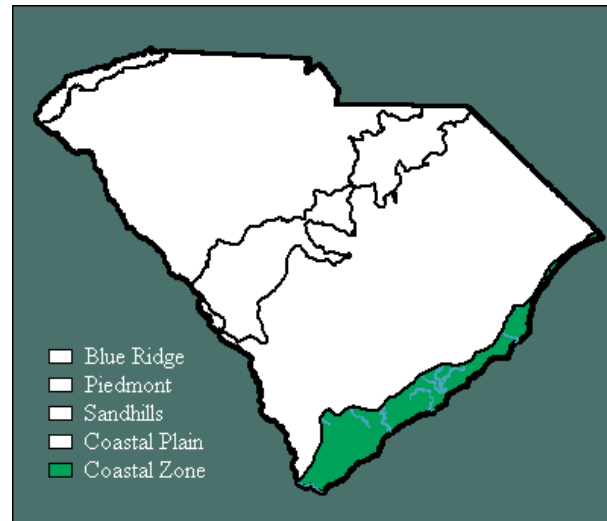


# Coastal Zone and Marine Ecoregion Terrestrial and Aquatic Habitats

## Description and Location

The coastal zone is that portion of the lower coastal plain that lies seaward of US Highway 17. This region includes a small portion of the mainland but is primarily comprised of tidal marshlands and associated uplands that include large sea islands that are greater in size than 1,000 acres (404.69 hectares) and extends eastward to include barrier islands, Atlantic Ocean beaches and the Atlantic Ocean shallow continental shelf offshore to South Carolina's 4.8-kilometer (3-mile) jurisdictional boundary. The lower approximately 32 to 48 kilometers (20 to 30 miles) of all of the state's coastal rivers is included in the coastal zone.



The inland boundary of the coastal zone is somewhat arbitrary relative to mainland habitats, but is particularly relevant to riverine and alluvial habitats since Section 50-5-80 of the Code of Laws of South Carolina establishes boundaries for fresh and 'marine' waters that generally are associated with US Highway 17. These boundaries were established primarily for wildlife law enforcement concerns related to the enforcement of freshwater and marine fishery laws and regulations. The actual point at which riverine waters change from fresh (less than 0.5 parts per thousand salt) to brackish or 'marine' (greater than 0.5 parts per thousand salt) is highly variable, even daily, depending on the combined impacts of tides and river discharge as determined by rainfall or water releases from dams. During each approximately six-hour tide cycle from maximum ebb or low tide to maximum flood or high tide, the point of change from fresh to slightly brackish water may move several miles upriver, only to return downriver during the next ebb tide period.

The soils or surface sediments of the coastal zone (sands, silts and clays) are derived from the Appalachian Mountains and are organized into coastal, fluvial (riverine) and aeolian (dune) deposits. Most of these deposits were transported seaward during the Quaternary period, which began about 1.8 million years ago. Underlying the surface sediments is a bedrock stratum of eroded sedimentary rocks dating to the Tertiary period and the Mesozoic era, between 130 and 1.8 million years ago. With the exception of manmade quarries, the bedrock stratum is only exposed within the coastal zone in banks and bottoms of rivers, in deep scoured tidal channels and on nearshore Atlantic Ocean continental shelf bottoms as "hard bottom." The oldest sedimentary rocks are deeply buried sandstones, shales and siltstones from the Cretaceous epoch and up to 130 million years old. Limestone ranging in age from 100 to 30 to million years overlies the sedimentary rock (Matthews et al. 1980).

## **Habitats and Priority Species**

The coastal zone contains the most diverse myriad of habitats of any of the ecoregions of the state and is treated somewhat separately from the other ecoregions because of this complexity. Many habitats within the region that are very important to wildlife species are completely dependent upon the influence of salt water and direct management action, such as coastal impoundments. In some cases it was inappropriate to classify the habitats solely based on vegetation.

Diverse forest types are distributed throughout the extreme eastern portion of the lower coastal plain mainland that is adjacent to estuaries and tidal river basins. Due to this proximity, large coastal zone islands, including barrier islands, sea islands and many hammock islands also support forested habitats very similar to those found in the lower coastal plain. Forested habitats distributed within both the coastal zone and coastal plain include the following: bottomland hardwood, pine woodland, oak-hickory or hardwood dominated, mixed mesic hardwood and bald cypress-tupelo gum swamp. Larger landmasses within the coastal zone also contain grassland and early successional habitats and wet flatwoods. Ponds and depressions, or wetlands isolated from tidal waterways, occur in the coastal zone as well, including interdune ponds that are restricted to dune systems along the Atlantic Ocean beaches.

### *Forest and Wetland Habitats of the Coastal Plain*

#### **General Description and Location**

Typical coastal plain pine and hardwood forests extend into the coastal zone, sometimes with variations due to coastal influences or land management practices. Included are pine woodland, hardwood bottoms, upland forest and river slopes and bottoms. Cypress-tupelo hardwood bottoms within the coastal zone may be influenced more by tidal activity than by river flows, but the water is typically fresh or nearly so. Cypress-tupelo swamps may also be isolated from rivers and may be remnants of relict ricefield reserves. Several types of ponds and depressions occurring within the coastal plain ecoregion also occur within the coastal zone, including depression meadows, pond cypress ponds, swamp tupelo ponds, pocosins and limestone sinks.

#### **Associated Species**

Highest Priority: Southern Hognose Snake, Wood Stork, Yellow-crowned Night Heron, American Eel

High Priority: Upland Chorus Frog, Southeastern Bat, Pickerel Frog, Black Swamp Snake

Moderate Priority: Wood Duck, Snapping Turtle, Pickerel Frog, Black Swamp Snake

### *Early Successional Habitats of the Coastal Plain*

#### **General Description and Location**

Typical coastal plain upland grasslands or early successional fields extend into the coastal zone, with cover provided by grasses and/or weeds and with few, if any, trees. Also included are meadows, pastures, golf courses and expansive lawns with or without damp depressions.

### **Associated Species**

Highest Priority: Grasshopper Sparrow, Field Sparrow, Yellow Rail, Upland Sandpiper, American Golden Plover

### *Maritime Forest*

#### **General Description and Location**

Maritime forests are the typical forested plant community in the coastal zone and are found on barrier islands, salt marsh islands (hammock islands) and mainland areas that are influenced by salt spray. Maritime forests are typically dominated live oaks (*Quercus virginiana*), southern magnolia (*Magnolia grandiflora*) and one or more pine species. Typical shrubs and small trees include southern red cedar (*Juniperus silicicola*), cabbage palm (*Sabal palmetto*), American holly (*Ilex opaca*), red bay (*Persea borbonia*), wax myrtle (*Morella cerifera*) and yaupon holly (*Ilex vomitoria*). The herbaceous layer is usually fairly sparse due to the dense canopy cover.

Maritime forests exhibit much greater species and structural diversity away from the direct effects of salt spray. Deciduous trees are more common and include southern red oak (*Quercus falcata*), water oak (*Quercus nigra*), sugarberry (*Celtis laevigata*) and pignut hickory (*Carya glabra*). Dogwood (*Cornus florida*), American olive (*Osmanthus americana*) and Carolina laurel cherry (*Prunus caroliniana*) are common in the understory. Shrubs, including beauty-berry (*Callicarpa americana*) and red buckeye (*Aesculus pavia*), become more common, and saw palmetto (*Serenoa repens*) reaches its northern extent of its range on Kiawah Island in Charleston County.

A variant maritime forest resembling xeric pine woodland of the coastal plain occurs on relict dune ridges inland from the barrier island forests. This habitat has an open super-canopy of longleaf pine (*Pinus palustris*) with an understory composed of live oak (*Quercus virginiana*), laurel oak (*Quercus hemisphaerica*), sand live oak (*Quercus geminata*) and turkey oak (*Quercus laevis*). Unlike typical maritime forests, maritime sandhill forests are open and characterized by patches of bare sand and lichens such as reindeer lichens (*Cladonia* spp.).

### **Associated Species**

Highest Priority: Painted Bunting, Southern Hognose Snake, Island Glass Lizard, Northern Yellow Bat

Moderate Priority: Northern Flicker, Eastern Woodrat

### *Hammock Island*

#### **General Description and Location**

Approximately 3,500 marsh hammocks are distributed through the coastal tidelands of South Carolina. They are most abundant within the expansive estuarine and brackish marshlands and tidal waterways of Charleston, Colleton and Beaufort Counties, where nearly 90 percent of such islands occur. Hammock islands range in size from 0.04 to 404.5 hectares (0.108 to 999.9 acres) and are surrounded by tidal wetlands; hammock islands are located inland of barrier islands. Most were naturally formed while some, particularly along the Intracoastal Waterway, were created by disposal of dredged materials or sediments excavated from post-civil war era

phosphate mining. Many hammocks also occur within the delta portions of coastal river basins. As upland landforms, hammocks provide a diversity of woodland, shrub and wetland habitats.

Diversity of habitats, plant communities and associated fauna generally increases with hammock size. Islands of less than 0.4 hectares (1 acre) in size may be of uniformly low elevation and may become partially or completely inundated by salt water during extreme high tides. Such hammocks have few if any large trees and may be predominantly salt-shrub or grassland. Some very small hammocks with elevations precluding inundation except during extreme storm driven tides may have a few stunted specimens of live oak (*Quercus virginiana*) and/or cabbage palmetto (*Sabal palmetto*), but frequently have nearly pure stands of southern red cedar (*Juniperus virginiana* var. *silicicola*) with a narrow salt-shrub collar.

Most hammock islands of at least 0.4 hectares (1 acre) in size have some cover provided by live oak and cabbage palmetto and in at least these respects share characteristics with typical maritime forest. A narrow band of salt-shrub thicket encircles most hammocks at the marsh and upland interface. A broken band of southern red cedar and shrub thicket dominated by wax myrtle (*Morella cerifera*) frequently occupies the transition zone directly upland of this thicket. Seasonally flooded depressions and high marsh or salt-shrub incursions or sloughs may extend beneath cabbage palmetto dominated swales. Frequently, salt-tolerant grasses, sedges and herbs colonize these hydric soils where the shrub layer is absent or sparse. Portions of hammocks abutted by tidal waterways often have an abrupt transition from mature canopy forest to the high tide zone, with a very thin salt-shrub or high marsh collar if such occurs at all.

### **Associated Species**

Highest Priority: Painted Bunting

High Priority: Bald Eagle, Barn Owl, Eastern Diamondback Rattlesnake, Diamondback Terrapin, Mink

Moderate Priority: "Pine Flatwood Crayfish"

### *Ocean Beaches and Transition Zones*

#### **General Description and Location**

Ocean beaches and the associated transition zones are formed primarily from unconsolidated sand and are ubiquitous features on barrier islands or ocean strand that directly fronts the Atlantic Ocean. Dune habitat includes sand dunes and swales, flats and pools between dunes and between dunes and other features. Seaward of the dune system, sandy flats may occur in areas where dunes have been eroded. Beaches and associated habitats are influenced by windblown salt spray and sand and may be occasionally flooded, particularly during storms. Vegetated components of the beach system include:

- Maritime Grassland. That portion of the Atlantic Ocean beach dune system vegetated by grasses and herbs. This habitat includes sand dunes and swales and flats between dunes and between dunes and other features. Characteristic plants include sea oats (*Uniola paniculata*), bitter panicgrass (*Panicum amarum*), seabeach evening-primrose (*Oenothera humifusa*) and dune waterpennywort (*Hydrocotyle bonariensis*).
- Interdune Pond. Low depressions or pools within the secondary dunes that hold water either permanently or seasonally. Both vegetation and animal life in pools is largely

determined by salinity. Interdune ponds, whether permanently or seasonally watered, may provide at least a short-term supply of low salinity water in areas where it is otherwise generally absent.

- Maritime Shrub Thicket. Thickets of shrubs, vines and stunted trees often in swales within secondary dunes. Trees and shrubs must be salt tolerant and are “pruned” by windblown salt spray and sand. Typical plants are wax myrtle (*Morella cerifera*), red bay (*Persea borbonia*), groundsel tree (*Baccharis halimifolia*), saw greenbrier (*Smilax bona-nox*) and poison ivy (*Toxicodendron radicans*).

### **Associated Species**

Highest Priority: Common Ground-dove, Wilson’s Plover, Gull-billed Tern, Painted Bunting, Island Glass Lizard, Least Tern, Piping Plover, Loggerhead Turtle  
Moderate Priority: Eastern Woodrat  
Unranked: Atlantic Ghost Crab, Sheepshead Minnow

### *Isolated Nonforested uplands*

### **General Description and Location**

Numerous small emergent landforms occur within inlets, sounds, bays and river deltas. They are generally sparsely vegetated and are constantly reshaped by the dynamic forces of currents, waves and wind. Such islands lying entirely within sounds and inlets and surrounded by expanses of open, relatively deep water are generally devoid of terrestrial predators, particularly raccoons. Lower-lying islands are vulnerable to over washing by storm-induced high tides and to salt spray from strong winds. In more sheltered situations, even though high-profile dunes are absent, vegetation develops to salt tolerant grasses and low shrubs. Sandy beach, intertidal beach and surf zone habitats may also be present. The extent and type of vegetation likely determines the utilization of such sites by nesting and resting seabirds, shorebirds and wading birds.

Emergent landforms influenced by human activity consist of diked spoil islands and shall rakes. Diked spoil islands are created from disposal of dredged materials in previously open tidal marshlands or on previously existing uplands. Both dikes and interior areas above normal spoil pooling are usually colonized by early successional grasses, such as broom sedges (*Andropogon* spp.) and shrubs and trees including groundsel tree (*Baccharis halimifolia*), tallowtree (*Triadica sebiferum*) and sugarberry (*Celtis laevigata*). Vegetation cover becomes more dense when spoil deposition is discontinued. Although the value of these sites to wildlife is highly variable, spoil islands receiving sediments consisting primarily of sand with a low organic content can be manipulated to maintain an unvegetated condition to facilitate use by sea and shorebirds.

Shell rakes are deposits of oyster and other mollusk shell produced by wave action from wind and/or boat wakes, occurring along exposed marsh borders of inlets, sounds, bays and other large waterways. These sites are partially abundant adjacent to the Intracoastal Waterway where wave action from boat wakes can deposit shell, but can also overwash them. Shell rakes are highly valuable as nesting and roosting sites for American oystercatcher (*Haematopus palliatus*) and as shorebird roost sites. High wakes are especially problematic during summer when overwashing can destroy oystercatcher nests (T. Murphy, SCDNR, pers. comm. 2004).

### **Associated Species**

Highest Priority: Wilson's Plover, Sandwich Tern, White Ibis, Least Sandpiper, Painted Bunting, Black Skimmer, Eastern Brown Pelican, Royal Tern, American Oystercatcher

High Priority: Black-bellied Plover, Diamondback Terrapin, Mink

### *Ponds and Depressions*

#### **General Description and Location**

Ponds and depressions, including pools and isolated wetlands, occur throughout the coastal zone and may be embedded within larger habitats. These include forested habitats, early successional habitats, hammock islands, maritime forest and diked spoil islands. Such sites are not generally identified on soil maps. In addition to the isolated wetland subtypes occurring throughout the coastal plain, the following subtypes are unique to the coastal zone:

- Manmade ponds, constructed for recreational, water supply or stormwater retention, are highly variable with regard to physical features, water chemistry and connection to open tidal systems. These factors, as well as land use and other human activities near such wetlands, primarily control both floral and faunal features. Though such habitats are not generally considered high quality wildlife habitat, some provide suitable habitat for priority species as foraging, nesting, roosting and resting habitat for wading birds.
- Vernal pools, small, seasonally flooded depressions with gradually sloping margins, occur in sandy uplands on barrier islands and other landforms of recent origin. They may be embedded in non-alluvial swamp forests or other forest types within the interior of uplands or may lie near the perimeter of uplands and receive occasional input of water of varying salinity on exceptionally high tides. Except where soils are highly saline, many of these habitats have been colonized by the invasive, non-native tallowtree (*Triadica sebiferum*). Vernal pools may be a primary source of low salinity water for birds and mammals and as breeding and/or resident habitat for turtles, amphibians and crayfish. Since these pools are only seasonally flooded, large predatory fishes are absent. Smaller vernal pools may afford the only wetland habitats on smaller islands.
- Small depression ponds may intergrade with vernal pools but are permanently flooded, except possibly during severe droughts. Obligate aquatic plants like fragrant waterlily (*Nymphaea odorata*) or yellow pondlily (*Nuphar lutea*) may inhabit submerged areas and a variety of emergent and wetland species, including sedges and grasses, generally colonize shallows and intermittently exposed borders. Small depression ponds generally are not affected by tidal activities.
- Interdune ponds are depressions located in swales between beach dunes or ridges that contain permanent or vernal pools.

### **Associated Species**

Highest Priority: White Ibis, Wilson's Snipe, Flatwoods Salamander, Broad-striped Dwarf Siren

High Priority: Chicken Turtle

Moderate Priority: Greater Yellowlegs

Unranked: Marsh Killifish, Sailfin Molly

## *Managed Impoundments*

### **General Description and Location**

The coastal wetland impoundments of South Carolina are managed and formerly managed tidal wetlands. Impoundments generally occur from Georgetown County southward, coincident with the state's most extensive tidal marshlands. Salinity regimes range from fresh to brackish, depending on water sources and management practices.

A diverse assemblage of rooted floating aquatics, such as white waterlily, American lotus, and pondweeds occupies managed freshwater impoundments. Emergent plants such as cattails, southern wild rice and pickerel weed are common. Submerged and free-floating aquatic plant species also occur and include duckweed, bladderwort, waterfern and fernwort. Managed brackish and intermediate emergent wetlands principally contain widgeongrass, saltmarsh bulrush and dwarf spikerush.

Emergent tidal marshes are common along the banks of canals of abandoned rice fields and modern-day waterfowl impoundments. Dominant species can include cutgrass (*Zizaniopsis miliacea*) or Jamaica swamp sawgrass (*Cladium jamaicense*). Intermixed among these grasses are various herbaceous plants such as pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* spp.) and alligatorweed (*Alternanthera philoxeroides*). Shrubs and trees are present in the more elevated areas of the tidal marsh community. Bald cypress-tupelo swamp communities occur on abandoned rice fields and swales inland of modern-day impoundments.

### **Associated Species**

Highest Priority: Glossy Ibis, Black Rail, Northern Pintail  
High Priority: Pee Dee Lotic Crayfish  
Moderate Priority: Black-necked Stilt, Tundra Swan

## *Tidal Fresh and Brackish Systems*

### **General Description and Location**

Tidal fresh and brackish systems consist of a complex of marshlands, sandbars, mud flats, sand flats and waterways that are subject to mixing of salt and freshwater flows, usually in association with a freshwater source, such as a river delta. Substrates and vegetation communities include intertidal marsh, intertidal flat, intertidal sandbar, channels, Creeks, subtidal/submerged flat and emergent marsh. Vegetation is predominantly grasses, sedges and herbs with few trees; species makeup depends on salinity. Submerged vegetation may occur as well.

### **Associated Species**

Highest Priority: Spotted Sandpiper, Black Skimmer, Lesser Scaup, Least Tern, Hickory Shad, Black Skimmer  
High Priority: Forster's Tern, Spiny Softshell Turtle, Florida Green Water Snake,  
Moderate Priority: Banded Killifish, Bluefin Killifish  
Unranked: Ohio Shrimp

## Estuarine Systems

### General Description and Location

Estuaries form one of the predominant landscapes of the coastal zone. They consist of interconnected networks of intertidal marshland with tidal channels of various sizes branching throughout, generally interfacing with marine or Atlantic Ocean waters via deep channels through sounds and bays or through smaller inlets. Following are the generally recognized vegetative and geophysical components of estuaries and their interrelationships:

- Salt Marsh. Intertidal marshlands in estuarine (salinity ranges 15 to ~40 ppt) areas that are variously flooded and dewatered by tidal forces, with influence from lunar cycles, wind, rainfall and river discharge, particularly within or near river deltas. Smooth cordgrass (*Spartina alterniflora*) is the dominant plant.
- Black Needlerush Marsh. The portion of highest elevation salt marsh dominated by black needlerush (*Juncus roemerianus*), which often occurs in dense stands. This habitat is usually near uplands.
- Salt Flat. Sparsely vegetated, hypersaline (greater than 40 ppt salinity) and exposed flats of sand and/or mud. Typical plants include glassworts (*Salicornia* spp.) and saltwort (*Batis maritima*).
- Salt-Shrub Thicket. Bands or patches of usually low, dense shrubs that typically interface high salt marsh and uplands. Characteristic plants include sea ox-eye (*Borrchia frutescens*), marsh elder (*Iva frutescens*) and groundsel tree (*Baccharis halimifolia*).
- High Marsh Pool. Poorly drained pools in high salt marsh, often near uplands. Salinity is highly variable depending on frequency and timing of tidal input and rainfall. Both soils and water may become hypersaline (greater than 40 ppt salinity).
- Estuarine Intertidal Flat. Mud and sand flats in estuarine systems that have little or no vegetation and are dewatered on ebb tide and submerged during high tides. Mud and sand flats may occur between marshlands and channels and creeks or may be interspersed within marshlands.
- Estuarine Intertidal Sandbar. Sandbars in estuarine systems that are partially exposed during part of most tide cycles and river stages but are typically submerged during high tide.
- Estuarine Tidal Channels and Creeks. Tidal estuarine waterways of variable depth and with currents generated by riverine and/or tidal flows.
- Estuarine Subtidal/Submerged Flat. Mud and sand flats with little or no vegetation that are inundated during all or part of each tidal cycle. Submerged flats include sand and/or mud bottom areas outside of channels and creeks and usually lie between channel habitats and tidal marshlands.
- Oyster Reef. Bars or reefs primarily composed of live and dead eastern oyster (*Crasostrea virginica*). Oyster reefs can be either intertidal or subtidal and are usually in flats between tidal channels and salt marsh. Reefs may occur in flats within expanses of salt marsh.

### Associated Species

Highest Priority: Louisiana (Tri-colored) Heron, Black Rail, Black Skimmer

High Priority: Mink, Diamondback Terrapin, Black-bellied Plover, Bottlenose Dolphin

Moderate Priority: Greater Scaup



Unranked: Ribbed Mussel, Sheepshead Minnow, Mud Fiddler Crab, Cobia, Atlantic Brief Squid, Colorful Sea Whip, Southern Flounder, Finetooth Shark, Horseshoe Crab, Knobbed Whelk

### *Marine Ecosystem*

#### **General Description and Location**

The Coastal Marine Ecosystem occurs along all 291.5 km (181 mi) of South Carolina's Atlantic Ocean coastline and extends offshore to the state 4.8-kilometer (3-mile) jurisdictional boundary, incorporating a surface area of nearly 140,000 hectares (~346,000 acres). The following habitats are generally recognized:

- Intertidal Beach. The front ocean beach region that is typically inundated on flood tides and dewatered on ebb tides. Invertebrate fauna in the intertidal beach zone such as the coquina clam (*Donax variabilis*) and the mole crab (*Emerita talpoida*) are an integral part of the food supply for shorebirds and seabirds (piping plover (*Charadrius melodus*), willet (*Catoptrophorus semipalmatus*), sanderling (*Calidris alba*) and red knot (*Calidris canutus*) that forage at the intertidal beach and surf interface.
- Surf Zone. The submerged portion of the beach area and extending offshore to a depth of 6 feet at any tidal stage. Marine aquatic species in this zone are heavily influenced by turbulence from wave action. Ninety-eight fish and 317 macro-invertebrate species are recognized as at least occasional inhabitants.
- Shallow Shelf. The portion of the Atlantic Ocean submerged continental shelf offshore to the 3-mile state territorial limit. Shallow shelf habitats can be further divided into three important types, *soft bottom*, *hard bottom* and *pelagic zone*. Soft bottom is composed of unconsolidated sediments that supply sand to the continental shelf, barrier islands, and beaches; store nutrients in the sediment; and are critical nursery and feeding habitat for fish. Hard bottom supports a wide variety of invertebrate and fish species, including many species popular with recreational fishers. Hard bottom habitats are continually being discovered and mapped. The pelagic zone supports many year-round nekton (water-column) species, but also is an important migration route or temporary home for numerous transitory species.

#### **Associated Species**

High Priority: Bottlenose Dolphin, Black Scoter

Moderate Priority: Common Loon

Unranked: Hardhead Catfish, Southern Kingfish, Surf Scoter, Sheepshead, Atlantic Spadefish, Cannonball Jellyfish, Coquina Clam

### *Man-made Structures*

#### **General Description and Location**

Engineered structures are estimated to cover over 25 percent of South Carolina's nearly 90 miles of developed coastline (SCDHEC 2005). Some of the most familiar structures include piers, boardwalks, housing and commercial development, jetties and groins. Manmade structures can provide hard surfaces and relief (vertical extension) of substrate into the water column that promote the attachment of many aquatic species, including algae and mosses in low salinity

waters and algae and sedentary invertebrates (hydroids, bryozoans, sponges, barnacles, oysters and mussels) in estuarine and near-shore marine waters.

Rock seawalls and jetties provide hardened substrate for attachment of organisms in intertidal and subtidal zones and exposed rock may be used by resting and foraging shore and seabirds, most notably the purple sandpiper (*Calidris maritima*), which prefers rocky coast habitats that are rare in the southeast. Submerged rock also provides cover for many fishes and invertebrates.

However, hardened structures designed for shoreline and channel protection also disrupt natural processes of sand movement along beaches and can contribute significantly to beach erosion. Seawalls and bulkheads in inland waterways can protect the immediate shoreline while potentially exacerbating erosion of the nearby, unprotected shoreline. Such structures also interfere with the nesting of sea turtles either by totally displacing nesting sites or by rendering them more susceptible to flooding.

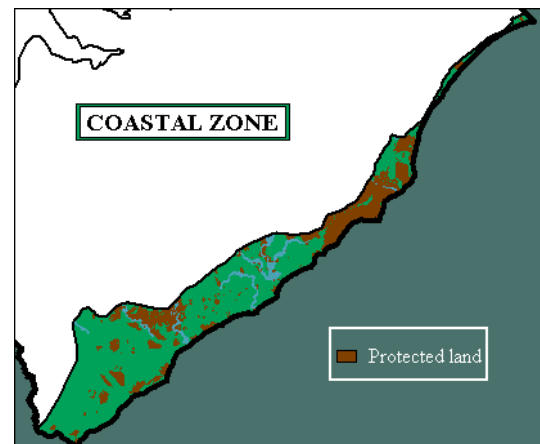
### Associated Species

Moderate Priority: Purple Sandpiper

Unranked: Gag, Lined Seahorse, Florida Stone Crab

### General Condition of Habitats

Much of the South Carolina coastal zone has been adversely affected by human population growth and associated development. By the early 1990's, about 50 percent of the total United States' human population lived in coastal areas (Moore et al. 1995), and the trend of concentrated growth along coasts is expected to continue into the next century (Cullitan et al. 1990). About 88 miles (48.6 percent) of South Carolina's beachfront is currently affected by development (Kana 1988). The high concentration of human population growth and development in the coastal zone has fragmented forests and reduced other valuable habitats, such as shrub thickets and isolated wetlands. The vast majority of protected coastal zone holdings are in two regions, the ACE Basin and the Cape Romain- McClellanville area.



### Region-wide Challenges

Non-native plants colonize both terrestrial and wetland habitats. Such species can dominate or displace native vegetation and can occur in nearly single-species colonies or stands that present a lowered structural diversity and poor wildlife habitat. Both tidal low-salinity marshes and wetlands and littoral (shallow water) areas in ponds and impoundments can be densely covered in waterthyme (*Hydrilla verticillata*) or common reed (*Phragmites communis*). Dense colonies of these plants may restrict flows and capture sediment, thereby increasing the rate of eutrophication and contributing to low dissolved oxygen (DO) (McCann et al. 1996; Aulbach-Smith and deKozlowski 1996). Forested wetlands and coastal forests with damp (hydric or

<b>Major Public land holdings and private lands in conservation status in the Coastal Zone (acres)</b>	
Belle W Baruch Foundation	6,815
Brookgreen Gardens	632
Lowcountry Open Land Trust	733
Nemours Wildlife Foundation	2,906
Public Service Authority	606
South Carolina Department of Natural Resources	35,585
South Carolina Department of Parks, Recreation & Tourism	2,798
The Nature Conservancy	3,952
United States Department of the Navy	1,056
United States Fish & Wildlife Service	29,297
United States Forest Service	4,732
United States Marine Corps	5,875
University of South Carolina	568
<b>Total</b>	<b>95,556</b>

mesic) soils may be heavily populated with tallowtree (*Triadica sebiferum*), which quickly becomes established and out-competes more desirable native plants (J.W. McCord, SCDNR, pers. obs.). Feral non-native mammals like goats (*Capra hircus*) and pigs (*Sus scrofa*), inhabit coastal zone islands and marshlands. Goats can heavily browse vegetation, thereby reducing plant diversity, cover and soil stability; feral pigs can damage soils, marshes and impoundment dikes (J.W. McCord, SCDNR, pers. obs.). Non-native fishes like the common carp (*Cyprinus carpio*), the flathead catfish (*Pylodictis olivaris*), and the blue catfish (*Ictalurus furcatus*), may not directly impact habitats, but can alter ecosystem health through predation on or competition with native species.

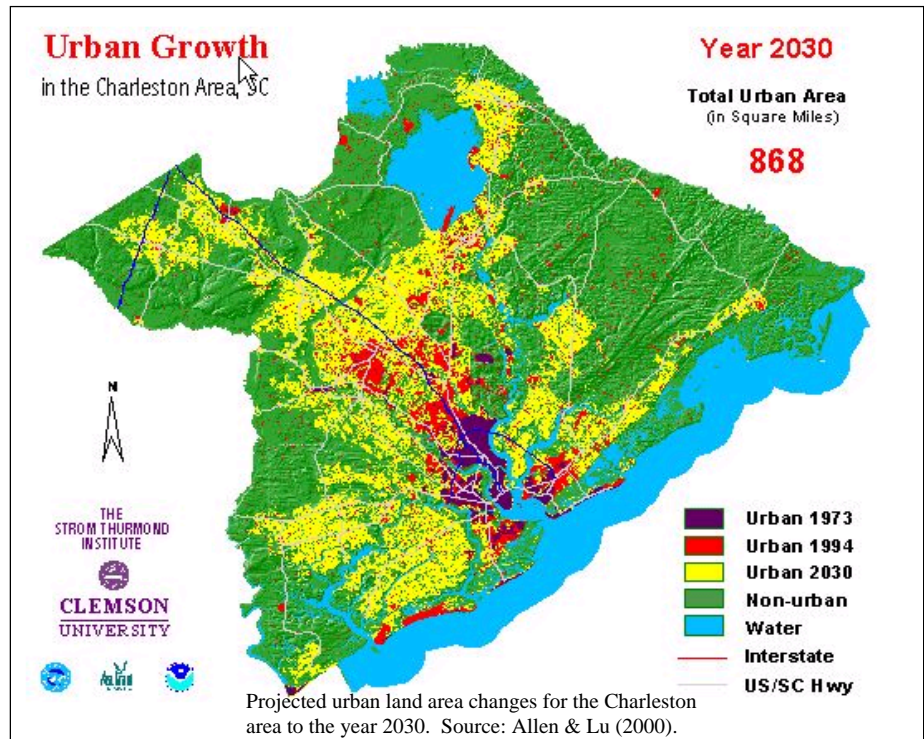
Coastal development along the Grand Strand and barrier island beaches has reduced unique coastal zone habitats. A high percentage of the state's maritime forests, maritime grasslands, maritime shrub thickets, beach flats and intertidal beaches have been negatively affected. Terrestrial habitats are physically removed to accommodate housing and other structures and natural and dynamic beach processes of erosion and accretion of sands have been altered to protect human structures and recreational interests. Hardened structures such as rocks, groins and jetties prevent natural sand movements. Beach renourishment from sand pumped from offshore or estuarine sites is frequently used to restore dune systems and beach flats.

Beachfront habitats in South Carolina have likely been more negatively affected by anthropogenic activities than any other ecosystem. Further, many priority species either presently rely, or once relied, upon such habitats. Human population growth and associated anthropogenic impacts are greater in or near the coastal zone than in any other ecoregion in the state.

According to the U. S. Census Bureau, the human population within the seven counties (Horry, Georgetown, Charleston, Berkeley, Colleton, Beaufort and Jasper) that include or border portions of the coastal zone increased by 41.1 percent from 1980 to 2000. Furthermore, this area is predicted to undergo an additional 28.1 percent growth in human population from 2000 to

2020. Over the past decade, there has been a substantial increase in the proportion of the population that lives within watersheds that drain into South Carolina estuaries (Cofer-Shabica et al. 1999).

The urbanized area of Charleston increased by more than 400 percent from 1973 to 1994 and is expected to increase at a similar rate for the next several decades (Allen and Lu 2000). Obvious impacts have been, and will continue to be, increased deforestation and forest fragmentation caused by increased residential, commercial and industrial development, and expanded highway and other transportation corridors to support the increased population.



Both point source and nonpoint source pollution also increase with population growth. Consumptive pressures relative to recreational uses of fishery resources will accompany population growth as well, as will nonpoint source pollution from watercraft and disturbance of wildlife from increased human activity. The ultimate result is increased stress on natural habitats and natural resources within the coastal zone, as well as increased vulnerability of habitats, fish and wildlife populations, and people to catastrophic events such as major hurricanes. Such predicted human population growth, and the associated impacts on wildlife and habitat, is added incentive to proactively plan for wildlife habitat conservation in the state's coastal zone.