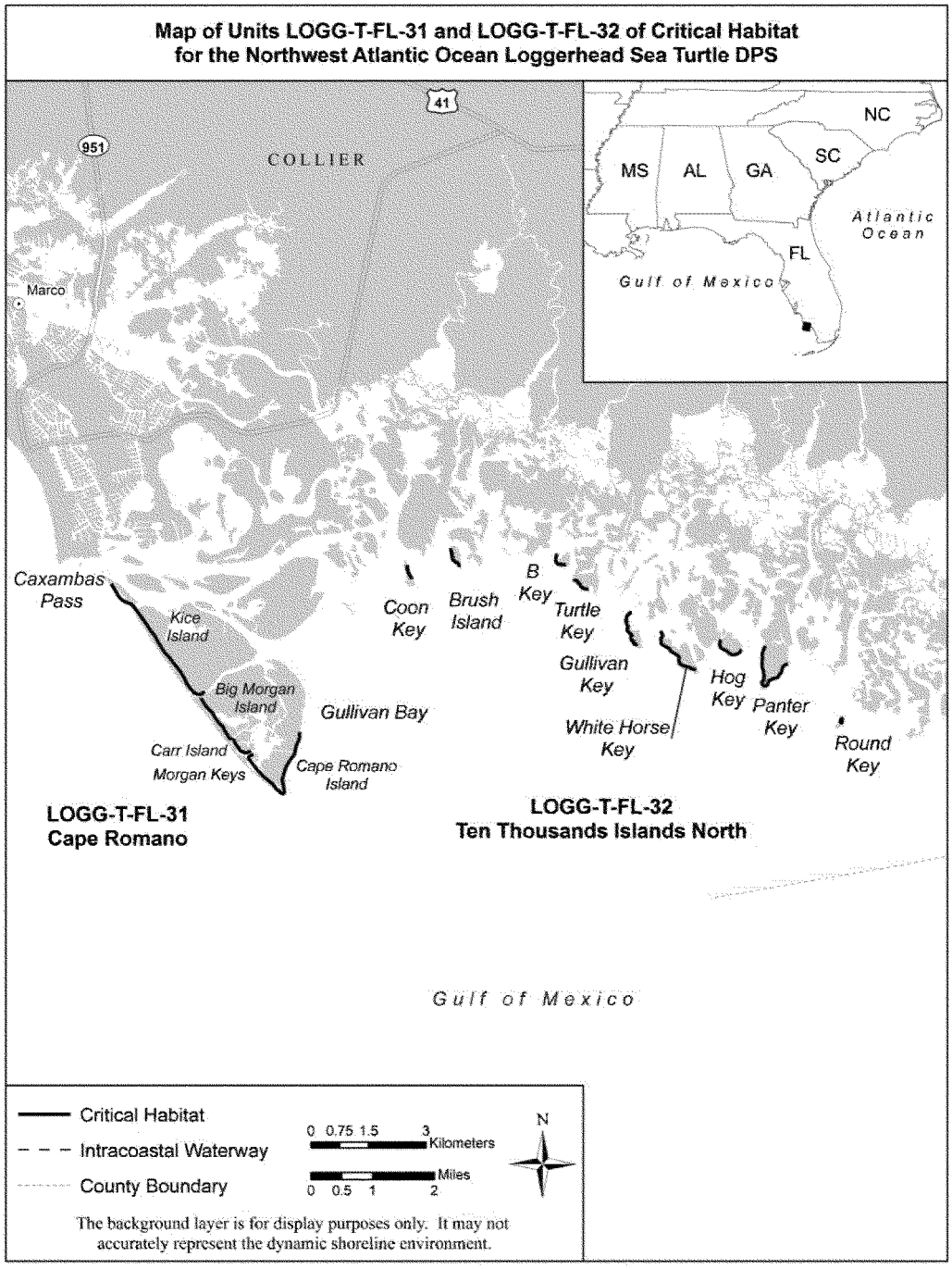
(i) LOGG–T–FL–31—Cape Romano, Collier County, Florida.

(ii) LOGG–T–FL–32—Ten Thousand Islands North, Collier County, Florida.

(A) (1) LOGG–T–FL–31—Cape Romano: This unit consists of 9.2 km (5.7 miles) of island shoreline along the Gulf of Mexico and Gullivan Bay and extends from Caxambas Pass to Gullivan Bay.

(2) LOGG–T–FL–32—Ten Thousand Islands North: This unit consists of 7.8 km (4.9 miles) of island shoreline along the Gulf of Mexico and within Gullivan Bay.

(B) *Note:* Map of Units LOGG–T–FL–31 and LOGG–T–FL–32: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(29) Units:

(i) LOGG–T–FL–33—Highland Beach, Monroe County, Florida.

(ii) LOGG–T–FL–34—Graveyard Creek-Shark Point, Monroe County, Florida.

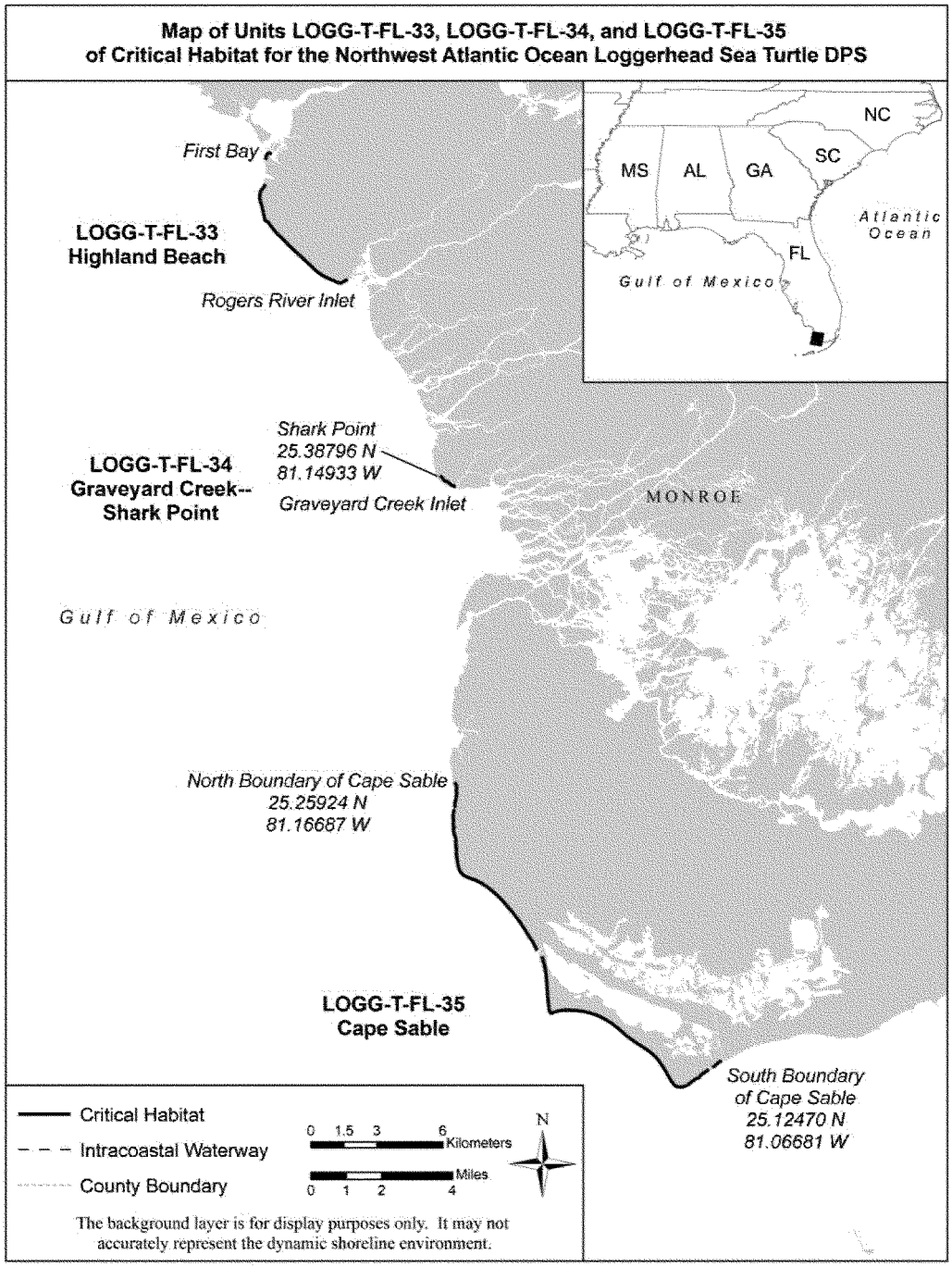
(iii) LOGG–T–FL–35—Cape Sable, Monroe County, Florida.

(A) (1) LOGG–T–FL–33—Highland Beach: This unit consists of 7.2 km (4.5 miles) of island (Key McLaughlin) shoreline along the Gulf of Mexico and extends from First Bay to Rogers River Inlet.

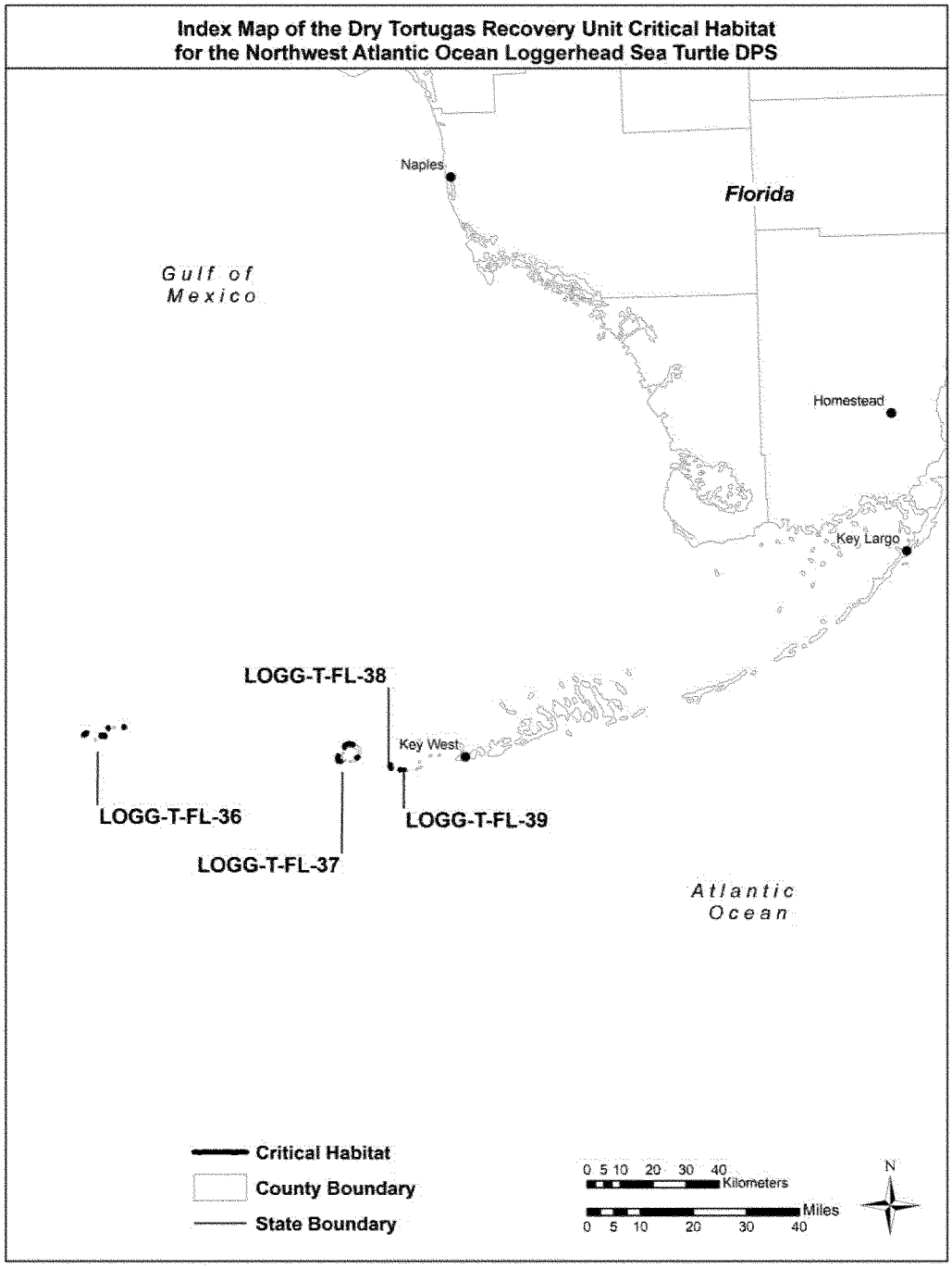
(2) LOGG–T–FL–34—Graveyard Creek-Shark Point: This unit consists of 0.9 km (0.6 mile) of mainland shoreline along the Gulf of Mexico and extends from Shark Point (25.38796 N, 81.14933 W) to Graveyard Creek Inlet.

(3) LOGG–T–FL–35—Cape Sable: This unit consists of 21.3 km (13.2 miles) of mainland shoreline along the Gulf of Mexico and extends from the north boundary of Cape Sable at 25.25924 N, 81.16687 W to the south boundary of Cape Sable at 25.12470 N, 81.06681 W.

(B) *Note:* Map of Units LOGG–T–FL–33, LOGG–T–FL–34, and LOGG–T–FL–35: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(30) Index Map of Critical Habitat Units in the Dry Tortugas Recovery Unit



(31) Units:

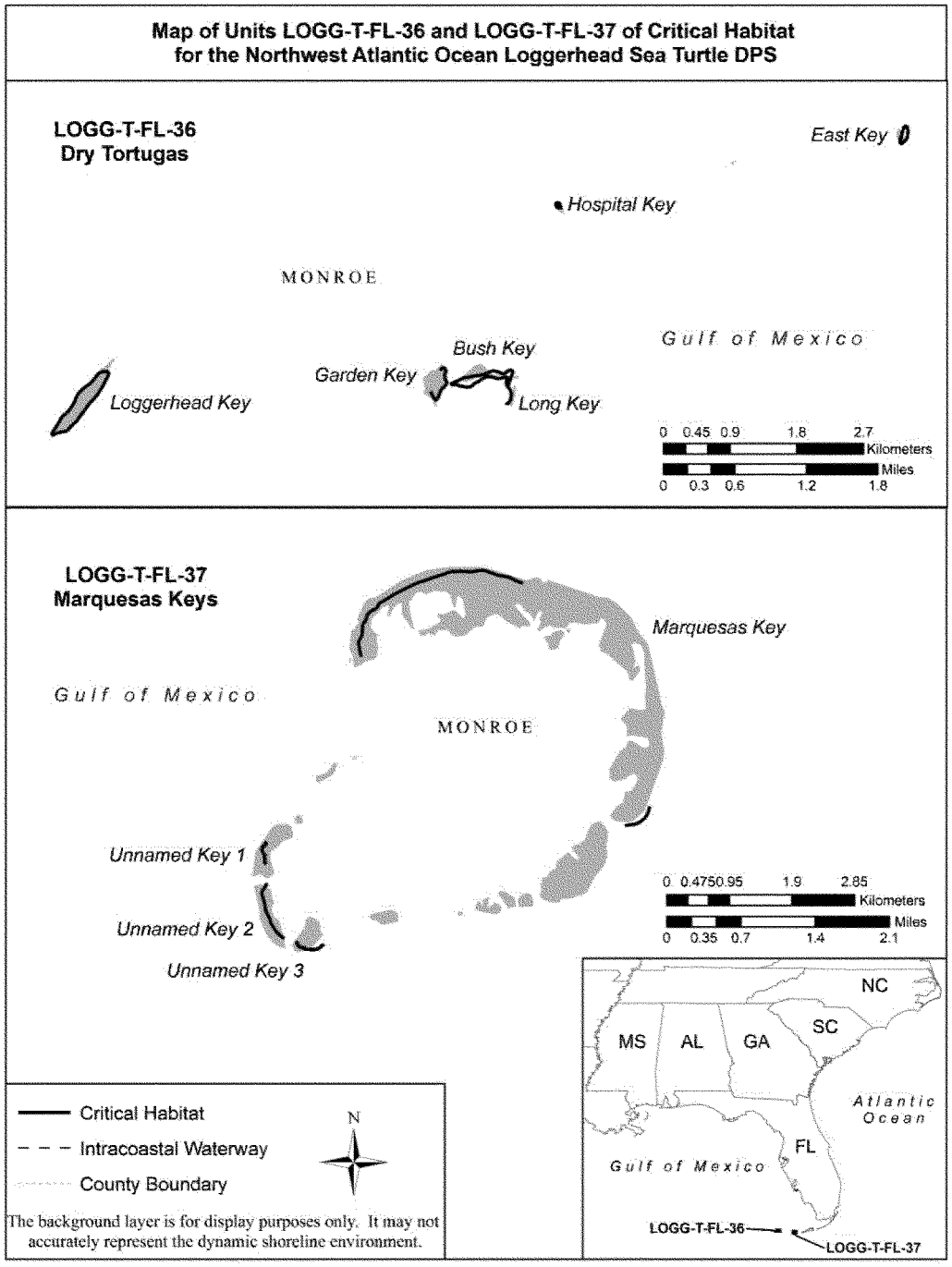
(i) LOGG–T–FL–36—Dry Tortugas, Monroe County, Florida.

(ii) LOGG–T–FL–37—Marquesas Keys, Monroe County, Florida.

(A) (1) LOGG–T–FL–36—Dry Tortugas: This unit consists of 6.3 km (3.9 miles) of shoreline along the Gulf of Mexico and consists of Loggerhead Key, Garden Key, Bush Key, Long Key, Hospital Key, and East Key located in the Dry Tortugas about 108 km (67 miles) west of Key West.

(2) LOGG–T–FL–37—Marquesas Keys: This unit consists of 5.6 km (3.5 miles) of shoreline along the Gulf of Mexico and consists of Marquesas Key, Unnamed Key 1, Unnamed Key 2, and Unnamed Key 3 located about 29.3 km (18.2 miles) west of Key West.

(B) *Note:* Map of Units LOGG–T–FL–36 and LOGG–T–FL–37: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(32) Units:

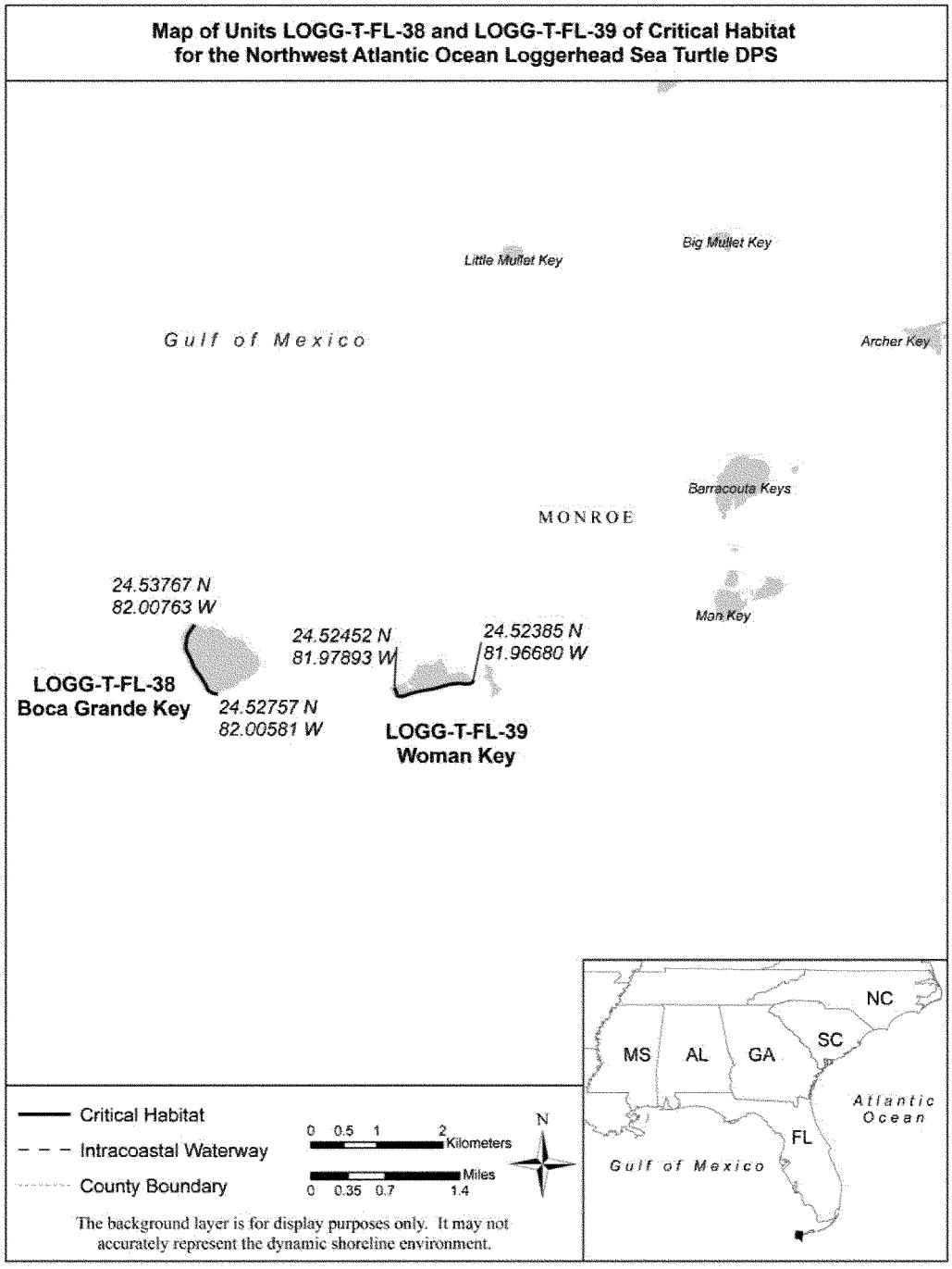
(i) LOGG–T–FL–38—Boca Grande Key, Monroe County, Florida.

(ii) LOGG–T–FL–39—Woman Key, Monroe County, Florida.

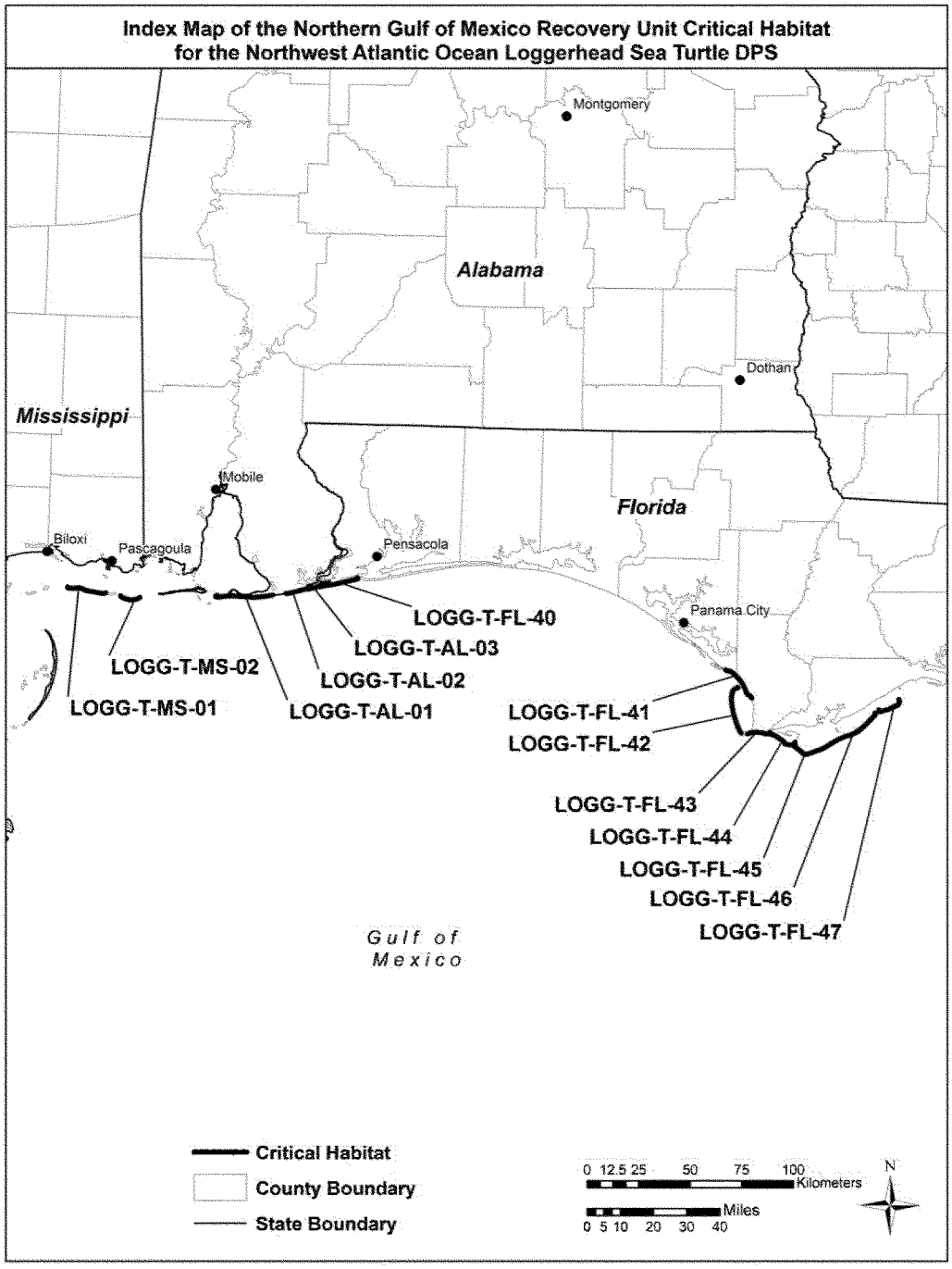
(A)(1) LOGG–T–FL–38—Boca Grande Key: This unit consists of 1.3 km (0.8 mile) of island shoreline along the Gulf of Mexico and extends from 24.53767 N, 82.00763 W (at the northern end of the key) to 24.52757 N, 82.00581 W (at the southern end of the key).

(2) LOGG–T–FL–39—Woman Key: This unit consists of 1.3 km (0.8 mile) of island shoreline along the Gulf of Mexico and extends from 24.52452 N, 81.97893 N (at the western end of the key) to 24.52385 N, 81.96680 W (at the eastern end of the key).

(B) *Note:* Map of Units LOGG–T–FL–38 and LOGG–T–FL–39: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(33) Index Map of Critical Habitat Units in the Northern Gulf of Mexico Recovery Unit.



(34) Units:

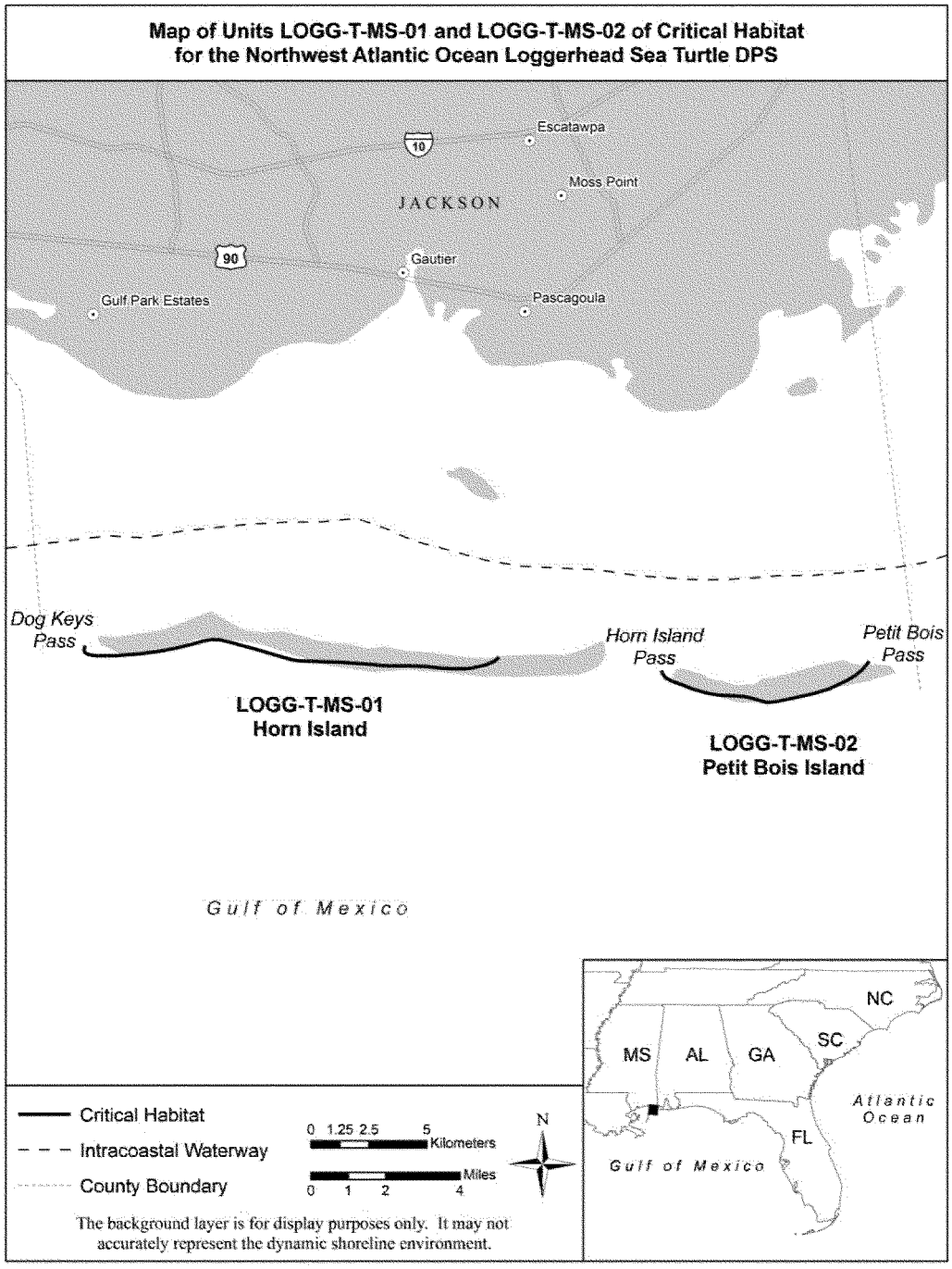
(i) LOGG–T–MS–01—Horn Island, Jackson County, Mississippi.

(ii) LOGG–T–MS–02—Petit Bois Island, Jackson County, Mississippi.

(A)(1) LOGG–T–MS–01—Horn Island: This unit consists of 18.6 km (11.5 miles) of island shoreline along the Gulf of Mexico and extends from Dog Keys Pass to the easternmost point of the ocean facing island shore.

(2) LOGG–T–MS–02—Petit Bois Island: This unit consists of 9.8 km (6.1 miles) of island shoreline along the Gulf of Mexico and extends from Horn Island Pass to Petit Bois Pass.

(B) *Note:* Map of Units LOGG–T–MS–01 and LOGG–T–MS–02: Mississippi Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(35) Units:

(i) LOGG–T–AL–01—Mobile Bay-Little Lagoon Pass, Baldwin County, Alabama.

(ii) LOGG–T–AL–02—Gulf State Park-Perdido Pass, Baldwin County, Alabama.

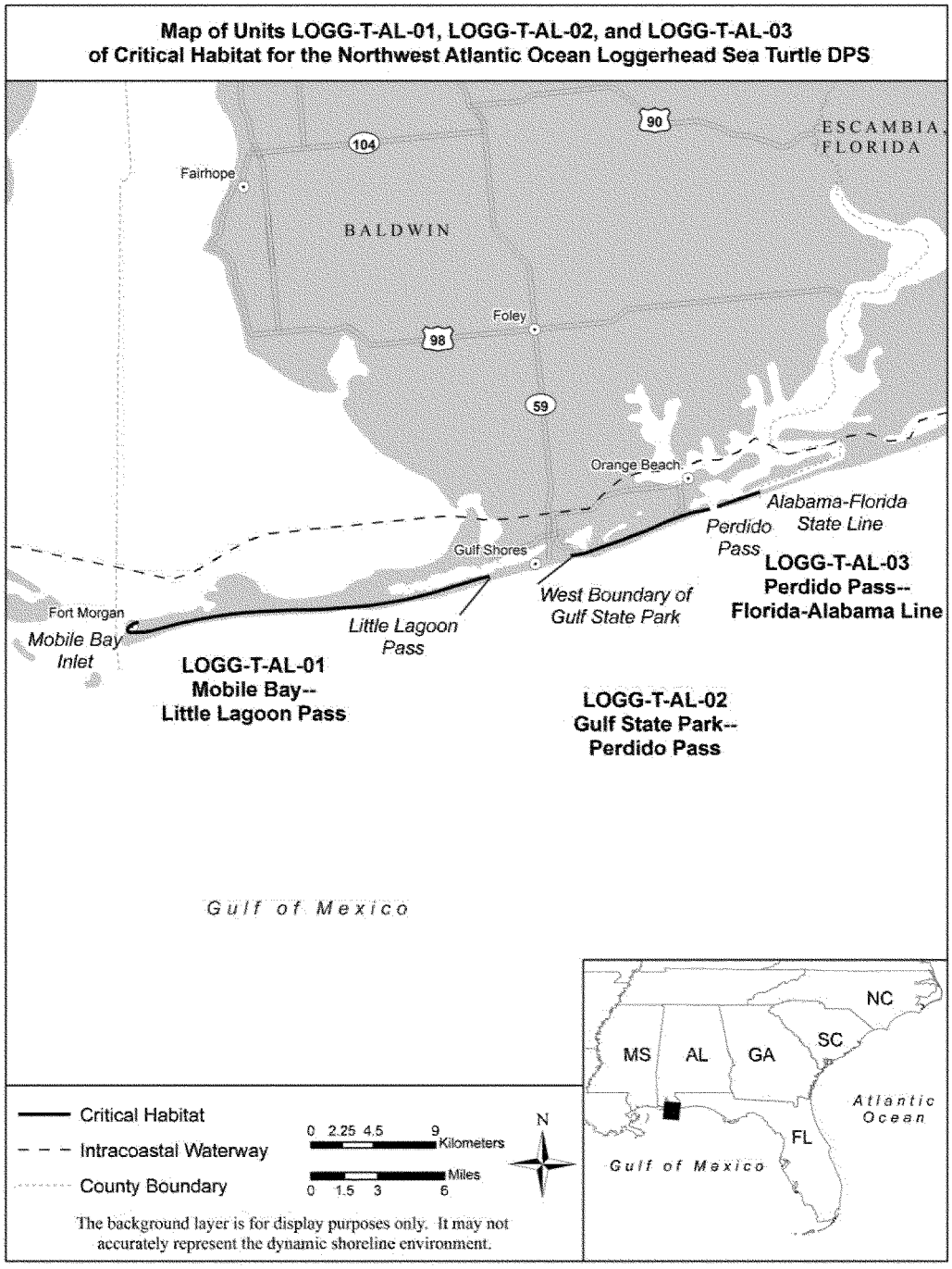
(iii) LOGG–T–AL–03—Perdido Pass-Florida-Alabama line, Baldwin County, Alabama.

(A) (1) LOGG–T–AL–01—Mobile Bay-Little Lagoon Pass: This unit consists of 28.0 km (17.4 miles) of island shoreline along the Gulf of Mexico and extends from Mobile Bay Inlet to Little Lagoon Pass.

(2) LOGG–T–AL–02—Gulf State Park-Perdido Pass: This unit consists of 10.7 km (6.7 miles) of island shoreline along the Gulf of Mexico and extends from the west boundary of Gulf State Park to Perdido Pass.

(3) LOGG–T–AL–03—Perdido Pass-Florida-Alabama line: This unit consists of 3.3 km (2.0 miles) of island shoreline along the Gulf of Mexico and extends from Perdido Pass to the Alabama–Florida border.

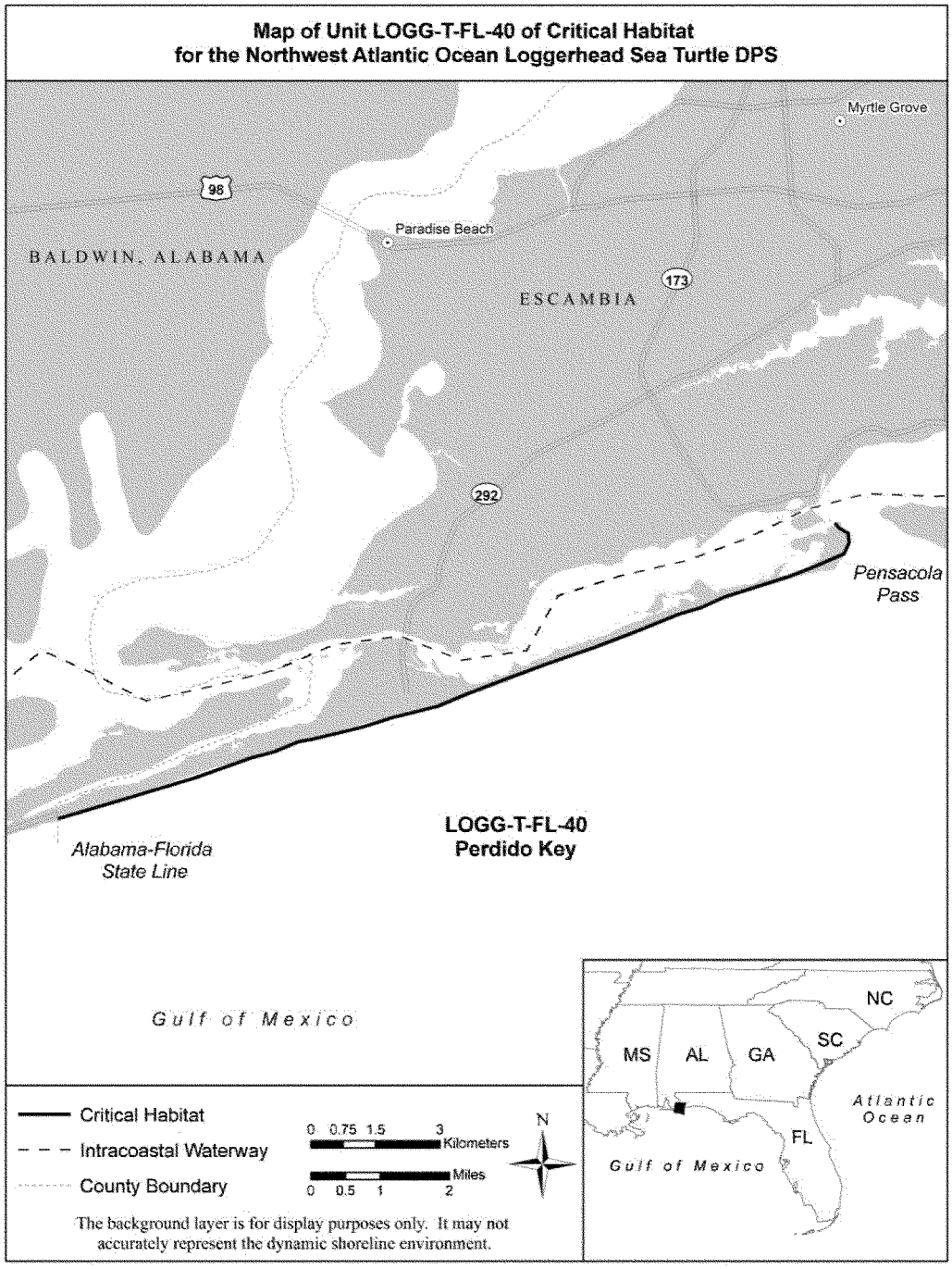
(B) *Note:* Map of Units LOGG–T–AL–01, LOGG–T–AL–02, and LOGG–T–AL–03: Alabama Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(36) Unit LOGG–T–FL–40—Perdido Key, Escambia County, Florida.

(i) LOGG–T–FL–40—Perdido Key: This unit consists of 20.2 km (12.6 miles) of island shoreline along the Gulf of Mexico and extends from the Alabama-Florida border to Pensacola Pass.

(ii) *Note:* Map of Unit LOGG–T–FL–40: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(37) Units:

(i) LOGG–T–FL–41—Mexico Beach and St. Joe Beach, Bay and Gulf Counties, Florida.

(ii) LOGG–T–FL–42—St. Joseph Peninsula, Gulf County, Florida.

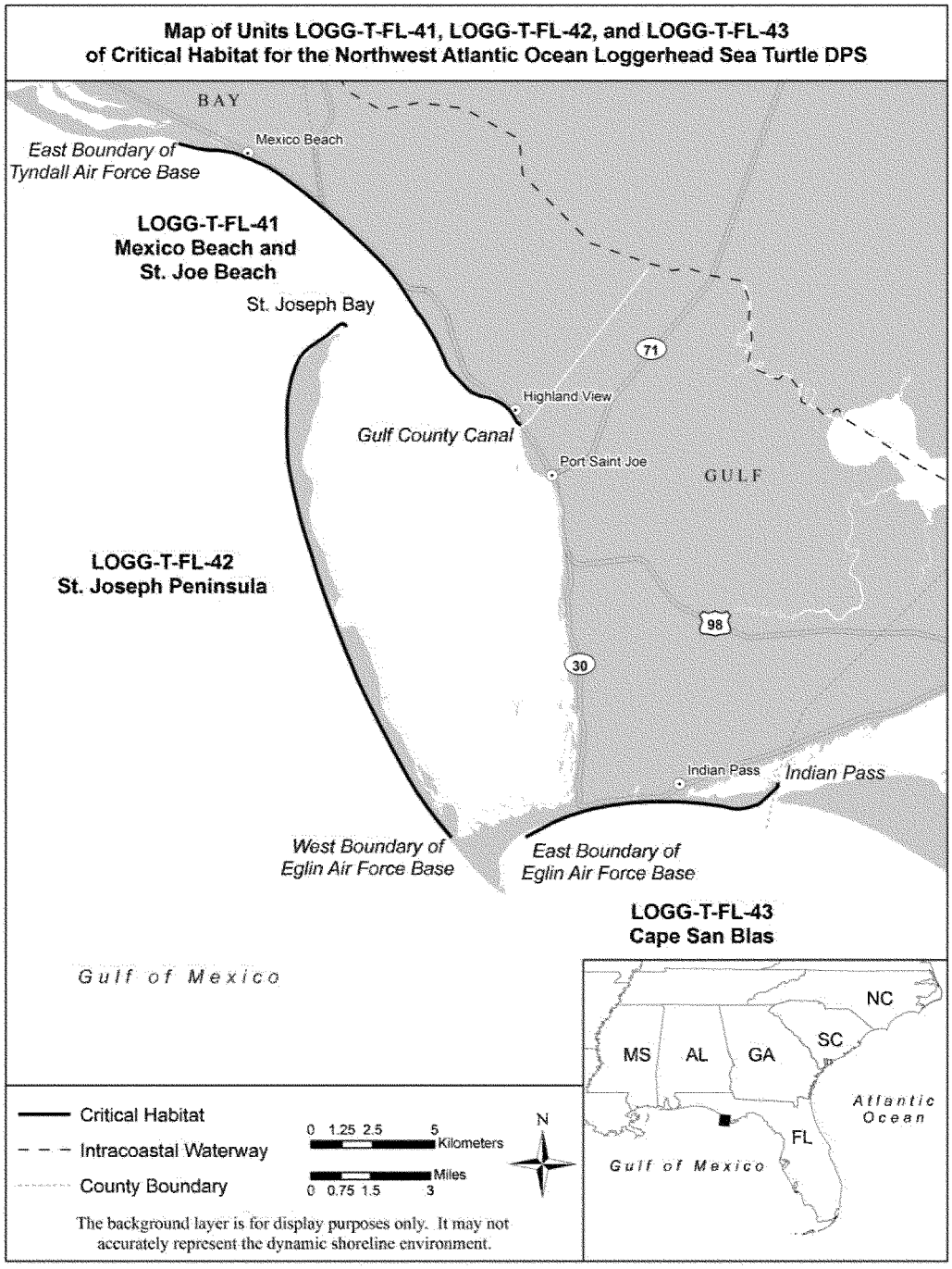
(iii) LOGG–T–FL–43—Cape San Blas, Gulf County, Florida.

(A)(1) LOGG–T–FL–41—Mexico Beach and St. Joe Beach: This unit consists of 18.7 km (11.7 miles) of mainland shoreline along the Gulf of Mexico and extends from the eastern boundary of Tyndall Air Force Base to Gulf County Canal in St. Joseph Bay.

(2) LOGG–T–FL–42—St. Joseph Peninsula: This unit consists of 23.5 km (14.6 miles) of a spit shoreline along the Gulf of Mexico and extends from St. Joseph Bay to the west boundary of Eglin Air Force Base.

(3) LOGG–T–FL–43—Cape San Blas: This unit consists of 11.0 km (6.8 miles) of mainland and spit shoreline along the Gulf of Mexico and extends from the east boundary of Eglin Air Force Base to Indian Pass.

(B) *Note:* Map of Units LOGG–T–FL–41, LOGG–T–FL–42, and LOGG–T–FL–43: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



(38) Units:

(i) LOGG–T–FL–44—St. Vincent Island, Franklin County, Florida.

(ii) LOGG–T–FL–45—Little St. George Island, Franklin County, Florida.

(iii) LOGG–T–FL–46—St. George Island, Franklin County, Florida.

(iv) LOGG–T–FL–47—Dog Island, Franklin County, Florida.

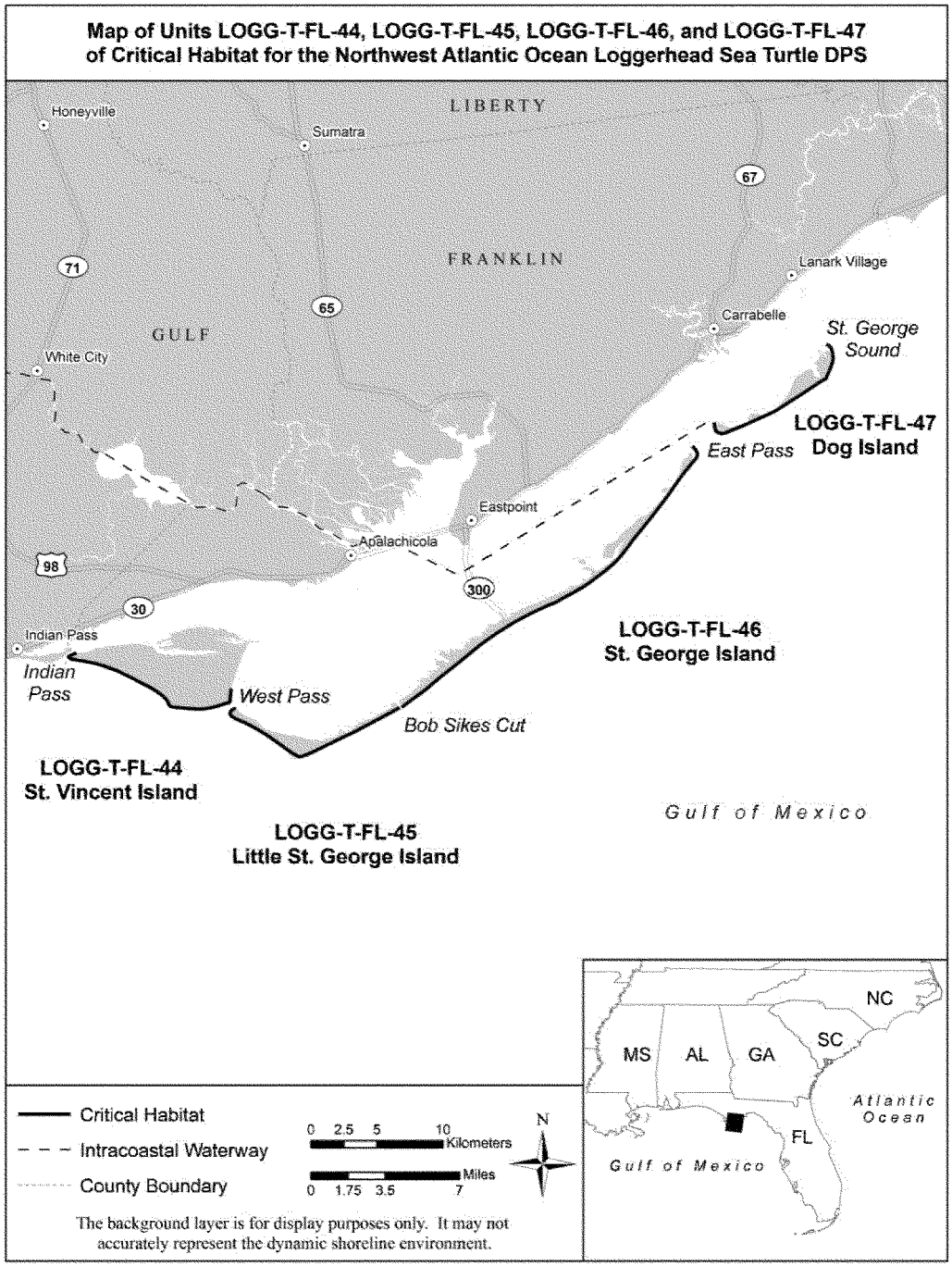
(A)(1) LOGG–T–FL–44—St. Vincent Island: This unit consists of 15.1 km (9.4 miles) of island shoreline along the Gulf of Mexico and extends from Indian Pass to West Pass.

(2) LOGG–T–FL–45—Little St. George Island: This unit consists of 15.4 km (9.6 miles) of island shoreline along the Gulf of Mexico and extends from West Pass to Bob Sikes Cut.

(3) LOGG–T–FL–46—St. George Island: This unit consists of 30.7 km (19.1 miles) of island shoreline along the Gulf of Mexico and extends from Bob Sikes Cut to East Pass.

(4) LOGG–T–FL–47—Dog Island: This unit consists of 13.1 km (8.1 miles) of island shoreline along the Gulf of Mexico and extends from East Pass to St. George Sound.

(B) *Note:* Map of Units LOGG–T–FL–44, LOGG–T–FL–45, LOGG–T–FL–46, and LOGG–T–FL–47: Florida Terrestrial Critical Habitat Units for the Loggerhead Sea Turtle follows:



* * * * *

Dated: December 17, 2012.

Michael J. Bean,

Acting Principal Deputy Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 2013–06458 Filed 3–22–13; 8:45 am]

BILLING CODE 4310–22–C

Atlantic States Marine Fisheries Commission

DRAFT ADDENDUM I TO AMENDMENT 2 TO THE RED DRUM FISHERY MANAGEMENT PLAN

This draft document was developed for Management Board review and discussion. This document is not intended to solicit public comment as part of the Commission/State formal public input process. Comments on this draft document may be given at the appropriate time on the agenda during the scheduled meeting. If approved, a public comment period will be established to solicit input on the issues contained in the document.

ASMFC Vision Statement:
Healthy, self-sustaining populations for all Atlantic coast fish species or successful restoration well in progress by the year 2015.

May 2013

Public Comment Process and Proposed Timeline

This addendum is intended to provide supporting information on Red Drum habitat needs and concerns and does not impact current regulatory measures.

The public is encouraged to submit comments regarding this document at any time during the addendum process. The final date comments will be accepted until **5:00 PM (EST) on XXXXX 2013.** Comments may be submitted by mail, email, or fax. If you have any questions or would like to submit comment, please use the contact information below.

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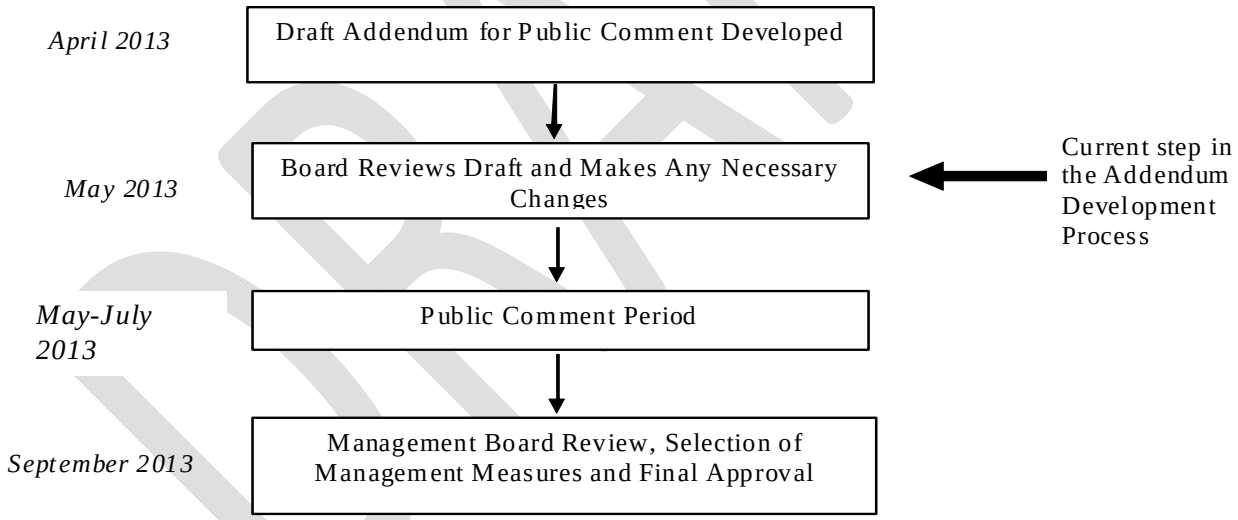

RED DRUM HABITAT ADDENDUM

1.4 HABITAT CONSIDERATIONS

1.4.1 Description of Habitat Important to the Stocks

1.4.1.1 Spawning Habitat

Red drum (*Sciaenops ocellatus*) spawn from late summer to early fall in a range of habitats, including estuaries, near inlets, passes, and near bay mouths as opposed to further offshore or inland habitats (Peters and McMichael 1987). Earlier studies have illustrated that the spawning often occurred in nearshore areas relative to inlets and passes (Pearson 1929; Miles 1950; Simmons and Breuer 1962; Yokel 1966; Jannke 1971; Setzler 1977; Music and Pafford 1984; Holt *et al.* 1985). More recent evidence, however, suggests that in addition to nearshore vicinity habitats, red drum also utilize high-salinity estuarine areas along the coast (Murphy and Taylor 1990; Johnson and Funicelli 1991; Nicholson and Jordan 1994; Woodward 1994; Luczkovich *et al.* 1999; Beckwith *et al.* 2006). Coastal estuarine areas that have high salinity levels provide optimal conditions for eggs and larval development, as well as circulation patterns beneficial to transporting larvae to suitable nursery areas (Ross and Stevens 1992). Spawning in laboratory studies have also appeared to be temperature dependent, occurring in a range from 22° to 30° C but with optimal conditions between temperatures of 22° to 25° C (Holt *et al.*1981). Renkas (2010) was able to duplicate environmental conditions of naturally spawning red drum from Charleston Harbor, SC in a mariculture setting, and corroborated that active egg release occurred as water temperature dropped from a peak of ~30^{o} C during August. Cessation of successful egg release was found at 25^{o} C, with no spawning effort found at lower temperatures (Renkas 2010). Pelagic eggs, embryos, and larvae are transported by currents into nursery habitats for egg and larval stages, expectedly due to higher productivity levels in those environments (Peters and McMichael 1987; Beck *et al.* 2001).

Part 1.4.1.2 Eggs and Larvae Habitat

Red drum eggs have been commonly encountered in several southeastern estuaries in high salinity, above 25 ppt (Nelson *et al.* 1991). Salinities above 25 ppt allow red drum eggs to float while lower salinities cause eggs to sink (Holt *et al.* 1981). In Texas, laboratory experiments conducted by Neill (1987) and Holt *et al.* (1981) concluded that an optimum temperature and salinity for the hatching and survival of red drum eggs and larvae was 25° C and 30 ppt. Spatial distribution and relative abundance of eggs in estuaries, as expected, mirrors that of spawning adults (Nelson *et al.* 1991); eggs and early larvae utilize high salinity waters inside inlets, passes, and in the estuary proper. Currents transport eggs and pelagic larvae into bays, estuaries and seagrass meadows (when present), where they settle (Levin *et al.* 2001) and remain throughout early and late juvenile stages (Pattillo *et al.* 1997; Holt *et al.* 1983; Rooker and Holt 1997, Rooker *et al.* 1998b; Levin *et al.* 2001). Larval size generally increases as distance from the

mouth of the bay increases (Peters and McMichael 1987), possibly due to increased nutrient availability. Research conducted in Mosquito Lagoon, Florida, by Johnson and Funicelli (1991) found viable red drum eggs being collected in average daily water temperatures from 20° C to 25° C and average salinities from 30 to 32 ppt. During the experiment, the highest numbers of eggs were gathered in depths ranging from 1.5 to 2.1 m and the highest concentration of eggs was collected at the edge of the channel.

Upon hatching, red drum larvae are pelagic (Johnson 1978) and laboratory evidence indicates that development is temperature-dependent (Holt *et al.* 1981). Newly hatched red drum spend around twenty days in the water column before becoming demersal (Rooker *et al.* 1999; FWCC 2008). However, Daniel (1988) found much younger larvae already settled in the Charleston Harbor estuary. Transitions are made between pelagic and demersal habitats once settling in the nursery grounds (Pearson 1929; Peters and McMichael 1987; Comyns *et al.* 1991; Rooker and Holt 1997). Tidal currents (Setzler 1977; Holt *et al.* 1989) or density-driven currents (Mansueti 1960) may be utilized in order to reach a lower salinity nursery in upper areas of estuaries (Mansueti 1960; Bass and Avault 1975; Setzler 1977; Weinstein 1979; Holt *et al.* 1983; Holt *et al.* 1989; Peters and McMichael 1987; McGovern 1986; Daniel 1988). Once inhabiting lower salinity nurseries in upper areas of estuaries, red drum larvae grow rapidly, dependent on present environmental conditions (Baltz *et al.* 1998).

Red drum larvae along the Atlantic coast are reportedly common in southeastern estuaries, with the exception of Albemarle Sound, and are abundant in the St. Johns and Indian River estuaries in Florida (Nelson *et al.* 1991). Daniel (1988) and Wenner *et al.* (1990) found newly recruited larvae and juveniles through the Charleston harbor estuary over a wide salintity range. Mercer (1984) has also summarized spatial distribution of red drum larvae in the Gulf of Mexico. More recent studies conducted by Lyczkowski-Shutlz and Steen (1991) reported evidence of diel vertical stratification among red drum larvae found at lower depths less than 25 m at both offshore and nearshore locations. Larvae (ranging between 1.7 to 5.0 mm mean length) were found at lower depths during night and higher in the water column during the day. At the time of the study, water was well mixed and temperature ranged between 26° C to 28° C. There was no consistent relationship between distribution of larvae and tidal stage. Survival during larval (and juvenile) stages in marine fish, such as the red drum, has been identified as a critical bottleneck determining their survival and contribution to adult populations (Cushing 1975; Houde 1987; Rooker *et al.* 1999).

1.4.1.3 Juvenile Habitat

Juvenile red drum utilize a variety of inshore habitats within the estuary, including seagrass meadows, tidal freshwater, low-salinity reaches of estuaries, estuarine emergent wetlands, estuarine scrub/shrub, submerged aquatic vegetation, oyster reefs, shell banks, and unconsolidated bottom (SAFMC 1998; ASMFC 2002). Smaller red drum seek out and inhabit rivers, bays, canals, boat basins, and passes within estuaries (Peters and McMichael 1987;

FWCC 2008). Wenner's studies (1992) indicate that red drum juvenile habitats vary slightly seasonally: most often between August and early October, red drum inhabit small creeks that cut into emergent marsh systems and have some water in them at lower tides, while in winter, red drum reside in main channels of rivers ranging in depths from 10 to 50 feet with salinities from one-half to two-thirds that of seawater. In the winter of their first year, 3 to 5 month old juveniles migrate to deeper, more temperature-stable parts of the estuary during colder weather (Pearson 1929). In the spring, they move back into the estuary and shallow water environments. In the following spring, juveniles become more common in the shallow water habitats. Studies show that red drum inhabiting non-vegetated sand bottoms exhibit the greatest vulnerability to natural predators (Minello and Stunz 2001). Juvenile red drum in their first year generally avoid wave action by living in more protected waters (Simmons and Breuer 1962; Buckley 1984).

In the Chesapeake Bay, juveniles (20-90 mm Total Length, TL) were collected in shallow waters from September to November, but there is no indication as to the characteristics of the habitat (Mansueti 1960). Some southeastern estuaries where juvenile (and subadult) red drum are abundant are Bogue Sound, NC; Winyah Bay, SC; Ossabaw Sound, and St. Catherine/Sapelo Sound, GA; and the St. Johns River, FL (Nelson *et al.* 1991) and throughout SC (Wenner *et al.* 1990; Wenner 1992). They were highly abundant in the Altamaha River and St. Andrews/St. Simon Sound, GA, and the Indian River, FL (Nelson *et al*. 1991).

Peters and McMichael (1987) found in Tampa Bay that juvenile red drum were most abundant in protected backwater areas, such as rivers, tidal creeks, canals, and spillways with freshwater discharge, as well as in areas with sand or mud bottom and vegetated or non-vegetated cover. Juveniles found at stations with seagrass cover were generally smaller in size and fewer in number (Peters and McMichael 1987). Near the mouth of the Neuse River, as well as smaller bays and rivers between Pamilico Sound and the Neuse river, surveys from the North Carolina Division of Marine Fisheries (NCDMF) indicate that juvenile red drum were consistently abundant in shallow waters of less than 5 feet. Generally, habitats identified as supporting juvenile red drum in North Carolina can be characterized as detritus laden or mud-bottom tidal creeks (in Pamlico Sound) and mud or sand bottom habitat in other areas (Ross and Stevens, 1992). In a Texas estuary, young red drum (6-27 mm Standard Length, SL) were never present over non-vegetated muddy-sandy bottom; areas most abundant in red drum occurred in the ecotone between seagrass and non-vegetated sand bottom (Rooker and Holt 1997). In SC, Wenner (1992) indicated that very small red drum occupy small tidal creeks with mud/shell hash and live oyster as common substrates (since sub-aquatic vegetation is absent in SC estuaries).

1.4.1.4 Subadult Habitat

The subadult phase of the red drum's life cycle begins when late-stage juveniles leave shallow nursery habitats at a size of approximately 200 mm TL and 10 months of age. These subadults later attain sexual maturity, at about 3-5 years of age. Subadult red drum are most vulnerable to fishery exploitation (Pafford *et al.* 1990; Wenner 1992). They utilize many habitats within the

estuary, including tidal creeks, rivers, inlets, and waters around barrier islands, jetties and sandbars (Pafford *et al.* 1990; Wenner 1992). While subadults are found in habitats similar to that of juvenile red drum, they are also found in large aggregations on seagrass beds, over oyster bars, mud flats, and sand bottoms (FWCC 2008). In a study conducted by Bacheler *et al.* (2009a), age-0 to age-3 red drum are commonly found in upper estuarine environments, but each fall a portion of age-1 and age-2 cohorts move to high-salinity coastal waters, while some red drum remain in upper estuarine habitat until age-3; at this age the last remaining red drum move to coastal environments. Tagging studies conducted throughout the species' range indicate that most subadult red drum generally remain in the vicinity of a given area (Beaumarriage 1969; Osburn *et al.* 1982; Music and Pafford 1984; Wenner *et al.* 1990; Pafford *et al.* 1990; Ross and Stevens 1992; Woodward 1994; Marks and DiDomenico 1996). Movement within estuaries is assumed to be related to temperature changes and food availability (Pafford *et al.* 1990; Woodward 1994). The following is taken from the Atlantic States Marine Fisheries Commission (ASMFC) Red Drum Fishery Management Plan (2002):

> "During 1994 and 1995, the Inshore Fisheries Section of the South Carolina DNR conducted several aerial surveys to attempt to evaluate abundance and habitat utilization of subadult red drum along the South Carolina coast. Aerial surveys were generally deemed inefficient at estimating the number of fish inhabiting particular areas, especially inlets and beachfront areas because of the visibility of schools from the air depends on the interplay of temporal, climactic, topographic and behavioral factors. On the occasions when red drum schools were reliably located, they were found in flats at the confluence of rivers, inside inlets, creeks, sounds and bays. Aerial surveys proved useful to characterize the general topography of subadult red drum habitat in the intertidal and shallow-subtidal portions of the coast. It appears that typical habitats where subadult red drum are found in South Carolina are of two general types. In the northern portion of the coast, typical subadult habitat consists of broad (up to 200 m or more in width), gently sloping flats often leading to the main channel of a river or sound. Along the southern portion of the coast, subadult red drum habitat consists of more narrow (50 m or less), fairly level flats traversed by numerous small channels, typically 5-10 m wide by less than 2 m deep at low tide."

1.4.1.5 Adult Habitat

The adult phase begins when the fish are mature and can spawn regularly (Wenner 1992). Along the Atlantic coast adult red drum migrate north and inshore in the spring. In the fall, they migrate offshore and south (from Virginia to North Carolina). South of Hatteras, movement of adult red drum is typically described as inshore and offshore as opposed to north and south. Adults generally spend more time in coastal waters after they reach sexual maturity, but they do frequent inshore waters on a seasonal basis. Bacheler *et al.* (2009b) collected data that

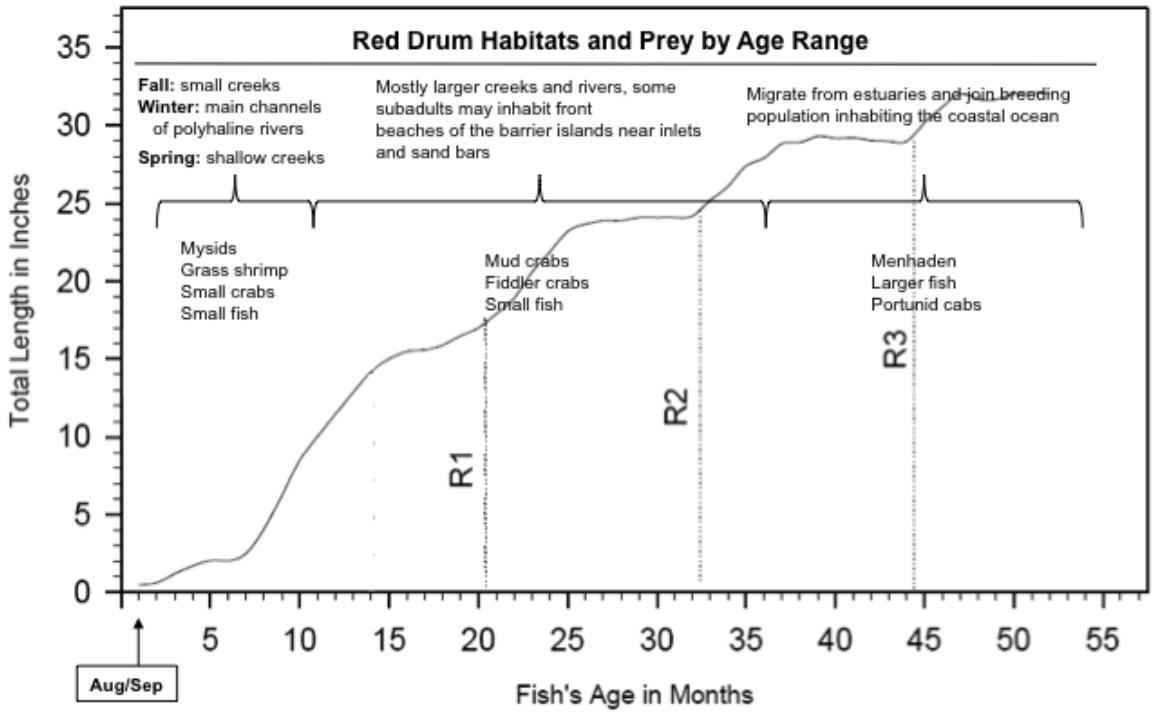

Figure 1. Red drum habitats and primary prey by age and size. Figure adapted from Wenner (2004) and based on research in South Carolina. R1, R2, and R3 are the ages of red drum when they have deposited 1, 2, or 3 rings on their ear bones or scales.

concluded that red drum of age 4+ generally moved furthest north and south, but traveled distances shorter than other life stages when moving east or west, from coastal waters to inshore waters. According to the 2008 Stock Assessment, red drum are found most abundantly in nearshore (coastal) shelf waters, and males reach maturity at an earlier age (1 to 3 years) than females (3 to 6 years) (FWCC 2008). The biology of the adult red drum is less well known than the younger stages, and therefore there is a lack of information regarding habitat utilization by adults. The South Atlantic Fishery Management Council's (SAFMC) Habitat Plan (SAFMC 1998; ASMFC 2002) cited high-salinity surf zones and artificial reefs as Essential Fish Habitat (EFH) for red drum in oceanic waters, which comprise the area from the beachfront seaward. Both nearshore and offshore hard/live bottom areas have been known to attract concentrations (schools) of adult red drum. Tagging studies have shown repeatedly that adult red drum in the Gulf of Mexico move tens and even hundreds of kilometers from original capture locations (Ingle *et al.* 1962; Osburn *et al.* 1982; Overstreet 1983; Julien *et al.* 2004). The following description of these habitats is taken from the SAFMC's Habitat Plan (1998) and ASMFC's Fishery Management Plan (2002):

"Hard, or live bottom (Struthsaker 1969), consists of aggregations of coral generated habitats that have a thinner layer of live corals (soft and hard), among other biota types, existing among different sediments, older reefs or rock bottom. Often these bottom assemblages of coral provide reef structure for aggregations of red drum. Coral assemblages vary with geographical area. On the South Atlantic coast, coral communities are dominated by ahermatypic species, which are not reef building species. In the South Atlantic Bight (SAB), hard or live bottom habitats are generally small outcropping areas scattered in a patchy distribution over the continental shelf north of Cape Canaveral, FL. These habitats are most numerous off the coast of northeastern Florida and typically occur at depths greater than 27 m. Benthic temperatures in deeper areas range from 11° C to 27° C, while nearshore temperatures are typically cooler (from SEAMAPs South Atlantic Bottom Mapping Work Group effort, beginning in 1992). Data suggest that red drum prefer higher salinities as they age (Neill *et al.* 2004), which could partially provide an explanation as to why red drum move more into coastal areas during their subadult and adult life stages (Bacheler *et al.* 2009b)."

In addition to natural hard/live bottom habitats, adult red drum also use artificial reefs and other natural benthic structures. As of 2002, 120,000 acres of ocean and estuarine bottom along the south Atlantic has been permitted for the development of artificial reefs (ASMFC 2002). In Florida alone, 34 out of 35 coastal counties have been involved in artificial reef development (FWCC 2012). Most Atlantic coast states are in the process of establishing or have already established artificial reef management programs in their coastal waters.

Red drum were found from late November until the following May at both natural and artificial reefs along tide rips or associated with the plume of major rivers in Georgia (Nicholson and Jordan 1994). Data from this study suggests that adult red drum exhibit high seasonal site fidelity to these features. Fish tagged in fall along shoals and beaches were relocated 9 to 22 km offshore during winter and then found back at the original capture site in the spring. In summer, fish moved up the Altamaha River nearly 20 km to what the authors refer to as "pre-spawn staging areas" and then returned to the same shoal or beach again in the fall.

1.4.2 Identification and Distribution of Habitat and Habitats of Concern (HOC)

Red drum populations along the Atlantic coast are managed through the Atlantic Coastal Fisheries Cooperative Management Act (Atlantic Coastal Act). Unlike the Magnuson-Stevens Fishery Conservation and Management Act which addresses fishery management by federal agencies, the Atlantic Coastal Act does not require the Atlantic States Marine Fisheries Commission to identify habitats that warrant special protection because of their value to fishery species. Nonetheless, the Commission believes this is a good practice so that

appropriate regulatory, planning, and management agencies can consider this information during their deliberations.

As reviewed in section 1.4.1.1, habitats used by the various life stages of red drum include: tidal freshwater wetlands, estuarine wetlands, tidal creeks, mangrove wetlands, submerged aquatic vegetation (SAV), oyster reefs and shell banks, ocean high-salinity surf zone, hard bottom, and natural and artificial reefs. Spawning occurs within passes and inlets of high salinity estuaries on the southeastern U.S. coast and outer bars within surf zones (Murphy and Taylor 1990; Johnson and Funicelli 1991; Nicholson and Jordan 1994; Woodward 1994). In more recent studies, increased spawning habitat of red drum upriver to Oriental, NC, was due to elevated levels in salinity (Beckwith *et al.* 2006). Specific "hot spots" for red drum spawning include: North Carolina – waters of Pamlico Sound near Hatteras, Ocracoke and Drum Inlets and between the Neuse and Pamlico rivers in the western portion of the sound; South Carolina – main channel leading to Charleston Harbor and estuarine waters of St. Helena Sound; Georgia – the Altamaha River estuary; Florida – Ponce de Leon inlet and the Mosquito Lagoon system (ASMFC 2002). For red drum, nursery areas exist throughout estuarine environments, usually in shallow waters with varying salinities. Areas included are coastal marshes, shallow tidal creeks, bays, tidal flats of varying substrate type, tidal impoundments, and SAV beds. Red drum larvae and juveniles occur within a broad range of estuarine habitats. Similarly, subadult red drum are found throughout tidal creeks and channels of southeastern estuaries, in backwater areas behind barrier islands, and in the front along ocean beaches during certain seasons. Estuarine systems as whole, ranging from lower salinity rivers to the mouths of inlets, are needed to support populations of red drum.

A subset of red drum habitats, which the Commission refers to as Habitats of Concern (HOC), is especially important as spawning and nursery areas for red drum. HOC for red drum include all coastal inlets, SAV beds, the surf zone (including outer bars), and state-designated nursery habitats (e.g., Primary Nursery Areas in North Carolina; Outstanding Resource Waters in South Carolina's coastal counties; Aquatic Preserves along the Atlantic coast of Florida).

Table 1. Summary of red drum life stage dependent physical and temporal habitat characteristics.

Life stage	Optimal Temperature Range	Salinity range	Habitats	Timing
Adults-spawning	22-25^{o}C (up to 30^{o}C)	>25ppt (high salinities)	Estuary, passes/inlets, along open coasts	Late Summer-Early Fall
Eggs	20-30 ^{o}C	>25ppt (high salinities)	Estuary, passes/inlets, seagrass meadows	Fall
Larvae	Based on regional temperature regime (10-25 ^{o}C)	Low Salinities (10-20 ppt)	Pelagic-20days; then demersal Upper estuary	Late Fall-Spring
Juveniles	Based on regional seasonal temperature regime (10-30 ^{o}C)	Low-High Salinities (15-25 ppt)	*Estuary:* seagrass, tidal freshwater, low-salinity reaches, emergent wetlands, estuarine scrub/shrub, submerged aquatic vegetation, oyster reefs, shell banks, unconsolidated bottom Passes/Inlets	*Winter:* Deeper bay and river channels *Spring/Summer:* Shallow creeks and shorelines
Sub-Adults	Based on regional seasonal temperature regime	Low-High Salinities (high estuarine to marine)	*Estuary to Marine:* tidal creeks, rivers, inlets, shallows near barrier islands, jetties and sandbars; large aggregations in seagrass beds, over oyster bars, mud flats, and sand bottoms	Seasonal movement within habitats based on temperature changes and food availability
Adults	Based on regional seasonal temperature regime	High salinities (25-35 ppt)	*Marine*: Frequent inshore shelf waters on a seasonal basis; nearshore and offshore hard/live bottom, high salinity surf zones, artificial reefs *Lower Riverine*: pre-spawning	*Virginia and N.C.:* Seasonal migrations north and inshore in the spring; offshore and south in the fall *South of Cape Hatteras*: Seasonal migration onshore in the spring; offshore in the fall Summer

1.4.3 Present Condition of Habitats and Habitat of Concern

1.4.3.1 Coastal Spawning Habitat: Condition and Threats

The productivity and diversity of coastal spawning habitat can be compromised by the effects of industrial, residential, and recreational coastal development (Vernberg *et al.* 1999). Coastal development continues in all states and coastlines of the nation despite the increased protection afforded by federal and state environmental regulations. Threats to nearshore habitats in the south Atlantic that are documented spawning habitats for red drum or are suitable spawning habitats are described below.

Navigation and boating access development and maintenance activities, such as dredging and hazards from ports and marinas, are a threat to spawning habitats of red drum. According to the SAFMC (1998) and ASMFC (2002), navigation related activities can result in removal or burial of organisms from dredging or disposal of dredged material, effects due to turbidity and siltation, release of contaminants and uptake in nutrients, metals and organics, release of oxygen-consuming substances, noise disturbance, and alteration of hydrodynamic regime and habitat characteristics. All listed effects have potential effects to decrease the quality and quantity of red drum spawning habitat.

Ports also pose the threat of potential spills of hazardous materials. Cargo that arrives and departs from ports can contain highly toxic chemicals and petroleum products. While spills are rare, constant concern exists for extensive spans of estuarine and nearshore habitat being at risk of contamination. Even a small spill could result in a huge exposure of productive habitats. Oil releases such as the MC 282 or Deepwater Horizon oil release (2010) into the Gulf of Mexico has severely affected aquatic life, water quality and habitat posing many threats such as mortality, disease, genetic damage, and immunity issues (Collier *et al.* 2010). Chemicals in crude oil can cause heart failure in developing fish embryos (Incardona *et al.* 2004, 2005, 2009). Chronic exposures for years after the Exxon Valdez oil spill were evident in fish and other marine life, resulting in a higher pattern of mortality (Ballachey *et al.* 2003). Oiling of nearshore high-energy habitat along beaches of the Gulf of Mexico from Louisiana to Florida occurred for prolonged periods of time during the spring of 2010, and weathered oil products were found in offshore benthos where spawning red drum can occur. The discharge of oil may have also altered migration patterns and food availability. Port discharge of marine debris, garbage, and organic waste into coastal waters is also a concern.

Beach nourishment projects and development of wind and tidal energy could also alter red drum spawning and offshore adult habitat dynamics. Beach nourishment can result in removal of offshore sediments resulting in depressions and altering sediment characteristics along the shoreline (Wanless 2009). Sediments eroded from beaches after nourishment projects can also be transported offshore and bury hard bottoms, which can diminish spawning aggregation habitat for red drum. Beach nourishment projects can also alter forage species abundance, distribution

and species composition in the high-energy surf zone for a time, but this varies by species and timing of nourishment activities (Irlandi and Arnold 2008). Wind and tidal energy projects can create artificial structure in migration corridors and submarine cables may produce electrical fields that can affect red fish movement patterns and habitat use in affected areas (DONG 2006; OEER 2008; ASMFC-Habitat Committee 2012).

Use of certain types of fishing gear, such as trawls and bivalve dredges can also adversely affect spawning habitat (Northeast Region Essential Fish Habitat Steering Committee 2002). Trawls and dredges remove structure-forming epifauna, alter sediment contours, redistribute reef aggregate materials (e.g. fractured rock outcroppings and boulders) and change infaunal and demersal organism assemblages in areas where fishing gear is operated. These effects can reduce forage species abundance for red drum thereby affecting spawning success. The most significant effect of this type of fishing gear is long-term changes in bottom structure and long-term changes in benthic trophic or ecosystem functions. These effects can be on the order of months to years in low energy environments, so alterations can have a long-term effect on red drum spawning habitat.

Spawning is optimal within a specific range of temperatures. Climate change and resulting temperature regime changes in spawning habitats could alter the timing of spawning and egg development, which may be detrimental in a specific habitat area of concern. Such alterations in phenology are recognized as such a threat to the survival of many species (USFWS 2011). Significant climate change could alter current patterns and significantly change water temperatures, affecting migration and spawning patterns, and larval survival (Hare and Able 2007; USFWS 2011).

1.4.3.2 Estuarine Spawning, Nursery, Juvenile and Subadult Habitat: Condition and threats

Between 1986 and 1997, estuarine and marine wetlands nationwide experienced an estimated net loss of 10,400 acres (Dahl 2000). The majority of this loss was from urban and rural activities and the conversion of wetlands for other uses. Along the south Atlantic coast, Florida experienced the greatest loss due to urban or rural development (Dahl 2000). In Tampa Bay, 3,250 acres of seagrass have been recovered between 2008 and 2010 (EPA 2011b).

Conditions of red drum estuarine habitats vary depending on the level of urbanization. Generally, an estuarine environment closer to a highly developed urban area will exhibit degradation when compared to the quality of estuarine habitat with less development of its surrounding landscape. Runoff, waste, and sewage pollution of sensitive coastal environments and can result in the proliferation of pathogens. Pathogens can result in lesions, developmental issues, disease of major organs, and mortality in red drum and other fishes (Conway *et al.* 1991) Red drum may exhibit a higher tolerance to bacteria with age, and antibody response also increases as water temperature does (Evans *et al.* 1997). Atrazine, a widely used pesticide in the

United States, was exposed to red drum in low levels to test its' affect on growth, behavior, and survival of red drum. In laboratory experiments, using realistic doses of atrazine with respect to runoff amounts, red drum larvae exhibited a 7.9% - 9.8% decrease in growth rate (Alvarez & Fuiman 2005).

Nutrient enrichment of estuarine waters is a major threat to water quality and habitat available to the red drum. In the southeast, forestry practices significantly contribute to nutrient enrichment, as does pesticide use, fertilizers, and pollution runoff (ASMFC 2002; NSCEP 1993). Urban and suburban development are the most immediate threat to red drum habitat in the southeast. Port and marina expansion also impact the estuarine habitat important to red drum by pollution contributed from stormwater originating from altered uplands and through alterations to hydrodynamic flows and tidal currents. Watercraft operation can result in pollutant discharge, contributing to poor water quality conditions. Facilities supporting watercraft operations also result in the alteration and destruction of wetlands, shellfish and other bottom communities through construction activities. Motorized vehicles in Class A (< 16 ft) and Class 1 (16 to 25 feet) have seen major recreational growth in estuarine waterways (NMMA 2004). Operation of watercraft equipped with outboard and inboard engines and propellers over shallow seagrass communities can cause increased seagrass scarring (Sargent *et al.* 1995). Mining activities in nearby areas can also pose a threat with nutrient and contaminant runoff, dredging material deposition, and through alternations of the hydrology of the estuary.

Hydrologic modifications can negatively affect estuarine habitats. Aquaculture, mosquito control, wildlife management, flood control, agriculture, and silviculture activities can result in altered hydrology. Ditching, diking, draining, and impounding activities also qualify as hydrologic modifications that can impact estuarine environments (ASMFC 2011). Alteration of freshwater flows into estuarine areas may change temperature, salinity, and nutrient regimes as well as wetland coverage. Studies have shown that alteration in salinity and temperature can have profound effects in estuarine fishes (Serafy *et al.* 1997) and that salinity can dictate the abundance and distribution of organisms residing in estuaries (Holland *et al.* 1996). Certain areas in the southeast concern the maintenance and stabilization of coastal inlets. Construction of groins and jetties has altered hydrodynamic regimes and in turn, transport of larvae of estuarine dependent organisms through inlets (Miller *et al.* 1984; Miller 1988).

Shoreline erosion patterns can also affect the hydrodynamics and transport of larvae to estuarine environments. Erosion has the potential to alter the freshwater flow into habitats essential for egg, larval, and juvenile survival. Whether erosion is human-induced or naturally occurring, nearshore habitats are consequently affected and eroded sediment is transported and deposited elsewhere (ASFMC 2010). Beach nourishment activities can result in sedimentation in estuaries, covering seagrass beds and other nearshore habitats, and causing water quality to deteriorate (Green 2002; DEP 2011). Along the Atlantic coast, living shorelines are becoming a more popular management strategy to control and minimize erosion (ASFMC 2010).

As with other red drum habitat, trawl fisheries represent a threat to estuarine habitat for this species. In combination with the physical and biological effects identified in the Northeast Region Essential Fish Habitat Steering Committee workshop proceedings (2002), trawling activities and bivalve harvesting activities(oyster tonging, clam raking, clam kicking, etc.) can severely damage seagrass systems (Stephan *et al*. 2000). Such activities can reduce the productivity of estuarine red drum habitat and alter the ecology of this habitat. Forage species abundance can diminish and movement patterns for red drum schools within the estuaries they inhabit can be altered. Effects of these fishing gears can be ameliorated through effective management strategies, such as exclusion of trawl fisheries from seagrass communities, but without such management, the adverse effects of the fishery activities can be long-term.

Climate change has the potential to cause sea level rise, which could result in faster erosion of certain nearshore areas and loss of shallow nursery habitats to inundation. Projections of global sea level rise are from 18-59 cm by the year 2100, with an additional contribution from ice sheets of up to 20 cm (IPCC 2007). In addition to sea level rise, climate change could alter the amount of freshwater delivery and salinity levels in estuarine areas (USFWS 2011). Estuarine environments are highly vulnerable to changes in climate, so any change in temperature regime is also a concern. As temperature increases, the surface water in estuaries and marshes increases, which makes oxygen solubility more difficult (EPA 2011a) and can stress the environment. This can also minimize saltwater and freshwater mixture, and affect nutrient supply by changing hydrodynamics. Increases in carbon dioxide levels in ocean water, as a result of climate change, causes rises in acidity and pH levels. Estuarine waters are vulnerable to acidification, but seagrasses are particularly susceptible to changes in water column acidity (EPA 2011a).

Increases in temperature can also affect metabolism of seagrass (Evans *et al.* 1986, Marsh *et al.* 1986; Bulthuis 1987; Zimmerman *et al.* 1989b; Neckles and Short 1999), which alter the carbon balance and nutrient cycle. Changes could result in alterations in species distribution and abundance varying both geographically and spatially (McMillan 1984; Walker 1991).

1.4.3.3 Adult Habitat: Condition and Threats

While threats to adult red drum habitat exist, they are not as numerous as those faced by post-larvae, juveniles, and subadults in estuarine and coastal waters. According to the SAFMC (1998) and ASMFC (2002), threats to both nearshore and offshore habitats that adult red drum utilize in the south Atlantic include navigation management and related activities; dredging and dumping of dredged material; mining for sand or minerals; oil and gas drilling and transport; and commercial and industrial activities, and are similar to those for red drum coastal spawning habitat as mentioned in section 1.4.3.1 above.

Currently, mineral mining activities in the South Atlantic are highly limited. Offshore mining has the potential to pose a threat to adult red drum habitat in the future. Mining activities could alter the hydrology, sediment landscape, and water quality of surrounding areas, affecting both fish

and their habitat, by causing sediment plumes or releasing metallic substances into the water column (Halfar 2002).

A more immediate threat to red drum adult habitat is the mining of sand for beach nourishment projects. Associated risks include burial of hard bottoms near mining or disposal sites, contamination, and an increase in turbidity and hydrological alterations that could result in a diminished habitat (Green 2002; Peterson and Bishop 2005).

Although adult red drum are euryhaline and eurythermal, drastic or sudden changes in salinity or temperature can result in mortality (Gunter 1941; Buckley 1984). While climate change is not an immediate threat, drastic fluctuations in seasonal temperature regimes and predicted extreme weather events could potentially pose threats the future.

1.4.4 Habitat Bottlenecks

Red drum utilize all available estuarine and nearshore habitats throughout their life history. Although regional habitat types, such as mesohaline SAV communities, might be limited locally, red drum can use multiple habitat types at each stage of their development. There is no supporting evidence that habitat is currently limiting to populations of red drum throughout their range.

For example, oyster reefs are an important habitat to red drum at the juvenile and subadult life stages. In South Carolina, the abundance of red drum is not limited by the availability or health of oyster reef habitat, despite significant reductions of oyster reef habitat throughout the range of the red drum population. Data from Georgia's Marine Sportfish Health Survey (MSPHS) suggests over 80% of all juvenile red drum (< 375mm CL) captured since 2003 are associated with shell/oyster habitat. In comparison, less than half of the stations sampled were associated with shell. Since red drum use multiple habitat types at each stage of their development, limitation of one habitat type does not necessarily reduce survival of that life stage's cohort.

Creeks, tributaries, and estuaries are important habitats for red drum. Larval, juvenile, and subadult red drum are particularly sensitive to pollution contributed by watershed scale human activities. There is currently no evidence that chemical pollution is a limiting factor for juvenile and subadult red drum. However, changes in hydrology due to watershed activities that alter stormwater flow and sedimentation might restrict red drum larval recruitment both locally and regionally. The potential for impact on larval red drum recruitment is dependent upon the scale of stormwater change within the watershed and creek systems. Additionally, sediment accumulation may alter SAV abundance and circulation patterns resulting in lower recruitment into small creeks.

While these sensitive habitats have been identified as important to various life stages of red drum, none of them are believed to currently limit the successful recruitment of red drum individuals to regional stocks.

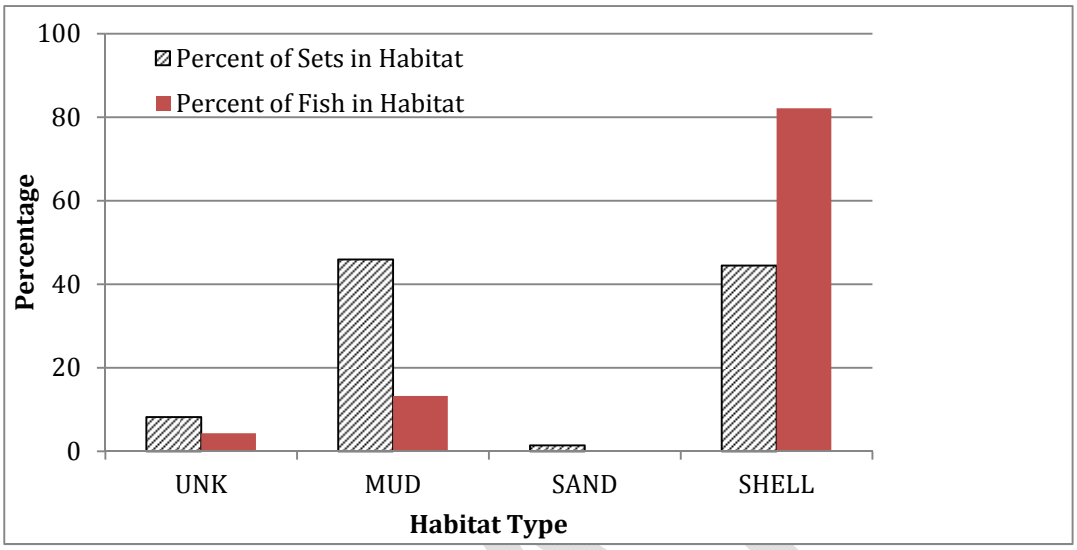

Figure 2. Red drum habitat preference from Georgia DNR MSPHS. Total sets across habitat types from 2003-2012.

1.4.5 Ecosystem Considerations

Ecosystem management considerations for red drum include protection and enhancement of habitat features, which can contribute to fish production, as well as consideration of how harvesting one species may impact the focus species and the biotic communities both supporting it, and which it supports.

The complexity of available habitat structure determines the ability of juvenile fish to avoid predation (Crowder and Cooper 1982; Salvino and Stein 1982; Nelson and Bonsdorff 1990; Heck *et al.* 1997; Minello and Stunz 2001). When available, seagrass environments serve as primary habitats for eggs and pelagic larvae and are also important to the juvenile stage of red drum. Seagrass habitats provide multiple ecosystem services in addition to their function as nursery systems (Constanza *et al.*1997; Heck *et al.* 2003), are highly productive environments that are nutrient rich from detrital sources, and they produce suitable habitat for prey and predators. Productivity outputs from seagrass habitats include carbon that enters coastal food webs and into other physiochemical structural pathways (Heck *et al.* 2003). Maintenance and restoration of seagrass habitats is beneficial to red drum by increasing nutrient and habitat availability, and in turn, increasing growth and development rates for larvae and juvenile red drum stages which have been previously described as a bottle-neck in determining regional

populations and the future survival of the species (Cushing 1975; Houde 1987; Rooker *et al.* 1999).

Marsh environments are also valuable habitats to the larval and juvenile life stages of red drum. Red drum use tidal creeks from post-larval through sub-adult life stages. Seasonally, tidal currents move and guide early life stages of red drum into new environments as they transition from pelagic to juvenile stages. Under certain tidal conditions, water levels in marsh habitats may be lower or remain higher than water levels of open water systems in estuaries, which reduces water exchange and in turn affects physiochemical conditions, such as oxygen levels, salinity, and temperature (Levin *et al.* 2001). In a closed environment, depleted oxygen levels can lead to fish kills, which can either directly affect red drum, or indirectly affect local populations by killing off much of their forage resource. Hypoxia can also lead to avoidance behavior, relative to affected system, in addition to reduced growth and survival rates of local populations of juvenile to sub-adult red drum (Pihl *et al.* 1991; Eby and Crowder 2002; Thornson and Quigg 2008; Bacheler *et al.* 2009a). Red drum are susceptible to harmful algal blooms in estuarine environments, which can be due to elevated nutrient levels and can cause anoxic water column conditions. (Steidinger *et al.* 1998; Adams *et al.* 2011). Because red drum have shown some selectivity in salinity and temperature levels in the waters they inhabit (Neill 1987; Holt *et al.* 1981), reduced water exchange in marsh habitats may affect pelagic life stages.

In estuarine habitats, red drum growth and survival may suffer from sub-lethal effects due to anthropogenic degradation of water quality (Adams *et al.* 2011). Beckwith *et al.* (2006) concluded that, in low-salinity years, poorer water quality has a greater impact and can result in higher egg mortality. Bacheler *et al.* (2009a) collected 5,961 red drum in Pamilco Sound, North Carolina, where age-1 red drum were in greatest abundance at low (0 to 8 psu) or high (20 to 30 psu) salinities while the lowest catches occurred in moderate salinities (10 to 15 psu). Age-1 red drum were also most abundant in bottom habitats where there was algae, detritus, and shell, but lowest in areas with seagrass. Along the Outer Banks, North Carolina, however, higher catches of red drum were made in seagrass areas, suggesting that shallow, nearshore areas may provide subadults with a greater amount of foraging opportunities (Ross and Epperly 1986; Ruiz *et al.*1993; Miltner *et al.* 1995; Craig and Crowder 2000; Bacheler *et al.* 2009a). Inhabiting nearshore areas may also minimize predation, because predators of the red drum, such as bottlenose dolphins (*Turisops trucatus*), primarily occur in deeper waters (Gannon 2003; Bacheler *et al.* 2009a).

Regarding biotic factors, growth and survival rates of red drum larvae are similar to other marine fishes in that they are associated with prey availability (G.J. Holt, unpublished data; Rooker *et al* 1999). In Minello's *et al.*'s experiment (2001), wild-caught red drum had higher average predation rates in non-vegetated mesocosms than in areas sampled with oyster reefs. Predation rates in seagrass and marsh systems were intermediate when compared to these other habitats and experimental conditions. Hatchery-reared red drum showed little difference in mortality rates among these different habitats when released and subsequently sampled from them.

Because of the complex physical structure provided, oyster reefs have the potential to provide better sheltering habitat for red drum, and thereby minimize predation. If oyster reefs provided a substantial enough advantage in protection from predation for red drum living in this habitat, more juveniles would survive the life stage associated with use of this habitat. This could result in an increase in individuals reaching reproductive maturity, which would positively affect the reproductive standing stock of regional populations recruiting individuals from this habitat. Research has concluded that oyster reefs provide more protection from predators to juveniles than seagrasses, marshes, or non-vegetated sand (Levin *et al.* 2001). Recruiting population vulnerability to depredation generally decreases as habitat complexity increases (Heck and Orth 1980; Levin *et al.* 2001).

Oyster reefs can also provide benthic-pelagic coupling (Hare and Maranick, 2007; ASMFC 2007b). Feeding activities by the oysters can cause a reduction in water column turbidity, which generally has a positive impact on submerged aquatic vegetation by allowing a higher degree of ambient light penetration in the water column. In addition to increasing water quality, oyster reefs reduce erosion (ASMFC 2007b), which can threaten estuarine habitats with sediment smothering, and baffle tidal currents that carry pelagic larvae into upper reaches of estuarine rivers.

Invasive species indirectly pose a potential threat to red drum by displacing or minimizing the populations of native species of animals and plants, which can alter the trophic structure of red drum communities, prey availability, and predator behavior dynamics. While red drum are considered a predatory fish, juveniles, eggs, and larvae may be adversely affected if they are directly displaced or if food sources upon which they depend are displaced by an invasive species or suite of species.

In south Texas estuarine habitats, spatial and temporal variation in meiofaunal prey density is common, so seasonal trends in prey abundance may affect early life survival of red drum (Rooker *et al* 1999). Predator suites also vary spatially and temporally, and abundance may be a factor in survival. Post-settlement red drum are often exposed to a large variety of predators with a shifting abundance and distribution in seagrass meadows (Rooker *et al.* unpublished data; Rooker *et al.* 1999). Predators inhabiting seagrass meadows are capable of consuming large numbers of red drum, which can result in prey and predator density fluctuations critical to the survival of red drum in the egg and larval stages (Rooker *et al.* 1998a).

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