

## **CHAPTER TWO: NATURAL RESOURCES**

### **INTRODUCTION**

The natural features and resources of the City of Beaufort are key factors to the nationally recognized quality of the character and environment of Beaufort. Residents of Beaufort have an immense pride in their City and recognize the importance of the natural environment that surrounds them. They also recognize that these assets are increasingly in danger of deterioration due to the expanding growth of Beaufort County. As the oldest developed portion of Beaufort County, Beaufort has watched nearby areas become heavily developed in a matter of decades. The economic benefit and potential of this growth is appreciated, but must also be weighed against negative impacts to environment and culture. In the midst of rapid growth and development, the City of Beaufort should continue to protect its heritage, environment, and thus the quality of life enjoyed by residents.

### **GEOLOGY AND TOPOGRAPHY**

The natural geography of South Carolina's Lowcountry is characterized by the transition from the mainland to the Atlantic Ocean. Along this transition exists a rich array of saltwater and freshwater marshes, rivers, bays, estuaries and barrier islands. The activity of the tides and ocean currents serves to make the area geologically dynamic as the sizes and locations of barrier islands and the courses of rivers are in a constant state of change.

The City of Beaufort is situated on Port Royal Island and along a low ridge that defines the western bank of the Beaufort River. This ridge is only significant in comparison with the minimal topography change in the larger area. High elevations in Beaufort are little over twenty feet above sea level. Despite its low elevation and proximity to the Atlantic Ocean, Beaufort is protected from much of the severe effects of the coast by substantial barrier islands.

### **SOILS**

The 1980 Soil Survey of Beaufort and Jasper County indicates that there are two major types of soils within Beaufort's City limits. The locations of these soils correspond generally to the locations of wetland areas and areas of stable ground.

Underlying Beaufort's wetland areas are BOHICKET-CAPERS-HANDBORO soils. These are "very poorly drained mineral and organic soils that are flooded daily or occasionally by saltwater, and adjacent to areas that are flooded occasionally by freshwater." These soils are rarely suitable for any type of development and, as they are characteristic of wetlands, are often in areas protected from development by federal regulation.

Non-wetland and developed areas of Beaufort are characterized by soils known as WANDO-SEABROOK-SEEWEE. These soils are “excessively drained, moderately drained and somewhat poorly drained soils that are sandy throughout.” Areas with these soils can be developed in a reasonable manner and are generally able to accommodate septic tank systems, barring other circumstances. The areas of these soil types in the City of Beaufort are indicated in Map 1.

## **CLIMATE**

The climate of Beaufort is subtropical, typical of much of the southeastern United States. This climate is characterized by long, hot summers and relatively short and mild winters. Summer temperatures average between 75 and 80 degrees Fahrenheit with a high level of humidity. The majority of Beaufort’s rainfall, approximately 70 percent of the yearly 49 inches of precipitation, occurs in the summer months when it is often accompanied by thunderstorms. Winter temperatures average near 50 degrees Fahrenheit and are generally 3 to 5 degrees warmer on the coastal islands than the mainland.

An important element of the climate of Beaufort and of all coastal areas is the potential for devastating tropical storms and hurricanes. A 1994 Hurricane Risk report prepared for Hilton Head Island by the South Carolina Department of Natural Resources (DNR) lists 60 tropical cyclones which passed within 75 nautical miles of the Beaufort County barrier islands from 1886 to 1993. The most recent of these storms, Hurricane Hugo, was the most devastating to the region in 100 years. Statistical analysis within the DNR study indicates that a storm with hurricane force winds could be expected to impact the region approximately every 11 years. Hurricanes and other tropical storms can impact coastal areas with high winds, heavy rainfall, tornadoes and storm surges. The impact that a hurricane has on a coastal community can depend on the way in which the community has planned for severe weather. Land use plans and emergency evacuation plans can work to mitigate the devastating effects of a hurricane through controlled development and organized emergency plans.

## **WATER RESOURCES**

The City of Beaufort benefits from the intricate network of rivers, creeks, estuarine wetlands, and the Atlantic Ocean which have defined the character and resources of Beaufort County. For as long as there have been people to inhabit the islands of the Lowcountry area, fishing and harvesting of shellfish have been important economic and cultural activities. As a means of transportation and trade, the navigable rivers and interconnectedness with the East Coast through the Intracoastal Waterway have given Beaufort’s waters additional significance. Beyond these economic activities, the coastal waters have always offered a source of recreation. Active recreation is evident with much boating and sailing in rivers and sounds. Another form of recreation, passive enjoyment of the coastal environment and its unique habitats, is an attraction

to residents and tourists alike.

Though great in size and volume, these waters are also fragile and susceptible to many of the development actions that occur on islands and the mainland. The South Carolina State Department of Health and Environmental Control (DHEC) has closed approximately 31,500 acres of Beaufort County shellfish waters to shell fishing. A Beaufort County “Clean Water Task Force” which organized around this issue has completed an extensive report on the effects of development and human activity on the quality of certain waters in Beaufort County. Pollution and the potential for pollution is a serious threat to all water resources in the County and is an issue of specific importance to areas of high development such as the City of Beaufort.

Another concern for water resources in Beaufort is the supply of water for human usage, or potable water. Though surrounded by water, Beaufort’s water supply is drawn from the Savannah River and delivered to the city via a canal and piping system developed in 1965. A backup water system has existed which drew from wells to the Floridan aquifer, but this system will not be relied upon in the future. This distant water source is currently the best option for Beaufort as the increased tapping of the Floridan aquifer by highly developed areas in Beaufort County such as Hilton Head Island is beginning to be problematic. Saltwater intrusion into this freshwater source is causing the state to regulate the amount of water that can be extruded from the aquifer and is forcing municipalities to seek alternate sources of potable water. Like the surface waters of the coastal area, groundwater resources must be protected from threats of pollution and saltwater intrusion.

## **WATER SUPPLY WATERSHEDS**

The City of Beaufort is primarily a watershed for the Port Royal Sound and area marshes. Though these waters are not sources of drinking water for any municipality, Port Royal Sound’s surface water quality, and that of the Beaufort River and other rivers draining into the sound are affected by watershed activity. Levels of pollution in these bodies of water can rise as development allows more unfiltered runoff to enter streams and rivers. Thus, the watershed does not affect the potable water source, but does have an impact on the quality of the environment. The issues concerning stormwater drainage will be discussed in detail under the heading of nonpoint source pollution.

## **RIVER CORRIDORS AND FLOODPLAINS**

The Beaufort River, Battery Creek, Albergotti Creek and Brickyard Creek feed into the Port Royal Sound and the Atlantic Ocean. The Beaufort River is a major navigable waterway and part of the Intracoastal Waterway system. Battery Creek extends into Port Royal Island and is bordered by saltwater wetland areas. The City of Beaufort is almost entirely bordered by these rivers.

As they are part of a tidal wetlands area, the channels and banks of creeks and rivers surrounding Beaufort are actively changing. Depths from 1997 soundings show the Beaufort River near the city boat docks to vary between 14 and 18 feet. The channel of the majority of the Beaufort River varies between 14 and 28 feet with depths of 17 feet near the Woods Memorial Bridge. Battery Creek on the West side of the city maintains a depth of up to 14 feet well into the wetland area with deep points of 34 feet.

## **NONPOINT SOURCE POLLUTION**

Nonpoint source pollution refers to the process of stormwater runoff carrying pollutant particles into streams, rivers and lakes. Factors that affect stormwater runoff and nonpoint source pollution are generally development related. With an increase in development, there is an increase in the amount of impervious surface area, those areas such as pavement or roofing which do not allow for filtration of stormwater. Impervious surfaces cause stormwater to drain more directly into streams and rivers. Unfiltered stormwater drainage allows more pollutant particles, which may have been filtered out through the natural landscape, to be transported into water resources thus increasing overall levels of pollution.

Studies of Beaufort County's rivers, streams and estuarine waters have revealed traces of fecal coliform, a pollutant normally attributed to septic tank leakage but which can also result from nonpoint source pollution in developed areas. Chemical contaminants such as polycyclic aromatic hydrocarbons (PAH's), trace metals and pesticides are evident as well. The levels of these contaminants are high enough in some places to restrict shell fishing, but this is a relative matter. The fecal coliform level for approved shell fishing waters cannot exceed a geometric mean of 14 per 100 ml. The standard for safe swimming water, by contrast, is 200 per 100ml. According to the Clean Water Task Force study, the closing of an area to shell fishing can serve as an early warning signal for serious problems with water pollution.

In addition to carrying pollutants into water resources, excessive stormwater runoff that is not polluted can be damaging to the fragile plant and animal life of wetland areas. Freshwater runoff into saltwater estuarine areas can reduce water salinity to levels that reduce biodiversity and encourage fecal coliform growth. This excessive stormwater runoff is generally attributed to poor patterns of development. Measures to reduce the amount of impervious surface in development and to encourage the natural filtration of stormwater runoff can be used to reduce levels of nonpoint source pollution.

## **WETLANDS**

The general definition of "wetland" includes any land area that is yearly covered in water for a period of time and which is able to foster the growth of plant or animal life specific to a wetland

environment. Wetland areas in the United States were routinely drained to allow for development until the Federal Government began to promote wetland areas as valuable assets to the natural environment. Research shows that wetland areas contribute to numerous ecological processes and are invaluable resources to an area. The Federal Government's section 404 legislation is currently in place to protect wetland areas from the damaging effects of development to their sensitive environment.

Wetlands in the City of Beaufort are a part of the ecosystem of coastal waters and tidelands which is recognized by the State of South Carolina as an extremely valuable natural resource for the people of the state. The 1977 South Carolina Coastal Management Act, passed as a measure to protect the state's coastal resources, makes specific statements about the value of wetland areas in the coastal environment:

*The tidelands and coastal waters of the South Carolina coast are a very dynamic ecosystem and an extremely valuable natural resource for the people of the state. The tides regularly ebb and can flood through the coastal inlets, bays and marshes which constitute a fragile area, vulnerable to the impacts of many of man's activities...*

*The saline marshes are highly productive components of the marine food web of coastal waters and estuaries... Many commercially and recreationally important fish and shellfish species depend on the marshlands and estuaries for all or part of their life cycle. In addition, many birds and other forms of wildlife utilize wetlands as habitat as well as a source of food. Tidelands and coastal waters also have become increasingly important in recent years for the purposes of aquaculture.*

*Among the more important functions of the salt and brackish marshes is their role in protecting adjacent highlands from erosion and storm damage. Marsh vegetation absorbs and dissipates wave energy and establishes a root system, which stabilizes the soils. Its effectiveness as a buffer depends on the surface area available which, combined with the composition of the underlying substrate, allows tidelands to act as "sponges," absorbing and releasing waters during storms or times of heavy river rain discharge.*

*Marshes also perform a valuable waste treatment function since the dense vegetation acts as a filter, trapping sediments and pollutants which enter as run-off from the upland areas. The trapping of sediments helps maintain water clarity, a factor important to clam, oyster, and phytoplankton productivity. The marshes also assimilate pollutants and recycle nutrients through various biochemical processes.*

*Coastal waters and the adjacent marshes are also significant as aesthetic, recreational and educational resources. Much of the expenditure for recreation and tourism in the South Carolina coastal zone is for purposes of enjoying outdoor activities and the aesthetic pleasures of undisturbed tideland areas.*

Along with the value of these resources, the Coastal Management Act suggests some potentially damaging issues facing the coastal wetland areas:

*These unique natural resource areas face increasing land development pressure and*

*negative impacts from man's activities in and around them. The marshes constitute a fragile ecosystem; consequently, indiscriminate dredging and filling, degradation of water quality or unsound building and development practices can have long-term detrimental effects. All development need not be prohibited; rather, the range of favorable and unfavorable results needs to be realized, and analysis made to determine priorities, evaluate alternatives, anticipate impacts, and suggest the best methods and designs to carry out wise development of resources.* The approximate locations of wetland areas in the City of Beaufort are indicated on Map 1: Soils Suitable for Development. In general, areas which are not indicated as having soil compositions suitable for development have soil compositions that are characteristic of wetland areas.

## **GROUND WATER RECHARGE AREAS**

Mapping of the cones of depression pertinent to recharge of the Floridan aquifer does not show the City of Beaufort to be significantly within a major groundwater recharge area. The Marine Corps Air Station to the north of the City, however, covers a groundwater recharge area for the Floridan aquifer. Other major recharge areas are to the south, near Savannah. Though not directly in a major recharge area, it is important that pollution be controlled in Beaufort where it may seep into the groundwater supply.

## **SCENIC VIEWS AND SITES**

The natural environment of the coastal Lowcountry enhances Beaufort's historic character to create numerous scenic features and views. With its situation along the Beaufort River, Waterfront Park offers what are probably the most memorable views including the river and marina, the extended shoreline of the city to the south, the opposing shore of Lady's Island, and a distant view of Woods Memorial Bridge. The notable design of this park has contributed to its value as a scenic area.

Of the numerous other scenic areas, those of particular interest include the various views over the marshlands from dead-end streets on "the Point," Pigeon Point Park at Albergotti Creek, and Bay Street vistas of historic houses and the Beaufort River. Many of these scenic views and sites maintain a pristine quality along with the natural landscape, but some are threatened by various types of development. As is very commonly the case, communications towers such as radio towers and cellular phone towers are beginning to have an impact on the scenic quality of Beaufort. Located along the shoreline of the Beaufort River to the south of Waterfront Park, a few of these towers are very noticeable. The installation of new such towers should be carefully considered to minimize impacts on scenic quality.

**GOALS, POLICIES AND STRATEGIES FOR NATURAL RESOURCES**

This section presents a listing of statements of goals, policies and strategies which have been developed in relation to the Natural Resources element of the Comprehensive Plan. Goals are designed to be general in scope, allowing for multiple targeted policy statements to follow each goal. Policies serve to articulate the means by which goals will be achieved. Strategies are evolved from policies and are the mechanisms through which policies can be implemented.

**CITY OF BEAUFORT NATURAL RESOURCES**

**GOAL 1: Clean, Aesthetically Pleasing and Accessible Water Resources**

The rivers, streams and wetland marshes which surround Beaufort are very valuable natural resources. Polluting of these resources should be minimized and they should be preserved for the responsible recreation and enjoyment of Beaufort citizens and visitors.

**POLICIES AND STRATEGIES:**

1.A. Improve Watershed Quality through Reduced Nonpoint Source Pollution.

Public education concerning the proper disposal methods of oil, grass clippings, and other household wastes can help keep pollutants from draining into water resources.

Existing laws and regulations intended to reduce the amount of pollutant materials transferred to water resources via stormwater drainage should be enforced and strengthened.

Sewer service should be extended to every Beaufort household in order to eliminate septic tanks from the city's limits.

Additional Land Use Policies should be established which promote control of runoff from development. These policies would include limitations on impervious surfaces and placement of buffers of vegetation along waterways.

Consider increasing the current 30-foot critical area buffer to 50 feet as in Beaufort County.

Consider establishing similar restrictions against the removal of small trees and groundcover vegetation as exist in Beaufort County.

The City should seek to cooperate with the Beaufort County Watershed Protection and Stormwater Management plans. Associated with this, the City also should study the development of a Stormwater Utility as has been recommended for the County.

Develop a specific water quality management plan for the Battery Creek watershed.

1.B. Establish and Maintain Standards for Recreational and Occupational Uses of Rivers and Marina which Protect Natural Resources.

The management objectives for Beaufort's waterways should include recreation, quality of water, water supply, aesthetics of the river and marshes, and year round use.

A coastal zone management plan should be developed with specific policies concerning boat mooring and allowable dumping into the Beaufort River. Boats remaining in Beaufort for extended stay should be encouraged to register with enforcement officers. Zoning of river and creek areas should be used to indicate appropriate areas for mooring and other recreational activity.

Regulations which restrict dumping from boats into Beaufort's waterways should be strictly enforced.

Coastal wetland preservation policies should be determined to address house-boats and other potential residential uses on the Beaufort River and Battery Creek.

Occupational uses of the Beaufort River and other waterways should be encouraged to the extent that they are a healthy component of the aquatic ecosystem.

Recreational boating should be more closely monitored by an enlarged water law enforcement force. The City should consider moving to a Harbor Master form of management for the River and Marina.

Consideration should be given cooperating with Beaufort County to establish "no wake zones" for smaller creeks and streams where appropriate.

Some recreational boating activities should be restricted in certain locations, such as use of "personal watercraft" near the Beaufort marina.

A study should be conducted to investigate the efficacy of a Waterway Corridor overlay district, similar to those applied to highway corridors, for the purpose of preserving a pristine coastline.

1.C. Preserve the Natural Flow of Rivers and Creeks.

Seek to enact and enforce measures against unapproved dredging of waterways.

Consider the reestablishment of a natural connection between Battery Creek and Albergotie Creek.

**GOAL 2: A Natural Landscape Consistent with the Quality of Environment and Culture in Beaufort.**

The natural features of Beaufort are a necessary complement to the historic and cultural character of the City and should not be compromised in any way.

**POLICIES AND STRATEGIES:**

2.A: Minimize Negative Effects of Development on Beaufort's Remaining Forested Areas.

Land use and development policies should encourage preservation of forested areas and/or development that seeks to protect trees.

Prohibit open air burning without a permit.

Encourage the use of native vegetation in all site development and landscaping. Ensure that with any development of forested areas or removal of timber, a vegetated buffer remains along public roadways.

2.B: Preserve Developable Land in its Natural State where Appropriate.

The work of the Beaufort Open Land Trust to acquire land for preservation should be encouraged. An open space plan should be developed for the entire city to approach conservation of land in a comprehensive manner.

Whenever possible, the City should seek to secure undeveloped areas for park and open space.

2.C: Protect Scenic Areas and Views.

Design guidelines, corridor zoning overlays and other means of permitting should consider the effect of new structures on scenic areas in Beaufort.

All new development and redevelopment activity in the City should be encouraged to enhance views to waterways and marshes from public roads.

Support the efforts of the Beaufort chapter of the Keep America Beautiful program in its efforts to reduce litter along highway corridors through public education and volunteerism.

Seek easements in strategic locations to protect scenic views both to and from the City.

Improve scenic street ends in the Point area by adding amenities such as benches and trash receptacles.

Consider establishing scenic view sites in the Pigeon Point area that are similar to those on the

Point.

Encourage community docks or shared dock facilities over private individual docks in order to minimize the amount of dock construction into the marshes.

Establish design guidelines for docks to protect the scenic quality of the shoreline.