



NATURAL RESOURCES ELEMENT

Element Goal

Maintain Seabrook Island's environmental integrity and natural beauty through the continuation of sustainable actions that ensure that natural systems and built structures protect habitats, create a healthy environment, and promote energy efficiency.

5.1: OVERVIEW

Seabrook Island is a coastal barrier island located in the South Carolina Lowcountry between Johns Island and the Atlantic Ocean. The island is surrounded by saltwater bodies and marshes: to the north is Bohicket Creek and its marshes, to the south is the Atlantic Ocean, to the east is Kiawah River and its marshes, and to the west is the North Edisto River. The Island has a rich variety of maritime habitats and scenic natural resources that include miles of beach, a broad salt marsh with tidal creeks, freshwater wetlands, and extensive maritime forest and shrub thickets.

Human impact has played a large role in the quantity and quality of natural resources on Seabrook Island. Even prior to Spanish exploration in the 1500's and English settlement in the 1600's, native American Indians cleared lands in the Lowcountry to grow maize and other crops. While the Spanish were in search of gold and moved on, the English had a stronger appreciation for working the land agriculturally. English Lord Proprietors of Carolina received their charter from King Charles II of England in 1663, and accepted a collective land grant from the king that encompassed over 850,000 square miles extending from Virginia to Spanish Florida. In the Lowcountry, Native Americans welcomed the English settlement that followed, even showing them how to live off the land. While rice and indigo were the common crops in surrounding areas, Seabrook Island was transformed into a sea-island cotton

plantation. Cotton production on the island remained lucrative until the Civil War, however after the war cotton production declined. Seabrook Island then gradually reforested into the ecosystem found on the island today; a maritime forest of pines, live oaks, hickories, magnolias, sweetgums and palmettos, surrounded by saltwater wetlands, dune fields and sandy beaches.

Today, while most of the geographic Seabrook Island is in the incorporated Town, a large majority is also within the Seabrook Island Development (SID). The SID is a planned unit development that is a gated and privately managed community with a private club, a church/environmental camp operated by the Episcopal Diocese of South Carolina, and SIPOA. The SIPOA provides many of the community services and facilities typically provided by local government. The area of the Town not within the SID includes several parcels "outside the gates", and flanking the only land-based access to the SID. Through decades of environmentally conscious leadership, Seabrook Island has successfully maintained a spectacular range of wildlife and a thriving ecosystem, while providing its residents and visitors with a wonderful array of both human-inspired and nature-based amenities and activities.

5.2: BACKGROUND AND INVENTORY OF EXISTING CONDITIONS

With regard to development, the vast majority of Seabrook Island is substantially "built out". The island has retained much of its rich natural resources thanks to an environmentally conscious regulatory structure provided through Town and SIPOA governing documents.

Town of Seabrook Island Governing Documents. As required by the South Carolina Local Government Comprehensive Planning Enabling Act, the Town's Code, Development Standard Ordinance (DSO), and Zoning Map shall implement, and remain consistent with this Town of Seabrook Island Comprehensive Plan. The DSO is the primary document guiding development within the Town, and



does so “in accordance with existing and future needs, and in order to protect, promote and improve the public health, safety, morals, convenience, order, appearance, prosperity and general welfare; to preserve the environmental character of the Town of Seabrook Island; and to facilitate the timely and adequate provision of water, sewage disposal and other utility services, parks and other public requirements.”

Seabrook Island Property Owners Association Governing Documents. Most recently modified in February 2017, the Protective Covenants for Seabrook Island Development state that each property owner in the SID “becomes a member of SIPOA with voting rights as set forth in the Bylaws of SIPOA and obligations as set forth in these Protective Covenants and their derivative rules and regulations”. The covenants further declare that “the purpose and business of SIPOA is to preserve the property values and the quality of life in the SID through *development and implementation of programs to protect the environment, to facilitate acquisition and maintenance of green space*, and to provide for the health, safety, security and welfare of property owners”. Additional SIPOA responsibilities that contribute to the preservation of Seabrook Island’s natural resources include a continual update and enforcement of the SIPOA Rules and Regulations Handbook, a security force of commissioned code enforcement officers, multiple all-volunteer special interest groups, and ten standing committees, including an architectural review committee, environmental committee and planning committee.

Other Documents Promoting Environmental Sustainability. There are additional documents and studies related, at least in part, to environmental protection. These documents and studies are sanctioned by the Town, SIPOA, or both, and either serve as regulatory documents in and of themselves, or contribute to the principles and content of the Town and/or SIPOA’s regulatory structure. Below is a list of the Primary and Secondary Seabrook Island Natural Resource Preservation Documents. These

documents directly or indirectly promote the preservation of Seabrook Island’s natural resources.

Primary Documents:

- The Comprehensive Beach Management Plan (Town); and
- The Comprehensive Emergency Plan (Town).

Secondary Documents:

- The SIPOA Architectural Review Committee’s Policies and Procedures for Residential Development (SIPOA);
- The Lake Management Plan (SIPOA);
- The Deer Management Program (SIPOA);
- Stormwater System Rehabilitation Plan (SIPOA);
- Backyard Buffers for the South Carolina Lowcountry (SIPOA);
- The Sustainable Community Baseline Report & Site Assessment (SIPOA); and
- Protective Covenants, Rules and Regulations (SIPOA and Condo, Villa and neighborhood Regimes).

Seabrook Island Green Space Conservancy. In 2000, this Section 501(c)(3) charitable organization began as a response to the SIPOA Board of Directors concern over the permanent loss of green space and wildlife habitat resulting from the “build out” of Seabrook Island. The Conservancy’s objective is to identify, for potential acquisition, high visibility properties that preserve substantial green space and wild life habitat. These properties, once acquired by the Conservancy through charitable donations, bargain sales, or traditional purchase procedures, are transferred, by deed, to SIPOA for permanent preservation and maintenance as green space. The properties are also rezoned to Agriculture – Conservation, and are inspected annually by the Conservancy and the SIPOA Environmental Committee to insure compliance with the green space provisions in the transferring the property to SIPOA.

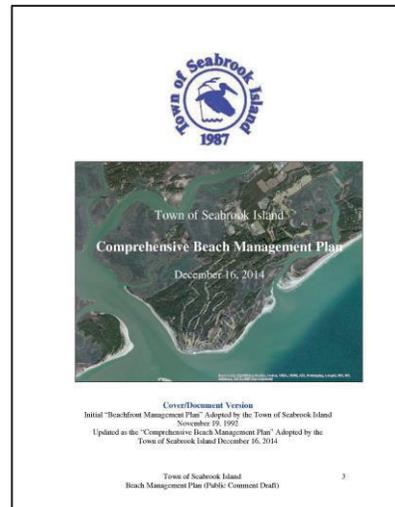


According to the Conservancy's website, a total of 24 acres, or 1 percent of Seabrook Island, has become property that will remain green space in perpetuity through the actions of the Conservancy and donors.

Beach and Dune Preservation

Oceanfront beach and dunes serve several important functions. These include storm protection for upland areas, habitat for a variety of plant and animal species, nesting habitat for sea turtles and recreation for Town residents, property owners and visitors. The management and preservation of Seabrook Island's beaches and dunes is a continual process, and a recent comprehensive update to the 20-plus year old beach management plan has given the Town, SIPOA, SIC, and the St. Christopher Camp and Conference Center (the "Camp") a better understanding of the issues and needs, and a clear and purposeful set of goals and implementation strategies.

Seabrook Island Town Council adopted the 2014 Update of their Comprehensive Beach Management Plan (referred to hereafter as the "BMP") on December 16, 2014. The BMP is a complete revision of the Town's original Beach Management Plan adopted in 1992. The BMP is consistent with the South Carolina State Beachfront Management Act and was updated in accordance with the guidelines provided by the South Carolina Department of Health and Environmental Control's Office of Ocean and Coastal Resources Management. The BMP was a joint effort from the Town of Seabrook Island leadership and staff, the SIPOA, SIC, and the Camp. The BMP cites Dr. Tim Kana, founder



and president of Coastal Science and Engineering, as the primary author. The BMP represents a comprehensive analysis of the island's beach management, including a full review of all Seabrook Island Coastal Erosion Studies and Annual Beach Monitoring Surveys, many of which were conducted over decades of research by the primary author cited above. This Natural Resources Element acknowledges by reference, the findings, needs, goals and implementation strategies contained within the above referenced 2014 Update of the Town of Seabrook Island Beach Management Plan.

While it is not within the context of this Natural Resources Element to fully describe the BMP, a brief overview of its structure and recommendations is warranted. The BMP is a technical document that comprehensively describes all aspects of beach management regarding Seabrook Island in seven detailed sections:

- **Section 1 Introduction** - describes the purpose and history of the plan, an overview of the municipality and history of beach management practices, and a summary of the current beach management issues impacting Seabrook Island's coastline;
- **Section 2 Inventory of Existing Conditions** - provides an inventory of existing conditions, including general characteristics of the beach and beachfront structures, and a description of the current state of the shoreline as a natural resource with ecological habitats;
- **Section 3 Beachfront Drainage Plan** - describes the surface drainage patterns of land along the island's beachfront;
- **Section 4 Beach Management and Authorities** - includes a thorough description of beach management, and a thorough summary of the multiple authorities that regulate and enforce beach development, shoreline protection, and other regulations regarding the island's beach management;



- Section 5 Erosion Control Management – cites numerous previous coastal erosion studies to support a discussion on shoreline change analysis, then provides an inventory of beach alterations, including previous beach renourishments and various “soft engineering” solutions conducted over the past 30 years, and ends with a discussion of future erosion control alternatives;
- Section 6 Needs, Goals and Implementation Strategies – includes a strategy for preserving and enhancing public beach access and description of the three components of the Town’s “retreat strategy” (the creation of a stable or accreting beachfront that is compatible with the State’s retreat policy):
 - 1) The relocation of Captain Sams Inlet to support the continued migration of sand down the coast from Kiawah Island;
 - 2) Maintaining a “shelf” down to and around the corner of the Edisto River inlet to continue renourishment of the Edisto River shoreline of Seabrook Island; and
 - 3) Supplementing the first two components by sand scraping from sections of excess accretion along the north shore of the island and moving that sand to the south beach area.
- Section 7 Appendix – includes much of the technical data referenced in the previous sections of the BMP.

It should be noted that in May 2015, Seabrook Island, with the cooperation of federal, state, and local authorities and utilizing SIPOA funds, relocated Captain Sams Creek using scientific island inlet relocation methodology. The environmentally-friendly significance of allowing the inlet to migrate naturally over a

designated inlet conservation zone, as opposed to stabilizing the inlet itself or heavily armoring the shoreline, led to the American Shore and Beach Preservation Association (ASBPA) awarding the 2016 Best Restored Beach Award to Seabrook Island.

Maritime Forest Preservation

Inland from the beaches and dunes described in the previous section, the interior of Seabrook Island is dominated by a maritime forest ecosystem. As described in the introductory section of this chapter, soon after the Civil War, the sea-island crops that had dominated much of the Seabrook Island landscape since colonial times were abandoned, allowing land on the island to naturally and gradually reforest. Many years later, the forward thinking conservation efforts of early SID leaders has resulted in many of the beautiful characteristics of the maritime forest ecosystem to still remain today.

As noted in the BMP, barrier islands such as Seabrook Island are comprised of habitats that are characterized to varying degrees by instability. The habitat providing the greatest stability is a maritime forest, which is a natural vegetation unique to many parts of the coastal Lowcountry, and more formally identified as the Atlantic Maritime Forest. Within this forest, the tree canopy is dominated by southern live oak (*Quercus virginiana*), laurel oak (*Q. laurifolia*), southern magnolia (*Magnolia grandiflora*), and loblolly pine (*Pinus taeda*). Conspicuous understory plants include sabal palmetto (*Sabal palmetto*), southern red cedar (*Juniperus silicicola*), and yaupon holly (*Ilex vomitoria*) among others. The maritime forest forms the relatively stable core of Seabrook Island that has endured over long periods of time, as opposed to the maritime shrub thickets, saltwater wetlands, dune fields, and sand beaches that become progressively less stable over time.

The Seabrook Island environment as a whole, and the maritime forest in particular, play an important role in the design of a new home, and this is emphasized throughout the Seabrook Island



Architectural Review Committee's Policies and Procedures manual. The manual's opening paragraph under the section entitled Design Guidelines for New Single-Family Residences illustrates this emphasis well;

"The sea island environment of Seabrook creates opportunities to design residences which incorporate the natural characteristics of the property, its surrounding environment, and the island into the design. Those residential designs which respond to the nature and character of the individual property become a positive contribution to the island by maintaining the maritime forest and landscape, while at the same time allowing for the residence to take full advantage of its views and surrounding environment. Residential designs which respect and complement the natural surroundings are the most successful designs."

Wildlife on Seabrook Island

As noted in the Sustainable Community Baseline report and Site Assessment, approximately 33 percent of Seabrook Island is devoted to legally protected green space (22 acres including beach trust), recreational green spaces (horse pasture, golf courses, trails), wetlands, dry beach/dunes, maritime forest (200 acres in Camp St. Christopher), or undeveloped lots (150 acres). This provides an excellent habitat for a diverse mix of flora and fauna.

While the maritime forest, maritime shrub thicket, and even the dune fields provide the ideal habitat for many land animals including deer, fox, squirrel, bobcat, and coyote, the island's tidal creeks and marshes serve as nurseries and food sources for a myriad of salt water species, from microscopic to huge herons, pelicans, raptors, and dolphins.

A webpage created by SIPOA and dedicated to Seabrook Island Wildlife can be accessed from either the Town's website or the Discover Seabrook website maintained by the SIC and SIPOA. The

webpage provides information on the many mammals, birds, fish, reptiles and insects that call Seabrook Island or its surrounding waters home. The webpage also provides direct links to documents of interest, such as the SIPOA Deer Management Program, special informational pages, such as information on dolphin strand feeding, and additional links to SIPOA special interest groups, such as the Seabrook Island Birders Group and the Seabrook Island Turtle Patrol. Much of the following information describing the abundant Seabrook Island wildlife has been extracted from this webpage.

Mammals on Seabrook Island. Mammals are abundant on Seabrook Island, and thanks to preservation efforts they are able to thrive in their native habitat while safely coexisting in close proximity to humans.



Bottlenose Dolphin at Seabrook Island

Photo Source: www.discoverseabrook.com



Wildlife Protection. Protection of the abundant wildlife on Seabrook Island comes in many forms. The first two sections of this chapter detail beach management and maritime forest management, and under both management efforts the unique habitats preserved provides food, shelter, and safety for much of the wildlife listed in this section. Continuation and enhancement of these management efforts is the primary wildlife protection tool available to the Town of Seabrook Island.



Seabrook Island Baby Loggerhead Turtle

Photo Source: www.siturtlepatrol.com

In addition, many volunteers are actively involved in wildlife protection. While some serve preservation-related SIPOA committees, such as the Architectural Review Committee, the Environmental Committee, and the Planning Committee, others remain active in wildlife protection-related SIPOA special interest

groups, such as the Seabrook Island Birders Club, the Seabrook Island Natural History Group, and the Seabrook Island Turtle Patrol.

The Town's DSO, and several documents created under SIPOA, also explicitly or inherently protect wildlife. For example, the rezoning review criteria in Section 20.40.10 of the Town's DSO requires consideration of the effect of the proposed rezoning "on environmentally sensitive land or natural features, wildlife habitat, vegetation, and water and air quality". Similarly, Section VI.A. of the SIPOA Rules and Regulations require all members to follow specific procedures to ensure protection of vegetation, stating that "the grassy dunes, maritime forests, and wetlands of Seabrook Island provide food, cover, and nesting for wildlife". Finally, several other SIPOA documents are specifically written with wildlife protection in mind, including a Deer Management Plan and informational brochures providing tips for helping Loggerhead Turtles.

Natural Hazards

As evidenced in recent years, the Charleston area is no stranger to the recurrent burden of flooding and threats of hurricanes. In addition, the Charleston region lies within one of the most seismically active areas in the Eastern United States. As a coastal community, Seabrook Island's housing stock, infrastructure, and topography itself is vulnerable to threats associated with flooding, storm surges, hurricanes, sea level rise, and earthquakes.

Flooding is the most frequent and costly natural hazard in the United States. On Seabrook Island, the most common types of flooding are rain events, tidal, and storm surges. Other issues that enhance the effects and extent of flooding are sea level rise and climate change.

Rain Event Flooding. Rain event flooding can be classified by severe rain events, whether associated with tropical weather or not, that cause major flooding in areas that may not have experienced flooding in prior years. Like tidal flooding, these big rain events are



exacerbated by a combination of several factors that result in widespread flooding, including king tides, sea level rise, drainage issues, and storm surges.

Charleston County experienced flooding as a result of continual rain lasting several days in 2015 that caused extensive damage and shut down businesses for days. The storm drainage systems could not handle the amount of rain that fell in the area, and because there was no break in the rain, the drainage systems had no time to recover. In addition, the storm hit during high tide, adding more stress to the already aggravated system.

Tidal Flooding. Tidal flooding, also called nuisance flooding, can shutdown areas of Seabrook Island for hours or days. Sea level rise leads to increases in tidal flooding. Rising seas means higher tides, and more frequent king tides, which are now an issue to formerly non-flood-prone areas. Frequent road closures, property damage, loss of business, and potentially hazardous conditions leave areas affected by tidal flooding in a state of uncertainty all too often. Sea level rise will continue to be a more frequent issue to all coastal areas within the County, and time is of the essence to study and make modifications to alleviate some of the effects that this will have on Seabrook Island. This not only impacts the ability for area residents to get to and from their homes, but also has a large impact on continuity of services for business operations, safety services, including access to area hospitals, and the general functioning of the area and its residents on a normal day-to-day level.

King Tides in November of 2018 resulted in the sixth highest tide on record, leading to several road closures and flooding on a perfectly sunny day. Instances like these are becoming more and more common, and Seabrook Island needs to plan for ways to protect and prepare the community.

Storm Surge. Storm surge is the rise of water level that occurs as a result of high winds pushing onto the coast due to tropical conditions. In combination with regular tides, storm surge can cause

significant flooding in coastal areas, and is exasperated depending on the intensity of the storm. Some problems that storm surge cause include: inland flooding, flooding in advance of a storm, dangerous debris carried by waves, severe beach erosion, and significant property damage.

Advancements in mapping have provided flood inundation maps to inform citizens of potential flood impacts during different categories of storm events where a citizen can simply type in their address on a webpage and have a visual reference of where flooding can occur around them. These tools are very helpful when planning and preparing for an event. It is important to note, however, that storm surge is merely one element of total water level rise, with tides, waves, and freshwater flow making up the other components.

Hurricanes. Records dating back to the 1600's indicate there were about 43 tropical cyclones in Charleston County before official records were started in 1851. Since then, an additional 41 tropical systems: 25 hurricanes, 10 tropical storms, and six tropical depressions, have hit or affected the Charleston region (NOAA). Seabrook Island remains vulnerable to hurricanes and tropical weather, and there is potential for this threat to increase with climate change and warming seas. Hurricanes pose many threats to the area, including wind, rainfall, and storm surge. In addition, tides can also have a major effect on the extent of hurricane-related flooding.

In 2016, the area was hit by Hurricane Matthew, which made landfall near McClellanville, SC as a Category 1 Hurricane. The storm dumped nearly a foot of rain on parts of the County, and the combination of a six-foot storm surge and strong winds led to extensive damage along the coast, despite hitting the area during a relatively low tide. Matthew resulted in water levels three to five feet higher than normal astronomical tides.

In 2017, Seabrook Island felt the effects of Hurricane Irma, which had weakened to a tropical storm before Seabrook Island felt its effects. Tropical Storm Irma swept through Charleston during an



extremely high tide, resulting in a peak storm tide recorded at almost 10 feet in the Charleston Harbor, the third highest on record in Charleston County.

Sea Level Rise. Sea level rise is the result of two major causes: the thermal expansion caused by warming of the ocean and increased melting of land-based ice (NOAA). The current global rate of rise is about one-eighth of an inch per year, and scientists are confident that the global mean sea level will rise from 8 inches to 6.6 feet by the year 2100 (NOAA, Climate.gov). Global sea level trends and local sea level trends are different measurements; the sea level is not changing at the same rate across all regions of the ocean. Sea level rise at specific locations may vary from the global average due to many local factors such as: land subsidence from natural processes and withdrawal of groundwater and fossil fuels; upstream flood control; erosion; changes in regional ocean currents; variations in land height; and whether the land is still rebounding from the compressive weight of Ice Age glaciers. NOAA estimates the rate at which sea levels are rising in South Carolina has been increasing, and is now around one inch of rise every two years.

Earthquakes. Although Seabrook Island has not had a major damaging earthquake, they regularly occur in South Carolina, and there have been several small scale earthquakes nearby, mainly clustered around Summerville. Additionally, Seabrook Island lies within a "high potential for liquefaction" area. Liquefaction is the transformation of loosely packed sediment or cohesion-less soil to a liquid state, as a result of increased pore fluid pressure and reduced effective stress, and it is caused by the ground shaking during an earthquake.

Community Resilience

Charleston County defines resilience as the ability of a community to respond, adapt, and thrive under changing conditions, including, but not limited to, recurrent burdens and sudden disasters.

The Town of Seabrook Island has numerous existing tools and protective measures already in place that contribute to resilience. As detailed in the Community Facilities Element of this Comprehensive Plan, the Town, SIPOA, and other Seabrook Island entities and residents have addressed emergency preparedness and disaster response through a Comprehensive Emergency Plan, Disaster Recovery Council, a volunteer Community Emergency Response Team, and the preparation of an Emergency Preparedness Homepage on the Town's website. Additionally, the Town's Development Standards Ordinance Article 9.0 sets specific Environmental Performance Standards for sensitive areas.

The Town should continue to utilize the best available data, findings, strategies, and plans to develop a community resilience plan that identifies the potential impacts and appropriate mitigation efforts necessary to improve the Seabrook Island community's resilience to hazards and changing conditions. This should not be a static plan, but rather a plan that is periodically updated to address changing conditions and include the most recent data, findings, and strategies available.



5.3: NATURAL RESOURCES ELEMENT GOAL

Element Goal

Maintain Seabrook Island's environmental integrity and natural beauty through the continuation of sustainable actions that ensure that natural systems and built structures protect habitats, create a healthy environment, and promote energy efficiency.

Natural Resources Element Needs

- As the Town is further developed, an increasing amount of the Island's natural habitat is taken away;
- Development also removes the connectivity between natural habitats, putting stress on the Island's wildlife to find alternate routes to move around the Island;
- Continued monitoring and research of the island's ecosystems, and the wildlife species they support, in order to best prepare and revise current and future preservation studies, regulations, policies and procedures;
- Best available data should be taken into account when planning new developments or other projects;
- Determine areas that are at a high risk for natural hazards, evaluate development intensity regulations for these areas, and prioritize projects in these areas;
- Strengthen the Town's partnerships with surrounding jurisdictions in order to combat natural hazard issues that cross jurisdictional boundaries;
- Educate the public about their role in building resilience;

- Encourage property owners and the island entities to eliminate existing invasive plant species and discourage future use of these plants; and
- As they are the Island's key natural resources, the beach, and dunes must be maintained and protected.

5.4: NATURAL RESOURCES ELEMENT STRATEGIES AND TIMEFRAMES

The Town should undertake the following strategic actions in support of the Vision and Goals of this Plan. These implementation strategies will be reviewed a minimum of every five years and updated every ten years from the date of adoption of this Plan.

1. Pursue the goals and support and promote the implementation of strategies contained in Section 6 of the Town of Seabrook Island Comprehensive Beach Management Plan.
2. Complete the Island's development in a way that maintains the Island's environmental integrity and natural beauty and is consistent with the Vision of the Town.
3. Maintain the existing quality of the natural resources on Seabrook Island, as well as the waters and marine environment surrounding the Island.
4. Maintain, expand, and support public education, outreach programs, and natural resource preservation volunteer groups.
5. Support the strategies and recommendations included in the Primary and Secondary Seabrook Island Natural Resource Preservation Documents listed in Section 5.2, *Background and Inventory of Existing Conditions*, of this Natural Resources Element.



6. Identify and pursue amendments to existing Town policies and regulations to improve the Town's resilience towards long-term stresses and acute disasters, using the best available data to inform decisions.
7. Work with adjacent jurisdictions to secure funding to perform a regional vulnerability, risk, and resilience assessment and watershed assessment.
8. Develop, adopt, and implement a Drainage Master Plan in coordination with adjacent jurisdictions.
9. Amend applicable Town ordinances to meet the Community Rating System (CRS) standards not currently addressed by the Town.