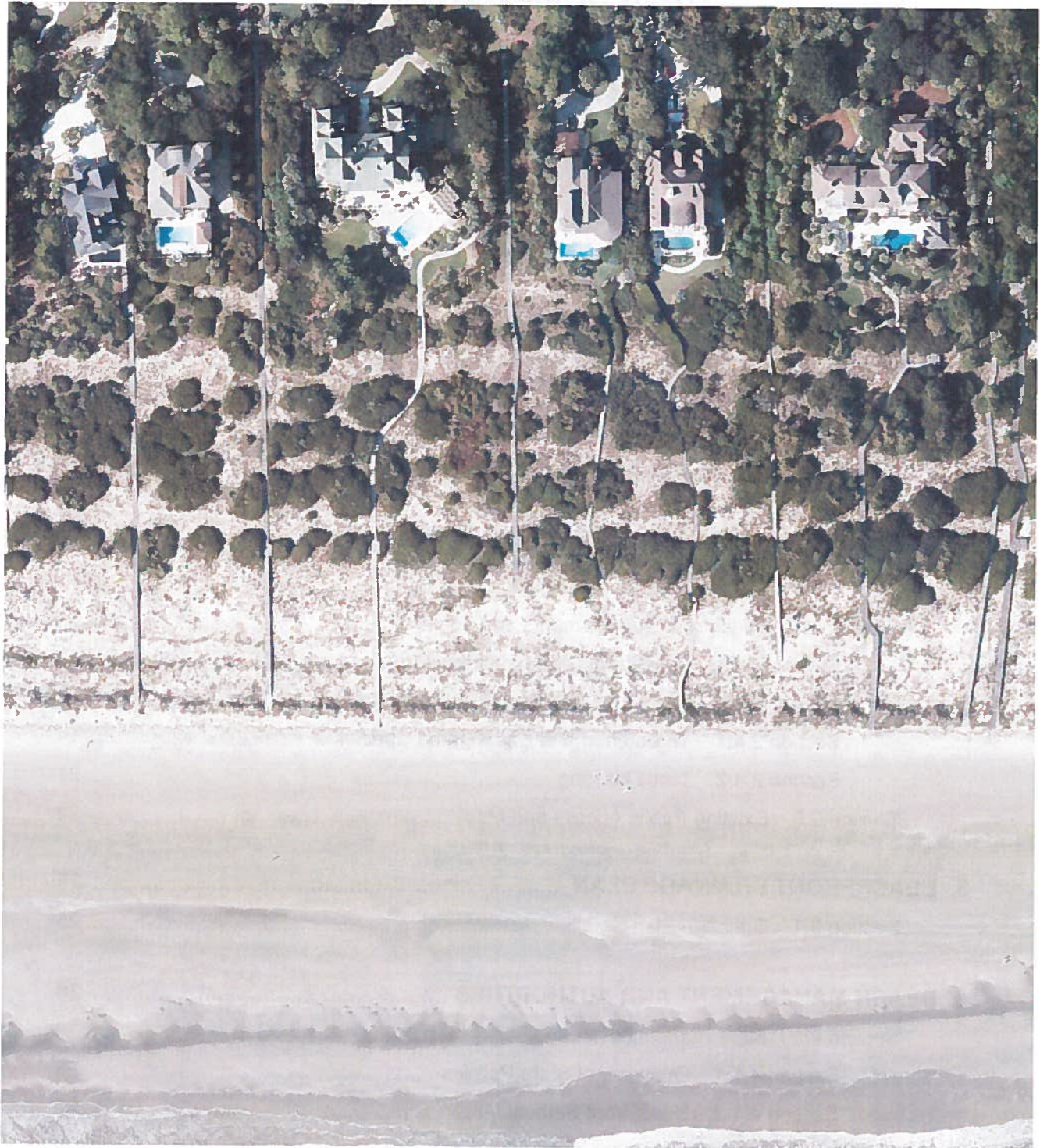


# TOWN OF KIAWAH ISLAND



## 2012 LOCAL COMPREHENSIVE BEACH MANAGEMENT PLAN





Catherine B. Templeton, Director  
*Promoting and protecting the health of the public and the environment*

December 3, 2012

Mayor G. Steven Orban  
Town of Kiawah Island  
21 Beachwalker Drive  
Kiawah Island, SC 29455

RE: State Approval of the Local Comprehensive Beach Management Plan for the  
Town of Kiawah Island

Dear Mayor Orban,

In accordance with the Beachfront Management Act, S.C. Code Ann. § 48-39-250 *et seq.*, South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management (DHEC-OCRM) has reviewed and hereby approves the locally adopted Comprehensive Beach Management Plan for the Town of Kiawah Island. Congratulations on your achievement and thank you for your commitment to effective collaborative management of our state's coastal resources.

Implementation of your state-approved local plan begins immediately and DHEC-OCRM published a public notice to that effect on Friday, December 7, 2012. As you are aware, the Town's Local Comprehensive Beach Management Plan must be updated at least every five years in coordination with DHEC-OCRM. Prior to your next scheduled plan update, we welcome your input as we work to streamline the plan development process, improve coordination and enhance the value of your plan as a meaningful resource for the Town and its residents and visitors.

Congratulations again on the approval of the Local Comprehensive Beach Management Plan for the Town of Kiawah Island. We look forward to working with you on this and other efforts to promote and protect our coastal environment.

Sincerely,

  
Carolyn Boltin-Kelly  
Deputy Commissioner

cc: Tumiko Rucker, Town Administrator, Town of Kiawah Island  
Dan Burger, Director, Coastal Services Division, DHEC-OCRM  
Will Salters, Planner, Coastal Services Division, DHEC-OCRM

**TOWN OF KIAWAH ISLAND**  
**LOCAL COMPREHENSIVE BEACH MANAGEMENT PLAN**  
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## SECTION 1

### INTRODUCTION

The Town of Kiawah Island Local Comprehensive Beach Management Plan has been created to fulfill requirements established by the South Carolina Department of Health and Environmental Control's Office of Coastal Resource Management (OCRM) for beachfront municipalities.

#### ***Section 1-1 Purpose***

This document will serve as an important planning and decision-making tool for the Town of Kiawah Island.

#### ***Section 1-2 History of Plan Approvals and Revisions***

The Town of Kiawah Island was incorporated in 1988 and its first Local Comprehensive Beach Management Plan was produced and approved in 1992. In 2006, Town Staff completed a complete revision of the document and submitted it to OCRM. The document was given "conditional approval" on August 30, 2006 but was never officially approved by OCRM.

#### ***Section 1-3 Overview of Municipality/History of Beach Management Approaches***

Kiawah Island is gated residential-resort community located 20 miles southwest of Charleston. Approximately 4,100 of the island's 10,000 acres are 5 feet or more above mean sea level. Development of Kiawah Island began in the 1960's and continues today. The island is home to 5 golf courses, 1 hotel, villas, and single-family homes.

Kiawah's beach is very healthy and requires very little maintenance. There have been 2 beach management projects in the past 20 years. The first was a very small-scale sand-scraping project in 1996 to address some minor erosion along Eugenia Avenue. The second was a large-scale beach renourishment project conducted in 2006 on the eastern end of the island in response to extensive erosion along the beachfront adjacent to the Ocean Course Golf Club. The project plan was designed by the Town's beach consultant, Dr. Tim Kana, incorporating suggestions from several state and federal agencies. L. Dean Weaver Construction, Inc. was contracted to do the work and officially started on June 8, 2006. The primary objective of the project was to close an existing beachfront creek and open a new channel to the east, in order to reestablish the natural flow of sand to the beach in this area. In addition, 550,000 cubic yards of sand was placed along heavily eroded beachfront areas from the Ocean Course Clubhouse down to the 16th fairway. Work was done with land-based equipment and the project was completed on July 28, 2006. The Town funded the majority of this \$3.6 million project with the balance being covered by financial contributions from

the Kiawah Island Golf Resort (KIGR), Kiawah Development Partners (KDP), and the Kiawah Island Community Association (KICA).

***Section 1-4 Current Beach Management Issues***

Kiawah Island has a very healthy beach that requires very little management or manipulation to maintain. Kiawah's main issues are dog management, beach walkover maintenance, and protection of critical wildlife habitat areas.

## SECTION 2

### INVENTORY OF EXISTING CONDITIONS

#### Section 2.1 General Characteristics of the Beach

Kiawah Island is a ten-mile long barrier island bounded on the east by the Stono Inlet and Folly Beach, and on the west by Captain Sam's Inlet and Seabrook Island. The center of Kiawah Island is located 15 miles southwest of the Charleston Harbor Entrance (Figure 1).

The beach along Kiawah Island is composed of well-sorted, fine to very fine sands. The beach tends to be relatively wide and flat, and is backed by one or more dune ridges along most of the island's length. The areas adjacent to the inlets may not exhibit this characteristic profile due to the effects of inlet shoal bypassing and inlet migration.

Tides in the vicinity of Kiawah Island are semidiurnal, with a mean tide range of 5.2 feet. Waves along the shoreline tend to be relatively small, approaching the beach from the south and southeast during the summer months, and from the northeast during the winter. South/southeast waves are the most common but northeast waves tend to be stronger. This means that the net direction of sediment transport along Kiawah's beach is from east to west.

#### Large-scale coastal processes

The beaches and barrier islands of the Atlantic coast all respond to winds, waves, and tides that predominate in a particular area. No physical process is more complex or variable than the interaction of loose sediments with breaking waves and currents. It is little wonder then that confusion abounds in discussions of beach erosion. Even coastal experts, who know much about one site or type of coast, may have erroneous notions regarding the processes controlling beach changes at another site. Conditions, processes, and solutions should not be extrapolated from one site to another.

South Carolina beaches and barrier islands differ greatly from North Carolina or Florida beaches. South Carolina's higher tide range (averaging 5.4 ft in Charleston, but exceeding 8 ft during some new moon periods), lower average wave heights, and finer sand all contribute to our coast's unique character. Stronger tides allow more inlets to form and persist. Gentle slopes of the coastal plain and continental shelf allow sand to accumulate in beach ridges (ancient foredunes), offshore bars, and inlet deltas. As Hayes et al. (1984) described, South Carolina's tidal inlets and their affiliated seaward shoals (called ebb-tidal deltas) contain hundreds of millions of cubic yards of beach-quality sand. In fact, there is probably more sand trapped in inlets south of Charleston than exists above the low-tide line of every barrier island in the region. As it turns out, the shape,

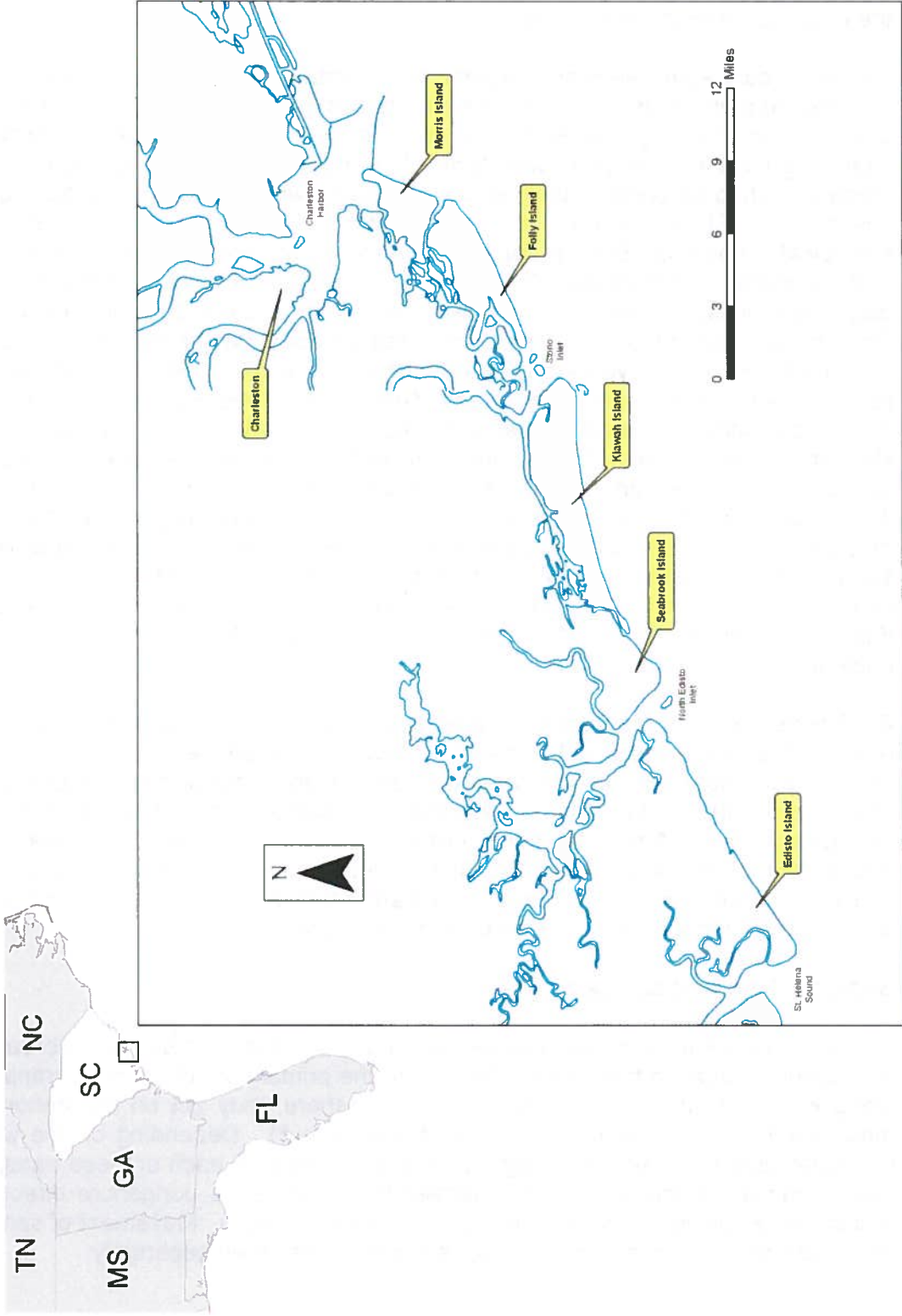


Figure 1. Kiawah Island location map.



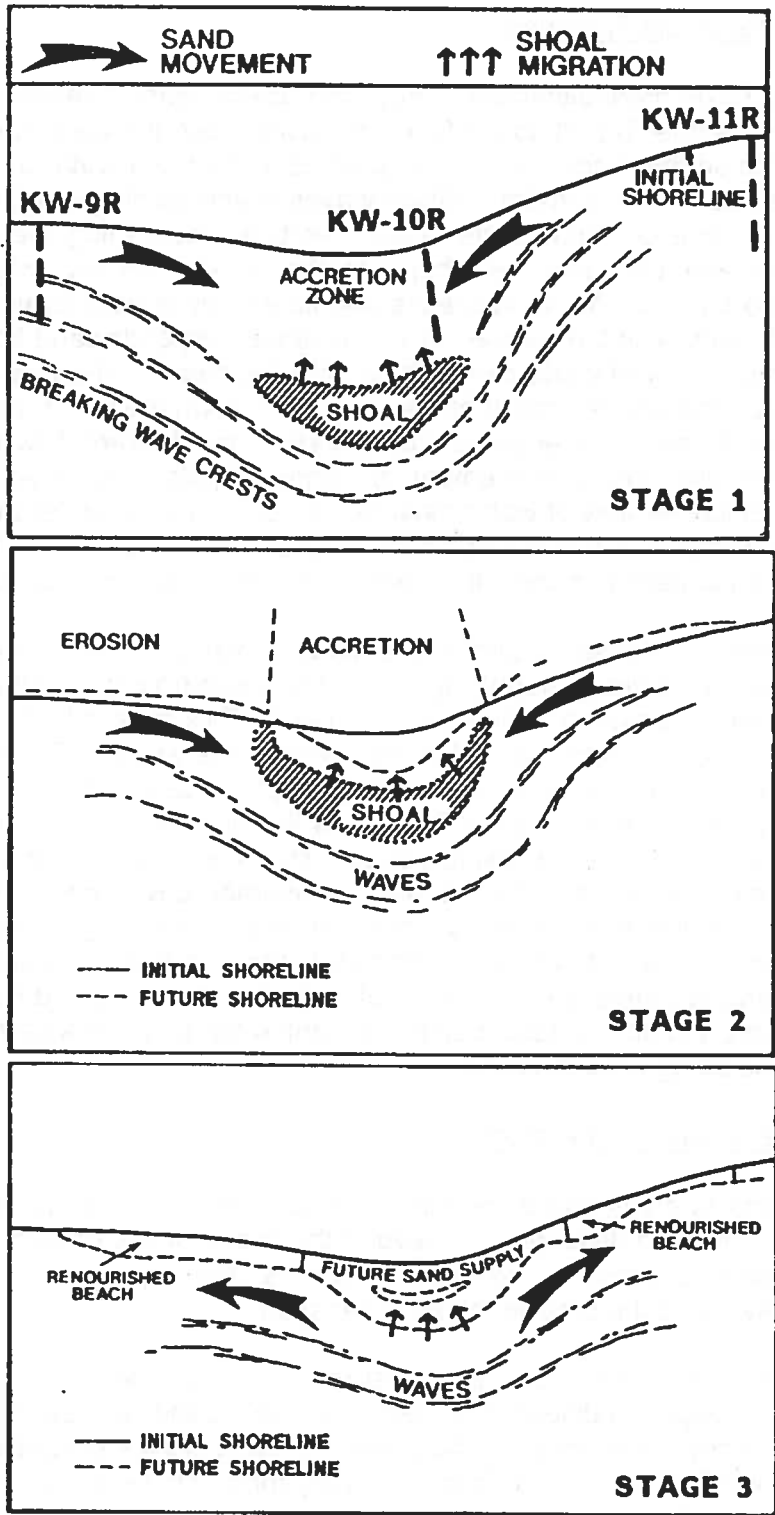
orientation, and modern shoreline evolution of all South Carolina barriers are intimately linked to the sand bars of the adjacent inlets. Ebb-tidal deltas may withhold sand from the beach, or just as often, release it to move downcoast under the influence of winds and waves.

Kiawah's consistent seaward growth this century is remarkable, especially considering many of its neighbors to the north and south have eroded. The shoals of Stono Inlet are responsible for this. Inlet sandbars act as natural breakwaters, sheltering the east end of Kiawah Island from northeast winds and waves. This creates a shadow zone in the lee of the shoals where sand can settle out of suspension. Strong currents in the inlet tend to hold most sandbars offshore. Periodically, however, Stono's entrance channel meanders, changing the position and orientation of the shoals. This triggers the release of sand from the inlet and begins a process of beach building--we refer to as "shoal bypassing" (Figure 2). Once freed of the currents in the inlet, isolated sandbars can be pushed shoreward by waves. Every five years or so, a sandbar containing upwards of one million cubic yards (the equivalent of ten football fields filled 60 feet high each) is released from Stono Inlet to Kiawah's east end. As the bar attaches to the beach, the shoreline jumps seaward by hundreds of feet. Once attached, the sandbar is spread in either direction with parts of it moved by waves along the oceanfront, and the remainder shifted back toward Stono Inlet. The massive bulge in the shoreline, produced where bars attach, contributes to the impression of the "drumstick" shape of Kiawah Island. Each sandbar added to Kiawah's east end is a form of natural beach nourishment. These free sand additions are the cornerstones of Kiawah's healthy beach. With a plentiful sand supply in place, islands like Kiawah begin to grow.

Geologists have long debated theories about barrier island formation. But the recent shoal-bypassing event at Kiawah proves one supremely important factor--plentiful sand supplies. In this case, the new supply overwhelmed the energy of waves and currents to move it, resulting in accumulation well seaward of the original shoreline. Windblown sand built a new dune line above the normal tides and added acres of dry-beach habitat. Once again, Kiawah is confounding conventional wisdom and showing us that barrier beaches can form quickly despite sea-level rise and a host of erosion-causing processes.

### Sediment Transport at Smaller Scales

As sand enters Kiawah's beach system around Stono Inlet, it is subject to breaking waves and fluctuating tide levels. Waves are the primary agents of sand transport along Kiawah Island. As waves propagate onshore, they act on the bottom to move sand in a number of ways or modes (Figure 3). Depending on the wave characteristics, such as wave height, period, and direction, each of these transport modes can act to move sediment parallel to the shoreline (longshore direction) and/or perpendicular to the shoreline (cross-shore direction). Movement of sand in the longshore and cross-shore directions is often considered separately.



**Figure 2.** Conceptual model of "shoal bypassing" events at the east end of Kiawah Island.

### Longshore Sediment Transport

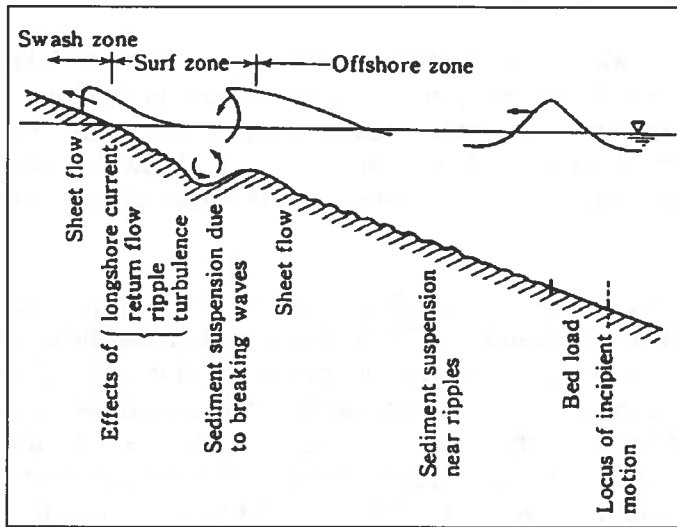
Waves may travel great distances through the open ocean while losing little of their energy. This is due, in part, to the fact that waves move the water beneath them in circular orbits so that once a wave has passed a point, the water at that point has experienced no net movement. When waves reach shallower waters, however, some of their energy impacts the bottom, vertically deforming the circular orbits into ellipses and changing the shape of the wave. Finally, when the water becomes too shallow, the wave breaks and its energy is transformed into the forward flow of water and turbulence. The turbulence suspends sand from the bottom and the forward flow of water carries it up onto the beach. The flow of water back into the ocean then carries much of the sand back down the beach in sheet flow. If the waves break at an angle to the shoreline, the forward flow of water (and therefore the direction of movement of sand) will also be at an angle to the shoreline. Since the flow of water back to the ocean occurs under the influence of gravity, it is always in a shore perpendicular direction. Thus, sand is transported in a saw-toothed pattern with the net movement in the longshore direction (Figure 4).

Along the coast of Kiawah Island, wave direction varies with the seasons. In the summer months, waves generally approach the shore from the southwest, while in the winter, wave approach is from the northeast. This means that sand generally moves to the east in summer and to the west in the winter. Furthermore, wave energy varies with the square of the wave height--meaning that a wave which is twice as high as another contains four times the energy (and thus four times the ability to move sand). As a result, periodic storm events tend to be much more significant to the movement of sand than the average day-to-day wave conditions. Since the wave climate is generally more severe in winter (larger waves and more frequent storms), the net direction of sand transport on Kiawah Island is from east to west. Although there are a number of other modes of wave-driven, longshore sand transport, the above-described movement in the surf and swash zones is the dominant one along Kiawah Island.

### Cross-shore Sediment Transport

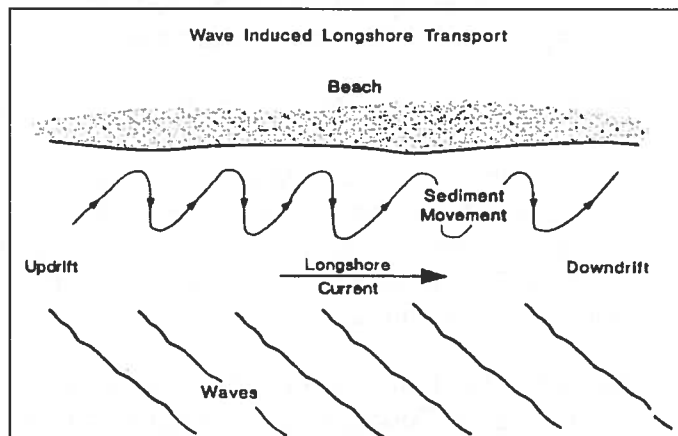
The dynamics of cross-shore sediment transport are significantly more complex, and even a simplified description is beyond the scope of this document. However, there are distinct seasonal cross-shore trends that can be commented upon without reference to the precise mode of transport.

It is well known that beach profiles adjust to variations in wave energy conditions. Under high-energy conditions (i.e., large waves), sand erodes from the upper beach and is deposited lower in the profile. If large waves persist over time, the beach face will flatten and an offshore bar may form. Under low energy conditions (i.e., small waves), sand is moved up the beach face. If small waves persist over time, the beach face will steepen and the offshore bar, if present, will weld onto the shoreline.



**Figure 3.**  
Cross-shore variation of sediment transport modes.  
[1999 Kana Report]

At Kiawah Island, winter wave conditions generally fall in the high-energy category, and erosion occurs along the entire island as waves get larger. Summer wave conditions, however, generally fall in the low energy category, and the sand deposited offshore over the fall and winter is moved back to the upper beach throughout the spring and summer.



**Figure 4.** Movement of sand in the surf.

In addition to wave-energy conditions, there is also a seasonal variation in sea level that contributes to the cycle of winter erosion and summer accretion. Data summaries by Hicks et al. (1983) show that water levels at Charleston are up to 0.5 foot (ft) higher in the autumn than in the spring. Although this is a function of storm frequencies as well as astronomical factors, it can be assumed that higher water levels allow waves to attack the beach higher in the profile, triggering the seasonal change to a "winter" profile.

## **Section 2.2 General Land Use Patterns**

Land use and development on Kiawah Island are regulated by the Kiawah Island Municipal Code, specifically Article 12; the Kiawah Island Comprehensive Plan; the 2005 Development Agreement with Kiawah Resort Associates; the 2010 Development Agreement with Kiawah Island Golf Resort; Kiawah Island Community Association's Covenants; the Architectural Review Board; and state/federal regulations.

Kiawah Island's beaches are also under the jurisdiction of OCRM. Using historic shoreline and present-day profile information, OCRM designates a baseline and setback line along the coast. The baseline is typically placed at the crest of the primary sand dune (that is the dune immediately adjacent to the ocean) while the setback line is demarcated landward of the baseline. The setback line's distance from the baseline varies along the coast. It is determined by the annual erosion rate in that particular area. Stable or accreting beaches have a minimum 20' setback line, while erosion areas have setbacks of as much as 400'. These lines are revised every 10 years as required by the South Carolina Coastal Zone Management Act. The last revisions were made in 2009.

### History of Land Use, Zoning and Subdivision Control

Prior to the Town of Kiawah Island's incorporation on September 13, 1988, development was governed by the Charleston County Zoning Ordinance, subject to the approved modifications in the Planned Development District (PDD-1A). The 1975 PDD-1A provided specific development criteria for each of the major use sub-districts on Kiawah Island.

As part of the PDD process, the Kiawah Island General Covenants were recorded in Charleston County to control specific matters pertaining to construction siting and appearance on the Island. The General Covenants delegated this control to the Architectural Review Board. Today, any new construction or alteration of existing construction, excepting certain areas that pre-dated the PDD, must comply with the General Covenants, other specific Covenants, and the ARB.

In 1994, the state legislature mandated that all municipalities prepare a Comprehensive Plan and revise zoning ordinances to be consistent with it. The Town concurrently developed and approved in September 1994 their first comprehensive plan, zoning ordinances, and a development agreement with the Island's developer. Together, these replaced PDD-1A and regulated development within the Town of Kiawah Island.

### Land Use/Zoning Ordinance

The Town's zoning ordinance is included as Article 12 in the Town's Municipal Code. Charleston County, as the Town's agent, continues to administer the provisions of the ordinance. Article 12 has been revised from time to time since 1994. The Ordinance was rewritten in 2005. While many of the specifications

remained the same, some items were changed and the entire ordinance was reformatted. In 2010, with the adoption of a Development Agreement with Kiawah Island Golf Resort, Article 12 was revised again and the zoning map and land use maps were republished. The zoning map and land use maps can be found in Appendix 7.1.

Article 12 describes, in detail, the zoning categories and standards for all classes of use, e.g., residential, resort, commercial, etc. Standards include permitted density, lot size and coverage, and supplemental regulations. It applies to all land, property and development in the Town of Kiawah.

**Table 1.** Kiawah Island zoning districts.

R-1, Residential	CS, Community Support
R-2, Residential	PR, Parks and Recreation
R-3, Residential	PD, Planned Development
C, Commercial	KC, Conservation District
RST-1, Resort	
RST-2, Resort	

The Zoning Map defines the boundaries of each district and is available at Town Hall and on the Town’s website at [www.kiawahisland.org](http://www.kiawahisland.org) for review.

Conservation District

The purpose of the Conservation District (KC) is to protect and preserve areas that are outside the OCRM Critical Line or define other sensitive areas, which are unsafe or unsuitable for permanent structures or developments. The zoning standards for KC are:

1. Accreted lands shall become part of the KC, Conservation District.
2. No development is allowed in this district.
3. Uses permitted in KC district shall be limited to boardwalks for beach access, unpaved temporary parking and non-habitable structures controlled by the Town relating to public health, safety and welfare.

**Section 2.2 Land Use**

Land use on Kiawah considers existing and future land use by categories, including residential, commercial, industrial, agricultural, forestry, mining, public and quasi-public, recreation, parks, open space, and vacant or undeveloped. As reflected in the Comprehensive Plan’s Vision statement, the “Town of Kiawah Island is a private residential community with a Resort.” Its residents and guests share an overwhelming commitment to the natural environment and wildlife. For this reason, land use on the Island is oriented toward residential, parks, open

space, recreation, and limited commercial development to service residents and visitors. The incorporated boundaries of the Town of Kiawah Island also include a considerable amount of marsh and water features.

Figure 5 and 6 on the following page, provide land use statistics for the Town of Kiawah Island. A considerable amount (58 percent) of the total area of the Town consists of marsh and water. Parks, recreation and open space encompass the next largest percent of area (18 percent). Excluding marsh and water (hereinafter referred to as adjusted land area), parks, recreation and open space is the largest use of land on Kiawah Island, accounting for 43 percent (Figure 6). The Land Use map in Appendix 7.2 demonstrates that open space and recreational uses are located throughout the Island in the form of parks, boat landings, wildlife viewing areas, recreational facilities and golf courses.

Single Family Residential encompass 10 percent of the Town's total incorporated area and 23 percent of the adjusted land area, while vacant residential parcels total 7 percent and 16 percent, respectively. Road right-of-ways consist of 10 percent of the adjusted land area. Multi-family and commercial land uses each consist of 3 percent of the adjusted land area. Single family residential areas are found throughout the Island, while multi-family residential uses are located solely on the western part of the Island.

Commercial land use makes up a very small percent of the land use. Commercial development has occurred (restaurants, a convenience store, small shops, etc.) in proximity to the East and West Beach Resort facilities and at the Main Security Gate. Additionally, there are 5 golf courses (4 public, 1 private) on the island, each with a clubhouse and pro shop. The clubhouses at Turtle Point, Osprey Point, the Ocean Course, and the River Course all have restaurants. In addition, the private Kiawah Island Beach Club located beachfront on the eastern end of the island has dining facilities as well.

### *Section 2.2.1 Beach Uses*

Kiawah's beach is used for a variety of purposes and is a big attraction for residents and visitors to the island. Uses include: swimming, surfing, surf fishing, bird watching, dog walking, bicycling, walking, and running. The western end of the beach near Captain Sam's inlet is a popular spot for viewing dolphins and birds. The eastern end of the beach (east of the Ocean Course Golf Course) is also a popular birding and fishing location.

### *Section 2.2.2 Benefits and Values of the Beach*

The beach is a major attraction for both residents and visitors to the island. It is one of the island's best amenities. Beachwalker County Park was ranked as the 9<sup>th</sup> best beach in the country in 2012 by Dr. Stephen Leatherman (Dr. Beach). The beach has a tremendous economic impact to the Town and serves as a major tourism generator for the local community. The beach draws many of the nearly

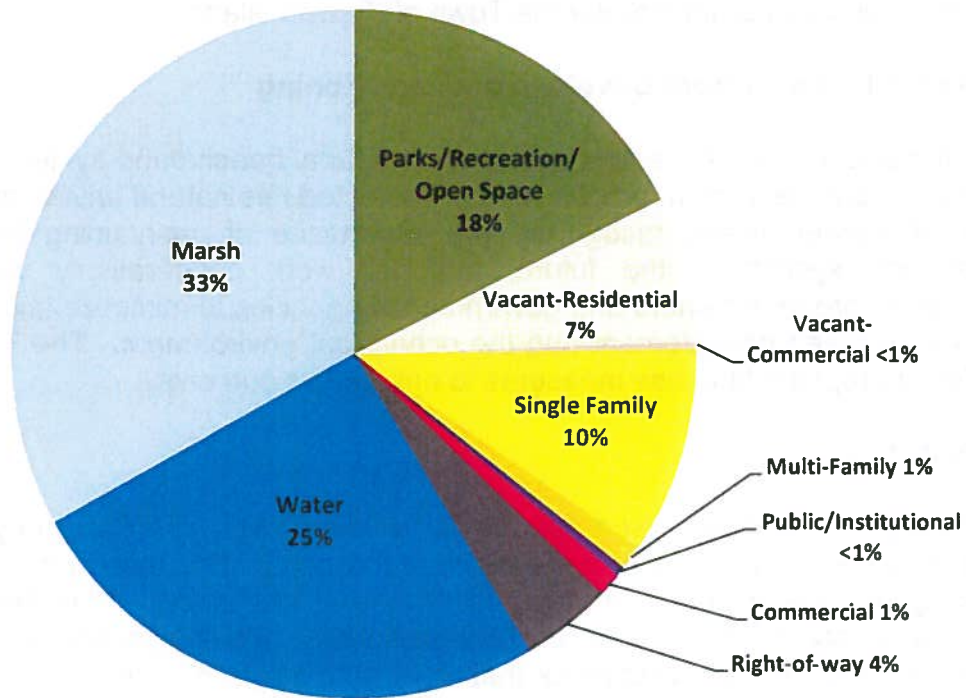


Figure 5. Percentage of Existing Land Use of Total Incorporated Area

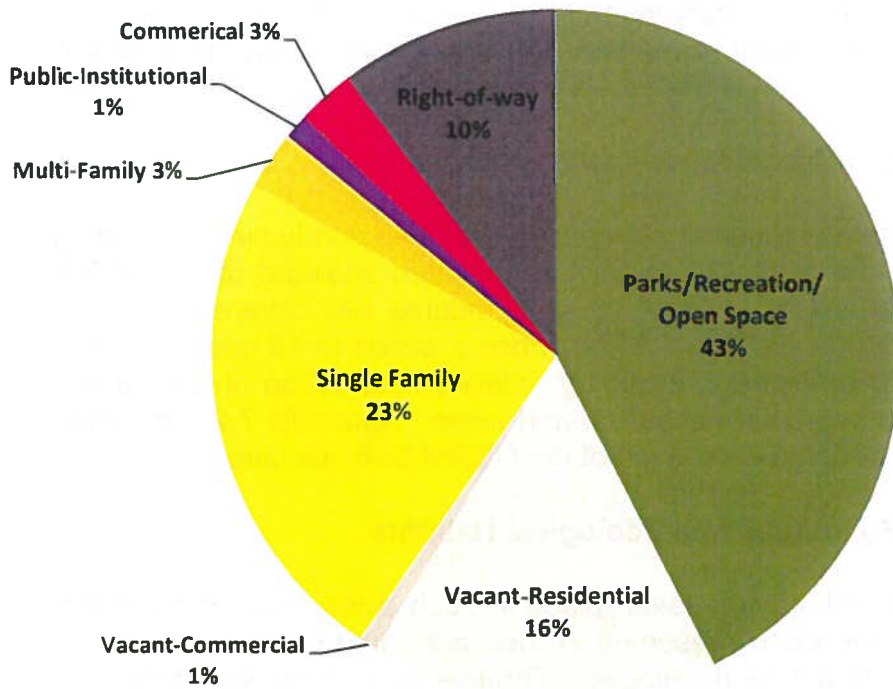


Figure 6. Percentage of Existing Land Use of Total Incorporated Area Excluding Marsh and Water



200,000 visitors per year to the Town, generating \$1.1 million in State Accommodations Tax funding for the Town of Kiawah Island.

### **Section 2.3 Beachfront Developments and Zoning**

One of Kiawah Island's greatest assets is its natural beach/dune system. Prudent planning and development practices have protected this natural environment. The Town of Kiawah Island recognizes the importance of maintaining the natural beach/dune system in the future, and will work cooperatively with island developers, property owners and governmental agencies to minimize and eliminate conflicts between development and the oceanfront environment. The Town shall employ appropriate land use measures to ensure this outcome.

#### The Sanctuary

The Kiawah Island Golf Resort opened its newest facility, The Sanctuary, in 2005 which is a commercial facility adjacent to the beach. The Sanctuary offers 255 deluxe guest rooms, a spa, meeting facilities and fine dining. The Resort plays host to a variety of Fortune 250 companies annually. It also sponsors several high profile golf and tennis tournaments that work to spotlight Kiawah Island and all of Charleston to national and international audiences.

#### Development Agreements

The Town has a Development Agreement with Kiawah Development Partners originally executed in 1994 and subsequently revised in 2005. In addition the Town entered into a Development Agreement with the Kiawah Island Golf Resort in 2010.

#### *Section 2.3.1 Beachfront Structural Inventory*

An inventory of all structures along the beachfront has been conducted. Excluding beach walkovers, there are a total of 4 structures located seaward of the OCRM Setback Line on Kiawah Island. All of these structures are covered decks or ancillary buildings. Appendix Section 7.2.2 provides a series of 16 maps showing the entire Kiawah Island beachfront, including detailed information on structures, beach walkovers, beach vehicular accesses, and more. Appendix 7.2.1 provides details on each of the 4 structures seaward of the OCRM Setback Line.

### **Section 2.4 Natural Resources and Ecological Habitats**

Development on Kiawah Island has taken place in such a way that much of the island's 10,000 acres have been preserved in their natural state. Approximately 3,800 acres have been or will be developed. The island contains significant salt and freshwater wetlands, maritime forest, dune fields, and wide beaches. As such, the island provides habitat for a variety of coastal plant and animal species.

### Section 2.4.1 Threatened and Endangered Species

There are a number of plant and animal species that have been classified by either state or federal agencies as endangered or threatened (“endangered species” include any species which is in danger of extinction throughout all, or a significant portion of its range; “threatened species” include any species which is likely to become endangered within the foreseeable future). Other species have been identified as being of special concern by the South Carolina Department of Natural Resources (SCDNR) because of restricted or declining populations, and threats to habitat and food sources. The species listed in Table 2 are classified as either endangered, threatened or of special concern, and are found along the beachfront of South Carolina.

**Table 2.** Endangered, Threatened and Protected Species Regularly Found Along the Shoreline of Kiawah Island, South Carolina.

Species	Latin Name	Federal Status*	State Status*	Habitat
Loggerhead Sea Turtle	<i>Caretta caretta</i>	T	T	Beach
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E	-	Beach
Island Glass Lizard	<i>Ophisaurus compressus</i>	-	SC	Dunes
Brown Pelican	<i>Pelecanus occidentalis</i>	-	SC	Beach
Wilson’s Plover	<i>Charadrius wilsonia</i>	-	T	Beach, dunes
Piping Plover	<i>Charadrius melodus</i>	T	T	Beach, dunes
Red Knot	<i>Calidris canutus</i>	C	-	Beach
Least Tern	<i>Sternula antillarum</i>	-	T	Beach
Seabeach Amaranth	<i>Amaranthus pumilus</i>	T	T	Dunes
Sweetgrass	<i>Muhlenbergia filipes</i>	-	SC	Dunes
Beach Morning Glory	<i>Ipomoea pes-caprae</i>	-	SC	Dunes

\* E = endangered, T = threatened, SC = species concern, C = candidate for listing

The leatherback sea turtle is the only federally “endangered” species that occurs along the beaches of Kiawah Island (discussed in section 2.4.2), however, there are three federally “threatened” species: loggerhead sea turtle (discussed in section 2.4.2), piping plover, and seabeach amaranth. Additionally, the Wilson’s plover and least tern are listed as state “threatened”, and the island glass lizard, brown pelican, sweetgrass, and beach morning glory are of “special concern”. The red knot is a candidate for federal listing. Efforts will be made to monitor the presence and abundance of these species along the beach.

#### Piping Plover

Piping plovers are typically found along South Carolina beaches from August through April where they utilize beaches and intertidal sandflats for feeding and roosting. On Kiawah Island, piping plovers are most common on the extreme western and eastern ends of the beach, however during fall and spring migration piping plovers can be found anywhere along the front beach. This is especially true in March during the peak of spring migration when it is possible to have 50

birds scattered along the front beach. The wintering population tends to be restricted to the ends of the beach.

The USFWS designated critical habitat areas for wintering piping plovers along the Atlantic coast in 2001 (Figure 5). Both the western and eastern ends of Kiawah Island were identified in this report as offering suitable habitat for these birds. During 2005, the Town of Kiawah Island designated two areas as piping plover critical habitat. The Town-designated areas (Figure 6-7) include the locations where piping plovers are known to occur and are located within USFWS-designated critical habitat areas. Under Town Ordinance 2006-9, Section 16-604, dogs are not allowed off lead in this area and vehicular traffic is restricted to emergency vehicles only.

As a result of the East End Beach Renourishment Project in 2006, the USFWS mandated that the Town of Kiawah Island conduct piping plover surveys within the project area for 6 years post-project. In addition to the required surveys, the Town began surveying for piping plovers on the west end and the front beach in 2007. Survey data for the west and east end areas can be found in Tables 3-4. As mandated by USFWS, the piping plover surveys followed the schedule below:

1. Fall migration period (August 1 – October 31) – surveys conducted twice every 10 days with one survey occurring within 2 hours of low tide and one survey occurring within 2 hours of high tide.
2. Winter period (November 1 – February 28) – surveys conducted twice per month with one survey occurring within 2 hours of low tide and one survey occurring within 2 hours of high tide.
3. Spring migration period (March 1 – April 30) – survey conducted twice every 10 days with one survey occurring within 2 hours of low tide and one survey occurring within 2 hours of high tide.

**Table 3.** Piping Plover surveys on the east end of Kiawah Island from 2006-2012.

Season	Mean number birds per survey							All years
	2006	2007	2008	2009	2010	2011	2012	
Spring	12.6	8.6	11.6	3.8	3.3	1.2	1.5	5.5
Fall	13.5	6.9	11.2	10.6	7.4	4.6	DNS	7.5
Winter	23.2	14.7	7.4	4.3	2.5	2.5	DNS	9.0

DNS = Did not survey

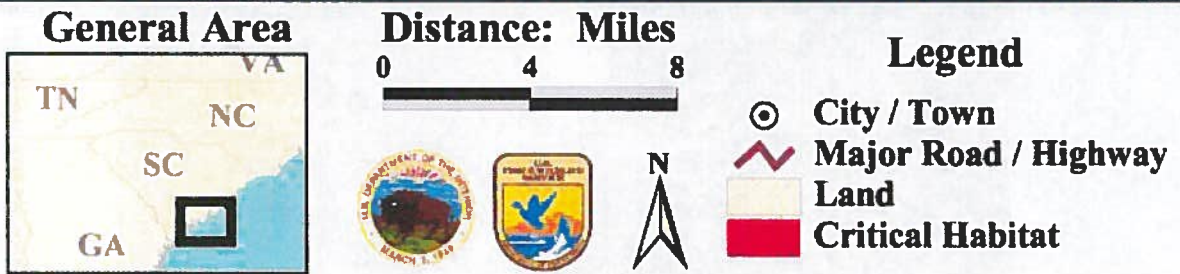
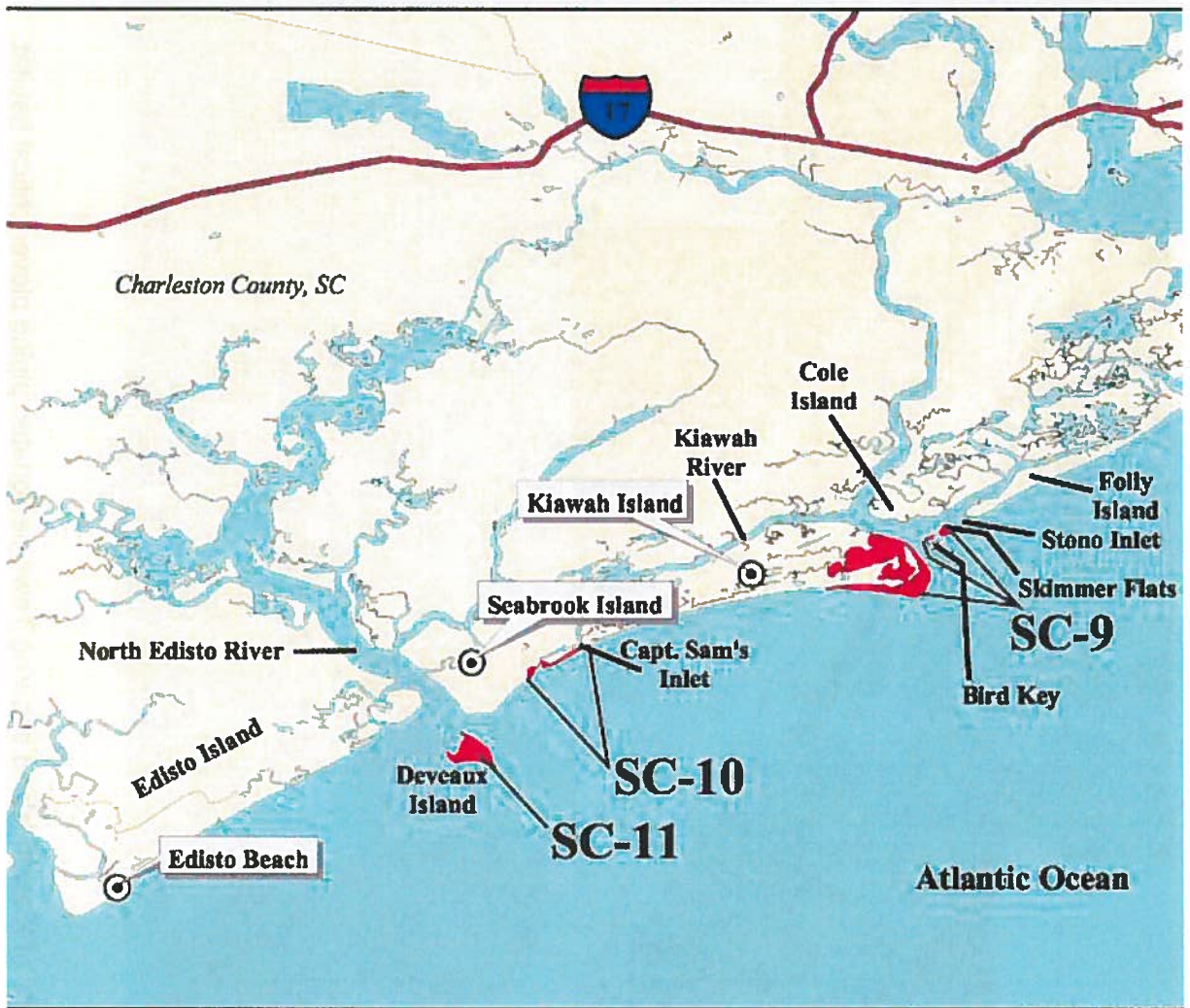


Figure 7. Map showing the general location of Piping Plover Critical Habitat near Kiawah Island, South Carolina.



Figure 8. Map of the western end of Kiawah Island showing Town-designated piping plover critical habitat.



Figure 9. Map of the eastern end of Kiawah Island showing Town-designated piping plover critical habitat.

**Table 4.** Piping Plover surveys on the west end of Kiawah Island from 2006-2012.

Season	Mean number birds per survey							All years
	2006	2007	2008	2009	2010	2011	2012	
Spring	DNS	INC	7.1	9.6	8.7	9.4	6.5	8.4
Fall	DNS	4.7	5.8	4.3	8.9	7.6	DNS	6.3
Winter	DNS	1.6	3.9	6.3	6.6	5.3	DNS	4.7

DNS = Did not survey, INC = incomplete data, not reported

Since the East End Beach Renourishment Project, wintering piping plovers have decreased dramatically on the east end of the beach from 23.2 birds per survey in 2006 to 2.5 birds per survey in 2011. Alternatively, plover numbers increased moderately during the same period on the west end of the beach from 1.6 to 5.3 birds per survey. The ends of the island are very dynamic because of their close proximity to major river inlets and major changes in elevation can occur in short periods of time which may have affect the plover's preferred food source causing them to shift to the west end of the beach.

#### Seabeach Amaranth

Seabeach amaranth is an annual plant that is typically found on barrier islands. Its primary habitat includes overwashed sand flats at accreting ends of barrier islands and lower foredunes and upper strands of noneroding beaches. While the ends of Kiawah Island appear to be suitable habitat for this species, there are no known plants in existence at the present time. Attempts were made to reintroduce this plant to Kiawah Island in the late 1990s but no evidence of survival of the plants is currently available. Monitoring of the island for the presence of this plant is ongoing and involves personnel from SCDNR and USFWS. In cooperation with these entities, plans could be formulated to monitor and maintain populations of this plant if it is documented.

#### Wilson's Plover

The Wilson's plover is found along the South Carolina coast and nests primarily from April to June along our beaches. Nests are found singly or in very loose colonies often near low-lying vegetation. On Kiawah Island, their nesting is restricted to the ends of the beach. In recent years, an effort has been made to locate nest and monitor their success. Because Wilson's plovers usually nest higher up the beach, they are not as susceptible to being overwashed by high tides and storm surges. Predation and disturbance by dogs and people are a significant threat to their nesting success. Signs are placed around nesting areas at both ends of the beach to restrict people and dogs from entering the area.

### Least Tern

Least terns are frequent visitors to the Kiawah Island coasts during the summer months. It is during this time of year that these birds are initiating nests and raising their young. During the last 6-7 years, least terns have been nesting on the east end of Kiawah Island. In 2010, least terns began nesting on the west end of the island, possibly for the first time since 1979. Unfortunately, most of the nests are overwashed during extreme high tide events. Currently, the only successful nesting occurs on the east end in an area that was created during the 2006 Beach Renourishment Project. The best nesting year was in 2009 when an estimated 78 nests were recorded. Since then, much fewer nests have been reported probably due to the area becoming more vegetated. In addition to becoming overwashed, predation and disturbance by dogs and people are a significant threat to nesting success. Signs are placed around nesting areas at both ends of the beach to restrict people and dogs from entering the area.

### Red Knots

Red knot populations have decreased dramatically across their range and in 2006 they were named as a candidate for Endangered Species Act protection. Red Knots occur on the beaches of Kiawah Island from November through May. During the winter months, Kiawah may have between 200-500 birds but their numbers increase to several thousand in April and May. Red Knots have one of the longest migrations traveling more than 9,300 miles from their wintering grounds in South America to their breeding grounds in the high Arctic and repeat the process in reverse in fall. Kiawah Island is an important staging site for red knots during their spring migration. The birds use Kiawah Island to rest and "fatten-up" for their next leg of their migration. In recent years, the Town of Kiawah Island started a campaign to raise awareness of the importance of protecting red knots through its website ([www.wildlifeatkiawah.com](http://www.wildlifeatkiawah.com)) and public education.

### Leatherback Sea Turtles

Leatherback Sea Turtles are commonly found in the nearshore waters off Kiawah Island, particularly during spring and fall. These very large sea turtles (1,000 pounds or more) typically nest in Florida, the Caribbean, and Central and South America, but do nest in South Carolina in very low numbers. South Carolina has had 20 nests in the last 10 years (2003-2012), two of which were on Kiawah Island. Leatherback nests that occur on Kiawah's beach are marked and monitored by the Kiawah Island Turtle Patrol, following the same general protocol used for loggerheads (see Section 2.4.2).

### Loggerhead Sea Turtles

Loggerhead sea turtles are commonly found in coastal waters near Kiawah Island. These large turtles can weigh up to 350 pounds. Females come ashore, between May-August, to dig nests and lay their eggs. Females typically lay several clutches per season. Kiawah Island has one of the highest densities of nesting loggerheads



in the state of South Carolina, averaging 176 nests per year over the last 10 years. Details on the Kiawah Island Turtle Nesting Program can be found in Section 2.4.2.

### Other Species

There are 4 other state protected species that are listed as “species of special concern”. These include: brown pelicans, sweetgrass, beach morning glory, and the island glass lizard. Populations of each of these species, with the exception of the island glass lizard, are found on Kiawah Island though there is no data available on their abundance.

### *Section 2.4.2 Turtle Nesting*

A program to protect the nests of loggerhead turtles on the beach of Kiawah Island has been in operation since 1973. In the early years, support came from the Kiawah Island Community Association (KICA) and the island developers, but since 1990, the Town of Kiawah Island has provided funding for the program. Beginning in 1998, the turtle program has operated under a permit from the South Carolina Department of Natural Resources under authority granted through Cooperative Agreements with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) under Section 6 of the Endangered Species Act.

The program has four major components: (1) protect the rookery, (2) maintain records of nesting and hatching activity, (3) educate residents and visitors of the island, and (4) conduct cooperative research projects with state and federal agencies. Protection of the rookery requires the monitoring of nest laying as well as nest hatching. During the nesting phase, trained volunteers patrol the length of the beach at daybreak looking for turtle crawls. Nests are located and marked with numbered posts. Nests too far seaward on the beach are relocated landward to prevent future wash-over by spring tides. When nests begin to hatch, approximately 55 to 60 days later, volunteers patrol segments of the beach on foot to inspect each nest for signs of hatchling emergence. Several days after emergence, each nest is excavated to conduct a complete inventory of hatching success.

Historic records show that the Kiawah beach is an important site for loggerhead turtle nesting, with a density of eighteen to twenty nests per mile. This rate is among the highest in the state for developed areas. Nesting turtles showed some preference for the undeveloped east end of the island before 1990, but that preference has diminished since then. Figure 8 shows the location of turtle nests on the Kiawah beach for the last 2 years (2010-2011). With a few exceptions in recent years, the yearly pattern of nesting activity on Kiawah Island has exhibited a cyclical pattern with a two year repeat: odd numbered years generally have fewer nests than even numbered years. The total number of nests per year between 1992-2011 can be found in Figure 9. There does not seem to be a significant long-term trend in nesting activity on Kiawah Island. However, more extensive data



Figure 10. Location of loggerhead turtle nests during 2010 -2011 on Kiawah Island, South Carolina.

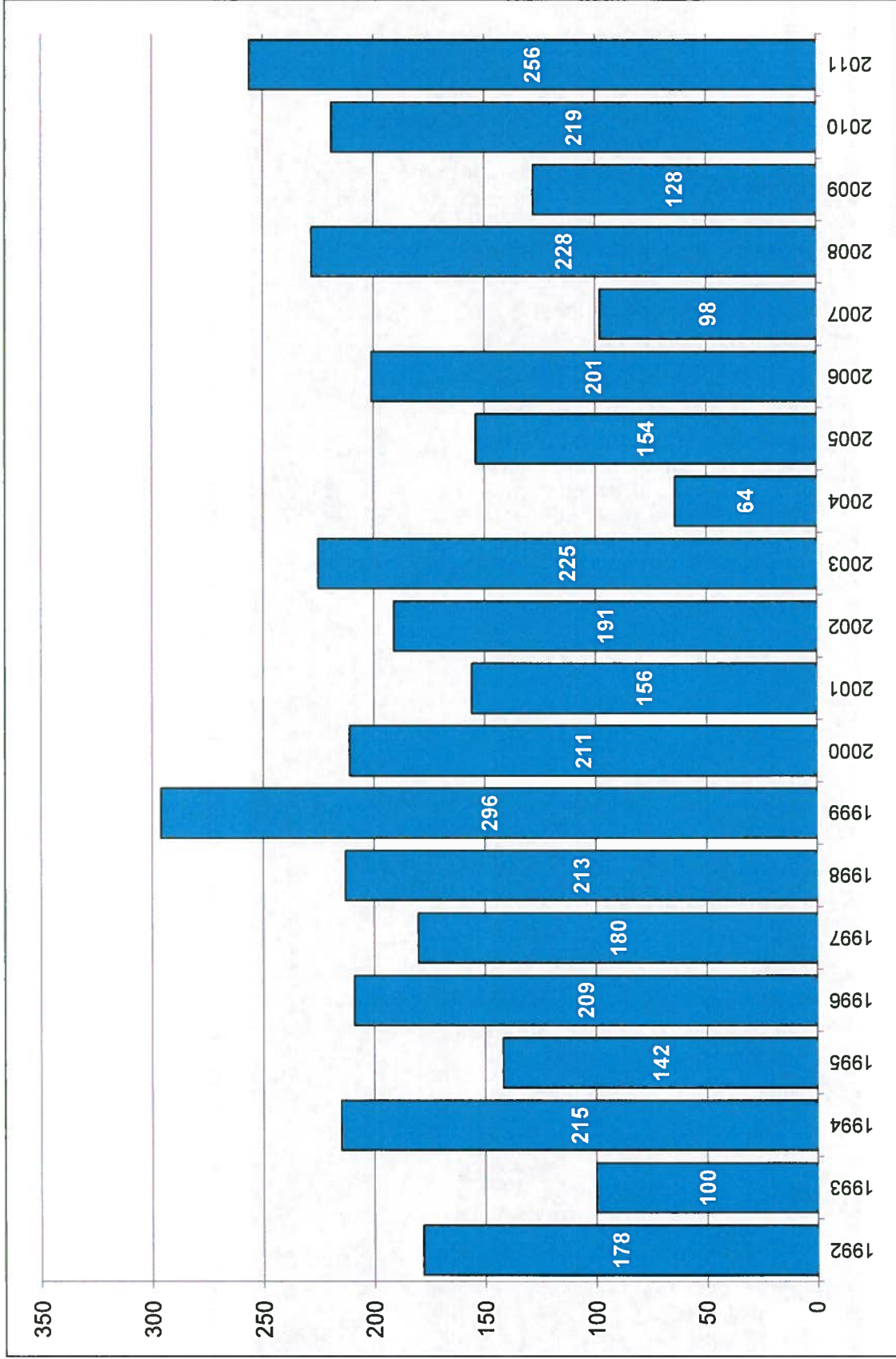


Figure 11. Annual numbers of loggerhead turtle nests between 1992-2011 on Kiawah Island, South Carolina.

from SCDNR, based on aerial surveys, show that there has been a substantial decline in the number of Loggerhead Turtle nests statewide since the 1980's.

## **Section 2.5 Existing Public Access and Map**

There are 165 pedestrian access points to the Kiawah Island beachfront. A breakdown of these accesses by ownership type is below. Maps of all of these accesses can be found in Appendix 7.2.2.

- 123 of these accesses are privately owned by Kiawah Island homeowners.
- 27 are owned by the Kiawah Island Community Association
- 4 are owned by the Kiawah Island Golf Resort
- 2 are owned by The Beach Club (private entity)
- 7 are owned by Regimes
- 1 is public

The only full and complete public access, as defined by OCRM, is Beachwalker County Park. It has 180 parking spaces and is classified as a Regional Public Access Park. By definition this park provides full and complete access to 1 mile of beach to the east and 1 mile of beach to the west of this location. A table and additional details can be found in Appendix 7.3.

In 2011, Kiawah Island Town Council passed a Beach Walkover Ordinance which requires boardwalks to terminate seaward of the primary dune. The enforcement of this ordinance will require many boardwalks to be lengthened in order to be compliant. A copy of this ordinance can be found in Appendix Section 7.5.

## **SECTION 3**

### **BEACHFRONT DRAINAGE PLAN**

#### **Section 3.1 Drainage Plan Details**

The Town shall encourage all property owners and developers to use those guidelines and best management practices outlined in the Stormwater Management and Sediment Control Handbook for Land Disturbance Activities.

Controlling stormwater and other discharges along the beachfront areas of Kiawah Island is a priority of the Town. Direct discharge to the beach leads to erosion of dune and beach areas and can also affect water quality and clarity.

Since the mid-1980's, the South Carolina Department of Health and Environmental Control has been actively monitoring beach water quality at five (5) sites along the Kiawah Island beach. Tests are conducted to determine the levels of Enterococcus bacteria at each site twice per month. Results from Kiawah Island have shown consistently low bacteria levels and there has never been a beach closure due to elevated bacterial levels.

The Town of Kiawah Island adopts, as part of this plan, a policy to prohibit any outfalls or other means of direct discharge to the beach. Currently, there are no outfalls or direct discharges to the beach. Prudent development practices along the shoreline have controlled beachfront construction and instituted sound stormwater management practices. Lot coverage by impermeable surfaces has been restricted and alteration of natural areas has been minimized. Landscaping, construction of grassed swales, construction of retention/detention areas and similar means of controlling runoff have been incorporated into the overall development scheme on Kiawah Island.

In the event that erosion of dune areas takes place and the potential for direct discharge of stormwater, pool overflow or golf course runoff to the beach increases, the Town shall require developers and property owners to redirect any potential discharges away from the beach. The Town shall work in conjunction with all affected groups to restore and maintain natural dune areas along the shoreline as a means of reducing or eliminating the potential for direct discharge to the beach. However, property owners should not rely only on the Town's dune program to control discharge.

Another priority of the Town is maintaining native vegetation in dune areas. Irrigation and runoff from upland development and golf courses to dune areas shall be controlled so that non-native vegetation does not displace native grasses and ground covers.

## SECTION 4

### BEACH MANAGEMENT AND AUTHORITIES

A number of agencies have responsibility and authority relating to beachfront management on Kiawah Island. Details are provided in this section, including

#### Section 4.1 State Authorities

##### 4.1.1 Overview of State Policies (*Beachfront Management Act*)

OCRM is responsible for the management of the state's beaches and coastal areas. In 1988, the State Beachfront Management Act was adopted by the General Assembly. This Act increased the state's authority to manage the coastal zone and beaches.

The Act included several key legislative findings, including (summarized):

- the importance of the beach and dune system in protecting life and property from storms, providing significant economic revenue through tourism, providing habitat for important plants and animals, and providing a healthy environment for recreation and improved quality of life of all citizens;
- unwise development has been sited too close to and has jeopardized the stability of the beach/dune system;
- the use of armoring in the form of hard erosion control devices such as seawalls, bulkheads, and rip-rap to protect erosion-threatened structures has not proven effective, have given a false sense of security, and in many instances, have increased the vulnerability of beachfront property to damage from wind and waves while contributing to the deterioration and loss of the dry sand beach;
- inlet and harbor management practices, including the construction of jetties which have not been designed to accommodate the longshore transport of sand, may deprive downdrift beach/dune systems of their natural sand supply;
- it is in the state's best interest to protect and promote increased public access to beaches for visitors and South Carolina residents alike.
- a coordinated state policy for post-storm management of the beach and dunes did not exist and that a comprehensive beach management plan was needed to prevent unwise development and minimize adverse impacts.

The Beachfront Management Act then established eight state policies to guide the management of ocean beaches:

1. Protect, preserve, restore, and enhance the beach/dune system;
2. Create a comprehensive, long-range beach management plan and require local beach management plans for the protection, preservation, restoration,

and enhancement of the beach/dune system, each promoting wise use of the state's beachfront to include a gradual retreat from the system over a forty-year period;

3. Severely restrict the use of hard erosion control devices and encourage the replacement of hard erosion control devices with soft technologies which will provide for the protection of the shoreline without long-term adverse effects;
4. Encourage the use of erosion-inhibiting techniques which do not adversely impact the long-term well-being of the beach/dune system;
5. Promote carefully planned nourishment as a means of beach preservation and restoration where economically feasible;
6. Preserve existing public access and promote the enhancement of public access for all citizens including the handicapped and encourage the purchase of lands adjacent to the Atlantic Ocean to enhance public access;
7. Involve local governments in long-range comprehensive planning and management of the beach/dune system in which they have a vested interest; and
8. Establish procedures and guidelines for the emergency management of the beach/dune system following a significant storm event.

DHEC-OCRM is responsible for implementing these policies through a comprehensive management program that includes research and policy development, state and local planning, regulation and enforcement, restoration, and extension and education activities.

#### *4.1.2 Beachfront Setback Area*

§ 48-39-280 of the Beachfront Management Act, as amended, requires DHEC-OCRM to establish and periodically review (once every eight to ten years) the position of the two lines of beachfront jurisdiction, the baseline and the setback line, as well as the average annual erosion rate for all oceanfront land that is developed or potentially could be developed. The purpose of these jurisdictional lines is to implement § 48-39-280(A) of the statute, which reads as follows:

*"A forty-year policy of retreat from the shoreline is established. The department must implement this policy and must utilize the best available scientific and historical data in the implementation. The department must establish a baseline which parallels the shoreline for each standard erosion zone and each inlet erosion zone."*

The baseline is the more seaward line of jurisdiction and is typically located at the crest of the primary sand dune. The setback line is the landward line of jurisdiction and is established landward of the baseline at a distance equal to 40 times the average annual erosion rate, as calculated from the best historical and scientific data, or at a minimum distance of 20 feet landward of the baseline for stable or accretional beaches.

To establish the baseline position, the shoreline must first be classified as an inlet zone or a standard zone. Areas that are close to inlets and have non-parallel offshore bathymetric contours and non-parallel historical shoreline positions are classified as inlet zones, while all other areas are classified as standard zones. Inlet zones are further classified as stabilized if jetties, groins, or seawalls are present, or as unstabilized. In unstabilized inlet zones, the baseline is located at the most landward shoreline position at any time during the past 40 years, unless the best available data indicates the shoreline is unlikely to return to its former position. No other data such as historical inlet migration, inlet stability, channel and ebb delta changes, sediment bypassing or sediment budgets indicated other data should be considered for Kiawah Island. This baseline position was established by reviewing historical aerial photographs and selecting the most landward shoreline position.

In stabilized inlet zones and standard zones, the baseline is located at the crest of the primary oceanfront sand dune using beach survey data or dune field topographic data such as LiDAR (Light Detection and Ranging). If the shoreline is armored with a seawall or bulkhead and no sand dune exists, then a theoretical dune crest position is calculated from beach survey data.

#### Setback Area Regulations (summary)

- No new construction, with the exception of wooden walkways not more than six feet wide, wooden decks no larger than 144 square feet, public fishing piers, golf courses, normal landscaping, pools that were located landward of existing functioning erosion control structures, groins, or structures permitted by an OCRM special permit. An OCRM permit is required for all of the above actions except the construction of wooden walkways.
- Owners may replace habitable structures within the setback area that have been destroyed beyond repair by natural causes after notifying OCRM. The new structure must not exceed the original square footage and can be no further seaward than the original structure.
- No new erosion control devices are allowed in the setback area except to protect a public highway that existed prior to the enactment of the Beachfront Management Act.
- No new pools are allowed in the setback area, unless they are located as landward as possible of an existing, functional erosion control device. Pools that existed prior to 1988 may be repaired or replaced if destroyed beyond repair. The owner must certify that the new pool is located as landward as practical, is no larger than the original pool, and is constructed in such a manner that it cannot act as an erosion control device.

Maps of the baseline and setback lines for Kiawah Island can be found in Appendix 7.2.2.



## Section 4.2 Local Government and Authorities

The Town of Kiawah Island, South Carolina, was incorporated by the State of South Carolina on September 13, 1988. The Town of Kiawah Island operates as a Mayor-Council form of government, i.e., strong mayor. The Town Council is composed of a Mayor and four Council Members. Terms for Mayor and Council Members are two years. The current term (2010-2012) is the twelfth full administration. The at-large elections are non-partisan. Currently, there are over 1,600 voters on the rolls. These elected officials are volunteers who receive no compensation or salary.

The Mayor and four Council Members comprise the legislative branch of the Town. It is their duty to set overall policy in matters concerning the operation of the Town's affairs. The Mayor is further charged with the administrative functions of Town management. He is responsible for coordinating and carrying out the policies established by the Town Council and for seeing that the duties of all Town employees are performed efficiently and effectively. The Town Administrator provides support and advice to the Mayor on these matters. Since incorporation, the Town has grown from 1 full-time employee to 10 full-time employees.

The Town of Kiawah Island is unique among other South Carolina municipalities. Its uniqueness stems from the fact that a private, non-profit organization, the Kiawah Island Community Association (KICA), provides many services that are typically performed by governments. Examples include road and drainage maintenance, public safety, and recreation. The Town, however, does provide services to its citizens including, but not limited to:

- Public Safety: Island-wide law enforcement through a contract with Charleston County Sheriff's office and code enforcement;
- Street and Drainage Maintenance: Beachwalker Drive, Kiawah Island Parkway from the roundabout at Betsy Kerrison Parkway to the front gate;
- Solid Waste Disposal: garbage, recycling, yard debris, brown trash and household hazardous waste collection and disposal for all residential property, excepting villas;
- Planning and Zoning Administration: through an agreement with Charleston County Planning;
- Criminal Court Administration: as part of the unified judicial system in South Carolina, it hears and determines offenses of a criminal nature which may be subject to a fine not exceeding \$500 or imprisonment not exceeding 30 days as well as cases arising under the ordinances of the municipality;
- Beach Maintenance and Safety: Beach patrol, solid waste collection and beach condition monitoring;

- Communications: Town website and monthly newsletter (*Town Notes*);
- Wildlife: Monitors, manages, and researches the Island's native wildlife species and habitats while educating the general Island public in these areas.

#### 4.2.1 *Municipality's Comprehensive Plan*

The Comprehensive Plan seeks to accomplish the Town's Vision by articulating goals to guide future Town Council actions regarding the pattern and intensity of land use, the provision of public facilities and services, economic development, housing availability, and natural and cultural resources. The Plan also sets forth specific criteria that will guide future Town Council actions to accomplish the Plan's goals, thereby realizing its Vision. That Vision and the guiding basis for the Plan is that "Kiawah Island is a residential community with a Resort surrounded by a unique a beautiful setting.

The Town's Vision Statement was originally developed as part of the Town's 1994 Comprehensive Plan. Research conducted to update that Plan in 2005 supported the Vision statement and concluded that it should be continued. The Planning Commission completed a 2010 review with input from the public and support and guidance from the professional staff of the Town of Kiawah Island and the Charleston County Planning Department. Accordingly, the Comprehensive Plan seeks to accomplish the Town's Vision by articulating goals to guide future Town Council actions regarding the pattern and intensity of land use, the provision of public facilities and services, economic development, housing availability, and natural and cultural resources.

The Town's pre-eminent goal is to protect and preserve the residential character of the community while maintaining the benefits inherent in the resort component. As a result, the Plan encourages high quality development of residences and resort, commercial and recreational facilities in an environmentally compatible setting. Low density development that is designed in harmony with nature is consistent with this Vision while tall, massive buildings are inconsistent because they dominate the landscape rather than blending-in and meshing with it. Large homes, hotels, and other large buildings should be located on large parcels or lots and should be set back from property lines to reduce their visual impact from streets, the beach, other open spaces, and neighboring lots. Careful citing and attention to design will serve to achieve this goal and to retain the natural character of Kiawah Island.

#### 4.2.2 *Municipality's Hazard Mitigation Plan*

The Town of Kiawah Island is a participating member of the Charleston Regional Hazard Mitigation Project Committee which is recognized as a continuing entity charged with reviewing, maintaining in accordance with Community Rating System, Flood Mitigation Assistance, and Disaster Mitigation Act requirements,

and periodically reporting on the progress towards and revisions to the plan to the Charleston County Council.

The Charleston Regional Hazard Mitigation Project Committee prepared the *Charleston Regional Hazard Mitigation Plan*, which was originally adopted by the Town of Kiawah Island on June 22, 1999 and is subsequently readopted annually. Also the Town of Kiawah prepares an annual action plan that delineates the various activities that it will complete to ensure compliance with the Hazard Mitigation Plan. A summary of these actions is listed in the Town's Action Plan in *Figure 1*.

#### *4.2.3 Municipality's Disaster Preparedness and Evacuation Plan*

The Town of Kiawah has an Emergency Committee that consists of key entities on and off the Island. The committee has representation from the Town of Kiawah Island, Kiawah Island Community Association, the Kiawah Island Golf Resort, Kiawah Island Utility, and Kiawah Development Partners, Berkeley Electric Cooperative, Kiawah Island Utility and Phillips & Jordan Disaster Recovery Specialists. Each entity has developed individual plans to address the preservation of life and property within their individual scopes of authority and responsibility. During hurricane season, the Town is in regular contact with these entities as well as with representatives of St. Johns Fire District, and Charleston County Sheriff's Office.

The Town's plan includes working in cooperation with all appropriate local entities, such as those listed above, as well as with Charleston County, State and Federal agencies, to effectively prepare and recover from severe storm or natural disaster damage. Preparedness goals include minimizing potential injury and damage and expediting recovery and redevelopment. Readiness and coordination activities include:

1. Meeting annually with representatives from local entities, such as those listed above, to review the status of preparations for evacuation, re-entry, response and recovery. Town will also meet as needed to discuss specific events that may affect the area.
2. Participating in Charleston County Emergency Operations Center and or Web Emergency Operations Center.
3. Updating communications, such as telephone and cell numbers, email addresses, and contact names.
4. Keeping residents informed of important evacuation or disaster-related procedures that should be followed. The Town holds an annual Disaster Awareness Day seminars; includes emergency preparation tips in its monthly newsletter and on its website ([www.kiawahisland.org](http://www.kiawahisland.org)) and prepares and distributes the Emergency Preparedness Plan (for property

owners); and continuously updates property owner phone numbers for the emergency telephone communication network (Code Red).

5. In the event of a disaster, coordinating actions, and those of residents and property owners, with all appropriate agencies involved in response and recovery actions.

Refer to the Town of Kiawah Island Emergency Preparedness Plan for more information about preparedness activities. The Town's plan is available on the website at [www.kiawahisland.org](http://www.kiawahisland.org). A copy can be found in Appendix 7.5.

### Damage Assessments

Following a severe storm, one of the first priorities of the Town shall be to assess damage to the beaches, dunes and upland development, and to institute emergency protective measures to prevent further damage. Town representatives shall work closely with representatives of OCRM, FEMA and the Corps of Engineers to complete damage assessments quickly.

OCRM, as part of its Disaster Management Plan, will dispatch a damage assessment team to conduct the initial damage assessments of all erosion control structures, buildings and pools located seaward of the setback area. The first stage of the assessment will involve deciding which structures are undamaged or well under the percentages required to qualify as destroyed beyond repair (DBR). Inasmuch as few structures (and only one habitable structure) encroach into the current 40-year setback zone, it is quite likely the Town will be called upon to aid OCRM in its damage assessment endeavors.

### Recovery and Redevelopment

All recovery and redevelopment shall be consistent with the Town's Land Use Planning/Zoning Ordinance, the Development Agreements with the Developer and Resort, the Comprehensive Plan, this Local Comprehensive Beach Management Plan, the requirements of the Beachfront Management Act, and other Town regulations and ordinances.

#### *4.2.4 Beachfront Development Regulations*

Recognizing that the State of South Carolina has provided authority to coastal municipalities to enact beach regulations, the Town of Kiawah has adopted a variety of ordinances that pertain to the protection of the beach, dune system and the wildlife found on the beach. Article 16 of the Town Code of Ordinances addresses a variety of matters pertaining to the beach including: beach lighting, beach traffic, control of pets, critical habitat areas, beach and dune protection, threatened and endangered species and beach and recreation area regulations. Most recently the Town amended Chapter 4: Beach and Dune protection to ensure that property owners along the beach adhered to the requirements to construct and maintain dune walkovers compliant with State and Town law and to allow adequate

time to resolve any deficiency that may exist. A complete listing of beach related ordinances is incorporated in Appendix 7.5.

#### *4.2.5 Regulations on Beach and Shoreline Protection*

Through its zoning regulations as cited in Article 12, the Town has limited development in waterfront areas. The Conservation District was created specifically to protect and preserve areas which are outside the OCRM critical line or define other sensitive areas which are unsafe or unsuitable for permanent structures or development. For example, in this district only beach access, unpaved parking or uninhabitable structures are allowed.

#### Protection and Restoration of Sand Dunes

The Town of Kiawah Island recognizes the important protective and ecological functions that a healthy dune system provides. The Town also recognizes that a healthy dune system along the oceanfront must be carefully managed to insure that these important functions are not lost. Hence, the Town adopts the following policies regarding dune protection and restoration.

- Work with property owners and island entities to protect, enhance, and restore the dune system along Kiawah Island.
- Any activity, construction, or alteration of sand dunes seaward of the OCRM setback line must be approved in advance by the Town and OCRM.
- Sand dunes seaward of the setback line must not be altered unless there is no feasible alternative. Permanent alterations should be conducted in such a way as to minimize disturbance to the dune system. In the case of temporary alterations, the dune system must be restored to its pre-existing condition.
- The Town may, at its discretion, require mitigation for the permanent alteration or destruction of dune areas seaward of the setback line. Such mitigation may include: creation of new dune habitat, enhancement of existing dune habitat, installation of protective fencing or walkover structures, dedication of land or easements for access to the beach, or contribution to the Town of Kiawah Island.
- All approved permanent structures constructed seaward of the setback line must be elevated at least two feet above grade, where possible. This provision applies to decks, walkways, and other similar structures.
- Sand dunes designated as critical habitat should not be altered, except when all other options have been exhausted.
- Dune construction, restoration, revegetation, and fencing must be carried out in accordance with Town-approved procedures.
- All activities should be confined to the winter/spring season (November 1 – May 14) when possible to avoid conflicts with nesting loggerhead sea turtles.

#### 4.2.6 *Other Regulations on Beach Management*

The Town of Kiawah values the importance of the Beach to the island and has enacted a number of ordinances, projects or initiatives to further its protection. Oceanfront beach and dunes serve several important functions. These include: storm protection for upland areas, habitat for a variety of plant and animal species (such as important daytime resting cover for bobcats and nesting for sea turtles and beachfront birds), and recreation for Town residents, property owners and guests.

##### Critical Habitat Areas

In October 2009, Town Council designated both ends of Kiawah Island's beach as critical habitat. The critical habitat designation prohibits pets from entering these areas at any time. Both areas provide vital habitat for a variety of shorebirds, including: Piping Plovers, Wilson's Plovers, American Oystercatchers, Least Terns, Black Skimmers, and Red Knots. An interactive map of these areas, including all beach pet restrictions, can be found on the following web page: <http://www.wildlifeatkiawah.com/dogleash.html>

## SECTION 5

### EROSION CONTROL MANAGEMENT

#### Section 5.1 Shoreline Change Analysis

The Beachfront Management Act, as amended, requires DHEC-OCRM to establish and periodically review (once every eight to ten years) the position of the two lines of beachfront jurisdiction, the baseline and the setback line, as well as the average annual erosion rate for all oceanfront land that is developed or potentially could be developed.

The Beachfront Management Act defines three types of shoreline zones.

- Standard Erosion Zone – a segment of shoreline which is not directly influenced by an inlet or associated shoals
- Unstabilized Inlet Erosion Zone – a segment of shoreline along or adjacent to tidal inlet which is directly influenced by an inlet or its associated shoals which is not stabilized by jetties, terminal groins, or other structures.
- Stabilized Inlet Erosion Zone – a segment of shoreline along or adjacent to a tidal inlet which is directly influenced by the inlet and its associated shoals and which is stabilized by jetties, terminal groins, or other structures.

The south-western end of Kiawah Island adjacent to Captain Sam's Inlet (west of OCRM monument 2625) is an Unstabilized Inlet Zone. The northern end of the island adjacent to Stono Inlet (east of OCRM monument 2735) is also an Unstabilized Inlet Zone. The middle part of the island (between OCRM monuments 2625 and 2735) is classified as a Standard Zone.

##### 5.1.1 Beach Profiles

Representative beach profiles measured from fixed starting points provide the best means of quantifying short-term beach changes. These data allow changes in beach width (in feet) and beach volume (expressed in cubic yards per foot of shore length) to be assessed. Twenty-five permanent beach profile monuments have been installed by DHEC-OCRM along the Town of Kiawah Island's beaches. These monuments have been surveyed routinely between 1987 and the present and provide the best basis for monitoring short-term beach changes.

Beach profile figures and tables of sand volume data are presented below:

Town of Kiawah Island Monuments:

Unstabilized Inlet Zone – Captain Sam's Inlet  
2620 and 2625

Standard Zone

2630, 2635, 2640, 2645, 2660, 2665, 2675, 2680, 2685, 2690, 2695, 2700, 2705, 2715, 2720, 2725, and 2730

Unstabilized Inlet Zone- Stono Inlet

2735, 2750, 2760, 2765, 2775, and 2780.

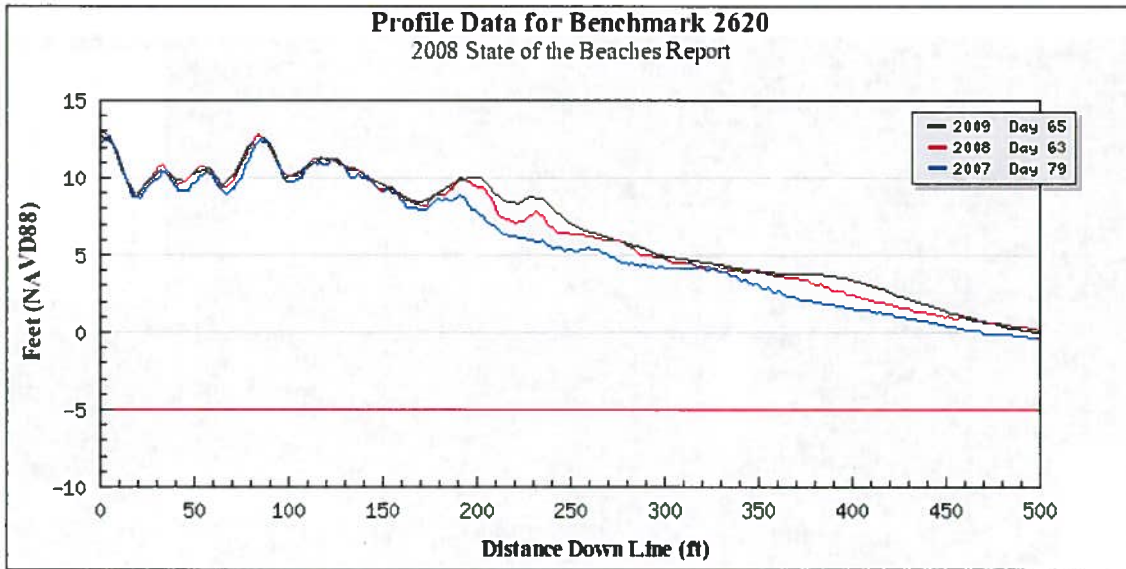
The "0" position on the x-axis of the profile figures marks the location of the beach profile monuments whereas the vertical red line marks the location of the DHEC-OCRM baseline. The figures and tables show the volumes of sand that were measured above the -5 ft contour (NAVD88) and seaward of the DHEC-OCRM baseline for the years 1998, 1999, 2000, 2001, 2004, 2007, 2008 and 2009.

It is important to note that the beach profile volume changes presented in this section are based on data from 1989 to 2009 whereas the shoreline change rates in Section 5.1.2 are based on historical shoreline positions from 1872 to 2006. The beach profiles show recent, annual changes whereas the long-term shoreline change rates show the annual erosion or accretion that has occurred since 1872.





Figure 10. Map of the Captain Sam's Unstabilized Inlet Erosion Zone.



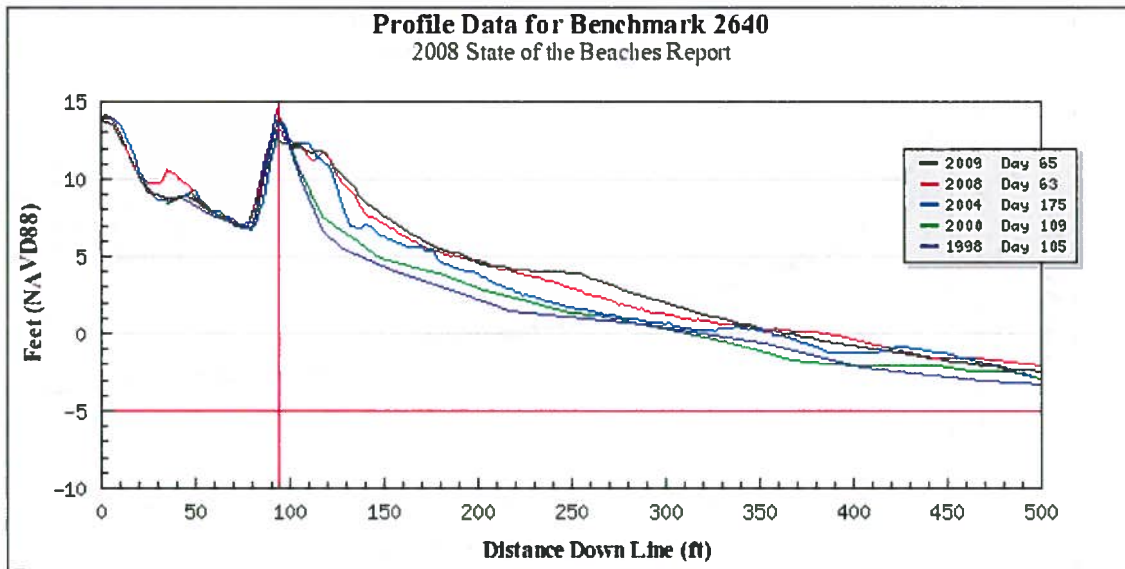
Survey Date	Profile Volume (yd <sup>3</sup> /ft)	Volume Change from Previous Profile (yd <sup>3</sup> /ft)
March 2009	3,421.0	-1,290.2
March 2008	4,711.2	1,550.2
March 2007	3,161.0	3,161.0

### Monument 2620

At Monument 2620, the average beach profile volume is 3,764 yd<sup>3</sup>/ft, but the volume at this station has varied from 3,161 yd<sup>3</sup>/ft to 4,711 yd<sup>3</sup>/ft. From March 2007 to March 2009, this station gained about 260 yd<sup>3</sup>/ft of sand. The most recent measurements, between March 2008 and March 2009, indicate that this profile lost about 1,290 yd<sup>3</sup>/ft of sand during this time.



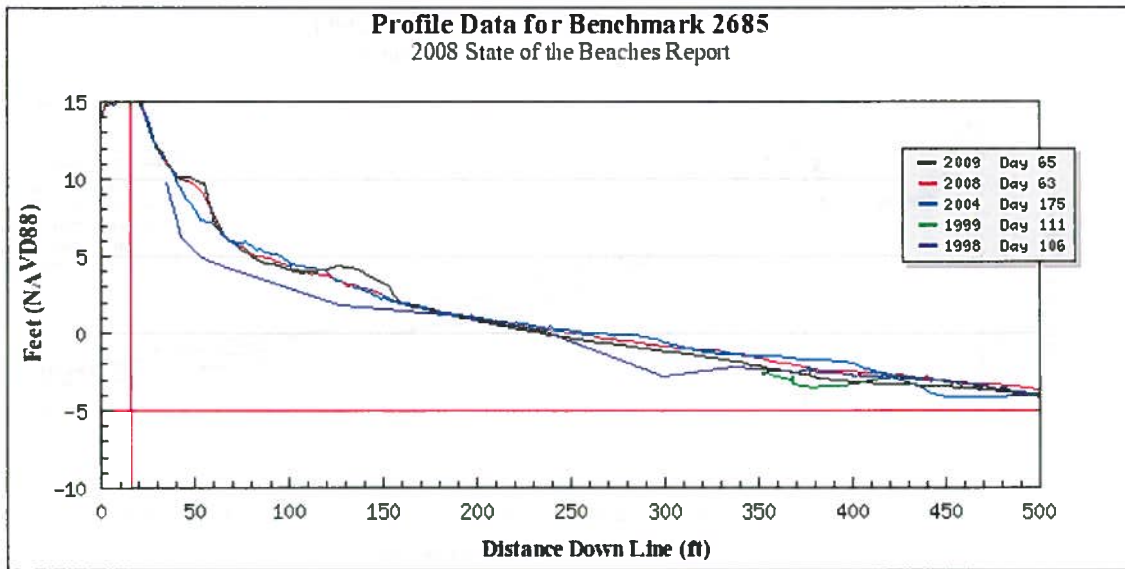
Figure 11. Map of the Kiawah Island Standard Erosion Zone.



Survey Date	Profile Volume (yd <sup>3</sup> /ft)	Volume Change from Previous Profile (yd <sup>3</sup> /ft)
March 2009	3,237.4	-1,249.0
March 2008	4,486.4	424.4
June 2004	4,062.0	50.0
April 2000	4,012.0	-18.0
April 1998	4,030.0	

### Monument 2640

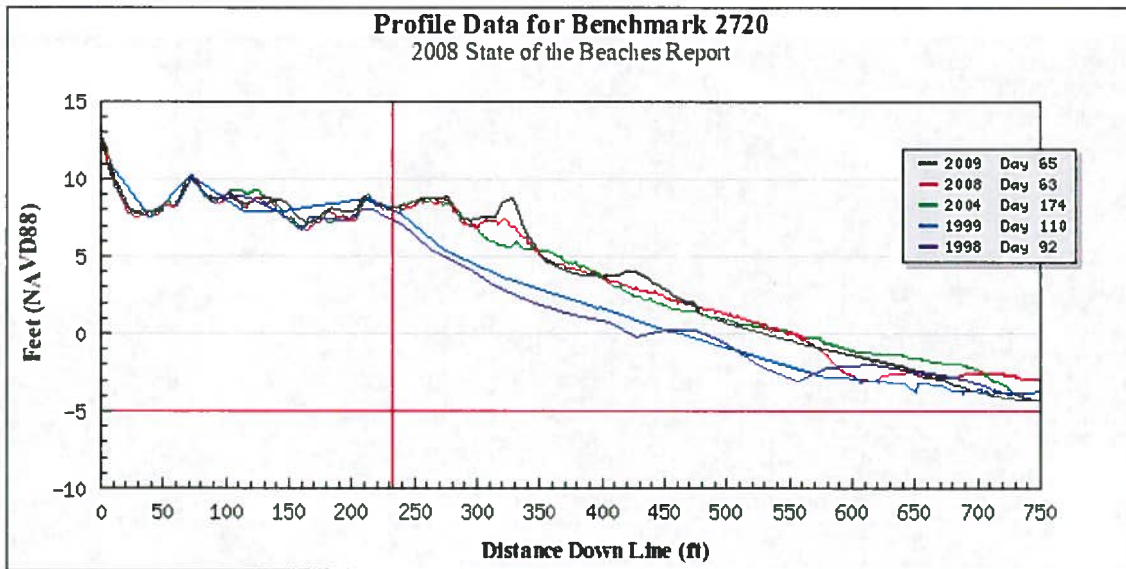
At Monument 2640, the average beach profile volume is 3,965 yd<sup>3</sup>/ft, but the volume at this station has varied from 3,237 yd<sup>3</sup>/ft to 4,486 yd<sup>3</sup>/ft. From April 1998 to March 2009, this station lost about 793 yd<sup>3</sup>/ft of sand. The most recent measurements, between March 2008 and March 2009, indicate that this profile lost about 1,249 yd<sup>3</sup>/ft of sand during this time.



Survey Date	Profile Volume (yd <sup>3</sup> /ft)	Volume Change from Previous Profile (yd <sup>3</sup> /ft)
March 2009	3,207.4	-1,189.5
March 2008	4,396.9	210.9
June 2004	4,186.0	-391.0
August 2001	4,577.0	555.0
April 2000	4,022.0	

### Monument 2685

At Monument 2685, the average beach profile volume is 4,078 yd<sup>3</sup>/ft, but the volume at this station has varied from 3,207 yd<sup>3</sup>/ft to 4,577 yd<sup>3</sup>/ft. From April 2000 to March 2009, this station lost about 815 yd<sup>3</sup>/ft of sand. The most recent measurements, between March 2008 and March 2009, indicate that this profile lost about 1,190 yd<sup>3</sup>/ft of sand during this time.



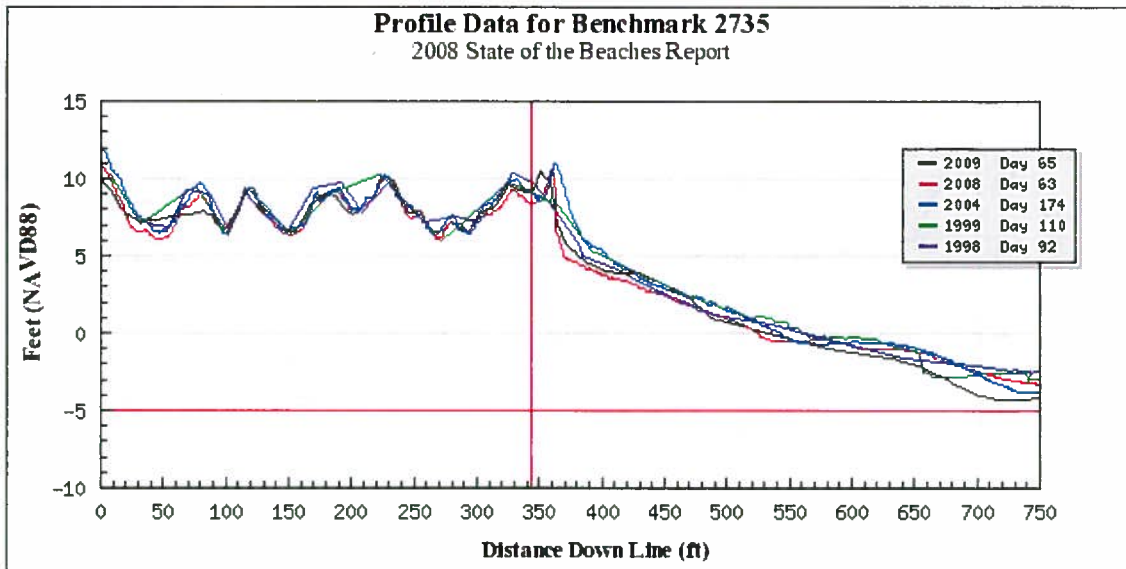
Survey Date	Profile Volume (yd <sup>3</sup> /ft)	Volume Change from Previous Profile (yd <sup>3</sup> /ft)
March 2009	3,290.8	-1058.16
March 2008	4,349.0	340.97
June 2004	4,008.0	-5.00
January 1999	4,013.0	-12.00
April 1998	4,025.0	

### Monument 2720

At Monument 2720, the average beach profile volume is 4,078 yd<sup>3</sup>/ft, but the volume at this station has varied from 3,290 yd<sup>3</sup>/ft to 4,349 yd<sup>3</sup>/ft. From April 1998 to March 2009, this station lost about 735 yd<sup>3</sup>/ft of sand. The most recent measurements, between March 2008 and March 2009, indicate that this profile lost about 1,058 yd<sup>3</sup>/ft of sand during this time.



Figure 12. Map of the Stono Inlet Unstabilized Inlet Erosion Zone.

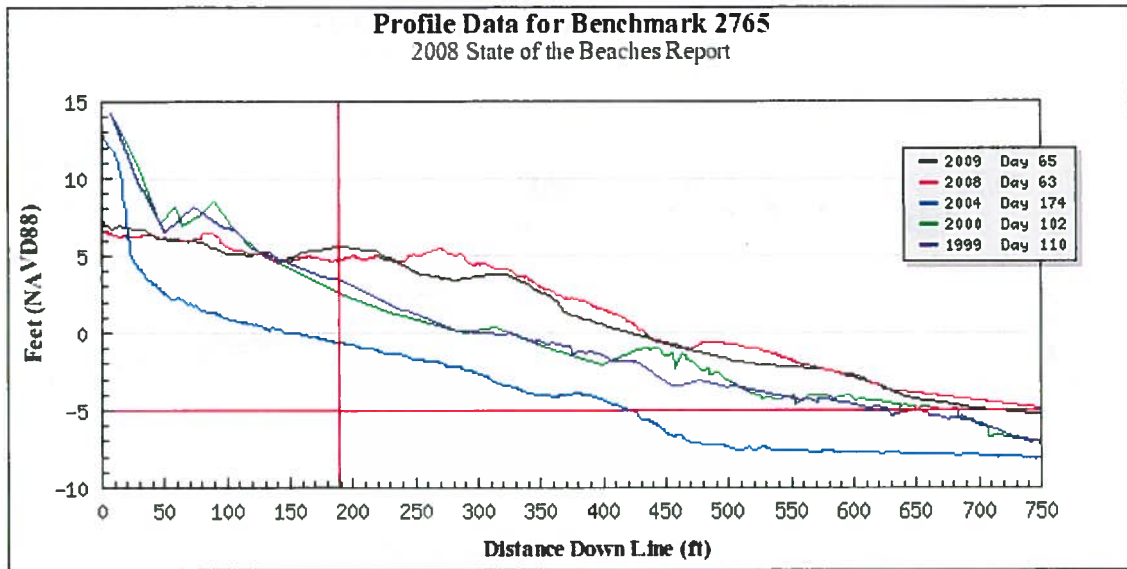


Survey Date	Profile Volume (yd <sup>3</sup> /ft)	Volume Change from Previous Profile (yd <sup>3</sup> /ft)
March 2009	87.4	-4.0
May 2008	91.5	-5.4
June 2004	96.8	-4.1
January 1999	101.0	5.2
April 1998	95.8	

### Monument 2735

At Monument 2735, the average beach profile volume is 93 yd<sup>3</sup>/ft, but the volume at this station has varied from 87.4 yd<sup>3</sup>/ft to 101 yd<sup>3</sup>/ft. From April 1998 to March 2009, this station lost about 8.4 yd<sup>3</sup>/ft of sand. The most recent measurements, between March 2008 and March 2009, indicate that this profile lost about 4.1 yd<sup>3</sup>/ft of sand during this time.





Survey Date	Profile Volume (yd <sup>3</sup> /ft)	Volume Change from Previous Profile (yd <sup>3</sup> /ft)
March 2009	96.3	-9.3
March 2008	105.6	86.7
June 2004	18.9	-38.3
April 2000	57.2	2.4
January 1999	54.9	

### Monument 2765

At Monument 2765, the average beach profile volume is 67 yd<sup>3</sup>/ft, but the volume at this station has varied from 18.9 yd<sup>3</sup>/ft to 105.6 yd<sup>3</sup>/ft. From January 1999 to March 2009, this station gained about 41.4 yd<sup>3</sup>/ft of sand. The most recent measurements, between March 2008 and March 2009, indicate that this profile lost about 9.3 yd<sup>3</sup>/ft of sand during this time.

### 5.1.2 Long-Term Erosion Rates and Shoreline Change

The setback line position depends upon the baseline position and the local long-term annual erosion rate. The erosion rates at all DHEC-OCRM beach monitoring stations statewide have been recalculated using the best available historical shoreline data. In most cases, the best available data included historical shoreline positions from as early as the 1850s. These older shoreline positions have also been used by the federal government to analyze shoreline change, and are considered to be accurate. The long-term erosion or accretion rate at each station was calculated by using a least-squares best fit regression through all data points. The resulting erosion rates are the official long-term rates used by DHEC-OCRM to update the beachfront setback line position. A variety of factors can cause short-term rates of change to be significantly different from the long-term erosion rates, but the setback line is based on a long-term trend. The adopted erosion rate at each station, expressed in feet per year, is then multiplied by 40 to obtain a 40-year setback distance. The setback line is drawn this distance landward of the baseline. For stable or accretional beaches, the setback line is located a minimum of 20 feet landward of the baseline.

All original baselines and setback lines on Kiawah Island became final in 1990. The jurisdictional lines for Kiawah Island were next revised in September of 1999, and most recently in October 2009.

In general, Kiawah is one of the most stable barrier islands in the state, although the eastern and western ends of the island are more dynamic due to their proximity to inlets. The long-term erosion rate at Captain Sam's Inlet shows the shoreline is accreting at 8.5 ft/yr. The erosion rates around the unstabilized erosion zone at Stono Inlet range from 0.92 ft/yr to 19.46 ft/yr. This wide variation is a perfect example of how dynamic these inlets are.

Stations 2615 through 2645 are located at the western end of Kiawah. This is usually one of the most stable sections of Kiawah Island. For all stations here the primary dune was stable and the beach profile seaward of the dune showed either no change or minor accretion. Some of the 2007 profiles document the formation of a small dune twenty ft seaward of the 2005 shoreline and the 2008 data continue to indicate an increase of sand in the shoreface.

The area from station 2660, near the middle of Eugenia Ave., through station 2680, at the eastern end of Windswept Villas, experienced significant erosion in 1995 and 1996, stabilized from 1997 through 1999, became erosional again in 2000 and 2001, and was accretional between 2002 and 2004. Through March 2007 continuing into March 2008 the dune field was stable but the beach seaward of the dune showed minor erosion. Station 2665 showed the development of a more pronounced berm, with minor erosion of the shoreface. Other stations to the northeast, from 2685 on Turtle Beach Lane to 2735 at the Kiawah Beach Club, also showed a stable dune and minor changes seaward of the dune and accretion in the shoreface.

The condition of the beach changes along the Ocean Course golf course, from station 2745 to 2780, which historically has been the most unstable section of Kiawah Island. Station 2750 experienced dune scarping and about 50 ft of erosion seaward of the dune from 2004 through 2007, with accretion in the upper beach and lower beach through March 2008. Station 2755 exhibited a loss of the 2001 dune, with a substantial longer term accretion of the beach and accretion of the berm. Erosion at 2760 near the 18<sup>th</sup> fairway and 2765 near the Clubhouse stabilized in the upper beach, and the lower beach continues to build up significantly between 5 and -5 ft. The erosion at stations 2775 and 2780, where emergency sand scraping was repeatedly performed during the fall of 2005, was alleviated with the large volume of sand on the beach in the 2007 survey.

The official DHEC-OCRM long-term erosion rates for the Town of Kiawah Island are listed below:

Monument	Beach Zone Classification	Long-Term Erosion Rate (ft/yr)
2620	IU	8.5
2625	IU/S	5.2
2630	S	2.49
2635	S	2.17
2640	S	1.9
2645	S	0.98
2660	S	0.69
2665	S	0.52
2675	S	0.85
2680	S	0.62
2685	S	1.28
2690	S	0.13
2695	S	1.02
2700	S	-1.38
2705	S	-0.75
2715	S	-1.28
2720	S	-0.75
2725	S	-0.07
2730	S	0.52
2735	IU/S	0.92
2750	IU	4.46
2760	IU	5.18
2765	IU	6.33
2775	IU	4.2
2780	IU	19.46

## **Section 5.2 Beach Alteration Inventory**

Kiawah Island has a natural beach and has no groins, bulkheads, revetments, or sea walls. Kiawah's beach is one of the few beaches in the state that generally been accreting sand over the last 100 years or more. For this reason, there has been no need to "armor" the beach front. Kiawah's eastern end did experience severe erosion between 2004-2006, leading to the completion of the Town of Kiawah Island's only beach renourishment project. Details on this project can be found below in Section 5.2.1.

### *5.2.1 Beach Renourishment*

The Town and its beach consultant, Coastal Science and Engineering (CSE) applied for a permit to conduct the East End Beach Restoration Project on September 15, 2005. Based on feedback received during several meetings with the U.S. Fish and Wildlife Service (USFWS) during late 2005 and early 2006, the original construction plan was substantially modified and reduced in scale. The predominant concern of the USFWS was that the project might have negative impacts on the state and federally threatened piping plovers that utilize the eastern end of Kiawah Island (the area is designated as Federal Critical Habitat). Piping plovers are small shorebirds that winter and feed on sand and mud flats in this area.

The final project plan (Figure 13) and mitigation package was agreed to in March 2006. The Town reduced the fill volume from 1.2 million cubic yards to 550,000 cubic yards, reduced the constructed dune heights from 7 to 5.5 feet (to promote overwash), eliminated direct impacts to piping plover feeding areas, and agreed to a 6-year piping plover monitoring plan.

On May 4, 2006, the South Carolina Wildlife Federation and the National Audubon Society (petitioners) filed a request for a contested case hearing before the Administrative Law Court in Columbia to effectively stop the Town's beach project. The Town of Kiawah Island, Kiawah Island Golf Resort (KIGR), and the SC Office of Coastal Resource Management (OCRM) were listed as respondents in the lawsuit. The petitioners argued that the Town's project would cause irreparable harm to the piping plover. The Town retained Mr. Ellison Smith, of Smith, Bundy, Bybee, and Barnett, to represent its interests in this matter.

The Town received all necessary state and federal permits to conduct the project on June 6, 2006. Work began on June 8, 2006. In response, the petitioners requested an emergency hearing and an injunction to stop the project. On June 28, 2006 the case was heard before Judge John Geathers in Columbia, SC. After a full day of motions and testimony, Judge Geathers ruled that the petitioners had not proven that there would be "harm" to the piping plover and that the project could continue as planned.

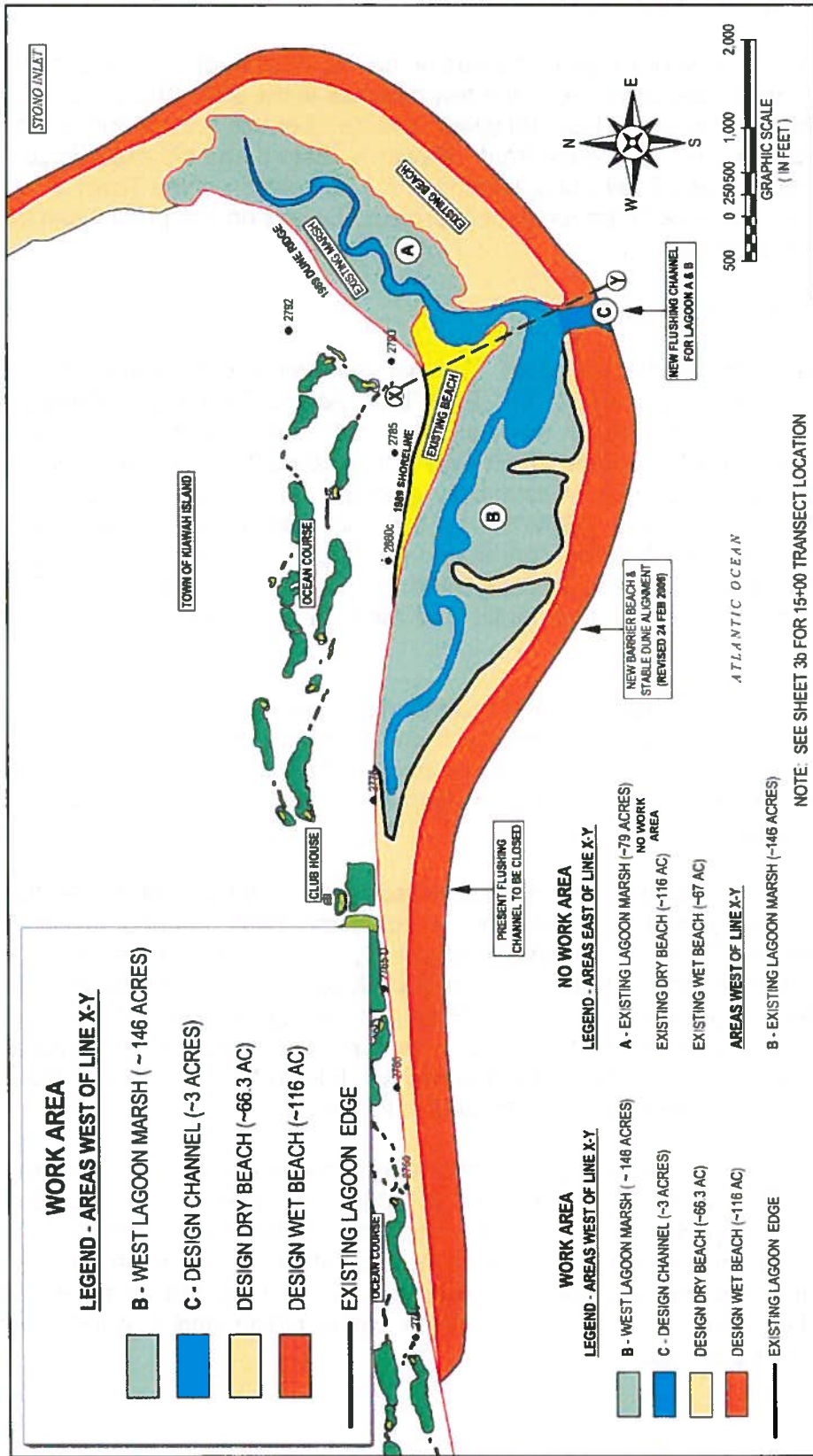


Figure 13. Project design map for the East End Beach Renourishment Project.

L. Dean Weaver Construction Company, Inc. of Pamplico, SC conducted the beach project for the Town. The primary objective of the project was to close an existing beachfront creek and open a new channel to the east in order to reestablish the natural flow of sand to the beach in this area. In addition, 550,000 cubic yards of sand was placed along heavily eroded beachfront areas from the Ocean Course Clubhouse down to the 16th fairway.



Several different types of equipment were utilized to excavate the new channel and move sand to the west. This equipment included 4-5 track hoes, 16-18 off road trucks, 3-4 bulldozers, and 2 pan scrapers. The primary mode of sand transport was with off road trucks loaded by track hoes (see picture above). Work was completed on July 28, 2006. The Town funded the majority of this \$3.6 million project with the balance being covered by financial contributions from Kiawah Island Community Association (KICA), KIGR, and Kiawah Development Partners (KDP).



Before and after photos of the East End Project Area.

### 5.2.2 Emergency Orders and Sandbags

If necessary, the Town may issue appropriate emergency orders allowing property owners to undertake emergency sand scraping and sand bagging as allowed under OCRM Critical Area Regulations. Emergency orders and protective work shall be consistent with the Town's erosion control plan (see Section 5.3).

The Town of Kiawah Island has only issued a handful of emergency orders in the last 10 years. All of these orders were issued to the Ocean Course Golf Course,

LLC between 2005 and 2006 to combat significant erosion adjacent to the 18<sup>th</sup> green of the Ocean Course Golf Course. There were a total of 10 Emergency Beach Scraping Orders and 1 Emergence Sandbagging Order issued. The issue dates of the orders are below:

#### Emergency Beach Scraping Orders

- 2005 – May 9, June 7, July 5, August 16, September 14, October 14, December 12,
- 2006 – January 12, February 12, May 11

#### Emergency Sandbagging Order

- September 15, 2005

#### 5.2.3 *Previous Hurricane and Storm Events*

Hurricanes and tropical storms pose a significant threat to Kiawah Island in the summer and early fall. Seventy-eight (78) hurricanes have affected this area between the years of 1686 – 1999. The most recent memorable storms have been Hurricane Hugo (1989) and Hurricane Floyd (1999).

The Charleston Regional Hazard Mitigation Plan, which is updated regularly by Charleston County and communities within the County, contains descriptions of storm and flood events. The following descriptions of significant storm and flooding events have been excerpted primarily from this plan:

September 29, 1959 – Hurricane Gracie: Hurricane Gracie moved inland on September 29. The eye of the storm passed over the South Carolina coast at St. Helena Sound about 10 miles east of the City of Beaufort. Damage of disastrous proportions occurred in the coastal region from Beaufort to Charleston, and considerable, additional damage occurred in the area of Walterboro. An enormous number of trees were felled, causing considerable random damage. There was a great deal of crop damage, especially to unpicked cotton. A barometric pressure of 905 nb (28.06 inches) was reported in Beaufort. The total damage inflicted by the storm was estimated at \$14 million. High water marks, which were reported near the Town of Edisto Beach, South Carolina, ranged from 7.3 to 11.9 feet msl.

September 5, 1979 – Hurricane David: Hurricane David was a Category 2 storm prior to entering the U.S. in Florida. It diminished to a borderline Category 1 storm upon exiting Florida and came ashore near Savannah (GA). It produced a minimal surge and high waves which damaged property in Edisto Beach and Seabrook Island. Kiawah Island experienced dune erosion and minor damage to some walkovers as well as localized flooding. At Seabrook, sections of a seawall around the Beach Club collapsed, and waves pushed large boulders into the main access road along the oceanfront.

July 24, 1985 – Hurricane Bob: Hurricane Bob entered the coast near Fripp Island as a low Category 1 storm. It caused minor flooding and uprooted trees at Kiawah Island.

September 19, 1989 – Hurricane Hugo: On September 19, 1989, emergency officials recognized Hugo as a “real” and “major” threat based on National Weather Service information. Hurricane Hugo was 997 miles southeast of Charleston at 6:00 P.M. The coastal counties released hurricane evacuation information through the media.

On September 20, a voluntary evacuation took place in the afternoon and throughout the night. At 6:00 P.M. Hugo was 584 miles southeast of Charleston. The Governor declared a State of Emergency to exist at approximately 7:00 P.M. (Executive Order 89-32)

On September 21, a hurricane warning was issued for the entire South Carolina coast at 6:00 A.M. The Governor issued an Evacuation Order for the peninsulas, barrier islands, and beach front with the exception of the City of Charleston. By 10:00 P.M. Charleston had high winds and many power outages. Communications were difficult. Hugo made landfall just after midnight.

Hugo, a Category 4 Hurricane (the second most powerful classification), moved ashore with high winds. Tidal surges north of the city were recorded at 19.8 feet and 11.8 feet in the Peninsula City. The hurricane struck at high tide. Its recorded diameter was over 500 miles.

**Preliminary Damage Assessment:** Although Hugo had high winds and a large storm surge, only four (4) people were killed and scores injured. The low death toll was largely due to the adequate warning and successful evacuation of the barrier islands, which were hit hardest.

Even with the success came destruction, Hurricane Hugo’s strike resulted in an estimated damage of \$7 billion for the total area. The insurance payouts for the unincorporated areas alone were estimated to be at \$909 million. Throughout the Region, an estimated 36,980 buildings suffered damages ranging from minor to total destruction. Heavy rains three (3) days later added to the damage that already existed.

September 15, 1999 – Hurricane Floyd: This hurricane was a Category 3 hurricane when it brushed the South Carolina Coast on September 15, 1999. Sustained winds of 58 miles per hour were recorded in downtown Charleston with gusts up to 85 miles per hour. Generally 3-5 inches of rainfall occurred in the Charleston area associated with Hurricane Floyd. An estimated \$10.5 million in damages occurred in the Charleston region as a result of Hurricane Floyd mostly as a result of the high winds. Minor to moderate beach erosion occurred along the South Carolina coast. Tides were 3.5 feet above normal during the hurricane.



September 17, 2003 – Hurricane Isabel: This storm created 8 foot surf at Kiawah Island and had wind gusts of 40 mph offshore and 20 mph in downtown Charleston when it passed offshore of Charleston County. Coastal erosion was expected, as tides were 6 to 12 inches above normal.

August 14-15, 2004 – Hurricane Charley: This storm made landfall near McClellanville as a Category 1 storm. An estimated 4 inches of rain fell in 2 hours in the Northern part of Charleston County on August 14, 2004, flooding low lying areas and areas with poor drainage (National Weather Service Storm Data and Unusual Weather Phenomena, 2004, August). Storm surge was estimated at 4-6 feet from Oyster Landing to the Cape Romain Wildlife Refuge in the northern portions of Charleston County. Barrier islands in Charleston County called for voluntary evacuations, and 4 emergency shelters were opened for Charleston County residents. Minor property and tree damage occurred as a result of this storm. The storm also dropped 1.5 inches of rain over 4 hours in Charleston, causing minor flooding of roadways in low-lying areas. The storm caused an estimated damage of \$2 million in South Carolina, and the Governor declared a state of emergency in South Carolina. The highest wind gusts in the central portions of the county associated with this storm were 63 mph at the Isle of Palms, 58 mph at Folly Beach, and 51 mph in downtown Charleston.

August 29, 2004 – Hurricane Gaston: Hurricane Gaston (originally classified as a Tropical Storm, but reclassified as a hurricane on November 22, 2004) made landfall near Awendaw with sustained winds of 75 mph. The storm brought a 4 foot storm surge into Bull's Bay; caused an estimated \$4.8 million in damages to homes, primarily in areas east of the Cooper River; created debris with an estimated clean up cost of \$2.2 million county wide; left nearly all of the customers of South Carolina Electric and Gas without electrical power; and ultimately resulted in a Presidential Disaster Declaration for Public Assistance for Charleston County. The storm dropped an estimated 6-10 inches of rain on Sullivan's Island, the Isle of Palms, and Mt. Pleasant, flooding numerous roads and retention ponds. Maximum wind gusts from this storm were 81 mph at the Isle of Palms, 59 mph at Pineville, 55 mph at the Charleston airport, 51 mph at Folly Beach, and 48 mph in downtown Charleston. Over 3,000 structures in Charleston, Berkeley, and Dorchester counties sustained minor damages. At the height of the storm, there were over 150,000 people in the area without power. Total estimated damages, per the National Weather Service, were \$7.6 million in Charleston County. Total estimated damages, per the National Weather Service, were \$7.6 million in Charleston County.

September 6, 2004 – Tropical Storm Frances: This storm created nearly 6 ft. surf, dropped nearly 5 inches of rain, and had winds of 35 mph when it struck Charleston County on Labor Day. The storm caused mostly nuisance-type flooding in Charleston County, and blew down trees along the Hwy. 52 Connector in North Charleston. The storm spun off nearly 2 dozen tornadoes, one of which touched down at Northwoods Mall in North Charleston, causing minor tree damage.

September 27, 2004 – Tropical Storm Jeanne: This storm brushed the Charleston County coast. This storm, combined with the other tropical systems that affected the region during 2004, resulted in 40ft. of beach erosion on the north end of Folly Beach. A flood watch was posted in Charleston County for September 27, 2004, on the anticipation that the area could receive 3-6 inches of rain from this storm. Maximum wind gusts in Charleston County from this storm were 41 mph in downtown Charleston and at the Charleston airport. Maximum wind gusts at Folly Beach were 38 mph. Non-tornadic damage was limited to a few trees falling on cars.

September 13, 2005 – (Tropical Storm Ophelia): This storm, which was especially difficult to track as it moved towards the Eastern Atlantic Coast ended up brushing the Charleston County area as a tropical storm with 75 mph winds. McClellanville experienced hurricane force winds within 10-20 miles of the coast, and power outages occurred as a result of the storm in multiple areas east of the Cooper River. Trees were knocked down in McClellanville and Mt. Pleasant. Beach erosion occurred on Folly Beach and other beaches along the South Carolina coast. One surfer lost his life while surfing near Folly Beach when this storm was in the area.

October 5, 2005 – (Tropical Storm Tammy): This storm struck Folly Beach with 54 mph wind gusts and dropped more than 4 inches of rain on Folly Beach. The storm caused power outages to at least 3,500 properties in Charleston County, flooded roads and yards, and brought down tree limbs. This storm also caused significant beach erosion at Edisto Beach and the Isle of Palms.

August 31, 2006 – (Tropical Storm Ernesto): After crossing through South Florida, Tropical Storm Ernesto was predicted to make landfall in Charleston County which prompted Charleston County to fully activate its Emergency Operations Center and multiple closings of schools and offices in Charleston County. Folly Beach City Hall recorded the highest wind speed associated with this system of 40 mph gusts (Petersen, 2006, September 1). The storm ultimately made landfall in North Carolina and traveled further North causing wind and flood damages.

June 2, 2007 – (Remnants of Tropical Storm Barry): This storm system brought heavy rains, strong winds and rough surf in coastal Charleston County. This storm system dropped up to 3 inches of rain in the Lowcountry, took out electric service to 13,900 customers of SCE& G and Berkeley Electric Cooperative, mostly in the Summerville area, caused vessels to break their lines, and flooded streets, particularly on the Charleston Peninsula. Wind gusts up to 60 mph were recorded from this storm at the Ben Sawyer Bridge.

September 5, 2008 – (Tropical Storm Hanna): This storm passed by to the east of coastal South Carolina, resulting in strong wind and localized heavy rain in the Charleston County area. Flooding was reported throughout downtown Charleston.

September 17, 2010 – (Hurricane Igor): This Category 2 hurricane passed off-shore approximately 800 miles from South Carolina and caused high waves and some minor beach erosion.

August 19, 2011 – (Hurricane Irene): This Category 2 hurricane passed off-shore the South Carolina coast and caused high waves and beach erosion in Charleston County. Winds of 40-50 miles an hour were recorded along the coast as the storm passed by. Folly Beach experienced severe beach erosion during this storm. Kiawah Island also had minor beach erosion.

Extratropical Storms (Northeasters): Kiawah Island is subject to extratropical storms that occur frequently, mostly during winter months. Northeasters occurring in quick succession some winters have produced significant erosion along the oceanfront. The winters of 1982-1983 and 1986-1987 had significant storms that eroded upward of one million cubic yards from the upper beach. Sand which moved offshore during these northeasters eventually returned to the visible beach within about two years. Significant storms also occurred from late fall 1992 to March 1993.

Northeasters along the South Carolina coast tend to be less intense compared with New England storms. Typical peak winds are likely to be 30-40 mph, versus >60 mph in New England. Dune erosion is most common during northeasters when they occur in phase with maximum lunar tides (ie., "spring" tides which occur during full moon and new moon phases). Storms on New Year's Day 1987 and on March 13, 1993, were among the worst northeasters to impact Kiawah in the past 30 years. Some emergency beach scraping and dune restoration were performed at Kiawah following the New Year's Day storm.

### **Section 5.3 Discussion of Erosion Control Alternatives**

Given the natural setting that exists along the beaches of Kiawah Island, the Town will encourage erosion control strategies that work in concert with local coastal processes and will discourage strategies that harden the shoreline. The 1990 Beachfront Management Act prohibits the construction of bulkheads, seawalls, and revetments, except to protect public highways that existed prior to June 25, 1990. It is important to note that new groins are allowed under current SCDHEC-OCRM regulations under special circumstances. The Town of Kiawah Island may consider the use of groins, but only after all other strategies have been examined and rejected.

The preferred erosion control strategies and techniques for protecting the ocean shoreline of Kiawah Island are:

- Dune restoration and revegetation
- Beach renourishment using approved borrow sources
- Sand scraping and sand bagging (under emergency conditions)

All erosion control activities will be approved by OCRM, other appropriate state and federal agencies, and the Town. Preferred borrow sources and transportation/placement methods are as follows (Note: this does not constitute Town approval for specific projects):

- Beach scraping from the low tide beach, using land-based equipment
- Borrowing sand from inlet shoals at Stono Inlet, using land-based equipment or hydraulic dredge
- Borrowing sand from the end of the spit at Beachwalker Park, using land-based equipment or hydraulic dredge
- Upland sources of beach-compatible sand, hauled to the site by truck or other approved means

The Town may issue emergency scraping and sand bagging orders to protect golf courses and non-habitable structures as allowed by law. The Town must approve, in advance, all erosion control projects along Kiawah Island, including any that use the beaches, dunes, or adjacent tidal inlets for borrowing, transportation, or placement of sand. The Town must approve any future inlet relocation projects at Captain Sam's Inlet.

#### *5.3.1 Beach Renourishment*

The Town of Kiawah Island has conducted one beach renourishment project in its history. This 2006 project is described in detail in Section 5.2.1. Due to the healthy nature of Kiawah's beach, there are no plans to renourish the beach at any time, barring a natural disaster.

#### *5.3.2 Other Measures*

There are no other erosion control alternatives in use on Kiawah Island.

## **SECTION 6**

### **NEEDS, GOALS AND IMPLEMENTATION STRATEGIES**

#### **Section 6.1 Retreat Strategy**

The Beachfront Management Act states very clearly that the policy of South Carolina is to protect, preserve, restore and enhance the beach/dune system. This act also calls for a forty-year withdrawal from the shoreline and more stringent regulations on use of beachfront areas. The State seeks to encourage wise development of the shoreline, including the adoption of appropriate management strategies to deal with existing and future development. These strategies include, where necessary, selective beach/dune restoration and or relocation of oceanfront structures and facilities. The Town of Kiawah Island shares the objectives of the State, and will accomplish those objectives through its Local Comprehensive Beach Management Plan.

At this time, there are no habitable structures or erosion control structures located seaward of the setback line. There is 1 covered beach walkover deck (49 Eugenia) and 3 ancillary buildings on the Ocean Course Golf Course seaward of the setback line.

#### **Section 6.2 Strategy for Preserving and Enhancing Public Beach Access**

Beachwalker County Park offers the only "true" public access to the Kiawah Island beach. The Town will make all efforts to maintain the county park and the public access it provides. In fiscal year 2013, the Town of Kiawah Island received notice of a Transportation Sales Tax grant from Charleston County totaling \$60,000 that will be used to construct an asphalt bike path along Beachwalker Drive into the County Park. This addition will further enhance access to the public beach and park.

**SECTION 7**  
**APPENDIX**

## Appendix 7.1 Beach Management Overlays

Beach Management Overlays

ZONING DISTRICTS*		ZONING MAP				WATER FEATURES	
CONSERVATION	R-2/COMMERCIAL	COMMUNITY SUPPORT	Water	RESORT OVERLAY DISTRICT	Water		
PARK	R-3/COMMERCIAL	COMMERCIAL	Marsh	RESORT OVERLAY DISTRICT	Marsh		
R-1	RST-1	PLANNED DEVELOPMENT					
R-2	RST-2						
R-3	RST-1/R-3						



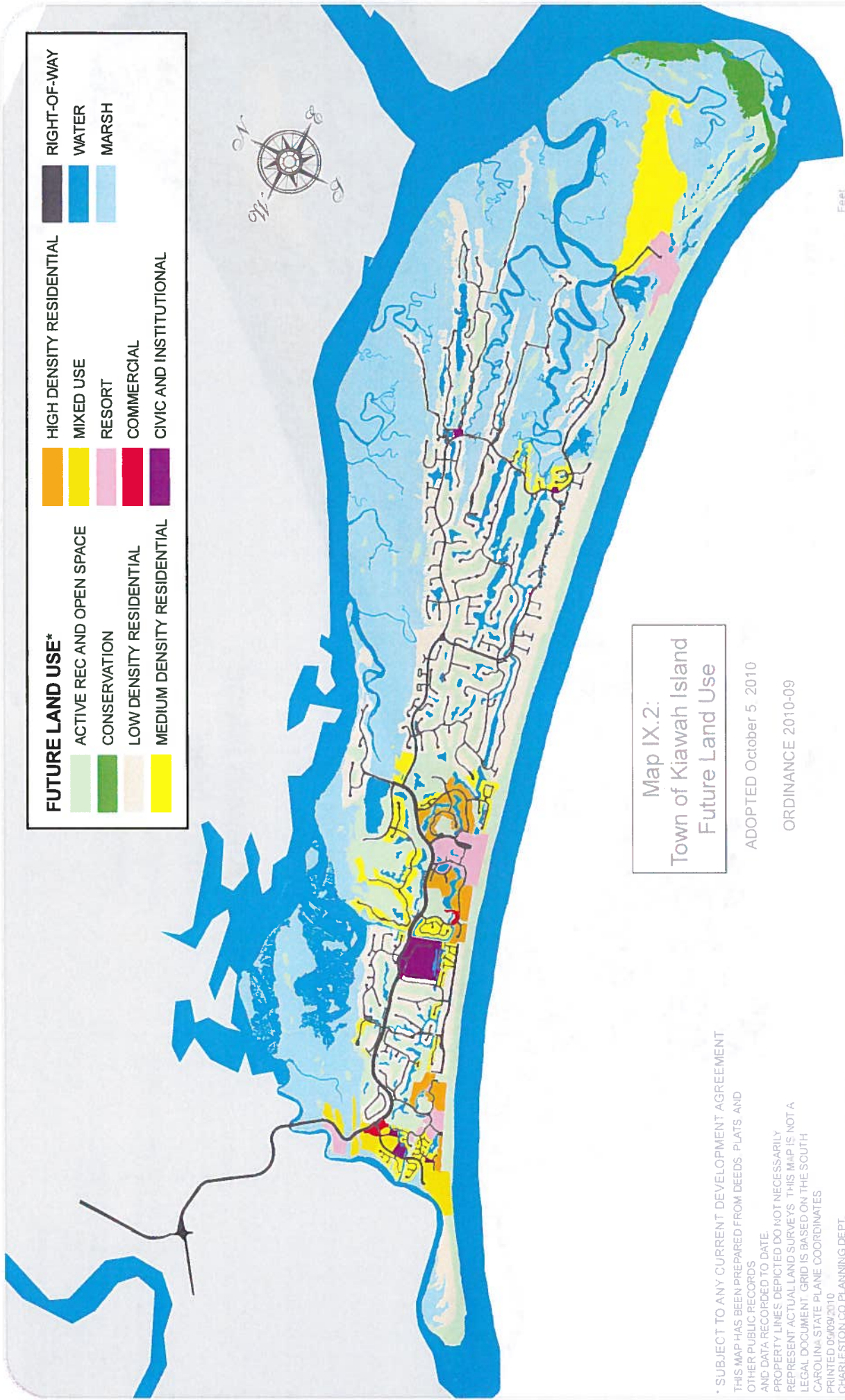
# Town of Kiawah Island Zoning Map

ADOPTED OCTOBER 5, 2010  
ORDINANCE 2010-09

\* SUBJECT TO ANY CURRENT DEVELOPMENT AGREEMENT  
THIS MAP HAS BEEN PREPARED FROM DEEDS, PLATS AND  
OTHER PUBLIC RECORDS  
AND DATA RECORDED TO DATE  
PROPERTY LINES DEPICTED DO NOT NECESSARILY  
REPRESENT ACTUAL LAND SURVEYS. THIS MAP IS NOT A  
LEGAL DOCUMENT. GRID IS BASED ON THE SOUTH  
CAROLINA STATE PLANE COORDINATE.  
PRINTED 09/03/2010  
CHARLESTON, CO PLANNING DEPT  
KiaZone\_Dav1011x17.mxd



FUTURE LAND USE*		RIGHT-OF-WAY	
	ACTIVE REC AND OPEN SPACE		WATER
	CONSERVATION		MARSH
	LOW DENSITY RESIDENTIAL		HIGH DENSITY RESIDENTIAL
	MEDIUM DENSITY RESIDENTIAL		MIXED USE
			RESORT
			COMMERCIAL
			CIVIC AND INSTITUTIONAL



Map IX.2:  
Town of Kiawah Island  
Future Land Use

ADOPTED October 5, 2010

ORDINANCE 2010-09

\* SUBJECT TO ANY CURRENT DEVELOPMENT AGREEMENT  
 THIS MAP HAS BEEN PREPARED FROM DEEDS, PLATS, AND  
 OTHER PUBLIC RECORDS  
 AND DATA RECORDED TO DATE.  
 PROPERTY LINES DEPICTED DO NOT NECESSARILY  
 REPRESENT ACTUAL LAND SURVEYS. THIS MAP IS NOT A  
 LEGAL DOCUMENT. GRID IS BASED ON THE SOUTH  
 CAROLINA STATE PLANE COORDINATES  
 PRINTED 09/09/2010  
 CHARLESTON CO PLANNING DEPT  
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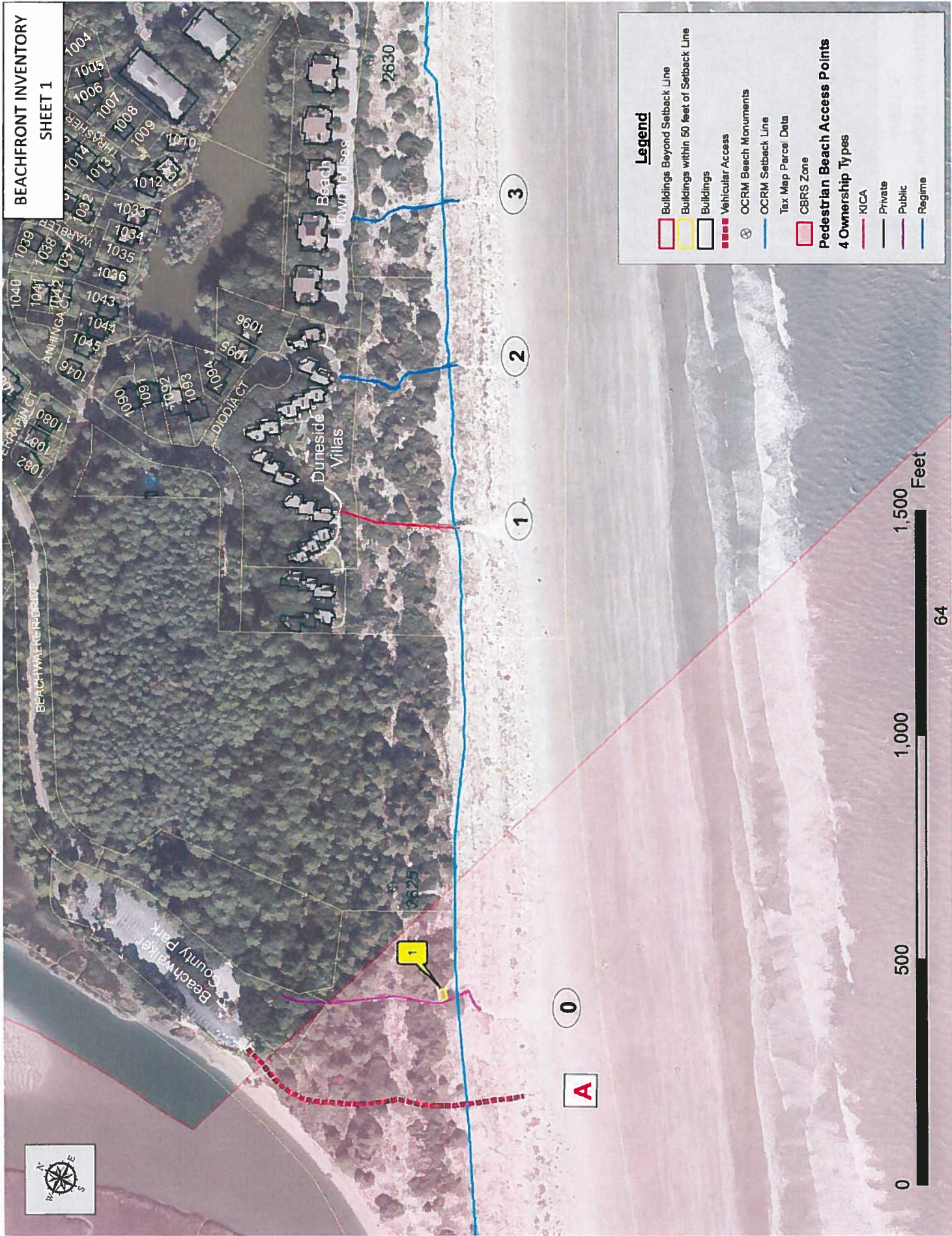
**Appendix 7.2.1 Structures Inventory Table**

Map ID	Street	Tax Map Number	Parcel Number	Structure Inventory	Structure Distance from OCRM Setback Line
1	Eugenia Avenue	2090500004	49	Covered Deck	10 feet
2	Ocean Course Drive	2070000020	N/A	Ancillary Building	195 feet
3	Ocean Course Drive	2070000020	N/A	Ancillary Building	112 feet
4	Ocean Course Drive	2070000020	N/A	Ancillary Building	129 feet

## **Appendix 7.2.2 Structures Inventory Maps**

A series of 16 map sheets showing the entire Kiawah Island beachfront.

**BEACHFRONT INVENTORY  
SHEET 1**



**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Beach Setback Line
- Tax Map Parcel Data
- CBRS Zone

**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime

BEACHFRONT INVENTORY  
SHEET 2



**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRBS Zone

**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



**BEACHFRONT INVENTORY  
SHEET 3**



**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRS Zone

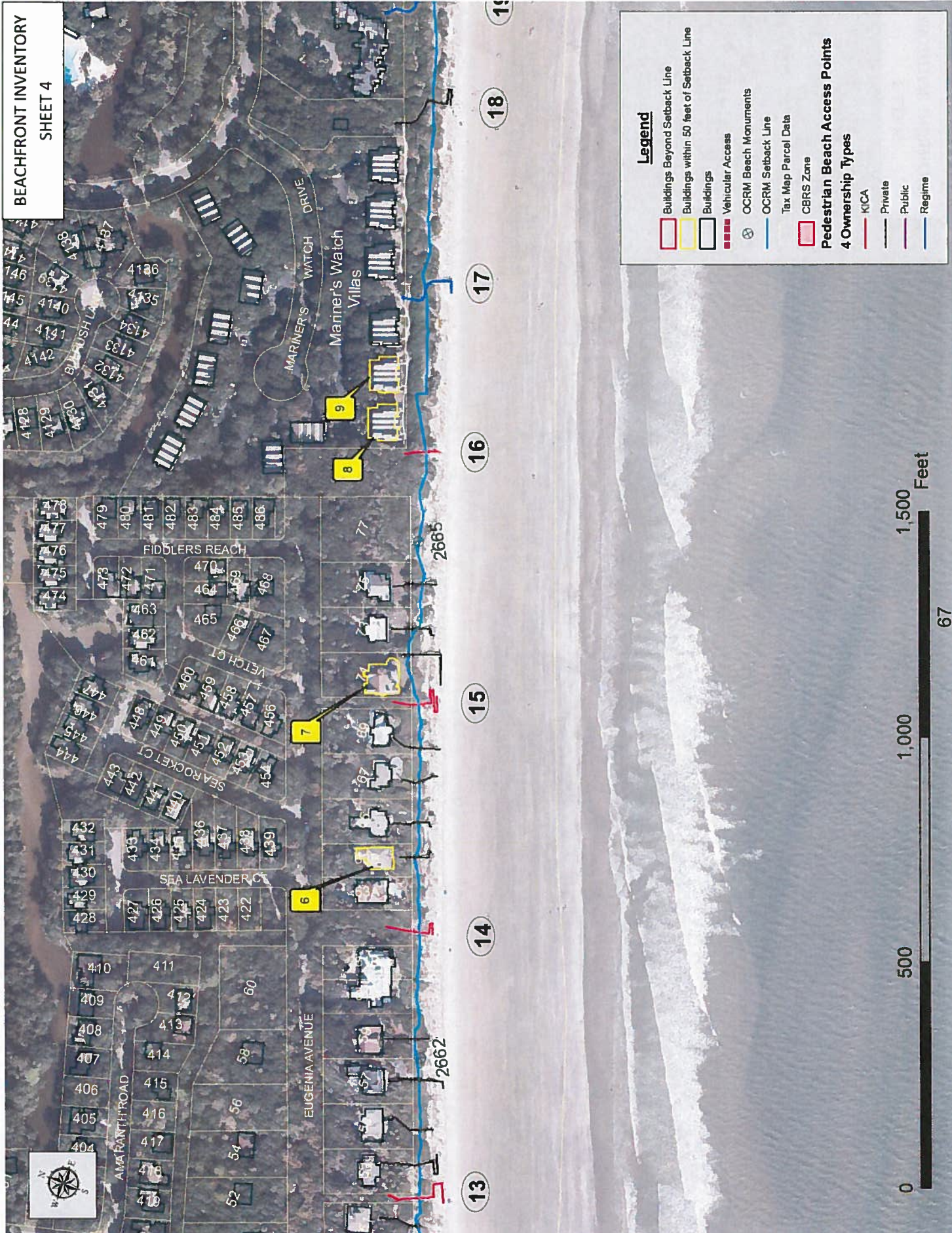
**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



**BEACHFRONT INVENTORY  
SHEET 4**



**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRRM Beach Monuments
- OCRRM Setback Line
- Tax Map Parcel Data
- CBRS Zone
- Pedestrian Beach Access Points

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



BEACHFRONT INVENTORY  
SHEET 5



**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRRM Beach Monuments
- OCRRM Setback Line
- Tax Map Parcel Data
- CBRS Zone

**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



BEACHFRONT INVENTORY  
SHEET 6

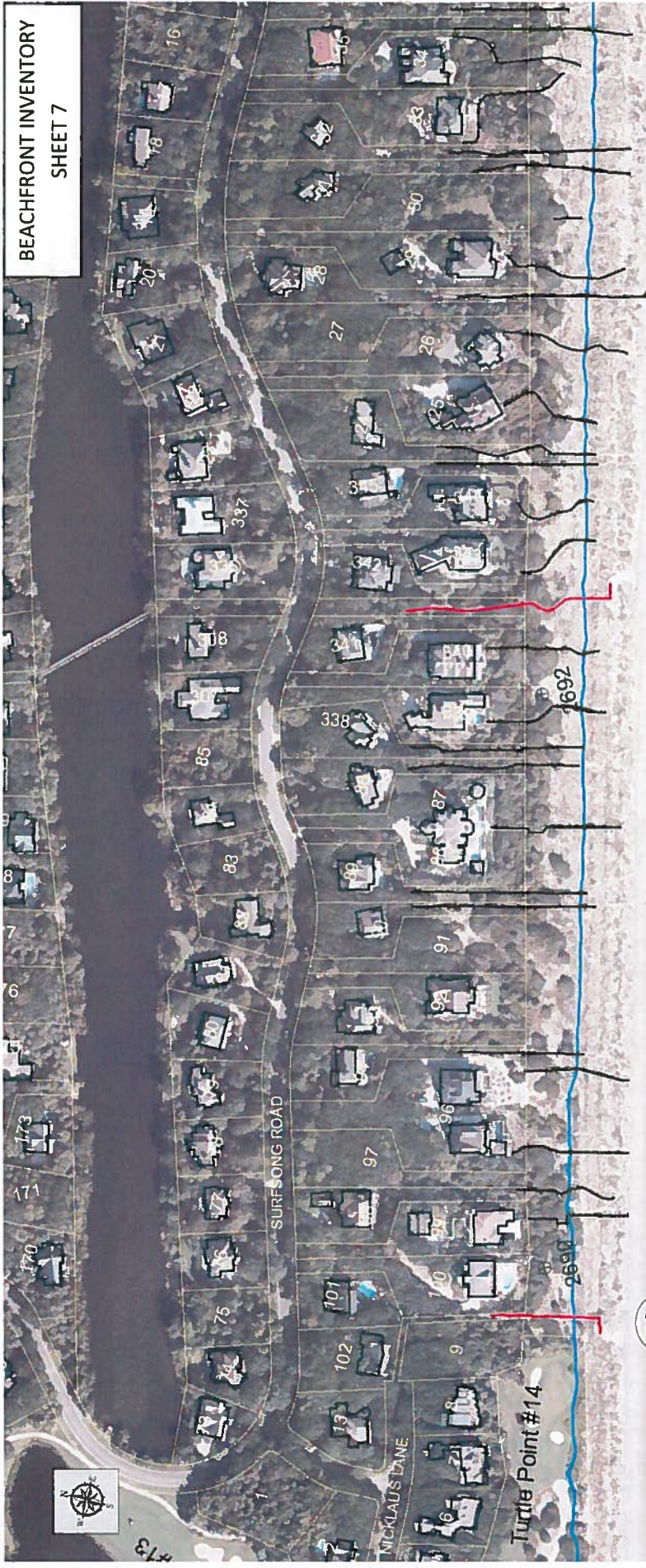


**Legend**

- Buildings Beyond Setback Line
  - Buildings within 50 feet of Setback Line
  - Buildings
  - Vehicular Access
  - Pedestrian Beach Access Points
  - OCARM Beach Monuments
  - OCARM Setback Line
  - Tax Map Parcel Data
  - CBRS Zone
- 4 Ownership Types**
- KICA
  - Private
  - Public
  - Regime



BEACHFRONT INVENTORY  
SHEET 7



30

31

**Legend**

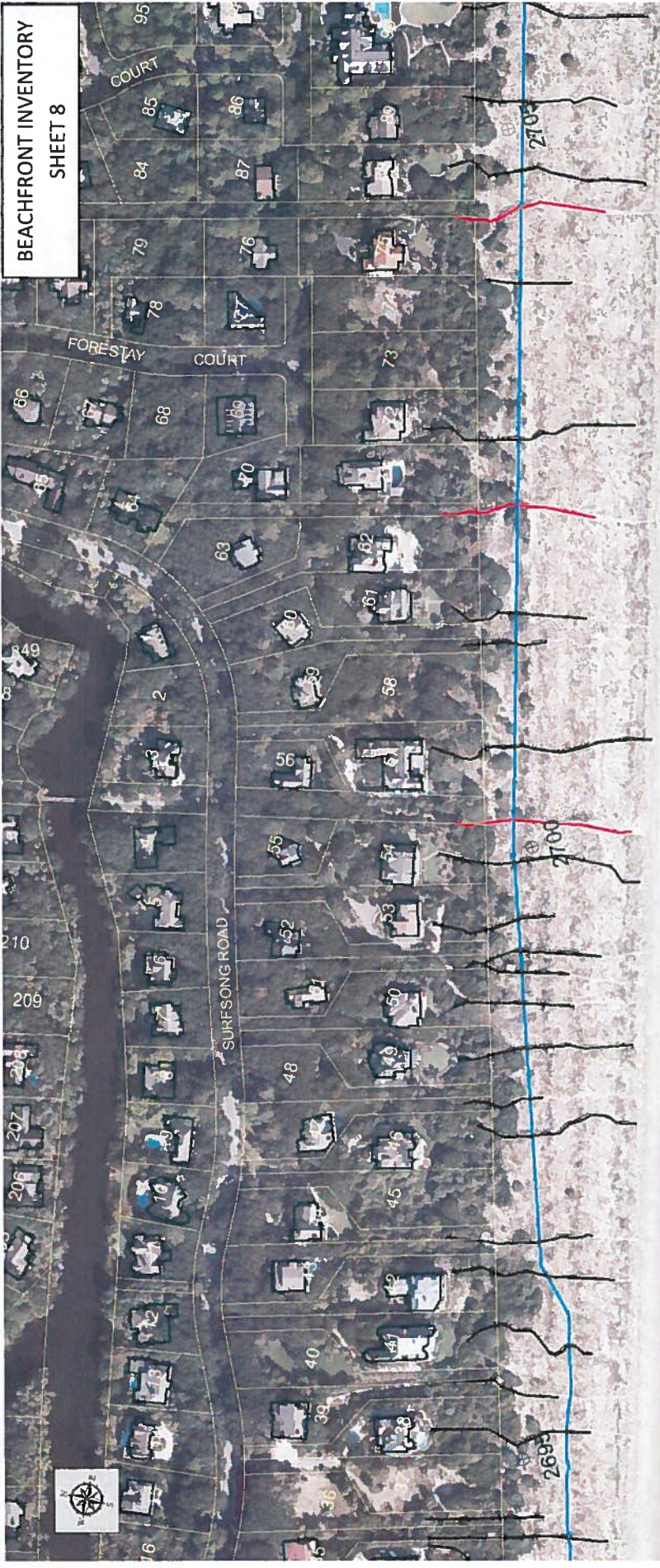
- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRRM Beach Monuments
- OCRRM Setback Line
- Tax Map Parcel Data
- CBRS Zone

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



**BEACHFRONT INVENTORY  
SHEET 8**



34

33

32

**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRS Zone

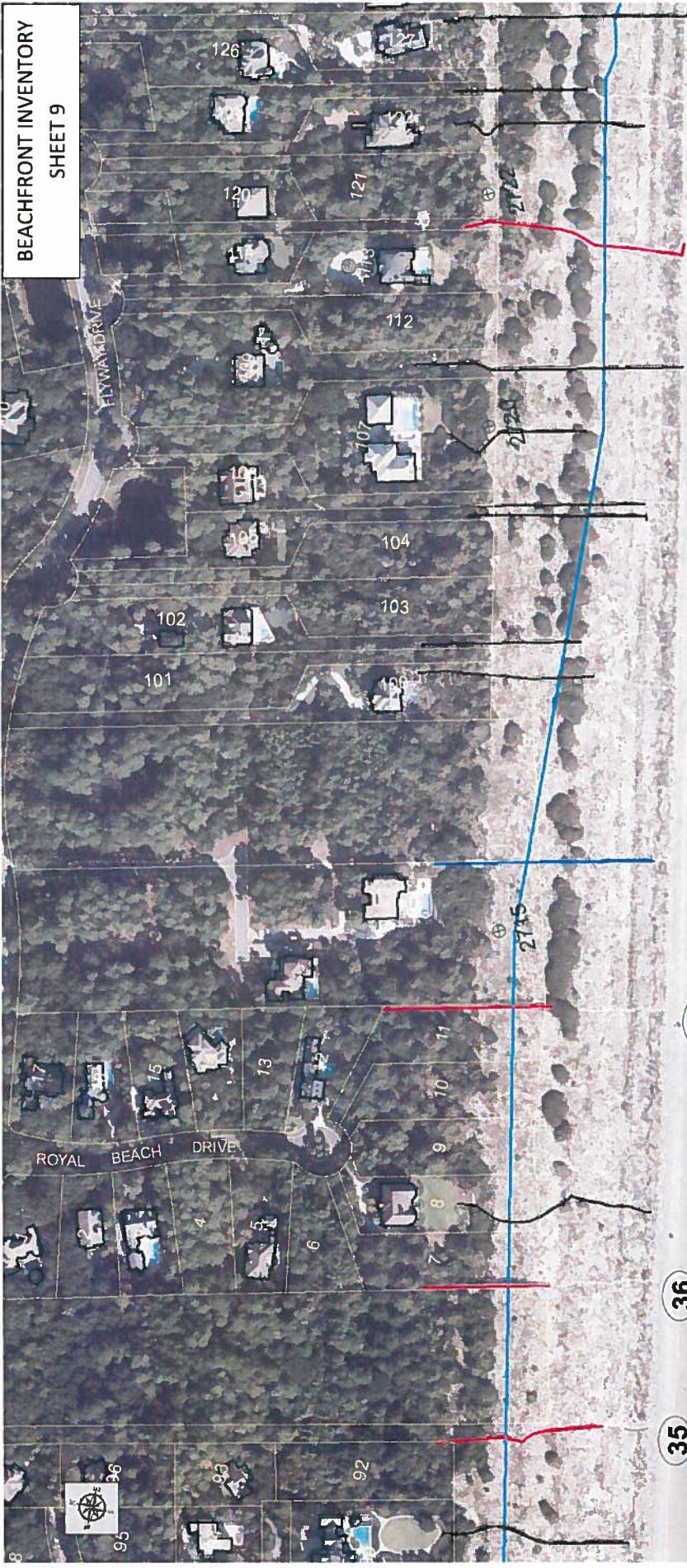
**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



**BEACHFRONT INVENTORY  
SHEET 9**



38

37

36

35

**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRS Zone

**Pedestrian Beach Access Points**

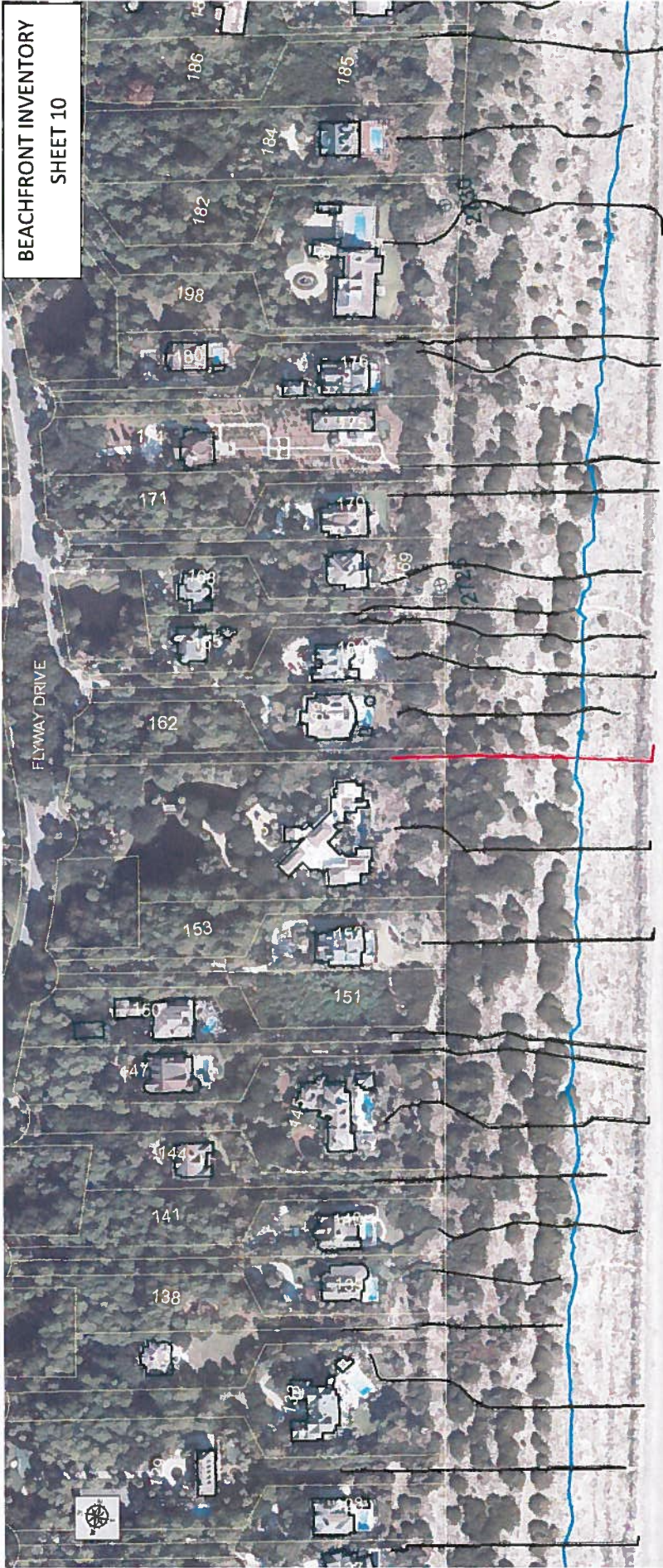
**4 Ownership Types**

- KICA
- Private
- Public
- Regime



72

**BEACHFRONT INVENTORY  
SHEET 10**



**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCORM Beach Monuments
- OCORM Setback Line
- Tax Map Parcel Data
- CBRS Zone

**Pedestrian Beach Access Points**

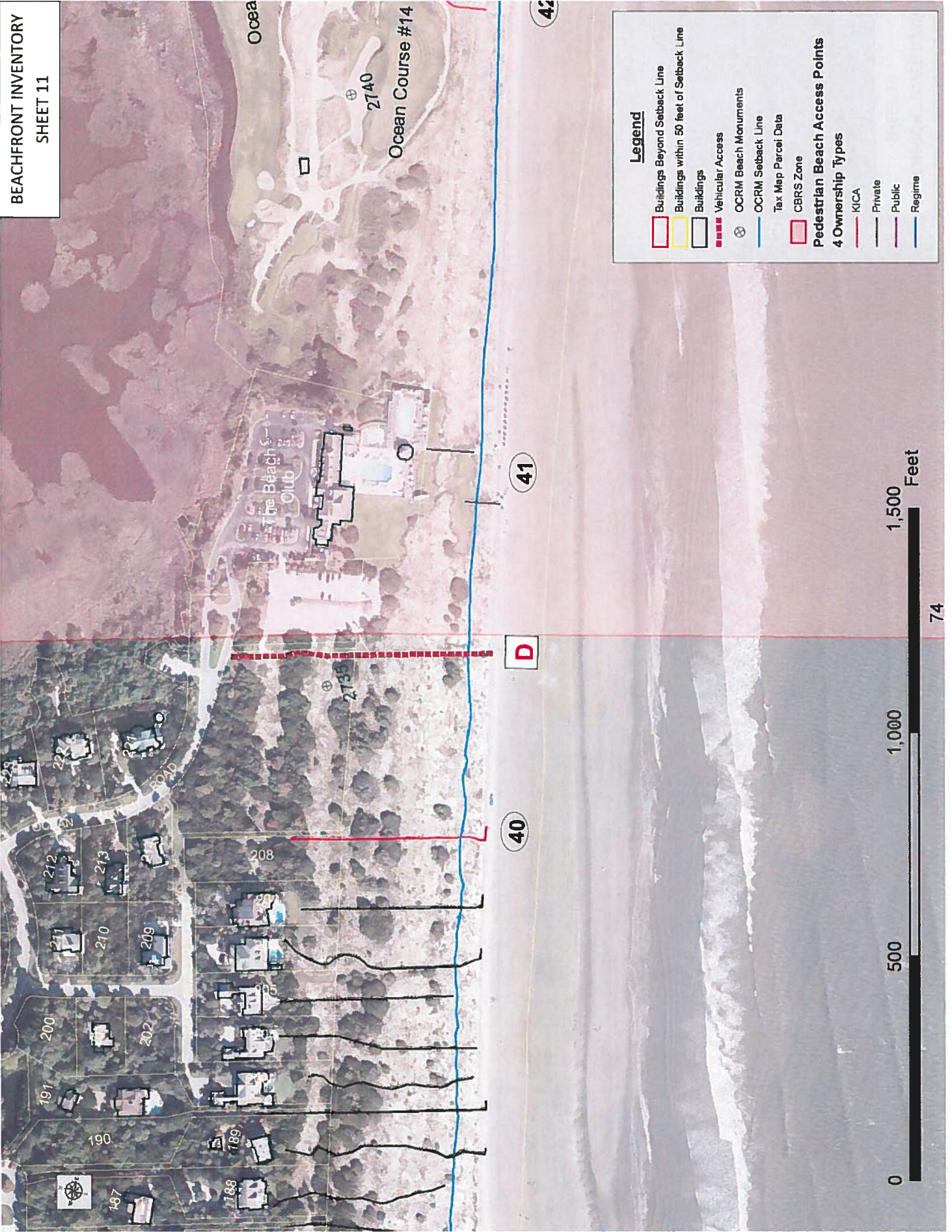
**4 Ownership Types**

- KICA
- Private
- Public
- Regime

39



BEACHFRONT INVENTORY  
SHEET 11





Ocean Course #13

Ocean Course #12

Ocean Course #15

Ocean Course #16

#14

2745

42

**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRIS Zone

**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



75

BEACHFRONT INVENTORY  
SHEET 13



Ocean Course #11

Ocean Course #17

Ocean Course #10

Ocean Course #18

2150

2160

10

Ocean Club

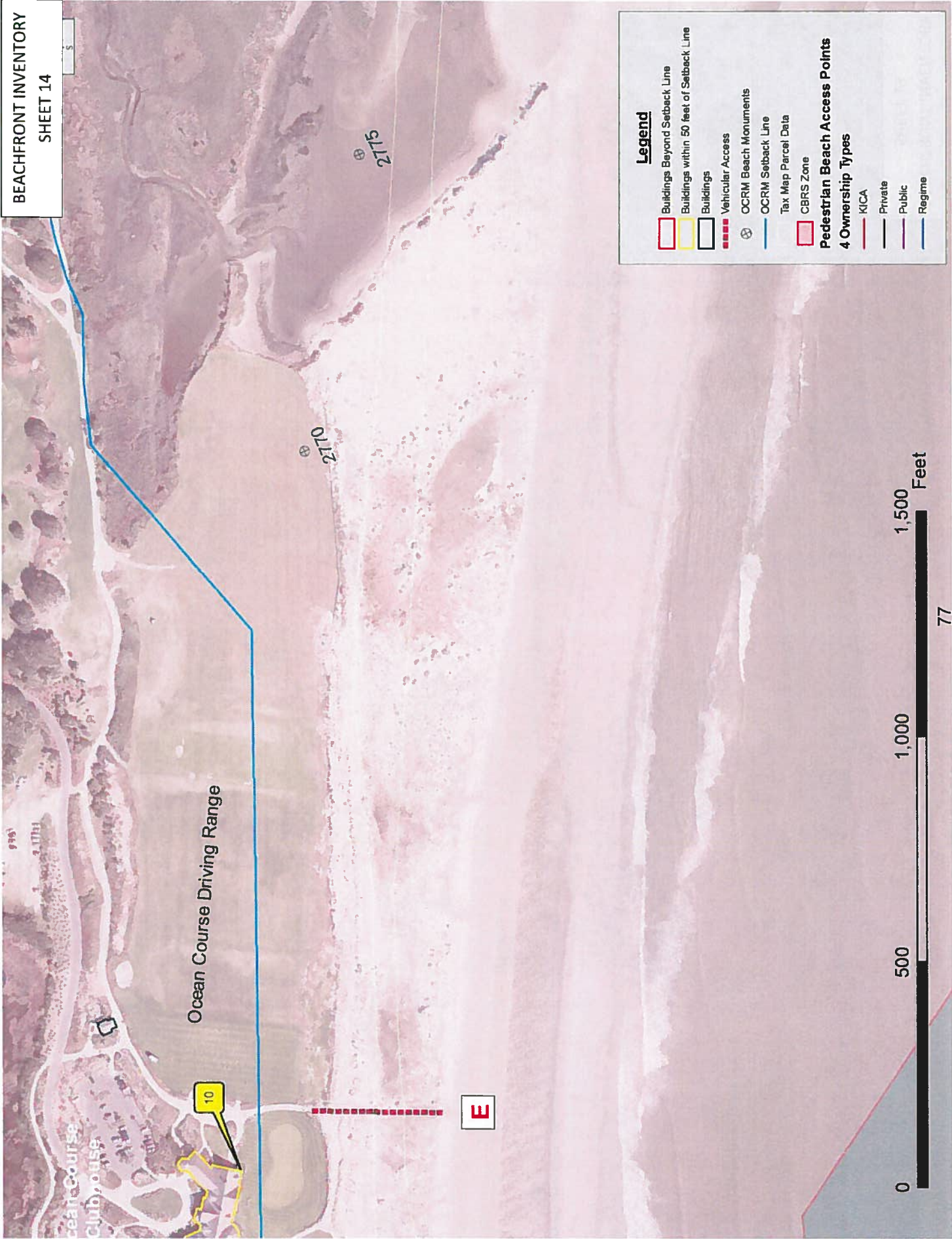
**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRS Zone
- Pedestrian Beach Access Points
- 4 Ownership Types
  - KICA
  - Private
  - Public
  - Regime





BEACHFRONT INVENTORY  
SHEET 14



**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRS Zone

**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



Ocean Course #9

Ocean Course #2

Ocean Course #8

Ocean Course #7

2771

**Legend**

- Buildings Beyond Setback Line
- Buildings within 50 feet of Setback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Setback Line
- Tax Map Parcel Data
- CBRS Zone

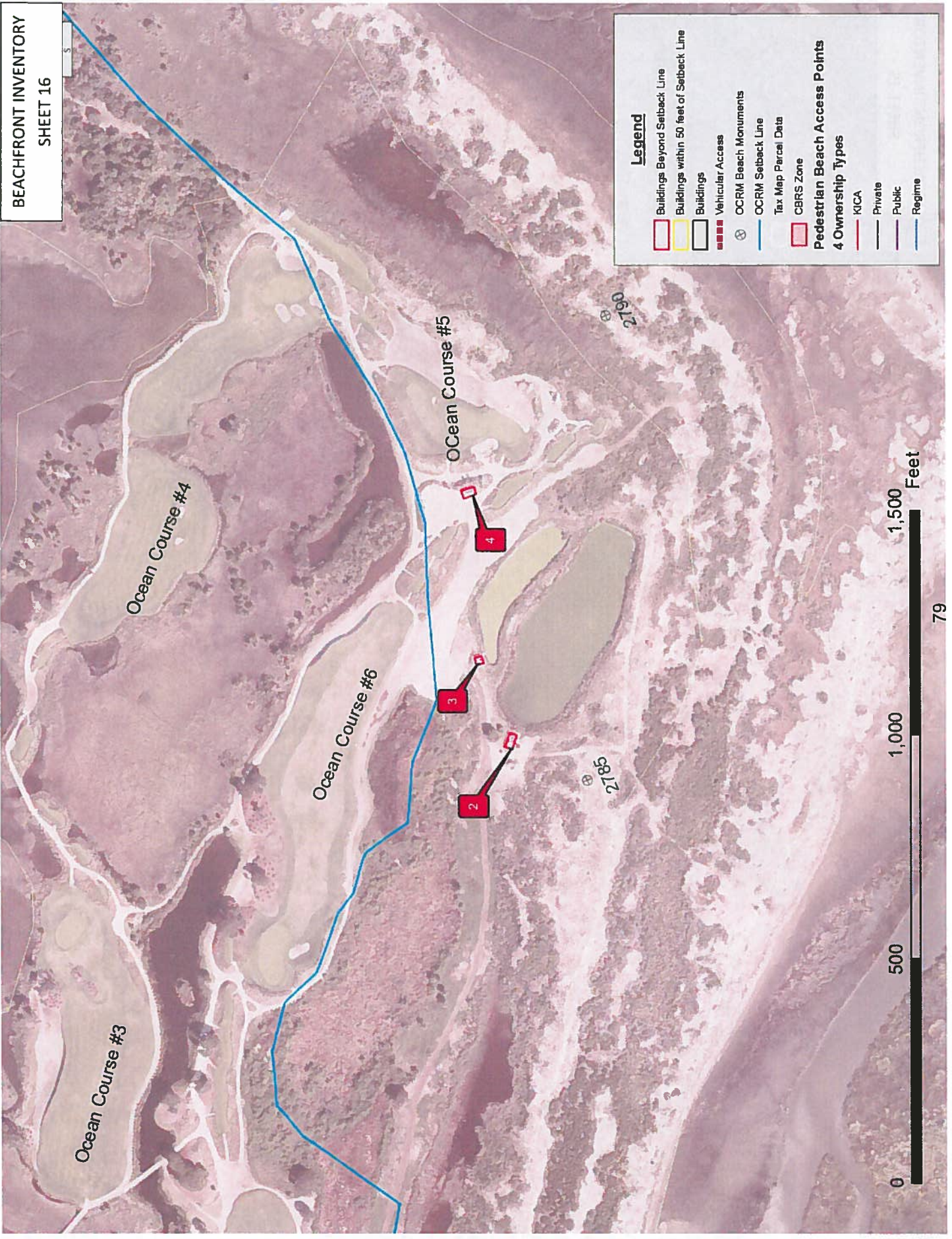
**Pedestrian Beach Access Points**

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



BEACHFRONT INVENTORY  
SHEET 16



**Legend**

- Buildings Beyond Selback Line
- Buildings within 50 feet of Selback Line
- Buildings
- Vehicular Access
- OCRM Beach Monuments
- OCRM Selback Line
- Tax Map Parcel Data
- CBRIS Zone
- Pedestrian Beach Access Points

**4 Ownership Types**

- KICA
- Private
- Public
- Regime



### Appendix 7.3 Public Access Inventory Table

The only full and complete public access, as defined by OCRM, is Beachwalker County Park. It has 180 parking spaces and is classified as a Regional Public Access Park. By definition this park provides full and complete access to 2 miles of the Kiawah Island beach. This park provides a number of amenities. Year-round amenities include: dressing areas, restrooms, picnic areas with grills, drink vending, boardwalks, and handicap-accessible ramps. Seasonal amenities (summer months) include: lifeguards, outdoor showers, snack bar, beach and umbrella rentals, and beach-accessible wheelchairs.

Street	Tax Map Number	Parcel Number	Facility Type
Beachwalker Drive	2070500001	N/A	RPAP

## **Appendix 7.4 Prior Studies**

A considerable amount of effort has been devoted to the description and analysis of shoreline changes and coastal processes along Kiawah Island. The Coastal Research Division of the University of South Carolina Geology Department conducted most of the early work after the island was purchased by the Kiawah Island Company in 1974. Later studies by various consultants, the South Carolina Coastal Council (SCCC), and DHEC-OCRM documented shoreline changes and established construction setback lines along the Kiawah Island shoreline using beach profile data and aerial photographs. Some of the more significant historical reports are summarized below.

**Beach Erosion Inventory of Charleston County, South Carolina – A Preliminary Report, March 1975, by M. F. Stephen, P.J. Brown, D.M. Fitzgerald, D.K. Hubbard and M.O. Hayes.** This report provided the first assessment of historic shoreline changes along Kiawah Island using 1939-1973 aerial photographs. The report classified all but the extreme east and west ends of the island as stable; the ends were generally unstable due to changes near Stono and Captain Sam's inlets.

**Environmental Inventory of Kiawah Island, 1975, by the Environmental Research Center.** This inventory included the first comprehensive description of local coastal processes and geomorphology.

**Development of Kiawah Island, South Carolina, 1977, by M.O. Hayes.** This report summarized the results of several studies related to shoreline dynamics and coastal processes along Kiawah's beaches. The report included a discussion of the impacts of the Charleston Harbor jetties on Kiawah Island and described the construction setbacks recommended to the island's developer.

**Shoreline Stability of Kiawah Island, South Carolina and Shoreline Changes along Kiawah Island, a series of reports by Research Planning Institute and Coastal Science and Engineering from 1981-1987.** This series of reports documented shoreline changes, including the impacts of shoal attachments and storms, based on beach profiles and aerial observations.

**Calculation of Interim Baselines and 40-Year Setback Lines, 1988, by C.P. Jones, D.M. Scaturo, T.W. Kana, and W.C. Eiser.** This report, prepared for the SCCC, established the June 1988 locations of the interim baselines and setback lines for Kiawah Island.

**Summary of Proposed Revision to Interim Baseline and Setback Line at Kiawah Island, January 1989, by C.P. Jones.** The results from this report were used by SCCC to revise baseline and setback lines in January 1989.

An additional list of beach surveys and reports can be found in the table on the next page.

Author	Year	Title
ATM, Inc.	2005	East end erosion assessment
Anders et al.	1990	Shoreline movements: Tybee Island (GA) to Cape Fear (NC) 1851-1983
Baca & Lankford	1987	<b>Environmental report: Captain Sams Inlet relocation</b>
Barwis	1976	Internal geometry of Kiawah Island beach ridges
Barwis	1978	Stratigraphy of Kiawah Island beach ridges
Barwis	1979	The sedimentological and stratigraphical characteristics of beach ridge and tidal channel deposits in mesotidal barrier systems
Barwis & Sexton	1986	Mesotidal barrier island depositional environments, Kiawah Island
Brown	1977	Variations in South Carolina coastal morphology
CSE Baird	1996	<b>Final survey report — 1996 beach scraping — Kiawah Island</b>
CSE Baird	1997	<b>State of Kiawah's beach 1997</b>
Duc and Tye	1987	Evolution and stratigraphy of a regressive barrier/back-barrier complex
ERC	1975	Environmental inventory of Kiawah Island
Eiser & Kana	1987	<b>Summary of shoreline changes along Kiawah Island</b>
Hayes	1977	Development of Kiawah Island
Hayes	1994	Georgia Bight
Hayes & Kana	1976	<i>Terrigenous Clastic Depositional Environments</i>
Hayes et al.	1975	Coastal processes and geomorphology — Kiawah Island
Hayes et al.	1976	Geomorphology of Kiawah Island, South Carolina
Hubbard et al.	1977	Sediment transport in South Carolina inlets
Kana et al.	1981	<b>Bathymetry of Kiawah River/Stono River, historical changes in Stono Inlet</b>
Kana et al.	1981	<b>Preliminary design/permit application for breaching Kiawah spit</b>
Kana et al.	1983	<b>Shoreline changes along Kiawah Island, May 1972 through May 1983</b>
Kana et al.	1999	<b>Updated shoreline assessment and condition of the beach</b>
Kana et al.	2005	<b>East end erosion - Opinion of probable causes and alternative strategies for management and mitigation</b>
Kana et al.	2006-12	<b>East end Renourishment Project Annual Reports – Annual reports on east end project, results, and analysis</b>
Katmarian & Kana	1996	<b>Shoreline assessment and recommendations for dune/beach restoration</b>
Leatherman	2004	<b>Kiawah Island Shoreline Assessment</b>
Moslow	1980	Stratigraphy of mesotidal barrier islands
Moslow & Davies	1979	Late Holocene depositional history of regressive barrier islands
NOAA	1983	Cooperative shoreline movement study: Cape Fear (NC) to Tybee Island (GA)
Neal et al.	1984	<i>Living with the South Carolina Shore</i>
SCCC	1990	Calculation of SCCC jurisdictional baselines and setback lines
SCCC	1991-94	<i>Annual State of the Beaches Report</i>
Sexton et al.	1981	<b>Shoreline stability of Kiawah Island, October 1975 through July 1981</b>
Stapor & Matthews	1976	Mollusc C-14 ages in the interpretation of South Carolina barrier island deposits and depositional histories
Stephen et al.	1975	Beach erosion inventory of Charleston County
Ward	1978	Physical and sedimentological processes in a salt marsh tidal channel
Williams & Kana	1985	<b>Shoreline changes along Kiawah Island, June 1984 — June 1985</b>
Zarillo et al.	1985	<i>An Illustrated History of Tidal Inlet Changes in South Carolina</i>

## Appendix 7.5 Copies of Local Laws and Ordinances

**ARTICLE 16**

**BEACH MANAGEMENT**

**ARTICLE 16**

**BEACH MANAGEMENT<sup>1</sup>**

Chapter	1	Beach Lighting
Chapter	2	Definitions
Chapter	3	Beach Traffic <sup>2</sup>
Chapter	4	Beach and Dune Protection
Chapter	5	Control of Pets <sup>3</sup>
Chapter	6	Critical Habitat Areas
Chapter	7	Threatened and Endangered Species
Chapter	8	Beach and Beach Recreation Area Regulations <sup>4</sup>

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<sup>1</sup> Amended by Ordinance 2001-2. Effective 3-13-01.

<sup>2</sup> Amended by Ordinance 2006-9. Effective 12-05-06.

<sup>3</sup> Amended by Ordinance 2009-6. Effective 9-1-09.

<sup>4</sup> Amended by Ordinance 2008-01. Effective 5-6-08.



**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 1**

**BEACH LIGHTING**

Section	16-101	Need for Beach Lighting
Section	16-102	Definitions
Section	16-103	New Development
Section	16-104	Exemptions for New Development
Section	16-105	Existing Development
Section	16-106	Community Owned Lighting

ARTICLE 16

BEACH MANAGEMENT

CHAPTER 1

BEACH LIGHTING

Section 16-101      Need for Beach Lighting Regulations

The purpose of this regulation is to protect sea turtles which nest along the beaches of Kiawah Island, by safeguarding the hatchlings from sources of artificial light.

Section 16-102      Definitions

For the purpose of this Chapter, the following terms shall have the meanings set forth below:

artificial light: Any source of light emanating from a manmade device, including but not limited to, incandescent, mercury vapor, metal halide, or sodium lamps, flashlights, spotlights, street lights, vehicular lights, construction or security lights.

beach: That area of unconsolidated material that extends landward from the mean low water line to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation (usually the effective limit of storm waves).

floodlight: Reflector type light fixture which is attached directly to a building and which is unshielded.

low profile luminaire: Light fixture set on a base which raises the source of the light no higher than forty-eight (48) inches off the ground, and designed in such a way that light is directed downward from a hooded light source.

new development: Shall include new construction and remodeling of existing structures when such remodeling includes alteration of exterior lighting.

person: Any individual, firm, association, joint venture, partnership, estate, trust, syndicate, fiduciary, corporation, group or unit of federal, state, county or municipal government.

pole lighting: Light fixture set on a base or pole which raises the source of the light higher than forty-eight (48) inches off the ground.

solar screen: Screens which are fixed installations and permanently project shade over the entire glass area of the window. The screens must be installed outside of the glass and must:

1. Have a shading coefficient of .45 or less, and
2. Carry a minimum five-year warranty, and
3. Must have performance claims supported by approved testing procedures and documentation.

tinted or filmed glass: Window glass which has been covered with window tint or film such that the material has:

1. A shading coefficient of .45 or less, and
2. A minimum five-year warranty, and
3. Adhesive as an integral part, and
4. Performance claims supported by approved testing procedures and documentation.

shading coefficient: A coefficient expressing that percentage of the incident radiation which passes through the window as heat.

**Section 16-103 New Development**

It is the policy of the Kiawah Island Town Council that no artificial light associated with new development within the 40-year setback zone illuminate any area of the beaches of Kiawah Island. To meet this intent, building and electrical plans for construction of single family or multi-family dwellings, commercial or other structures including electrical plans associated with parking lots, dune walkovers, or other outdoor lighting for real property (if lighting associated with such construction or development can be seen from the beach), shall be in compliance with the following:

- A. Floodlights shall be prohibited. Wall mounted light fixtures shall be fitted with hoods so that no light illuminates the beach.
- B. Pole lighting shall be shielded in such a way that light will be contained within an arc of three (3) to seventy-three (73) degrees on the seaward side of the pole. Outdoor lighting shall be held to the minimum necessary for security and convenience.
- C. Low profile luminaries shall be used in parking lots

and such lighting shall be positioned so that no light illuminates the beach.

- D. Dune walkovers shall utilize low profile shielded luminaries.
- E. Lights on balconies shall be fitted with hoods so that lights will not illuminate the beach.
- F. Tinted or filmed glass shall be used in windows facing the ocean above the first floor or multi-story structures. Shade screens can be substituted for this requirement.
- G. Temporary security lights at construction sites shall not be mounted more than fifteen (15) feet above the ground. Illumination from the lights shall not spread beyond the boundary of the property being developed, and in no case shall those lights illuminate the beach.

**Section 16-104 Exemptions for New Development**

The provisions of Section 16-103 of this Article shall not apply to any structure for which a building permit has been issued by the Town of Kiawah Island, prior to the effective date of Ordinance 91-4 (i.e., August 15, 1991), which preceded this Article.

**Section 16-105 Existing Development**

It is the policy of the Town of Kiawah Island Town Council that no artificial light illuminate any area of the beaches of Kiawah Island. To meet this intent, lighting of existing structures within the 40-year setback zone which can be seen from the beach shall be in compliance with the following within six (6) months of the effective date of this Article.

- A. Lights illuminating buildings or associated grounds for decorative or recreational purposes shall be shielded or screened such that they are not visible from the beach, or turned off after 9:00 p.m. during the period of May 15 to October 31, of each year.
- B. Lights illuminating dune crosswalks of any area oceanward of the dune line shall be turned off after 9:00 p.m. during the period of May 15 to October 31, of each year.

- C. Security lighting shall be permitted throughout the night so long as low profile luminaries are used and screened in such a way that those lights do not illuminate the beach.
- D. Window treatments in windows facing the ocean above the first floor of multi-story structures are required so that interior lights do not illuminate the beach. The use of black-out draperies or shade screens are preferred. The addition of tint or film to windows or awnings is also encouraged, as is turning off unnecessary lights if the light illuminates the beach.

**Section 16-106 Community Owned Lighting**

Street lights and lighting at parks and other publicly owned beach access areas within the 40-year setback zone shall be subject to the following:

- A. Whenever possible, street lights shall be located so that the bulk of their illumination will travel away from the beach. These lights shall be equipped with shades or shields that will prevent backlighting and render them not visible from the beach.
- B. Lights at parks or other public beach access points shall be shielded or shaded or shall not be utilized during the period May 15 to October 31, of each year.

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 2**

**DEFINITIONS**

Section 16-201 Definitions

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 2**

**DEFINITIONS**

**Section 16-201 Definitions**

- A. OCRM - the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resource Management
- B. Beaches - those lands subject to periodic inundation by tidal and wave action so that no nonlittoral vegetation is established

For the purposes of this Chapter and all other Chapters and Sections set forth herein, the following terms, phrases, words and their derivation shall have the meaning given herein, as applied to Kiawah Island:

Beach shall mean those areas including the waters of the Atlantic Ocean (1) from the mean low water mark one mile out, (2) the area between the mean low water mark and the mean high water mark from Captain Sam's Inlet in the West to the Northernmost portion of Little Bear Island in the East, and, (3) the area between the mean high water mark landward to include the baseline and the landward OCRM setback line beyond the baseline on Kiawah Island.

C. Active Beach - the area seaward of the escarpment or the first line of stable natural vegetation, whichever first occurs, measured from the ocean landward

D. Baselines:

- (1) Within a standard erosion zone the baseline is established at the location of the crest of the primary oceanfront sand dune in that zone. In a standard erosion zone in which the shoreline has been altered naturally or artificially by the construction of erosion control devices, groins, or other man-made alterations, the baselines must be established by the Department using the best scientific and historical data, as where the crest of the primary oceanfront sand dune for that zone would be located if the shoreline had not been altered.

- (2) Within an unstabilized inlet zone the baseline must be determined by the Department as the most landward point of erosion at anytime during the past forty years, unless the best available scientific and historical data of the inlet and adjacent beaches indicate that the shoreline is unlikely to return to its former position. In collecting and utilizing the best scientific and historical data available for the implementation of the retreat policy, the Department as part of the State Comprehensive Beach Management Plan provided for in this chapter, among other factors, must consider: historical inlet migration, inlet stability, channel and ebb tidal delta changes, the effects of sediment bypassing on shorelines adjacent to the inlets, and the effects of nearby beach restoration projects on inlet sediment budgets.
- E. Setback Line - the line landward of the baseline that is established at a distance which is forty times the average annual erosion rate as determined by historical and other scientific means and adopted by the department in the State Comprehensive Beach Management Plan. However, all setback lines shall be established no less than twenty feet landward of the baseline, even in cases where the shoreline has been stable or has experienced net accretion over the past forty years.
- F. Standard erosion zone - a segment of shoreline which is subject to essentially the same set of coastal processes, has a fairly constant range of profiles and sediment characteristics, and is not influenced directly by tidal inlets or associated inlet shoals
- G. Inlet erosion zone - a segment of shoreline along or adjacent to tidal inlets which is influenced directly by the inlet and its associated shoals
- H. Beach/Dune System - all land from the mean high-water mark of the Atlantic Ocean landward to the 40-year setback line
- I. Beach nourishment - the artificial establishment and periodic renourishment of a beach with sand that is compatible with the existing beach in a way so as to create a dry sand beach at all stages of the tide
- J. Coastal waters - the navigable waters of the United States subject to the ebb and flood of the tide and which are saline waters, shoreward to their mean high-water mark



- K. Coastal zone - all coastal waters and submerged lands seaward to the State's jurisdictional limits and all lands and waters in the counties of the State which contain any one or more of the critical areas. These counties include Charleston.
- L. Critical areas - any of the following (1) coastal waters; (2) tidelands; (3) beaches; (4) beach/dune system which is the area from the mean high-water mark to the setback line
- M. Tidelands - all areas which are at or below mean high tide and coastal wetlands, mudflats, and similar areas that are contiguous or adjacent to coastal waters and are an integral part of the estuarine systems involved. Coastal wetlands include marshes, mudflats, and shallows and means those areas periodically inundated by saline waters whether or not the saline waters reach the area naturally or through artificial water courses and those areas that are normally characterized by the prevalence of saline water vegetation capable of growth and reproduction. Provided, however, nothing in this definition shall apply to wetland areas that are not an integral part of an estuarine system. Further, until such time as the exact geographic extent of this definition can be scientifically determined, the Department shall have the authority to designate its approximate geographic extent.
- N. Department - South Carolina Department of Health and Environmental Control
- O. Mean High Water Mark - the arithmetic mean of the high water heights observed over a specific 19-year Metonic cycle. For stations with shorter series, simultaneous observational comparisons are made with a primary control tide station in order to derive the equivalent of a 19-year value.
- P. Mean Low Water Mark - the arithmetic mean of the low water heights observed over a specific 19-year Metonic cycle. For stations with shorter series, simultaneous observational comparisons are made with a primary control tide station in order to derive the equivalent of a 19-year value.

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 3**

**BEACH TRAFFIC**

Section	16-301	Need for Regulating Traffic on Beaches and Dunes
Section	16-302	Essential Vehicular Traffic <sup>1</sup> <sup>2</sup>
Section	16-303	Emergency Vehicular Beach Access Points
Section	16-304	Wheeled and Pedestrian Traffic on Beaches and Dunes
Section	16-305	Operation of Vehicles on Beaches and Dunes

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<sup>1</sup> Amended by Ordinance 99-2; effective 3/9/99. Amended by Ordinance 2002-4; effective 6/11/02. Amended by Ordinance 2005-5; effective 9/13/05.

<sup>2</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

ARTICLE 16

BEACH MANAGEMENT

CHAPTER 3

BEACH TRAFFIC

Section 16-301 Need for Regulating Traffic on Beaches and Dunes

Kiawah Island beaches and dunes provide a number of important functions. These include:

- storm protection for upland areas
- habitat for a variety of plant and animal species
- nesting habitat for sea turtles
- recreational opportunities for residents and guests

Regulation of wheeled and pedestrian traffic is necessary to protect natural resources and habitats, and to insure the safety of beach visitors.

Section 16-302 Essential Vehicular Traffic<sup>1</sup>

Vehicular traffic on the beach shall generally be discouraged. However, there are certain vehicular uses which the Town deems essential to the health, welfare and safety of residents of and visitors to the Town.

It shall be unlawful for any person to drive any motor vehicle, of any nature or description, on the beaches and dunes of Kiawah Island seaward of the OCRM 40-year setback line, unless such use is specifically allowed as set forth below.

The following uses shall be permitted, provided the vehicles satisfy those restrictions and conditions located elsewhere in this Section and Chapter:

- a. Emergency vehicles;

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<sup>1</sup> Amended by Ordinance 99-2; effective 3/9/99. Amended by Ordinance 2002-4; effective 6/11/02. Amended by Ordinance 2005-5; effective 9/13/05.

- b. Town and other government vehicles;
- c. Vehicles used in the turtle monitoring program;
- d. Vehicles used to conduct Town approved beach surveys;
- e. Vehicles used in conjunction with Town contracts, concessions or franchise agreements;
- f. Kiawah Island Community Association security and maintenance vehicles;
- g. Kiawah Development Partners vehicles solely for the purpose of inspecting and maintaining its beachfront properties;
- h. Vehicles used in conjunction with surf fishing and other recreational activities east of Ghost Crab Run (Ocean Course) shall generally be allowed from September 1st through May 15th each year; provided, however, the Town Administrator may, at his discretion, alter the dates and/or temporarily suspend the privilege if doing so is in the best interests of the Town. Vehicles used for this purpose must enter the beach via Ghost Crab Run vehicular access point, which is seaward of the Ocean Course Clubhouse or other such entry as may be designated. A Town permit shall be required; and,
- i. Other vehicle uses deemed essential by the Town, as permitted by the Town pursuant to administrative regulations promulgated by the Town.

**Section 16-303 Emergency Vehicular Beach Access Points<sup>1</sup>**

Emergency vehicular beach access points are hereby defined as those certain access points identified below which shall be limited to vehicular use as set forth in Section 16-302.

Vehicular access onto Kiawah's beaches shall be restricted to the following designated emergency vehicular beach access points:

- a. Ocean Marsh Road emergency vehicular access point adjacent to the Atlantic Ocean at Lots 218 and 219, off Ocean Marsh Road and Governors Drive. This emergency access point was granted pursuant to the South Carolina Coastal Council permit No. CC-93-056 on

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

April 20th, 1993.

- b. Eugenia Avenue emergency vehicular access point adjacent to the Atlantic Ocean between Lots 29 and 31, off Eugenia Avenue. This emergency access point was granted pursuant to the South Carolina Coastal Council permit No. CC-90-167 on July 25th, 1990.
- c. Ghost Crab Run emergency vehicular access point adjacent to the Atlantic Ocean near and in front of the Ocean Course Club House. This emergency access point has been in continuous use for decades and did not require a South Carolina Coastal Council permit. This emergency vehicular access point more fully appears on an undated plat prepared for Kiawah Beach Company by Sea Pines Plantation Company Engineering Group, a copy of which is on file in Town Hall.
- d. Ocean Marsh Road emergency vehicular access point adjacent to the Atlantic Ocean at Lot 225, off Ocean Marsh Road. This emergency access point was granted pursuant to the South Carolina Coastal Council permit No. CC-93-032 on April 20, 1993.
- e. Beachwalker Drive emergency vehicular access point adjacent to the Atlantic Ocean at Beachwalker County Park, off Beachwalker Drive. This emergency access point was granted pursuant to OCRM permit No. 97-171-H in 1997.
- f. The Sanctuary emergency vehicular access point is adjacent to the Atlantic Ocean near and to the west of The Sanctuary Hotel. This emergency access point was granted pursuant to OCRM permit No. 05-070-E on May 18, 2005.

**Section 16-304      Wheeled and Pedestrian Traffic on Beaches and Dunes**

Wheeled vehicles traveling through dune areas seaward of the OCRM 40-year setback line to the beach shall be restricted to the designated emergency vehicular beach access points. Vehicular traffic onto and off the beach through other areas shall be prohibited. The placement and/or storage of sailboats or trailers on the primary dunes, or dunes landward thereof, is expressly prohibited.

Pedestrians shall not walk through dunes areas seaward of the OCRM 40-year setback line, unless on official business. Access

to the beach is restricted to pedestrian access points at community dune walkovers or private dune walkovers, or emergency vehicular accesses.

The retrieving and launching of sailboats (whether trailered or not) shall be limited to the emergency vehicular access points. No motor vehicles shall be allowed beyond these access points unless specifically provided for elsewhere herein. The sailboat (whether trailered or not) shall be manually retrieved or launched, provided that electric or manual winches may be used for retrieving and launching.

**Section 16-305 Operation of Vehicles on Beaches and Dunes**

Vehicles using the beach shall be operated in such a manner that pedestrians and other beachgoers are not endangered or harmed. The maximum permissible speed limit on the beach shall be twenty (20) miles per hour. Further, vehicles shall be driven on the wet sand beach and shall not travel on the dry sand or upper beach; vehicles shall not travel into or otherwise disturb nesting or designated critical habitat areas.

Vehicles traveling through dune areas to the beach shall be restricted to designated emergency vehicular beach access points. Travel onto and off the beach through other areas shall be prohibited.

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 4**

**BEACH AND DUNE PROTECTION**

Section	16-401	Importance of Beaches and Dunes
Section	16-402	Erosion Control Strategies for Kiawah Island <sup>1</sup>
Section	16-403	Dune Protection
Section	16-404	Dune Restoration and Revegetation
Section	16-405	Funding for Beach and Dune Restoration Projects <sup>2</sup>
Section	16-406	Dune Walkovers <sup>3</sup>
Section	16-407	Destruction of Sea Oat or Venus Flytrap Plant
Section	16-408	Discharge on the Beach Prohibited <sup>4</sup>

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

<sup>2</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

<sup>3</sup> Created by Ordinance 2000-3; effective 6/27/00. Amended by Ordinance 2000-9; effective 1-9-01.

<sup>4</sup> Created by Ordinance 2006-9. Effective 12-05-2006.

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 4**

**BEACH AND DUNE PROTECTION**

**Section 16-401 Importance of Beaches and Dunes**

Beaches and dunes along Kiawah Island provide protection against storm waves and tides, provide habitat for a variety of plant and animal species, and offer exceptional recreational opportunities. The Town of Kiawah Island has determined that the protection and restoration of beaches and dunes is essential to the quality of life on Kiawah Island.

**Section 16-402 Erosion Control Strategies for Kiawah Island<sup>1</sup>**

Given the natural setting that exists along the beaches of Kiawah Island, the Town will encourage erosion control strategies that work in concert with local coastal processes, and will discourage erosion control strategies that harden the shoreline. The Town of Kiawah Island declares that preferred erosion control strategies for the protection of habitable and other structures along the ocean shoreline will consist of:

dune restoration and revegetation

beach nourishment using approved borrow sources

sand bagging (under emergency conditions)

All erosion control efforts shall comply with the requirements set forth in Section 1-6 of the updated Town of Kiawah Island

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.



Local Comprehensive Beach Management Plan, the provisions of which are adopted by reference as part of this Chapter.

The Town must approve, in advance, all erosion control activities along Kiawah Island, including any that use the beaches, dunes or adjacent tidal inlets for borrowing, transportation or placement of sand. The Town must approve any future inlet relocation projects at Captain Sam's Inlet.

**Section 16-403 Dune Protection<sup>1</sup>**

The Town of Kiawah Island recognizes the important protective and ecological functions that a healthy dune system provides. The Town also recognizes that the dune system along the oceanfront must be carefully managed to insure these important functions are not lost. Hence, any activity, construction or alteration of sand dunes seaward of the 40-year setback line must be approved, in advance, by the OCRM and the Town. Section 1-6 of the updated Town of Kiawah Island Local Comprehensive Beach Management Plan lists specific policies governing activities related to dune alteration, destruction, restoration and revegetation. These policies are adopted by reference as part of this chapter.

**Section 16-404 Dune Restoration and Revegetation<sup>2</sup>**

Dunes may sustain damage due to natural causes or because of man's activities. In both cases, damaged areas should be restored and revegetated using methods and materials approved by the OCRM and the Town.

Section 1-6 and Appendix B of the updated Town of Kiawah Island Local Comprehensive Beach Management Plan list specific dune restoration, dune revegetation and sand fence placement guidelines. These guidelines are adopted by reference as part of this Chapter and should be followed during any dune repair or construction projects.

**Section 16-405 Funding for Beach and Dune Restoration Projects<sup>3</sup>**

The Town maintains Accommodations Tax and Hospitality Funds that

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

<sup>2</sup> Amended by Ordinance 2006-9. Effective 12-05-2006

<sup>3</sup> Amended by Ordinance 2006-9. Effective 12-05-2006

must be spent exclusively toward projects such as tourism and cultural facilities, beach access, roads providing access to tourist destinations, etc. All expenditures from the Fund must be approved by the Town Council, in accordance with procedures contained in other articles of the Municipal Code and the State Code.

Within the Fund, the Town of Kiawah may include a budgeted Beach Restoration line item. Money in this line item can be used to fund projects that:

- Enhance or restore the beach and dune system
- Enhance or increase access to the beach
- Improve the condition or safety of the beach

**Section 16-406 Beach Walkovers**<sup>1 2</sup>

- (A) It is unlawful for any property owner to knowingly allow a dune walkover structure that extends more than ten (10) feet onto the active beach to exist sixty days from the date said property owner receives written notice from the Town requesting that the property owner remove and/or modify said dune walkover. The notice shall be sent by certified mail return receipt requested. The Town Administrator, however, may extend the sixty day time frame upon written request by the property owner.
- (B) It is unlawful for any property owner whose dune walkover structure terminates landward of a damaged primary dune to knowingly not extend said structure, in compliance with OCRM guidelines and the updated Town of Kiawah Island Local Comprehensive Beach Management Plan, sixty days from the date said property owner receives written notice from the Town requesting that the property owner extend and/or modify said dune walkover. The notice shall be sent by certified mail return receipt requested. The Town

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<sup>1</sup> Created by Ordinance 2000-3; effective 6/27/00. Amended by Ordinance 2000-9; effective 1-9-01.

<sup>2</sup> Amended by Ordinance 2006-9. Effective 12-5-06.

Administrator, however, may extend the sixty day time frame upon written request by the property owner.

- (C) Should said property owner fail to modify their dune walkover after receiving sixty days written notice or after the expiration of any extension granted by the Town Administrator, the Town of Kiawah Island, South Carolina, shall be authorized to remove/extend and/or modify said structure, and file a real property lien against said property owner's property for the costs associated with such modification, including reasonable attorney's fees.
- (D) The following definition shall be used in administering this Section:
1. Active Beach: the areas seaward of the escarpment or the first line of the stable natural vegetation, whichever first occurs, measured from the ocean landward.

**Section 16-407 Destruction of Sea Oat or Venus Flytrap Plant**

It shall be unlawful for any person to cut, collect, break or otherwise destroy sea oat plants, Venus-flytrap plants or any part thereof on public property or on private property without the owner's consent. Any person violating the provisions of this section shall be guilty of a misdemeanor and upon conviction shall be fined not more than Five Hundred (\$500.00) Dollars or imprisoned not more than thirty (30) days. Each violation shall constitute a separate offense. See also Section 15-203 of this Code. (Section 16-11-590, S.C. Code of Laws, 1976).

**Section 16-408 Discharge on the Beach Prohibited<sup>1</sup>**

Outfalls or other means of direct discharge onto the beach are prohibited. In the event that erosion of dune areas takes place

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<sup>1</sup>Created by Ordinance 2006-9. Effective 12-5-06.

and the potential for direct discharge of stormwater, pool overflow, or golf course runoff to the beach increases, developers and property owners are required to redirect any potential discharges away from the beach. The Town shall work in conjunction with all affected groups to restore and maintain natural dune areas along the shoreline as a means of reducing or eliminating the potential for direct discharge to the beach. However, property owners should not rely only on the Town's dune program to control discharge.

Irrigation and runoff from upland development and golf courses to dune areas shall be controlled so that non-native vegetation does not displace native grasses and ground covers.

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 5**

**CONTROL OF PETS**

Section	16-501	Need for Controlling Pets on Beaches and Dunes
Section	16-502	Restraint on the Beach and Dunes <sup>1</sup>

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<sup>1</sup> Amended by Ordinance 2009-6. Effective 9-1-09.

ARTICLE 16

BEACH MANAGEMENT

CHAPTER 5

CONTROL OF PETS

Section 16-501      Need for Controlling Pets on Beaches and Dunes

Kiawah Island beaches and dunes provide habitat for a variety of plant and animal species that could be harmed by free-roaming pets. Beaches also provide recreational opportunities for property owners and guests. Regulation of pets is necessary to protect natural resources and habitats, and to insure that property owners and guests, including small children, utilizing the beach for recreational purposes are safe and not threatened by free-roaming pets.

Section 16-502      Restraint on the Beach and Dunes<sup>12</sup>

- A. Owners may unleash their pets year round (in those areas designated as "Dog Use Areas" on the attached "Map of Kiawah Island showing proposed location of critical habitat areas and pet restraint requirements" which is attached hereto and made part hereof), if the pets are controlled by voice command.
- B. At no time shall pets go into the dunes or pose a threat to pedestrians, cyclists, or other pets. At no time shall pets be permitted to disturb marked turtle nests or interfere with shorebird nesting in the areas posted.
- C. No person shall permit any excrement from any animal under that person's control to remain on the beach, but shall dispose of same in a sanitary manner.

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<sup>1</sup> Amended by Ordinance 99-2. Effective 3/9/99.

<sup>2</sup> Amended by Ordinance 2009-6. Effective 9-1-09.

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 6**

**CRITICAL HABITAT AREAS**

Section	16-601	Importance of Critical Habitat Areas
Section	16-602	Designation of Critical Habitat Areas <sup>1</sup>
Section	16-603	Town Assistance for Area Identification <sup>2</sup>
Section	16-604	Restriction of Pedestrian, Vehicular and Other <sup>3</sup>
		Traffic in Critical Habitat Areas
Section	16-605	Signage

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

<sup>2</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

<sup>3</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

**ARTICLE 16**

**BEACH MANAGEMENT**

**CHAPTER 6**

**CRITICAL HABITAT AREAS**

**Section 16-601 Importance of Critical Habitat Areas**

Kiawah Island beaches and dunes provide habitat for a variety of plant and animal species, including species that may be designated as threatened, endangered or otherwise protected. Kiawah Island beaches also provide important nesting habitat for sea turtles. The State of South Carolina and the Town of Kiawah Island have determined that the protection of natural resources and critical habitats is of significant public interest.

**Section 16-602 Designation of Critical Habitat Areas<sup>1</sup>**

Critical Habitat Areas are defined as those areas identified by the South Carolina Department of Natural Resources (SCDNR), United States Fish and Wildlife Service (USFWS), and other natural resource agencies as providing active nesting areas, active areas of critical food sources, or specific habitat areas for endangered or threatened species.

When critical habitat areas are identified, all sections of this Chapter shall apply.

**Section 16-603 Town Assistance for Area Identification<sup>2</sup>**

The Town of Kiawah Island, or its designated representative, shall assist the SCDNR, USFWS, and other natural resource agencies in the identification and mapping of critical habitat areas. This shall include monitoring usage of critical habitat areas and making recommendations to the appropriate agencies as to when the areas can be unlisted.

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

<sup>2</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.



**Section 16-604      Restriction of Pedestrian, Vehicular and <sup>1</sup>  
Other Traffic in Critical Habitat Areas**

When critical habitat areas are designated, the Town of Kiawah Island shall restrict pedestrian, vehicular and other traffic in the critical habitat areas, as recommended by the SCDNR, USFWS, and other natural resource agencies. This may include a partial or total restriction on all traffic in those areas. Pets in critical habitat areas are subject to the provisions stated elsewhere herein.

**Section 16-605      Signage**

When critical habitat areas are designated, the Town of Kiawah Island shall post appropriate signs around the habitat areas. Signs shall be one of two types, as listed below:

- a. Critical Habitat Area - Leash Law in effect beyond this point
- b. Critical Habitat Area - No trespassing beyond this point from (insert date here) - Leash Law in effect

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

ARTICLE 16

BEACH MANAGEMENT

CHAPTER 7

THREATENED AND ENDANGERED SPECIES

Section	16-701	Identification of Protected Species <sup>1</sup>
Section	16-702	Protection of Threatened and Endangered Species

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.

ARTICLE 16

BEACH MANAGEMENT

CHAPTER 7

THREATENED AND ENDANGERED SPECIES

Section 16-701 Identification of Protected Species<sup>1</sup>

Section 4.1 of the Updated Town of Kiawah Island Local Comprehensive Beach Management Plan indicates that several species in South Carolina have been classified as threatened, endangered or of special concern by state and federal agencies. Thus far, census and management efforts on Kiawah Island have concentrated on the Loggerhead turtle and Piping Plover. In order to protect threatened and endangered species and species of special concern, the Town of Kiawah Island may assist the South Carolina Department of Natural Resources, United States Fish and Wildlife Service, and other natural resource agencies with identification and mapping of important habitat areas along the Kiawah Island shoreline.

Section 16-702 Protection of Threatened and Endangered Species

The Town of Kiawah Island has adopted several Chapters of the Municipal Code that will serve to protect threatened and endangered species. These include: beach lighting regulations, beach traffic regulations, erosion control regulations, a leash law and regulations to protect critical habitat areas.

In addition to the regulations contained in these Chapters of the Municipal Code, the Town of Kiawah Island shall encourage the completion of all erosion control, inlet management and dune restoration activities during the period November 1 to May 14. In cases where such activities must take place between May 15 and October 31, the Town shall work closely with property owners and natural resource agencies to insure adverse impacts on threatened and endangered species are eliminated or reduced to the extent possible.

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<sup>1</sup> Amended by Ordinance 2006-9. Effective 12-05-2006.



ARTICLE 16

BEACH MANAGEMENT

CHAPTER 8

BEACH AND BEACH RECREATION AREA REGULATIONS

Section	16-801	Littering on the Beach/Dune Area Prohibited
Section	16-802	Negligent Operation of Vessels
Section	16-803	Launching or Retrieving of Vessels Restricted
Section	16-804	Para-Sailing Prohibited
Section	16-805	Overnight Storage of Beach Equipment Prohibited
Section	16-806	Public Nudity Prohibited
Section	16-807	Limitations on Public Disrobing
Section	16-808	Overnight Sleeping on the Beach Prohibited
Section	16-809	Reserved
Section	16-810	The Wildlife and Marineline
Section	16-811	Fires on the Beach Restricted
Section	16-812	Fireworks on the Beach Restricted
Section	16-813	Breaching of the Peace Prohibited
Section	16-814	Commercial Activities Restricted
Section	16-815	Power to Recall Swimmers
Section	16-816	Fines and Penalties
Section	16-817	Organized Functions and Special Events Restricted
Section	16-818	Glass Containers and Products Prohibited <sup>1</sup>

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<sup>1</sup> Created by Ordinance 2008-1. Effective 5-6-2008.

ARTICLE 16

BEACH MANAGEMENT

CHAPTER 8

BEACH AND BEACH RECREATION AREA REGULATIONS

Section 16-801 Littering on the Beach/Dune Area Prohibited

It shall be unlawful for any person to throw or leave any trash, rubbish or other debris of any kind whatsoever on the beach/dune area seaward of the 40-year OCRM setback line unless such trash, rubbish or other debris is deposited in a receptacle placed on the beach seaward of the 40-year OCRM setback line for that purpose.

Section 16-802 Negligent Operation of Vessels

- (a) "Vessel" shall mean every description of watercraft, other than a seaplane on the water, used or capable of being used as a means of transportation on the water.
- (b) No person may use any motor boat, boat or vessel or manipulate any water skis, aquaplane, surfboard or similar device in a negligent manner so as to endanger the life, limb, or property of any person.
- (c) No person may use any motor boat, boat or vessel, or use any water skis, aquaplane, surfboard or similar device while under the influence of alcohol, any narcotic drug, barbiturate, marijuana, or hallucinogen.

Section 16-803 Launching or Retrieving of Vessels Restricted

- (a) No person shall launch or retrieve a vessel, excluding sailboats, surfboards, rafts, inner tubes or similar devices, anywhere on the beach seaward of the mean high water mark, except in case of emergency.
- (b) No person shall propel or cause to move any vessel, except sailboats, surfboards, rafts, inner tubes or similar devices from the water onto the sand beach above mean low water anywhere on the beach seaward of the mean high water mark, except in case of emergency.

**Section 16-804 Para-Sailing Prohibited**

No para-sailing operation shall be permitted within the jurisdiction of the Town.

**Section 16-805 Overnight Storage of Beach Equipment Prohibited**

Unless the Town grants special permission, it shall be unlawful for any person to leave overnight on the beach seaward of the OCRM 40-year setback line, including under dune walkovers, items of any kind whatsoever. These items include, but are not limited to, tents, tent frames, beach chairs, beach umbrellas, clothing and toys.

**Section 16-806 Public Nudity Prohibited**

It shall be unlawful for any person to appear or travel on the beach seaward of the mean high water mark in a state of nudity. A person shall be in a state of nudity when his or her clothing or absence of clothing uncovers or exposes to public view his or her genitals, pubic area, or the nipple or any portion of the areola of the human female breast. This shall not apply to persons younger than thirteen (13) years of age.

**Section 16-807 Limitations on Public Disrobing**

No person shall disrobe, undress, dress or change his or her clothes in public view such that he or she may be found to be in a state of public nudity.

**Section 16-808 Overnight Sleeping on the Beach Prohibited**

No person shall sleep on the beach seaward of the OCRM 40-year setback line between the hours of 10:00 p.m. and 8:00 a.m.

**Section 16-809 Reserved**

**Section 16-810 The Wildlife and Marineline**

In addition to any other applicable State or Federal laws, no person shall physically harm, harass or otherwise disturb any sea turtle (including eggs and hatchlings), marine mammals or any sea bird (including eggs and young). Beached or stranded sea turtles, whales or dolphins, shall be reported immediately to the Town.

**Section 16-811 Fires on the Beach Restricted**

No person shall build or start a fire on the beach except as permitted by the Town. (See Section 15-101 of this Code for further regulations regarding this activity.)

**Section 16-812 Fireworks on the Beach Restricted**

No person shall discharge fireworks on the beach seaward of the OCRM 40-year setback line, except by permit from the Town. (See Section 15-209 of this Code for further regulations regarding this activity.)

**Section 16-813 Breaching of the Peace Prohibited**

No person shall appear on the beach seaward of the OCRM 40-year setback line in a grossly intoxicated condition or otherwise conduct himself in a disorderly or boisterous manner or use obscene or profane language on the beach seaward of OCRM 40-year setback line.

**Section 16-814 Commercial Activities Restricted**

No person shall sell or offer for sale any goods or merchandise, or solicit any trade or business on the beach seaward of the OCRM 40-year setback line, except under license from the Town.

**Section 16-815 Power to Recall Swimmers**

The duly appointed Code Enforcement Officers of the Town shall have the power and authority to recall from the waters adjoining the beach any person who, in their discretion, shall be in danger of drowning or becoming imperiled, or who may imperil the safety of others, or when the condition of wind, water, weather or any hazard, including the physical and mental condition of the person in the water, shall be such as to constitute a danger to the health, life, or safety of that person, rescue personnel or other persons within the waters.

**Section 16-816 Fines and Penalties**

Unless a different penalty is specified, any person who violates a provision of this title is guilty of a misdemeanor and, upon conviction, must be fined not less than twenty-five dollars



(\$25.00) nor more than two hundred dollars (\$200.00) or imprisoned for not less than ten (10) days nor more than thirty (30) days. (Section 50-1-130 of the SC Code of Laws, 1976).

**Section 16-817 Organized Functions and Special Events Restricted**

Organized functions and special events shall be held on the beach seaward of the OCRM 40-year setback line only as permitted by the Town pursuant to administrative regulations as promulgated by the Town.

**Section 16-818 Glass Containers and Products Prohibited<sup>1</sup>**

It shall be unlawful for any person to use glass containers of any kind on the beach of Kiawah Island. Glass containers shall include but not be limited to glass bottles, drinking glasses, etc.; provided however, this prohibition does not include glass baby bottles or glass baby food jars if disposed of properly. Beach shall include that area as defined in 16-102 of the Municipal Code and extend into the waters of the Atlantic Ocean for a distance of 100 yards; provided, however, this prohibition shall not apply to persons operating boats in the area of waters described herein. Penalties for violation of this Section shall be as provided for in Sections 15-501 and 15-502 of the Municipal Code.

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<sup>1</sup> Created by Ordinance 2008-1. Effective 5-6-08.



# Town of Kiawah Island Emergency Preparedness Plan



June 2011



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**The Town of Kiawah Island has many brochures and guides  
 that will show you how to be better prepared for a disaster.  
 Please contact Town Hall for more information at 843-768-9166  
 or visit our website at [www.kiawahisland.org](http://www.kiawahisland.org)**

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## INTRODUCTION

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Kiawah Island is a barrier island and, as such, is particularly susceptible to damage from severe weather. Natural disasters like hurricanes, floods, tornadoes and earthquakes are potential hazards that need to be addressed not only by organizations like the Town and KICA, but also by individual residents and property owners.

The purpose of this plan is to keep residents and organizations on Kiawah Island informed of conditions which may present a threat to life and/or property, and to insure that all information, recommendations, and/or orders coming from national, state, or local authorities are passed on to all residents and organizations.

## OBTAINING INFORMATION

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All property owners, residents and guests are urged to monitor the Weather Channel, local television and radio stations, and communications from the Town and the Community Association. It is vital to be informed of potential dangers in order to best prepare to protect the persons and property of all concerned.

Additional important sources of information during a hurricane or other major event will be:

- **Charleston County Emergency Operations Center:** A telephone hotline will be established and publicized. Also, the County's website is constantly updated during emergencies. [www.charlestoncounty.org](http://www.charlestoncounty.org)
- **SC Emergency Management Division:** The SCEMD website will also post critical information and press releases. [www.scemd.org](http://www.scemd.org)
- **National Hurricane Center:** This agency will provide regular updates and predictions of storm position. [www.nhc.noaa.gov](http://www.nhc.noaa.gov)
- **The Town of Kiawah Island** plans to use several methods to make sure information, especially concerning evacuation and re-entry, gets to property owners and commercial interest in a timely manner. The Town's emergency hotline is (877) 288-3088
- **Town Website:** Information on emergency preparedness is located on the website year round. Links to important websites, such as those listed above, will be provided. Local condition updates by Town staff will be dependent on availability of phone lines, electricity and personnel. [www.kiawahisland.org](http://www.kiawahisland.org)
- **CodeRed:** This telephone-based notification system will be activated to provide information about evacuation and other important messages.

CodeRed will also be utilized after an event to provide information about cleanup activities and re-entry. You need to be sure your telephone numbers (including cellphones, if appropriate) are contained in the Town's CodeRed file. Visit the Town's website ([www.kiawahisland.org](http://www.kiawahisland.org)) or call Town Hall to add additional/alternate phone numbers to the CodeRed system. CodeRed also has the capability to send emergency notifications via text message and email.

- **Radio:** The following radio stations are key participants in the Emergency Alert System and the SC Educational Radio network. They broadcast emergency information throughout the state, as do numerous other radio stations.

**EAS Stations Radio**

WCAW.....680 AM  
 WVAF .....99.9 FM  
 WCHS .....580 AM  
 WKWS.....96.1 FM  
 WQBE .....950 AM or 97.5 FM  
 WVSR .....102.7 FM  
 WSCW.....1410 AM  
 WKAZ .....107.3 FM

**NPR News Stations**

WRJA-FM 88.1/Sumter  
 WNSC-FM 88.9/Rock Hill  
 WLJK-FM 89.1/Aiken  
 WJWJ-FM 89.9/Beaufort  
 WHMC-FM 90.1/Conway  
 WTCB 106.7 FM WEPR 90.1 FM (G'ville/Spart)  
 WLTR 91.3 FM WLJK 89.1 FM (Aiken)

- **Other Sources:** The information provided in the following websites will be very useful during emergencies. Note that not all of the listed sites are official government sites and may not be completely up-to-date or accurate.

**Traffic Information**

Department of Public Safety/Traffic  
[www.sctrffic.org](http://www.sctrffic.org)

**Road Closures**

Department of Transportation  
[www.dot.state.sc.us](http://www.dot.state.sc.us)

**Weather**

National Weather Service/Columbia  
[weather.noaa.gov/cae](http://weather.noaa.gov/cae)

**Other Useful Sites**

American Red Cross - Charleston [www.lowcountryredcross.org](http://www.lowcountryredcross.org)  
 S.C. Insurance News Service [www.scinsnews.com](http://www.scinsnews.com)  
 Federal Emergency Management Agency [www.fema.gov](http://www.fema.gov)  
 Ready America [www.ready.gov](http://www.ready.gov)

## HURRICANES AND SEVERE STORMS

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Severe storms can occur at any time and can often turn into something more. If a storm develops over warm Atlantic waters and winds intensify, it can easily become a tropical disturbance, then tropical depression, then tropical storm, and finally - when winds reach 74 mph - a hurricane. Hurricanes most often threaten coastal areas from June 1 to November 30. For our area, the greatest frequency of storms occur from August 15 to October 15, with September being the most likely time for an occurrence.

A hurricane's intensity is measured by the Saffir-Simpson Scale. Actual storm surge, however, will depend coastal configurations and other factors.

**Category 1 - Winds 74-95 MPH** Very dangerous winds will produce some damage

**Category 2 - Winds 96-110 MPH** Extremely dangerous winds will cause extensive damage

**Category 3 - Winds 111-130 MPH** Devastating damage will occur

**Category 4 - Winds 131-155 MPH** Catastrophic damage will occur

**Category 5 - Winds 155+ MPH** Catastrophic damage will occur

Perhaps the most famous hurricane that has effected Kiawah is Hurricane Hugo. This hurricane, which hit Charleston County near McClellanville on September 21, 1989, was identified as a Class 4 storm. Fortunately, it was only a Class 2 storm on Kiawah because the island lay on the south side of the eye of the storm and did not suffer the effects of the storm surge experienced on the north side of the storm. Had Hurricane Hugo not moved slightly north in the last few hours before landfall, the eye would have passed near Edisto Beach, and the storm surge on Kiawah would have been 12 to 16 feet. Hugo was responsible for thirty-five (35) deaths and approximately \$7.2 million in damages.

On September 15, 1999, Hurricane Floyd brushed by SC's coast with sustained winds of 58 mph and gusts up to 85 mph. Floyd dropped 3-5 inches of rain and caused \$10.5 million in damages. Kiawah experience included fallen limbs and trees, some home damage, and beach erosion. A new cut formed at the east end which continues to cause problems with the natural flow of sand down Kiawah's beach.

See **Evacuation Procedures** for more information about how to respond once a hurricane becomes a threat.

**For more information visit: [www.nhc.noaa.gov](http://www.nhc.noaa.gov)**

## FLOODS

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If you own property anywhere on Kiawah Island, then you own property located in a Special Flood Hazard Area that is known to have potential for flooding. Some properties are also located in a "V" zone, which means the property is subject to wave action in addition to rising water. The surrounding rivers (Stono & Kiawah), proximity to the ocean and land elevation contribute to the island's susceptibility to flooding.



Flooding on Kiawah Island may be caused by a number of naturally occurring events including hurricanes, wave washes, tidal surges, and tidal waves. Heavy rains over a short period can overwhelm existing drainage capabilities and prove disastrous at high tide. Floods are extremely dangerous events although not as glamorous as other types of severe weather. They can be every bit as dangerous and damaging to both property and lives.

The Town of Kiawah Island is a participant in the Community Rating System which allows property owners to receive flood insurance discounts. Currently, the Town has a Class 6 rating which allows for a 20% discount of flood premiums. Contact Town Hall for more information about the Community Rating System, the National Flood Insurance Program, how to assess your risk, and how to mitigate injury and property damage.

## TORNADO

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A tornado is defined as a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one mile wide and 50 miles long. Although most frequently associated with Texas and the southern High Plains, tornadoes can accompany tropical storms and hurricanes that move over land. Tornadoes are most common to the right and ahead of the path of the storm center as it come onshore. Tornadoes most commonly occur in Charleston County from March to May.

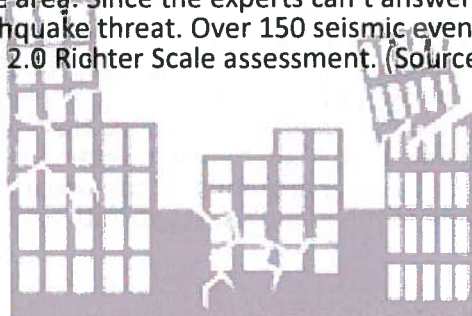
Waterspouts are weak tornadoes that form over warm water and are most common along the Gulf Coast and southeastern states. They have been known to move inland becoming tornadoes.

The safest place to be during a tornado is underground, preferably under something sturdy. Since Kiawah homes do not have a basement or cellar, a small room in the middle of the house - like a bathroom or a closet - is best. The more walls between you and the outside, the better. If possible, it is also recommended that you move to the center of the lowest level of your home, away from windows, and lie flat. If you are in your vehicle, get out and seek a safe structure or lie down in a low area with your hands covering the back of your head and neck. Keep alert for flash floods.

## EARTHQUAKE

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South Carolina and the tri-county area, in particular, has a significant earthquake history. What may elude us is the numerous, almost monthly earthquake activity that frequents this area. No one knows whether these small quakes are a pre-cursor to the so called "Big One," or if this seismic activity is actually releasing the buildup of pressure in the major fault line beneath the area. Since the experts can't answer this question, everyone on the island should be aware of the earthquake threat. Over 150 seismic events have been recorded in the area since 1996, with many exceeding a 2.0 Richter Scale assessment. (Source: South Carolina Seismic Network)



Although there is little one can do to prepare for an earthquake, the rule of thumb is "duck and cover." Duck under a strong table or desk and stay there unless falling debris forces you to move. Cover your head and face to protect them from broken glass and falling debris. **STAY INDOORS UNTIL THE SHAKING STOPS.** Wait for emergency personnel to order an evacuation as it is possible that bridges and roads will be unsafe and/or closed due to structural damage.

The Charleston County Emergency Preparedness Department has comprehensive plans for dealing with this type of disaster. For more information about earthquakes contact Town Hall.

## **FIRE**

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Kiawah Island's summer months are marked with extremely hot temperatures with a heat index often exceeding 100 degrees, drought, and severe thunderstorms. These conditions provide the right environment for fire. Please do not carelessly toss cigarette butts, leave barbeques unattended or shoot fireworks as these actions can lead to fire. It is for this reason that the Town prohibits fireworks (except by special permit), fires on the beach and grilling on decks of multi-family homes. Call 911 immediately to report suspicious smoke or a fire.

## **HAZARDOUS MATERIAL**

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The Charleston region is a rapidly growing international port with many industries and growing businesses. Kiawah is also experiencing rapid growth. Hazardous materials are a constant threat due to the large amounts being transported in and around the area. Incidents occur almost weekly in Charleston County.

Hazardous materials include substances such as flammables, combustibles, compressed gases, poisons, and corrosives. Unidentifiable substances may also be considered hazardous materials. Accidents may result in fire, explosions, radiation dangers, or contamination and toxic fumes. St. John's Fire District personnel have been trained to combat these dangers. Call 911 immediately to report an accident.

## **TERRORISM**

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Terrorism is defined as the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. The attacks of the Murrah Federal Building in Oklahoma City in 1995 and the Pentagon and World Trade Center on September 11, 2001, have proven that the U.S. is as much at risk of terrorism as any other nation.

Terrorists can use a variety of weapons including weapons of mass destruction, high-powered explosive agents, chemicals, biological agents and radioactive material and nuclear weapons. An attack could cause explosions and/or fire, damage to buildings and roadways, physical injuries and death, panic, contamination, and/or evacuation. Much has been done in the Charleston region to prepare for these types of attacks. Local emergency preparedness officials have been involved in drills, hospitals have enhanced security and response measures, water utilities have performed risk assessments and upgraded security, and the Charleston Port has received \$13 million in federal funding to enhance port security and screening methods.

Like earthquakes, terrorist attacks cannot be predicted. Citizens, however, should "prepare for the unexpected" by following general preparedness guidelines including, creating a emergency communications plan, establishing a meeting place, and assembling a disaster supplies kit. You should also be aware of your surroundings and report suspicious activities. Use common sense when reacting to or reporting an incident.



## TOWN EMERGENCY OPERATIONS

The National Weather Service in Charleston will identify all storms which present a real or potential danger to the area and will alert the Charleston County Emergency Preparedness Division (EPD). The EPD will then alert all local jurisdictions, including the Town of Kiawah Island. Town officials will then alert the Kiawah Island Community Association, Kiawah Island Resort, and all others who will be integral to preserving the safety of island residents and visitors.

The Kiawah Emergency Operations Center (EOC) will be set up at Town Hall to coordinate storm related activities and to answer inquiries from residents, visitors, and commercial interests. It will be staffed until the alert is over or evacuation is underway. As much as possible, updated information will be provided and/or posted to the Town website ([www.kiawahisland.org](http://www.kiawahisland.org)).

When appropriate, storm alert leaflets will be distributed to all vehicles passing through the gate by KICA Security. The leaflets will contain helpful evacuation hints as well as a map of the evacuation route to be used during a mandatory evacuation.

The Kiawah Emergency Operations Center will maintain contact with KICA, the resort, the Developer, rental agencies and commercial interests. These entities will be responsible for alerting their own employees and guests and keeping the EOC informed.

### **If a mandatory evacuation order is given, every person on the island is REQUIRED to evacuate.**

The Mayor of the Town of Kiawah Island may declare a State of Emergency before, or after, a hurricane or other disaster. If such is declared, the Mayor becomes vested with the following powers which may be exercised at his discretion:

- to establish a curfew to be effective within the corporate limits;
- to prohibit the sale of gasoline, explosives, dynamite, and/or any other type of inflammable or explosive materials, firearms, or any other materials or supplies or any component parts thereof which could readily be utilized as weapons
- to mobilize and deputize an emergency safety task force;
- to disperse assemblies or congregations of people;
- to suspend issuance of permits;
- to order evacuation of the Town;
- to designate off limit areas;
- to commandeer boats and vehicles; and/or
- to restrict trade/commerce (tourism).



## EVACUATION PROCEDURES

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Evacuation is not something that is ordered without full and careful consideration. Town, County and State officials are, however, charged with maintaining the health, safety, and welfare of the citizens of this community and they will act accordingly. ***It is incumbent on all residents and guests, permanent or temporary, to keep informed about emergency events.***

### Voluntary Evacuation/Relocation

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Based on National Weather Service forecasts and recommendations from the Charleston County EPD, the Mayor/County Council may issue a recommendation to evacuate the island. Once this recommendation is issued the following actions will be taken, as appropriate:

1. CodeRed will be activated.
2. Town website will be updated with pertinent information.
3. KICA Security will begin distributing leaflets to vehicles coming through the gate.

By evacuating early, you will be able to pick your own evacuation route. If you wait for a mandatory evacuation order, you will be told which route to take, you may be stuck in traffic and you may not be able to find accommodations. Vehicles maybe prohibited from crossing bridges due to strong winds. You are strongly encouraged to leave early.

### Mandatory Evacuation

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If, and when, a mandatory evacuation is ordered, the following actions will be taken:

1. KICA Security will ultimately block the incoming gate to all but emergency and official vehicles.
2. Providing its equipment is not being used, the St. John's/Kiawah Island fire personnel will broadcast the evacuation order throughout the island using loud speakers.
3. CodeRed will be activated and the Town website will carry the order. When an evacuation has been determined to be essentially complete, the Kiawah Emergency Operations Center may move to the St. John's Fire District Headquarters (Maybank Highway) or to another location as deemed appropriate.

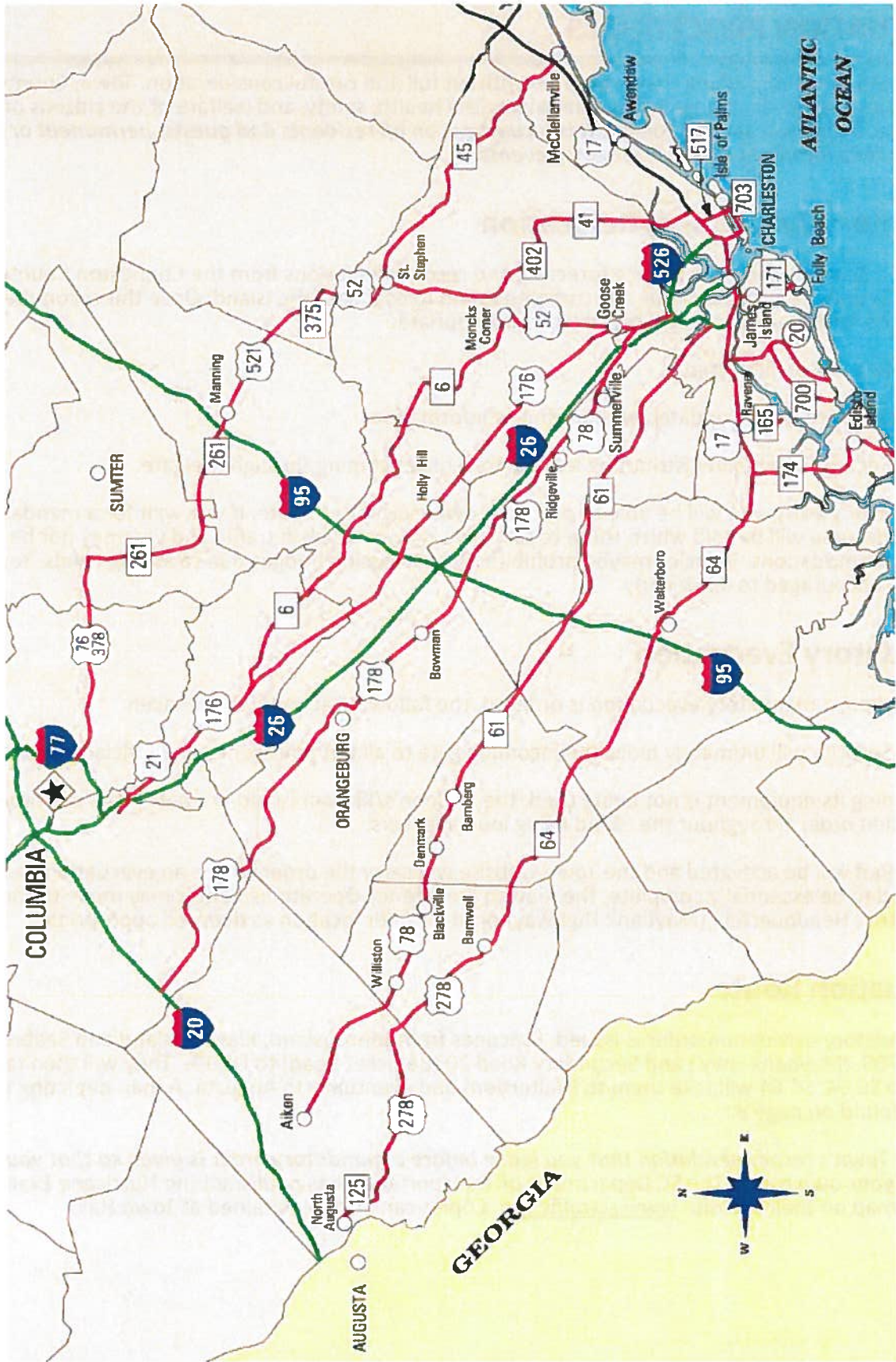
### Evacuation Route

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If a mandatory evacuation order is issued, Evacuees from Johns Island, Kiawah Island and Seabrook will use SC 700 (Maybank Hwy.) and Secondary Road 20 (Bohicket Road) to US 17. They will then take US 17 south to SC 64. SC 64 will take them to Walterboro and eventually to Augusta. A map depicting this route can be found on page 8.

***It is the Town's recommendation that you leave before a mandatory order is given so that you can choose your own route.*** The SC Department of Transportation has published the Hurricane Evacuation Routes map on their website [www.sctraffic.org](http://www.sctraffic.org). Copies can also be obtained at Town Hall.

# EVACUATION MAP



## PERSONAL PREPARATION AND EVACUATION PLANS

The Charleston County Emergency Preparedness Division and Town of Kiawah Island operate under alert levels called Operational Conditions, or OPCONs, during hurricane season. The OPCONs will be used here to provide a general timetable/framework for you to use in preparing for a natural disaster and evacuation.

EMERGENCY OPERATING CONDITION

**OPCON 5**

NORMAL OPERATIONS

**Day-to-day operations to include normal training and exercises.**

### Activities

- Obtain items you will need upon returning from any evacuation and organize an evacuation kit. For suggestions see page 18.
- Be sure to have an ample supply of necessary medications on hand in case obtaining renewal prescriptions becomes a problem.
- Review Town Emergency Preparedness Plan.
- Prepare/review list of potential evacuation destinations (homes of family and friends, hotels, etc.) with phone numbers and directions to have on hand. Prepare/review arrangements for pets.
- Review insurance coverage. HINT: Make an inventory of your belongings; photographs and/or videos of your home, inside and out, can be valuable if you have to file a claim.
- Notify Town Hall if you or someone you know will need special assistance due to physical infirmity or language barrier if an evacuation is ordered.

EMERGENCY OPERATING CONDITION

**OPCON 4**

ALERT - POSSIBLE THREAT

**Possibility of an emergency or disaster situation that may require a partial or full activation of the Charleston County Emergency Operations Center**

### Activities

- Begin preparing your home by securing outdoor furniture (including patio sets, grills, garbage cans, recycling containers, etc.); securing windows and/or doors; reviewing procedures for turning off water, gas, and electricity; etc.
- Begin personal preparations by gathering spending cash, important papers, medications, etc. and by preparing vehicles (fill gas tank, check oil, wiper blades, etc.) HINT: If power is disrupted, you will not be able to pump gas. It is a good idea to fill your tank at every opportunity.
- Arrange for accommodations which you might use for several days. Do not give them up until you know you can return to the island. Don't forget to question the acceptance of pets at hotels and/or the homes of friends and family.
- Review the evacuation route.



**Disaster or emergency situation likely or imminent. Full or partial activation of the Charleston County Emergency Operations Center; activate Charleston County Emergency Operations Plan.**

Activities

- Complete home and personal preparations if not already done so.
- Disinfect a bath tub(s), sink(s), and washing machine with unscented household bleach so that they can be used to store water. This will be helpful if you plan on returning right after the event.
- Evacuate if you wish to choose your own route. Let others know when you left, where you are going and how you can be reached. Don't forget to take your Evacuation Kit.



**Disaster or emergency situation in effect; maximum preparedness level; full activation of the Charleston County Emergency Operations Center.**

Activities

- Fill tub, sink, washing machine with water for use after the event.
- Consider early evacuation. Don't forget to take your Evacuation Kit.



**Disaster or emergency situation in effect; full-fledged emergency response operations on-going; highest state of emergency operations.**

Activities

- Secure your home.
- Shut off water, gas and electricity, IF YOU HAVE TIME.
- EVACUATE. Let others know when you left, where you are going and how you can be reached. Don't forget to take your Evacuation Kit.

## Tips for shutting off utilities

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### Preparing to Shut Off Water

- Locate the shut-off valve for the water line that enters your house.
- Make sure this valve can be completely shut off. Your valve may be rusted open, or it may only partially close. Replace it if necessary.
- Label this valve with a tag for easy identification, and make sure all household members know where it is located.

### Preparing to Shut Off Electricity

- First check for any structure or water damage before turning on the main breaker. If there is damage, have a certified Electrician first check out the electrical system in your home.
- When you leave, turn off the main breaker; do NOT do anything at the meter base!
- When you return, before you turn on the main breaker -, turn off all individual breakers. Then turn on the main, and turn each of the individual ones back on, one at a time, staggered over a period of several minutes.

## BE ADVISED

If a mandatory evacuation is ordered and when that evacuation is essentially completed Kiawah Island Utility and Berkeley Electric may turn off their services. If you have chosen to remain on-island, you may not have power or water until a thorough postdisaster damage assessment has been performed. There will be no medical, fire, rescue or police assistance available on the island. Even after the event, depending on the damage to the island, you may not get assistance for several days.

### DURING THE STORM OR EVENT

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After a mandatory evacuation order is issued, water and electrical utility workers, law enforcement, fire department, EMS and KICA security will leave the island when it is no longer safe to stay. These personnel will use their best efforts to secure the island from trespassers before departing.

### AFTER THE STORM AND RE-ENTRY

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The damage made by a serious event makes it difficult to predict when residents and property owners will be allowed to return to the island. You need to plan accordingly. The condition and safety of the island will be reviewed by County, Town and KICA officials before any property owners will be allowed to return.

Kiawah Island Utility and Berkeley Electric will need time to bring their services back on line. This process can be delayed due to line damage, inaccessibility to infrastructure, flooding, etc. Permission to return does not guarantee that water and power will be available. **DO NOT DRINK THE WATER UNTIL IT IS OFFICIALLY APPROVED.**

### Re-Entry

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Re-entry procedures will vary depending on the severity of the natural disaster but will generally be performed in stages so as to facilitate an orderly return to the Island following an evacuation. The time lapse between Stage 1 to Stage 3 could be hours, days or weeks depending on the severity of the event.

**Stage 1:** Critical needs personnel and Disaster Response Team. Will include Town, KICA, Resort, KDP, KI Utility, Berkeley Electric and other emergency personnel. These entities will coordinate recovery activities. Coordination will continue until the Island has been substantially restored to pre-storm conditions.

**Stage 2:** Damage Assessment Team. Town and KICA representatives, building officials, insurance adjusters, regime and property managers will work to generally assess the damage and will report results to the Town.

**Stage 3:** Once the ALL-CLEAR has been given, residents and property owners will be allowed to return.

#### REMEMBER

**You will be wasting your time and the time of the response team if you attempt to return to the Island before the ALL-CLEAR has been given by the TOWN OF KIAWAH ISLAND OFFICIALS. Check the Town website ([www.kiawahisland.org](http://www.kiawahisland.org)) or call the hotline 1-877-288-3088.**

## Damage Assessments

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After a disaster, members of the Disaster Response Team who are able to return will make visual inspections of houses and report findings to the Emergency Operations Center at Town Hall. The purpose of such inspections is only to identify where obvious major damage, such as caved-in roofs, has occurred, and does not replace a complete inspection of properties by competent personnel. The Town plans to post the results of this visual inspection on the Town's web site ([www.kiawahisland.org](http://www.kiawahisland.org)) if possible. Be patient: gathering this information will be time consuming and dangerous and it may be several days before all areas of the island can be inspected.

Regime managers will be responsible for damage assessments to units under their control.

## All Clear

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Be assured that you will be allowed to return as soon as it is deemed safe to do so. Please wait until you hear the ALL CLEAR from Town of Kiawah Island officials. The Town will issue an official statement to the State newspaper (Columbia, SC), the Post and Courier (Charleston, SC), the Charlotte (NC) Observer, and various local radio stations. Also, the Town will activate CodeRed and post updates on our web site ([www.kiawahisland.org](http://www.kiawahisland.org)) as soon as it is possible.

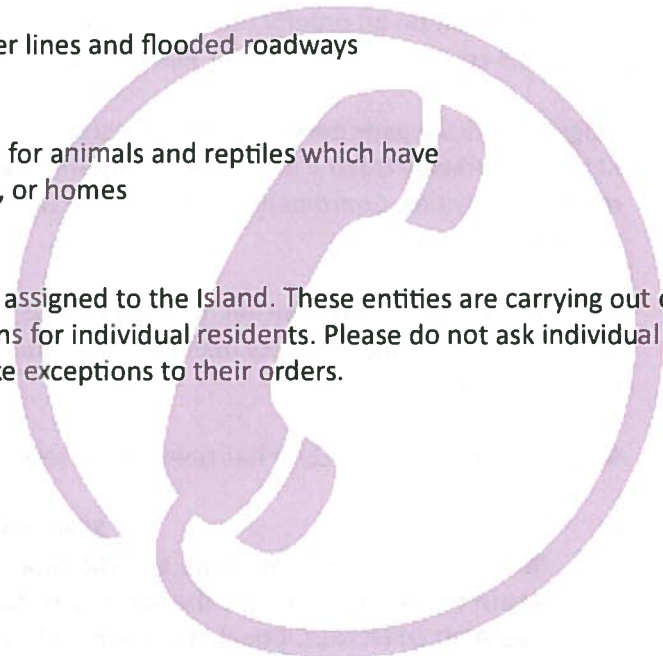
You may call the following numbers to determine when the island will reopen:

**Toll Free Hot Line 1-877-288-3088**

Once authorities give the ALL CLEAR, you can return to your home. You should, however, take the following precautions:

- Do not go sight-seeing
- Drive carefully and watch for downed power lines and flooded roadways
- Use caution when re-entering your home
- Check for gas leaks
- In the event of high water be very watchful for animals and reptiles which have taken refuge in your garages, storage areas, or homes
- Do not let your pets out without a leash

Please cooperate with all law enforcement agencies assigned to the Island. These entities are carrying out orders for the benefit of all and cannot make exceptions for individual residents. Please do not ask individual Law Enforcement officers or National Guardsmen to make exceptions to their orders.



## MISCELLANEOUS

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### Absentee Property Owners and Resort Guests

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The Town cannot keep track of absentee owners or house guests. Non resident property owners should leave a copy of the Emergency Preparedness Plan in their home for their personal use or for their house guests and/or renters.

Rental Agencies are responsible for their own rental guests and have developed their own policies with respect to notification of storm alerts, evacuation etc. Rental Agencies will receive storm updates via FAX notification and/or email from the Town Emergency Operations Center.

### Berkeley Electric

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In the event of power outages as a result of a storm, the Town will disseminate information from BEC and will keep you updated on the progress of restoring power.

Stay as far away as you can from downed power lines. You don't have to touch a downed power line to be electrocuted —if the line is touching any object, including the ground, it poses a deadly hazard. Report any downed power lines immediately to BEC (559-2458).

Be alert and be careful.

**Portable Generators - are designed to be connected ONLY to select appliances or lamps. These generators should NEVER be connected directly to the house's wiring system. Plugging the generator into house circuitry may cause the power to feed back through the meter to the power lines and endanger lives. Install in a clean, well-ventilated area, outside any structure. NEVER add fuel while a generator is running. Turn it off and let it cool first.**

If you have time prior to evacuation, turn off your electric service at the main breaker. If you do not do this, please try to do so before power is restored to your home.

Individual meter bases and weatherheads will be required before service can be restored. This is the responsibility of the homeowner.

For more information on generator safety call BEC at 843-559-2458.

**ELECTRIC POWER WAS NOT RESTORED TO THE ENTIRE ISLAND  
FOR TWO WEEKS AFTER HURRICANE HUGO. BE PREPARED!**





## Kiawah Island Utility

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When you return to your home, only drink the water that you have purchased and/or stored for that purpose. If there is an island-wide evacuation and water is turned off, there will be a mandatory “BOIL WATER NOTICE” issued until the Department of Health and Environmental Control inspects and tests the supply to determine if it is free from contamination.

KIU has produced a brochure which provides helpful hints about preparing your home for a disaster with regard to water and sewer. Call Town Hall or KIU (843-768-0641) for a copy.

## Debris Removal

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Even the smallest storm can produce an enormous amount of debris. The Town will work closely with the St. Johns Fire District and the Community Association to ensure that roads are cleared and residents can return to their homes. The Town will utilize the map on page 15 which divides the island in to zones. Please refer to the map to locate your zone.

The Town has a standby emergency debris removal contract with a company that specializes in storm debris removal. If appropriate, prior to the event, the company will be notified to begin mobilizing resources. After the event, the company will be instructed to begin collection sweeps of the island. **It will still be the responsibility of home owners to place their debris at the curb.**

Your cooperation with proper clean-up procedures will greatly speed up restoration of the island. Please be sure to separate your debris into the following categories:

- Yard debris - including trees and brush
- Building debris - including construction materials, carpet and furniture
- Bulky metal items - including appliances and bikes
- Household garbage - including food and paper waste
- Household hazardous materials - paint, solvents, cleaners, fertilizers and insecticides should be separated with extreme care

As you clear debris from your yard and home, please be careful not to block:

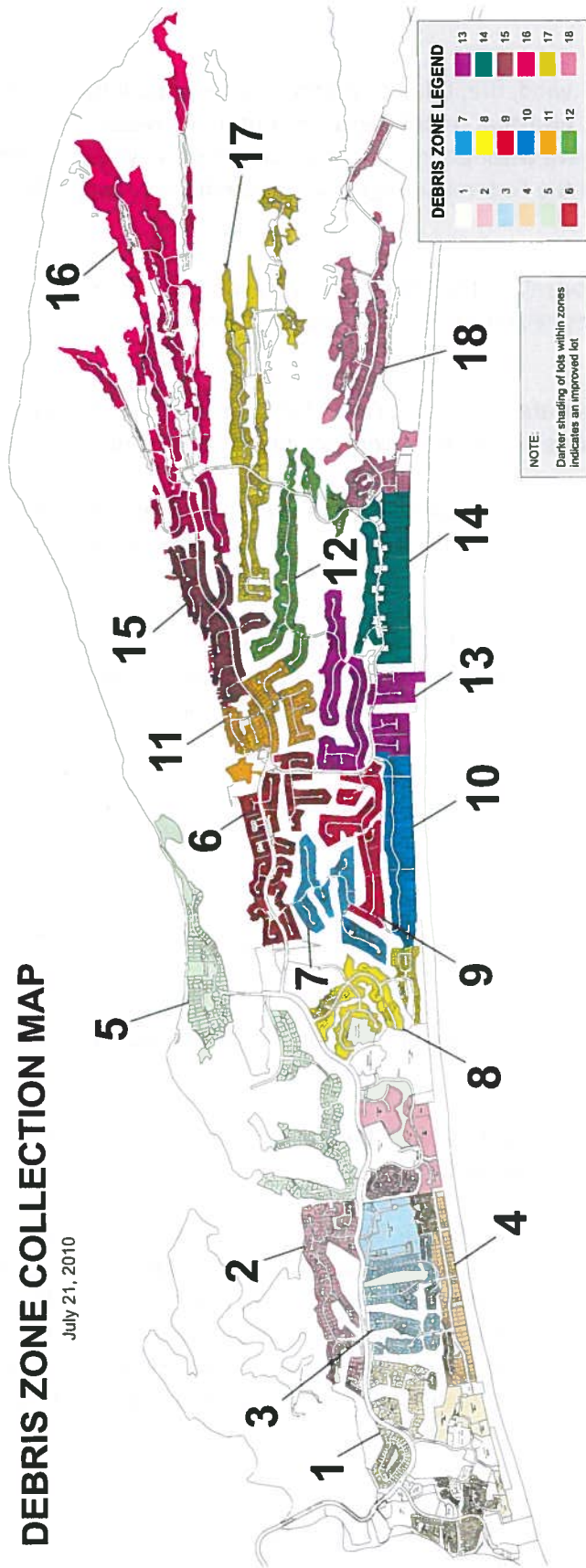


- Roadways
- Fire hydrants
- Utility boxes

Completion of emergency debris clearing will depend on the severity of the storm, the weather following the event, the timely return and clean-up of efforts of property owners, and other factors that may be beyond the control of the Town.

# DEBRIS ZONE COLLECTION MAP

July 21, 2010



Following damage assessment the Town with the debris removal firm will select which zone clean up efforts will begin with based upon the severity of damage. This map represents how the zones are divided.

## Hiring a Contractor After a Disaster

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If your house has been damaged by a natural disaster — wind, fire, flood or earthquake — a reputable contractor can help you get your home repaired. Unfortunately, disasters sometimes bring out home repair rip-off artists, who overcharge, perform shoddy work and often leave without finishing the job. What can you do to find a quality contractor? The Federal Trade Commission and the Federal Emergency Management Agency offer the following tips:

- Be wary of builders or contractors who go door-to-door selling their services, especially those who are not known in your community or offer reduced prices because they have just completed work nearby and claim they have materials left over.
- Deal only with licensed and insured contractors. Investigate the track record of any roofer, builder or contractor you are thinking of hiring. Get a list of recent satisfied customers from any prospective contractor.
- Ask friends, relatives, neighbors, co-workers, insurance agents or claims adjusters for recommendations. Also check with your Better Business Bureau to see if complaints have been lodged against any contractor you are considering.
- Do not let anyone rush you into signing a contract. Get written estimates from at least three firms. Ask contractors if there is a charge for an estimate before allowing them in your home. Ask for explanations of price variations. Do not automatically choose the lowest bidder. Get a copy of the final, signed contract.
- Beware of contractors who ask you to pay for the entire job up-front. Never give a deposit until you have done your homework. When you make a down payment, it should not be more than one-third of the total price. Pay only by check or credit card and pay the final amount only after the work is completed to your satisfaction. Do not pay cash.
- Be skeptical of contractors who encourage you to spend a lot of money on temporary repairs. Make sure you will have enough money to complete permanent repairs.
- Be cautious about using your home as security for a home improvement loan. If you fail to repay the loan as agreed, you could lose your home.
- Have a knowledgeable friend, relative or your attorney review a contract before you sign. If you get a loan to pay for the work, consider having these documents reviewed as well.

Remember! Before you remodel, repair, or simply build on to your house, the proper permits are required. If you have any questions regarding obtaining such permits, please call the Charleston County Building Inspection Service at (843) 202-6930 or the County Planning Department at (843) 202-7200. Also, before undertaking any permanent improvements, property owners must have permission from the Architectural Review Board of Kiawah Island (843) 768-3419. Make sure that the contractor you select has a business license from the Town of Kiawah Island. Contractors may obtain a business license from Town Hall located at 21 Beachwalker Drive, Kiawah Island (843-768-9166).

**If you suspect a repair rip-off, call the SC Department of Consumer Affairs (800-922-1594).**

**If you suspect fraud, waste, or abuse involving Federal Emergency Management Agency assistance programs, you can make a confidential report to FEMA's Inspector General's Office.**

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## EMERGENCY NUMBERS

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**For all medical, fire, or hazardous materials emergencies call 911**

Town Hall	768-9166 or 800-600-5050
Emergency Hotline	(877) 288-3088
Kiawah Island Fire Station	768-2664
Kiawah Island Utility	768-0641
Community Association	768-9194
Main Gate	768-5566
Berkeley Electric	559-2458
St. Johns Fire Department	559-9194

### **County Emergency/Resource Numbers:**

Charleston County Emergency Citizen's Info Line (843) 202 - 7100  
\*Open During Emergency Operations Center Activation Only

American Red Cross: Lowcountry Chapter (843) 764 - 2323

Charleston Disabilities Resource Center (843) 225 - 5080  
<http://www.drcilc.org/>

S.C. Dept. of Transportation (Evacuation Information) (888) 877 - 9151

S.C. Dept. of Health and Environmental Control (843) 953 - 2450  
[www.scdhec.gov/administration/ophp/hurricane/abc.htm](http://www.scdhec.gov/administration/ophp/hurricane/abc.htm)

Pet Friendly Hotel Information <http://hotels.petswelcome.com/south-carolina>

## RECOMMENDED CHECKLIST

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The following information is intended to be suggestive rather than all-inclusive. You should plan for your needs upon return to the island under what may be less than ideal conditions. You also need to identify those items you will want to take with you if an evacuation becomes necessary.

**Prepare yourself and your family for a minimum of three days.**

### **HOME NEEDS**

- Portable water (1 gallon per person per day) for at least 10 days
- Non-perishable foods and beverages
- Flashlights and battery-operated radio, with extra batteries
- Tools, saws, rakes, kitchen needs, plastic sheeting, duct tape, candles, matches
- Normal household supplies and personal items. Replenishment of these items may be difficult depending on status of area stores and roads

### **EVACUATION KIT**

- Cash, coins, credit cards and checkbooks
- Insurance policies and building plans
- Income tax records and other valuable papers
- An ample supply of all needed medications and first aid kit
- Personal items such as extra glasses, contact lenses etc.
- Family photographs and memorabilia
- Special needs for children, elderly or disabled family members and pets
- Maps and hotel/motel directories
- Enough clothing, footwear and rain gear for an indeterminate stay
- Automobile records such as spare keys, jumper cables, flares, tire repair kits and blankets
- Cold weather clothing, if appropriate
- Flash lights with extra batteries
- Important telephone numbers of family, friends, neighbors, service companies HOT LINE 1-877-288-3088
- Appropriate containers to transport and safeguard these materials



## INTERESTING FACTS

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- The **DEADLIEST** hurricane hit Galveston, TX, in 1900, killing 8,000 people. It was a category four.
- Hurricane Katrina hit Louisiana August 29, 2005, killing 1,833 people and causing more than \$75 billion in damages, making it the **COSTLIEST** hurricane in United States history.
- The **STRONGEST** hurricane made landfall in the Florida Keys in 1935, killing 408 people.
- Six inches of fast moving water can knock you off your feet and a depth of TWO feet will float a car.
- In the period, 1901-2009, only 27 tropical cyclones have made landfall on the South Carolina coast. Of these, only eight were of Category 2 to Category 4 intensity. Since 1900, no Category 5 hurricanes have hit South Carolina. There have been two Category 4 hurricanes (Hazel, 1954, and Hugo, 1989)
- Hugo (September 1989) Landfall at Isle of Palms, South Carolina with 138 miles per hour with gust over 160 miles per hour. Costliest storm in South Carolina history at over 6 billion dollars, 35 related fatalities, storm surge 20+ feet
- Hurricanes can cause floods, flash floods, tornadoes, and landslides.
- On average, there are 800 tornadoes each year in the U.S. Tornadoes have occurred in all 48 continental U.S. states. The average twister is about 660 feet (200 meters) wide and moves about 30 miles (50 kilometers) per hour.
- The 2011 twister outbreak in Alabama is the second deadliest in U.S. history. The tornado that went through Tusculoosa was reported to be a mile wide and the death toll is still unconfirmed. The largest death toll ever was on March 18, 1925, when 747 people were killed from storms in Missouri, Illinois and Indiana.
- On March 28, 1984, in the late afternoon-early evening, 22 tornadoes touched down across North and South Carolina, resulting in 57 deaths, 1,248 injuries, and \$200 million in damage.
- On August 5, 2002, a water spout was spotted off Kiawah's beach.
- Kiawah Island lies within the area of maximum damage of the 1886 earthquake, which had an estimated magnitude of 7.3 and is the largest historical earthquake in the eastern U.S. That earthquake killed approximately 60 people and caused \$5 to \$6 million ( in 1886 dollars) worth of damage.
- Scientists say the probability for a major quake in the Eastern United States over the next 30 years is 40 to 60 percent.
- In the late 1980's, Santee Cooper spent \$30 million to strengthen the West Pinopolis Dam to withstand an earthquake of the magnitude of the 1886 quake that occurred in Charleston (7.6 on Richter Scale).

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Fact are based upon information from the National Hurricane Center and the South Carolina State Climatology Office

