

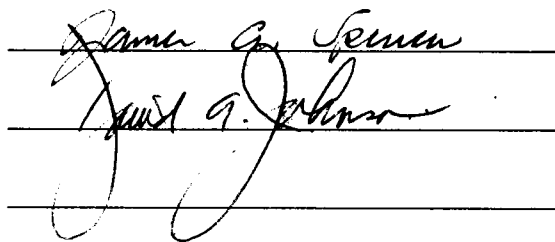
To the Graduate Council:

I am submitting herewith a thesis written by Harold Boyd Clark, Jr. entitled "Environmental Stewardship in Land Development: A Case Study of Spring Island, South Carolina." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Planning.



George E. Bowen, Major Professor

We have read this thesis and
recommend its acceptance:



Accepted for the Council:



Associate Vice Chancellor and
Dean of The Graduate School

Environmental Stewardship in Land Development:
A case study of Spring Island, South Carolina

A Thesis
Presented for the
Master of Science in Planning
Degree
The University of Tennessee

Harold B. Clark, Jr.

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ABSTRACT

During the past several years, real estate development has been a profession concerning more and more people. Reducing the detrimental impacts of development practices that destroy or endanger the environment's sensitive areas and ecosystems has been a primary objective of many local, state and federal organizations. The sensitive coastal areas of the United States are of primary concern. Another concern is, with the rise of real estate prices, whether or not practicing more environmentally sensitive development techniques can be economically feasible for the development field. It was the intent of this thesis to examine the environmental and economical issues present in the development of Spring Island, a sea island located in arguably one of the most popular spot on the East Coast, Beaufort County.

The thesis first examined environmental planning theory from the perspectives of several of the pioneers of planning theory. Theory was then compared to practice by conducting a case study of the Spring Island Development. Finally, cost elements and specific development techniques were analyzed in order to make recommendations that could be used in similar developments.

A literature review of the above theories was conducted. The second method involved research of local, state, and federal regulations that applied to the development of Spring Island. The examination of engineering and planning documents and interviews with members of the development team and other officials were used to conduct the case study.

The study found that environmentally, the Spring Island Development was planned and developed with extreme environmental stewardship and should be applauded for the use of

several techniques that promote environmental and cultural preservation. From an economic standpoint, the study concluded that at the present time, many techniques used by Spring Island could be beneficial in similar development schemes, but the clientele required to complete a project such as this exists in a very elite real estate market.

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CHAPTER 1

INTRODUCTION

With the advancement of modern society, types of urbanization are growing more intense each day. The land on which we live is not only physical spaces to accommodate our future urbanization processes, but as importantly, the natural environment is a set of resources that are vital to our very existence. These resources that we are stewards over must be preserved, and the fragile ecosystems and hazardous lands protected in order to achieve sustainable development, and to avoid the depletion of the natural systems that balance the environmental ecosystems (Chapin, p.172).

The process that man conducts with modern development techniques affect the natural environment in some way. The environment is always affected in either a positive or negative way by the disturbance of development. To say that man will not invade the undeveloped lands of the world is neither rational or possible, but responsibility for the environment's sensitive and pristine areas is one concept has been a major topic within the development field in recent years. With this growing concern for preservation and conservation, also comes economic concern for most developers. Many development companies view an environmentally sensitive development as too much of a financial gamble, and these projects are just thoughts and ideas that are never applied.

On the coast of South Carolina, the development market is one of the most aggressive in the entire United States, or even the world. The coastal zone development ranges from residential communities to recreational hot spots. The coastal regions also

contain more environmentally sensitive areas than do most inland areas. From wetlands, unique wildlife habitats, historic vegetation forests, to pristine bodies of open water, many concerns have to be dealt with in the development of these areas.

Purpose

The pressures of the development market can sometimes outweigh the environmental concerns shared by the individual developer. Much is being done by governmental regulations to help ensure that certain concerns are addressed, but a large part is still left up to the developer to decide how environmentally responsible a development actually is. The purpose of this thesis is to address several objectives. The first is to explore theory and methodology of learned environmental planning processes. This section will be composed strictly of material from literature searches, and explain the ideals of various planners and environmentalists on the sound methods of environmental planning. The second objective is to research the process of environmental planning that was performed by the Spring Island Company with regard to the Spring Island Development. This information is to be compared with governmental regulation, and evaluated. The third objective to be accomplished by this research, is a financial evaluation that is to be done on the economic implications encountered by the developers and how success is to be gained in spite of the financial gamble associated with responsible design. This thesis is concluded by encouraging present and future developers to pursue more environmentally sound developments, and to educate and provide some research on techniques that may or may not be advantageous to the

developer that would help take some of the financial risk out of environmental responsibility.

History

Located approximately ten miles southwest of Beaufort, South Carolina lies a three thousand acre sea island now called Spring Island. As shown in Figure 1, it is bordered by two rivers, the Colleton and the Chechessee which flow into the nearby Port Royal Sound.

The uniqueness of Spring Island comes from several factors. First, composed of several natural springs feeding fresh and salt water ponds, from which the island got its name, Spring Island is known to be the oldest of the islands in the area, aging to about 30,000 years older than Hilton Head Island, a close neighbor. The geological makeup of the island contributes to the unusual topography for this region. Average elevation on the island is about nineteen feet above sea level, as compared to twelve feet on most of the other islands nearby. The island also has a high elevation of up to thirty-five feet above sea level, and even an 8 foot waterfall can be seen on the island (King p.1).

Another unique factor of Spring Island is the magnificent vegetation and wildlife that is abundant. The pristine vegetation environment of Spring Island ranges from one of the oldest, and largest live oak forests in on the East Coast and one of the oldest pecan groves in existence, to wildflowers and other rare species of plant life (Jones p. 1).

Complementing the plant life existing on the island, the bountiful variety of wildlife species is astounding.

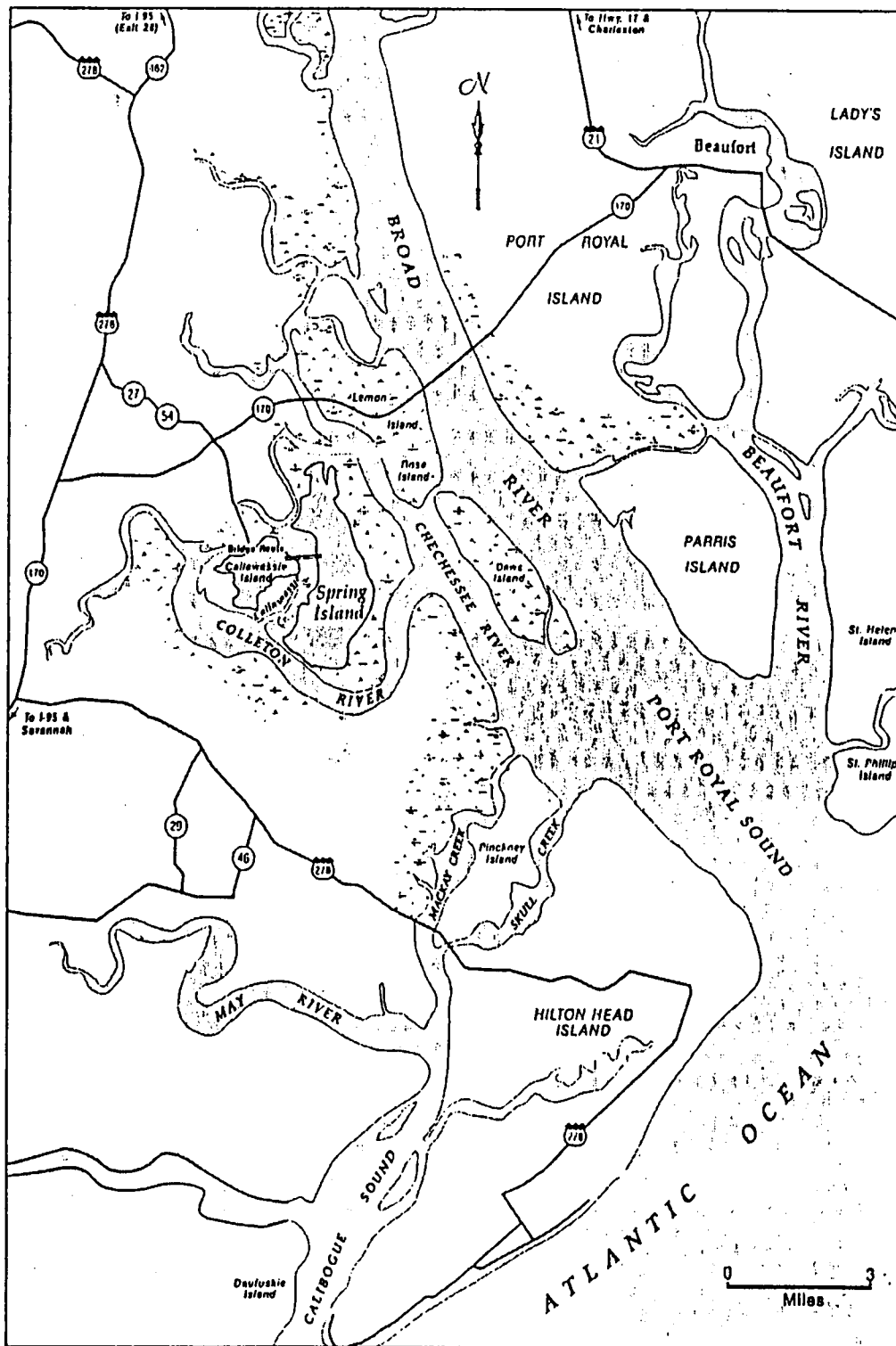


Figure 1. Site Location Map

Source: Spring Island Trust, A History of Spring Island Plantation

From the many varieties of wading birds and waterfowl that color the surrounding marshes and inner wooded ponds, to the deer, alligators, otters, and many other creatures that inhabit the island, the nature lover surely has much with which to pass the time.

The history of the island, from early years to recent times, is an especially interesting story in itself. The first recorded history of the island was from the Native American inhabitation of Spring Island. As early as 1706, documentation of the island's ownership has been recorded. During this period, a Scotsman named John Cochran was granted two 500 acre parcels on the island (Salveson p.). During his ownership of the island, which was then called "Cochran's Island, he established an English Indian trading post capitalizing on the location of the island between three towns of the Yemassee Indian nation called Alalamahaw, Chechessee and Okatie (Baldwin p. 2). As an Indian trader, Cochran was involved in many different trading projects. This trading post was the first major post on the eastern coast between Charleston and Savannah. Some of involvements included skin trading, crop growing, cattle raising, as well as some slave trading activity. Records state that among several of his trading encounters, Cochran created some ill feelings between himself and some of the Indian community. Because of some of these misdealings, in 1715 the Indian Nation engaged in an uprising in the Port Royal area, in which Cochran and his family were killed (Jones p. 2).

After this revolt, the island was claimed by the heir of John Cochran, a man named James Cochran, who was perhaps a brother of John's. James Cochran inherited the island and began to obtain grants for many acres of land in the adjacent areas. After his estate and properties had grown to a substantial amount, and his death between 1719

and 1724, the estate was left to his widow. Shortly after, Mary Cochran, James' widow died and all estates were granted to their son James Cochran, the younger (Baldwin p. 9).

Around the year 1760, the island was owned and managed by descendants Mary Cochran Edwards and her husband John Edwards. After their death, the island, now called Spring Island, was deeded to their son George Edwards in 1800, who established a thriving plantation. During his ownership of the island, the cultivation of sea island cotton was established and was a major contributor to the plantations riches. During this time, Edwards owned much agricultural land, livestock, horses, mules, many sheep and swine, and even many negro slaves. Spring Island Plantation was a very successful and profitable estate, and was passed down to his son George B. Edwards after his death, and because of the war, the plantation lost its fortune and all slaves acquired for 154 years (Jones p. 34). The remains of the Edwards mansion constructed in the tabby architectural style are magnificently still preserved today.

The first non-descendent to own the island was Thomas Martin who purchased the island in 1895. After several changes of hands, in November of 1964, Mr. and Mrs. Elisha Walker, Jr. purchased the island. During the Walkers' ownership, a wonderful guest house was built and food plots for wildlife were planted. attraction of the privacy and serenity of the island enticed the Walkers, and the island was used as an exclusive hunting and wildlife preserve even after their deaths, while managed by Gordon Mobley (Jones p. 40).

The Walker Trust was established and later sold the island in 1985, to a development company called Enmark Corporation from Columbia, South Carolina.

During this period, a plan for the island's redevelopment was constructed and approved. The plan for the development consisted of 5,500 lots and two golf courses to be constructed on the island. The development company did not, however, have access to the island from neighboring Callawassie Island, and proposed a high-rise access bridge from the mainland. This proposal was not approved within the option period, however, so the Walker Trust reclaimed the island (Jones p. 42).

With this initial proposal for development's expiration the opportunity to purchase the island became evident to several men with a joint vision to protect the rich ecological and cultural environment that had been cherished for the past 300 years. Previously purchasing adjoining Callawassie Island to develop a country club community, Jim Chaffin and partners Jim Light and Peter LaMotte, with consultation from Hilton Head developer and mentor Charles Fraser, secured an option to buy Spring Island in 1989. With the purchase of the island in 1990, an environmental priority was put into place, and a new development proposal was launched. With this new development proposal, the development was drastically reduced from 5,500 lots to 500, and the two golf course plan was reduced to one (Jones p. 42).

Environmental responsibility was the main priority when approximately one third of the island was designated as nature preserve and protected from future development. A causeway from Callawassie was constructed in October 1991, and the master plan as proposed today was begun.

Organization

With the organization of this thesis being that of a case study, it was very important to understand many different factors of the project. The research questions of this thesis targeted the environmental and economic aspects of Spring Island, but in order to ask the right questions a thorough research and literature review had to be conducted.

Chapters Two and Three were constructed by literature reviews of environmental planning and development theories and strategies. These chapters were constructed in order to compare the case study material to the fundamental development theories.

Chapter Four begins the case study material. With the development being a relatively new project, the literature and documentation on Spring Island was scarce. Although a few helpful periodical sources were found, the majority of information was obtained through personal interviews with the actual participants in the Spring Island Development. These interviews and a personal site visit provided much information on the actual processes and strategies taken by the Spring Island Company and Beaufort County.

The final chapter takes a look at the awards and recognition that Spring Island has received from around the country, and contains the findings and conclusions derived from the research study. This chapter also makes recommendations concerning future techniques, both environmental and financial that could influence development decisions in the future.

CHAPTER II

ENVIRONMENTAL PLANNING

In the opinions of some, the environment is the supply of natural resources and sensitive and hazardous areas that need to be protected and preserved for the good of society in the future. Yet another view of the environment is the undeveloped lands that hold the future advancements of our urbanization. For the land use planner, the definition of the environment must include both prior definitions. In the perfect paradigm, development and the environment would coexist and more importantly, complement each other within the context of planning (Chapin p. 172).

Throughout planning practice and academic history, there have been several theories and methodologies that have been created to explain the idea of environmental planning as a concept, and to educate on strategies and important factors that should be present in a functional environmental planning process. In this chapter, some of these noted theories and methodologies are discussed. After the discussion of these strategies, an evaluation of the Spring Island environmental planning process can be completed. This evaluation will be conducted in Chapter IV.

Environmental Planning Defined

"Environmental Planning" can be defined as " the systematic analysis of environmental factors relevant to the program; evaluation of anticipated environmental effects caused by the program; and the implementation of an effective course of action

resulting in minimizing the adverse environmental effects and maximizing the environmental benefits associated with program development."(Fabrick p. 1).

The consideration for the environment during allocation of specific land uses has been a significant part of the planning process for some time. Environmental planning was a compilation of several different disciplines in its early stages. Because of this fact, the processes and methodologies are comprehensive in nature. These different disciplines included, planners, geographers, architects, landscape architects, biologists, ecologists, attorneys, and foresters.

One important concept that was widely agreed upon was that "environmental information" is one of the most basic ingredient to the environmental planning process (Chapin p. 174). One of the most noted frontrunners of the environmental planning field, is Ian McHarg. McHarg spent much of his career studying the environment's natural processes, and man's impacts upon it. McHarg once stated:

If one accepts the simple proposition that nature is the arena of life and that a modicum of knowledge of her processes is indispensable for survival and rather more for existence, health, and delight, it is amazing how many apparently difficult problems present ready resolution (Chapin p. 174).

In McHarg's philosophy, every place consists of physical, biological and historical processes, which constitute social values. In each case, some specific areas are uniquely suitable for certain uses in development, and some areas happen to be suitable for several different land use types (Rogers p. 30). McHarg's approach mainly targeted the planning processes and effective methods of addressing ecological issues. McHarg

believes that cumulative, causative and interrelated natural, as well as, man-made processes make up what he calls the natural environment, and states that:

Planning for natural processes must begin with the identification of sub-processes; then determine the value of these sub-processes to man, and finally establish principles of tolerance and intolerance of the natural process to various aspects of urbanization (Morris p. 26).

With this in mind, in McHarg's philosophy, the traditional planning process must include a systematic analyzation of these sub-processes that occur in the natural environment.

Environmental planning, as stated, is usually not considered to be a separate entity among the planning profession. It is merely performed by incorporating environmental concerns into the traditional planning process, as stated by McHarg. There are several ways that these concerns can be incorporated into the process, such as, developing environmental related goals and objectives that insure the concern for development impacts on the environment become concerns at the beginning of planning stages (Morris p. 27).

Even though there are several methodologies and techniques of environmental planning processes and land use strategies differ in some aspects, all of them follow three basic concepts. These three concepts are land capability, land suitability, and carrying capacity.

Land Capability

The concept of land capability has been defined as:

the extent to which the environment of a natural system can be modified without the necessity for extensive artificial measures to redevelop or maintain a natural balance within the system (or in its place among other systems), once the new environment is established (Dethero p. 22).

In the land capability concept, an area is studied to determine if particular uses of the land would require excessive or artificial means to be functionally sound, or if certain types of development would disturb the balance between man and the environment (Zelinski p. 14). Many times a land capability study is affected, to a large extent, by time constraints, financial considerations, and even the extent of detail inventory a specific site requires. Even with these constraints, almost every capability analysis includes the inventory of excessive slopes, soil types, and hydrological systems with a study of surface and sub-surface geology on the site. In many cases, the information from these inventories is used to compile development standards, guidelines and specifications. Areas of concern, such as, erosion control, wastewater and stormwater management and the preservation of environmentally sensitive areas get the most attention (Thomas p. 24).

Land Suitability

In many ways the concepts of land capability and land suitability are very similar. However, in some ways they also differ in consideration. Land suitability considers the environmental and physical factors of an area, and includes the coexisting human and social factors as well. Land suitability has been defined as:

the ability of a natural system to accomodate a desired use of the human community without the necessity for extensive artificial measures to develop or maintain the human use desired (Zelinski p. 12).

Different degrees of modern urbanization requires require different degrees of analysis, depending on the desires of society that are placed on the land combined with the standard land capability standards (Morris p. 29). Both capability and suitability information usually finds itself within development standards and specifications in time, but the suitability data is more helpful in guiding the development of water and sewer services. Another consideration of the suitability plan is the relationship in location that a development occurs with regard to public facilities such as schools, transportation services, and recreational areas. With this extensive information of inventories and data, the difficult process is making a judgement on the density of development. The actual limit of development that can occur without destruction of an ecosystem or a sensitive area can be one of great subjectivity (Thomas p. 25). One method of analyzing these capacities of human development is called a site's carrying capacity.

Carrying Capacity

The concept of a development's carrying capacity follows a related path of capability and suitability analyses, but takes it a step further. An acknowledgement that there is a limit to which a property can be urbanized, and exceeding that limit can result in an encroachment on environmental quality and social and public welfare, sets carrying capacity apart from the prior concepts (Ortolano p. 244).

Carrying capacity analysis describes the amount of development an area can accommodate without undergoing irreversible ecological change or damage due to some threshold limits to growth. Limits may be environmental (air and water quality, ecosystem stability, soil erosion), physical (infrastructure capacity), or psychological

(e.g., perceptions of crowding or esthetics) (Chapin and Kaiser p. 50).

With the concept limiting development including such factors, an area can experience development pressures from many sides. In this case the amount of development that should be allowed in such a particular area should depend on three things.

1. The area's natural characteristics that limit development.
2. The perceptions and values of area residents as expressed in their preferences for lifestyles and environment.
3. The ability of the area's governing body and managing agencies to provide the services and impose the controls necessary to insure that the desired quality of life is maintained (Bishop p. 2).

In conducting a carrying capacity analysis, one must remember that as an entity, carrying capacity is a variable one. With the changes of lifestyles, technology and availability of infrastructure from sites other than the one under development, the carrying capacity is conformed to meet them. John Clark also reminds us that, "the analysis of carrying capacity is a method for testing the effects of policies, not for making them" (Chapin and Kaiser p. 50).

With this variability of cases, there are two concepts that are generally followed when conducting a carrying capacity analysis. One is a growth variable. This factor is either representative of the population or the measure of human activity. An example of this variable would be the number of visitors in a particular park per day, or the number of housing units constructed each year. The second factor that is generally included in

carrying capacity analysis are the factors that could limit development, such as natural resources or infrastructure accessibility. These factors, if not readily available could greatly limit the progress of the development process (Ortolano p. 244).

These limiting factors that frequently affect development usually occur in four types. These types are environmental, physical, psychological and institutional. The environmental types generally pertain to biophysical features, the physical usually deal with infrastructure concerns, the psychological types include factors such as individual perceptions of surroundings, and the institutional types are generally related to government's ability to provide services and regulate provisions that insure general quality of life. With each type of factor present in a development, individual studies are done on each type to help determine overall carrying capacity (Ortolano p. 244).

Environmental Carrying Capacity

The concept of environmental carrying capacity reflects the ideal that the environment itself can impose constraints on development. Under this assumption, the environmental carrying capacity is the limit to which development can advance that inhibits undesirable change to the environment (Dethero p. 26). There are three situations when environmental carrying capacity should apply.

The first situation is when development occurs in sensitive areas. In this instance, the environmental processes will undergo damaging changes if development disturbs more than a small portion of the site. In most instances, delicate ecosystems and areas containing sensitive, physical characteristics of the land are to be undisturbed when faced

by development. Some examples of these areas include wetlands, floodplains and freshwater and saltwater estuaries.

The second situation is for development that is based on environmental protection standards. In the case of environmental carrying capacity, this is the instance that occurs the most frequently. This situation involves the approval of certain development upon adherence to pre-existing environmental regulation standards that are enforced to protect such sensitive areas. These standards are adopted to serve dual purposes. The standards help to protect the environment, and allows for reasonable limits to change. In this instance, the standards are enforced and the carrying capacity is determined by analyzing the unused capacity.

The third situation refers to development that occurs in areas where extreme limitations exist. In this case, the environment places self-limitations on itself in response to the addition of new activities. Beyond the point of limitation, any more development would result in environmental degradation (Dethero p. 26-28).

Physical carrying capacity

Physical carrying capacity is termed as the point at which the development exceeds the current capacity of the existing infrastructure systems, such as water and sewer supply or transportation systems. These capacities are perhaps the easiest of the four to compute and manipulate because many times the need for additional capacity can be increased by the construction of additional systems or extending existing ones. This solution, however, has consequences that affect each of the other carrying capacities, and

is usually accompanied by other measures within the overall carrying capacity analysis (Thomas p. 29).

Psychological Carrying Capacity

Psychological carrying capacity is sometimes termed "perceptual carrying capacity" on the fact that it is from the perceptions of individuals that this kind of study is conducted. A definition of psychological carrying capacity is the threshold or limit of development that is tolerated by people before they consider it to be different than before (Thomas p. 30).

The methodology for conducting such a subjective study usually involves public surveys. During one of these surveys, photographs of current development can be shown in order to record each individual's perception of different levels and degrees of urbanization (Thomas p. 31).

Institutional Carrying Capacity

Institutional carrying capacity is a concept involving a community's governmental functions. This concept can be defined as the ability of a community to govern future development (Morris p. 34). These governing abilities may take the form of subdivision, zoning and development regulations, or in some cases, inter-governmental agreements. Overall, governmental agencies consist of three sub-institutional agencies that are the main contributors to the success of a community and its ability to govern development. These three sub-institutional agencies are:

1. Agencies involved in the planning functions of a community,
2. Specialized agencies that deal with health services, education, etc., and
3. All other private and/or public agencies and organizations that are involved in or are interested in community development(Dethero p. 31).

Environmental Planning Methodologies: Ian McHarg's Methods

In order to fully understand the environmental planning process, we must examine different methodologies that have been developed and studied over the years that have helped advance environmental awareness within development. These methodologies are all derived from the main concepts of land capability, land suitability and carrying capacity.

Map Overlay Technique

One method that is extremely helpful in analyzing the spatial data retrieved in the land use process is the map overlay technique. This process is composed of four steps.

1. Identify those factors which will be included in the planning exercise,
2. prepare an "inventory map" for each factor which shows how it varies over the study area,
3. create composite maps by overlaying two or more of the inventory maps, and
4. analyze the composite map to make inferences relevant to land use planning (Ortolano p. 232).

This technique forms a "comprehensive" analysis of an area in a land use study. This technique has been used for many years, but gained popularity in the 1960's. Environmental planning is greatly complemented by this technique by its ability to create maps composed of inventory information gained by individual site research. The map overlays can be used in projects from individual site planning nature to comprehensive land use plans for entire communities (Thomas p. 35).

The method of map overlays creates the opportunity for planners to analyze the potential of a development in a more extensive manner. For this reason, when combined with the land suitability analysis, this technique is a great tool for environmental planning. One way this method is used is by conducting environmental inventories of site characteristics, both physical and social. These factors can then be scored individually to create suitability standards. With all maps and scores compiled together, a composite map is created with designated areas that are more and less suitable for specific land uses. This method has come to be known as the "McHarg method" by a majority of the planning community. One reason for this is his widely successful book, Design with Nature. This, McHarg's most famous work, became the standard formula for much of planning and environmental methods today. His extreme concern for environmental processes popularized this method as a standard procedure in conducting environmental analysis (Thomas p. 36).

Raymond Belknap and John Furtado, discuss different approaches to environmental analysis in their book, Three Approaches to Environmental Resource

Analysis. In this book, they mention four specific reasons that this map overlay method is an important one.

1. It requires an understanding of nature as a process,
2. it requires the analyst to predict and prescribe compatible communities of prospective land uses,
3. it provides an insight into the given or natural form of the environment and thus provides implications for the man-made form of design through a better understanding of the forces at work, and
4. with the addition of demand and investment, a land use plan can be produced for a wide range of areas (Belknap and Furtado p. 62).

Also in this literature, a diagram of McHarg's approach is given. This outline shown in Figure 2, uses a specific coding system that will be discussed further in this chapter.

A. Study Area is Defined

Areas of study can vary in size from large communities, to small neighborgoods, to individual site projects. As these variations occur, environmental features and natural boundaries also define areas of study. With the inventory of these environmental and man-made factors, areas of study and subareas of study can be determined.

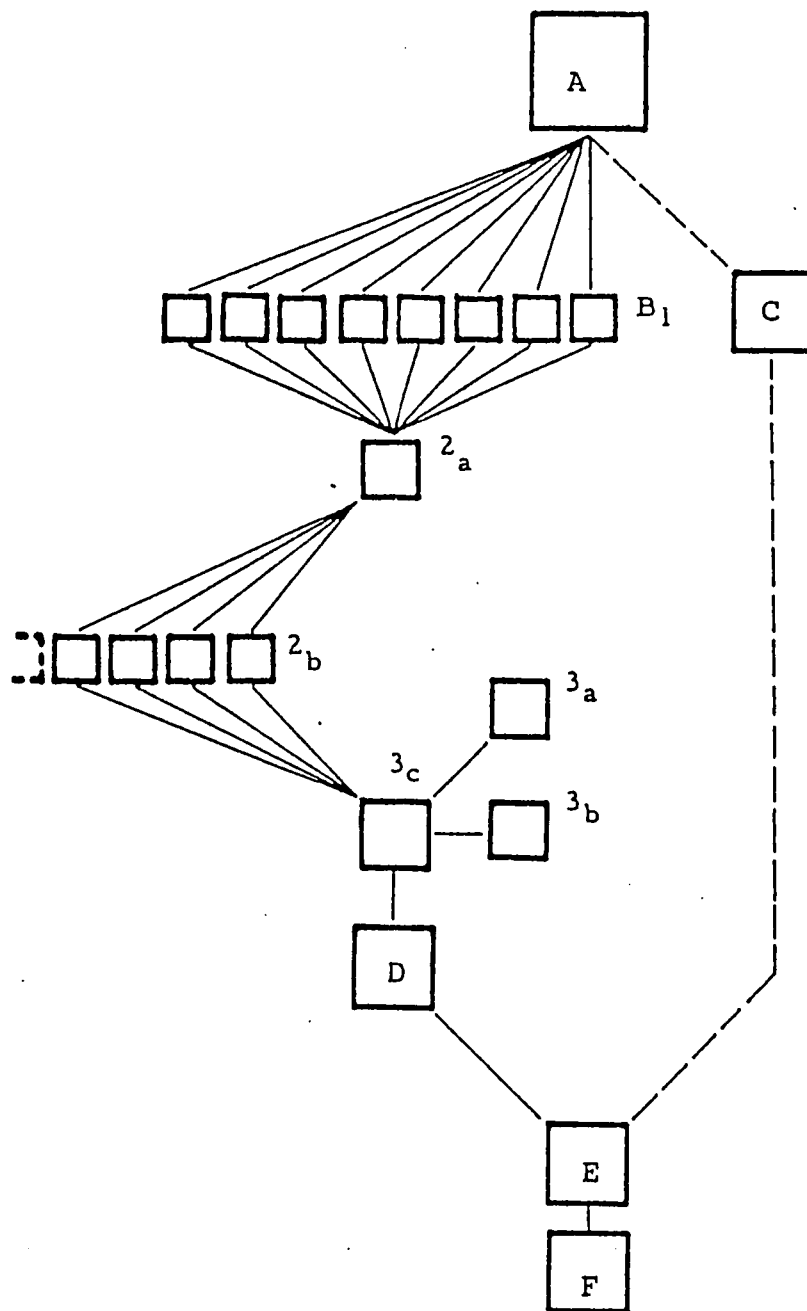


Figure 2. Diagrammatic Outline of Analysis Procedures.

Source: Raymond Belknap, *Three Approaches to Environmental Resource Analysis* (Washington, D.C.: The Conservation Foundation, 1967).

B. Natural Environmental Features are Inventoried

1. In order to analyze the environmental factors of a study area, the collection of certain data is essential. By McHarg's process, these areas include:

- 1) Climate
- 2) Historical Geology
- 3) Physiography
- 4) Hydrology
- 5) Pedology
- 6) Plant Association
- 7) Animals
- 8) Land Use

This sequence of inventories is important to McHarg's methods. This data collected in this pattern provides "cumulative causality". McHarg believes that in order to study an area's physiographical consistency, one must first analyze the area's climate and historical geology (Dethero p. 39).

2. Inventory data is then reviewed and interpreted. This is an important step in the process, because in this step the data is analyzed to determine the dominant prospective land use for each of the subareas.

a. With the data from the eight categories above, each category is noted for its effects on the particular land use. These effects are termed positive, negative or neutral. A comprehensive matrix is established from this data analysis, and other factors

such as economic minerals, scarce or unique features, water resources, and accessibility are also considered.

b. With this data, intrinsic suitability maps are constructed. These maps include the location of these unique sites and resources, slope, economic minerals and exposure qualities. Using transparencies of these features, different colors are used to determine a dominant land use for each subarea when overlaid over each other.

3. Every land area is then assigned a value for all possible land uses. In this step, McHarg recognizes that each area could have a dominant land use, but also have several compatible uses within the same subarea.

a. At this stage of the process, a rating system must be devised to rank the intrinsic resources established in the previous step. Each intrinsic resource receives a value, and is then mapped according to a scale of values, while being superimposed on transparencies. The result is a comprehensive map including a hierarchy of social values being interpreted from the lighter and darker tones of the overlayed maps.

b. Land uses that are compatible and incompatible are then acknowledged with the use of another matrix. This particular matrix shows all prospective land uses and their relationship to the resource data gathered in prior steps. The impacts of each land use on the ecosystem is used to evaluate each use, and mapped to show each land use's relationships in the form compatibilities with compatible and dominant land uses.

c. A suitability map is then constructed. This map illustrates the maximum conjunction of land uses that are compatible and that co-exist that can be sustained by each area (Belknap p. 69). These possible land uses are divided into four

main groups. These groups are agriculture, forestry, recreation and urbanism and their sub-dominant land uses. This map consists of the entire environmental supply inventory and analysis for each individual study area.

C. Economic Inventory is Performed and Analyzed

The next step is to conduct an economic inventory. In order to accurately conduct such a study, and economic planner should be consulted. Data such as locational values and spatial relationships of demand are studied and matched with the supply of the natural resources determined in prior steps.

D. Visibility Criteria are Established

Following the economic inventory, a set of visibility criteria is established. By this, McHarg states that visual values are very important in the planning process. These visual values are based on certain considerations:

1. The path of the viewer;
2. The fact that the visibility of the viewer, from the area is subject to variation with the physiography of the area;
3. The effect of vegetation as a natural and visual barrier independent of the physiography of the area;
4. The ability of a forest to absorb development while still preserving its natural cover and forest components.

This specific criteria data can be used in the recommendations of suggested densities of future developments in order to ensure visual and aesthetic quality.

E. Design and Form Criteria are Developed

With the economic, environmental and visual components of McHarg's process established, the step to follow is to incorporate these different factors and develop design and form criteria from them. Alternative development plans are constructed with varying intensity and location of compatible land uses, and considering the environmental factors for spatial design and form.

F. The Powers of Implementation are Acquired

The next step is the beginning of McHarg's implementation process. He believes that the powers that are necessary to realize the plan need to be acquired. In addition, adequate capital is needed for land purchasing and site improvements. Regulatory and zoning ordinance enforcement is also an important ingredient to McHarg's implementation formula (Belknap p. 66-74).

In McHarg's methods, we see that environmental factors play a major part in his process of planning. His process also allows "the causes and consequences--related policies, limitations and prohibitions provide the means to select the best alternatives for orderly growth and development" (Belknap p. 75). This ideal is the basis for most environmental analysis conducted to date. As we will see later in the case study of Spring Island, the environmental limiting factors played a major role in the development decisions made by Jim Chaffin and his development partners.

Environmental Planning Methodologies: William Marsh's Analysis

William H. Marsh developed a similar methodology to the process of environmental planning. His ideal related to the thought that people must view the landscape as a dynamic process. In his book, Environmental Analysis for Land Use and Site Planning, he states that "Processes must be treated together with forms and features revealing the vital relationship between an event and its setting". Three main methods are associated with environmental analysis, according to Marsh.

1. The identification of environmental constraints or capability analysis,
2. The identification of environmental opportunities, or suitability analysis,
3. The prediction of environmental impacts (Marsh p. 198).

This concern of the impact development has on the environment by such leaders as William Marsh began such techniques as impact analysis. Another main contributor to impact analysis or assessment techniques was The National Environmental Policy Act of 1969 (Thomas p. 47). The impacts of development on the environment over time was an important concern of Marsh's, therefore, his impact assessment theory is very closely related to the planning process. In his theory, he separates the environmental impact assessment approach into four major sections.

1. Identification of problems
2. Formulation of alternatives
3. Impact analysis
4. Evaluation of trade-offs

Each of these four steps occur simultaneously and are interrelated, with the only change during the process being an emphasis alteration. During an impact assessment analysis, however, Marsh mentions six steps to his formula:

1. Identification of variables termed as evaluative factors.
2. Identification of systems and the independent and dependent relationships between these evaluative factors.
3. Formulation of alternative scenarios of desired futures.
4. Identification or prediction of the impacts of each alternative and its effects.
5. Identification of various trade-offs among the different scenarios and alternatives.
6. Evaluation of the differences among alternatives and scenarios by means of a matrix or listing approach (Dethero p. 48-49).

At the end of this process, a comprehensive impact assessment approach is achieved. This approach identifies the impacts of each alternative or proposal, while determining the combination of different proposal elements that best serve an intended purpose (Thomas p. 48).

In efforts to implement environmental planning as a large scale concept, many federal and state agencies adopt legislation that requires environmental analysis and encourages the concern of future developmental impacts. Further into the study, more detailed environmental planning concepts will be discussed that are used at the state and local levels that put environmental planning theory into practice by promoting environmentally sensitive development.

CHAPTER III

DEVELOPMENT IN SENSITIVE AREAS

The planning and regulation of development in areas of environmental sensitivity is a topic that is often addressed by all branches of government. From federally enforced legislation, such as created by The Environmental Protection Agency's (EPA) Clean Air Act and Clean Water Act, to the Office of Ocean and Coastal Resource Management's (OCRM) Coastal Zone Management Act, federal agencies play a significant part in the protection of our sensitive lands. These federal legislations often give power to state governments to enforce regulations and implement their own statewide development regulations.

Although much of the protection of these sensitive lands are addressed by statewide or regional agencies, local governments can also play a major role in the regulation and implementation of protection policies that can aid in the protection of fragile ecosystems (Thorow p. ii).

In this chapter, several agencies from the federal to the local level will be discussed that provide valuable legislation and other regulatory mechanisms that are used to protect and conserve natural resources and fragile areas of the environment. This portion of the study is intended to provide an overview and analysis of the different environmental protection concepts, current governmental legislation and different implementation tools that are used in the protection of different areas of environmental

sensitivity. With this information, a better review of the regulatory process of Beaufort County and The State of South Carolina can be conducted.

In all development decisions, the natural relationships between soil, air and water are altered. These alterations may, in return, affect society for a long time to come. Our land use decisions must be carefully made in instances such as with topsoils, surface and subsurface waterways and various plant and animal habitats. Insensitive decisions may result in the erosion of soils, the pollution of water supplies and the extinction of many plant and animal species. Many such areas are categorized as areas of environmental sensitivity.

Environmentally sensitive areas are usually grouped into several categories.

- River corridors: Natural rivers, streams, or creeks and adjacent land that possesses important water conservation, flood prevention, scenic, biologic, historic, or outdoor recreation value.
- Natural areas: Undeveloped stretches of natural land (including steep slopes and erodible soils) or water that because of their values and functions should be preserved in the public interest and therefore protected from development.
- Groundwater: Subsurface waters in rock, sand, or gravel which are the present or future sources of public or private water supplies. The holding area, or aquifer (water-bearing) is recharged from precipitating rain and snow. Recharge land may become contaminated, which could pollute the aquifer; or, it might be covered over when buildings, roads, and parking areas are constructed, thereby reducing the amount which could be withdrawn.
- Geologic areas: Land forms subject to hazardous downward movement of soil and/or rock masses, slope failure, or landslides because of unique geologic, hydrologic, or topographical conditions.

- Flood zones: Area of past or planned development where life and property are threatened by documented flood damage, as in 100-year flood zones.
- Wetlands: Marshes, swamps, bogs, fens, and other wetlands with characteristic wet soil and vegetation which aid in flood protection and pollution abatement and which provide critical nursery areas and primary habitat for a variety of plants and animals.
- Coastal zones: Limited and irreplaceable stretches along freshwater and saltwater bodies that are rich in natural, commercial, recreational, industrial, and aesthetic resources and opportunities (Institute for Environmental Education p. 1-2).

One of the factors that adds to the special unique nature of Spring Island is that it is situated within the Atlantic Ocean coastal zone of South Carolina. These coastal areas are important ones within the environmental world, and have unique characteristics that require special considerations and protective management techniques. In understanding coastal environmental preservation, a more detailed definition and discussion of the nature of the coastal zone should be included.

Coastal Zone Management

The regions of our world within coastal areas are some of the most intriguing and valuable areas that exist. With all of this popularity and valuability, these areas are also some of the most fragile and sensitive of any lands. The natural aspects of the coastal zones range from the unique geological, ecological and biological features associated with the transitional area from land to sea. These zones provide natural habitats for incredible numbers of plant and animal species that can be found in no other areas on the planet. The portions such as the fresh water and salt water estuaries provide an especially

unique habitat for certain varieties of fish and seafood. Another environmental importance that coastal regions provide is natural filtration systems, as with coastal marshes and wetlands areas. These wetland areas filter out many impurities in the water that sifts through the vegetation of the marshes.

Although there are many different natural and ecological processes that interact within these coastal areas, when left undisturbed, the natural environment remains amazingly balanced. There are, however, many occurrences that can disturb this harmonious ecosystem. These harmful pressures may result from natural systems as well as human interferences. Natural features such as winds, rains and waves can disturb the natural processes of a sensitive coast very easily. Seasonal storms can destroy unstable coastlines and inlet areas and rearrange the configurations of ecosystems overnight (Beatley p. 2).

These natural shifts in topography and natural features and temporary disturbances caused by processes of nature are solved by the constant changes and adjustments of the environmental process. It is when external forces prohibit the natural evolution of environmental processes to work that nature cannot fully recover from these disturbances (Beatley p. 2-3).

These pressures are not strictly confined to negligent development of coastal areas, but often include everyday inhabitation of the regions. The coastal zones happen to provide some of the most opportunities for economic benefit in the United States. Many people like to live on the coast strictly for the scenic beauty, but many jobs are created for the simple reason that the coastal areas are rich in opportunity.

For these reasons, it is hard to believe that people are going to stop living and vacationing on our coasts, so some form of regulatory process must prohibit the destruction of these sensitive resources. Coastal zone management targets the preservation and conservation of the coastal ecosystems. The criteria that is used to classify these coastal elements are:

1. Vital or preservation areas: ecosystem elements of such critical importance and high value that they are to be preserved intact and protected from disruptive forces--encompassed within an area of environmental concern.
2. Environmental concern or conservation areas: broad areas of environmental sensitivity, possibly containing one or more vital areas, the development or use of which must be carefully controlled to protect the ecosystem.
3. Normal concern or utilization areas: regions where only the conservation practices of the land ethic apply to development activities (Richardson p. 7).

Coastal resources have been a concern of many planners and decision makers for quite a long time, but not until The Coastal Zone Management Act of 1972, did federal, state and local governments cooperate in the planning and management efforts of these areas. Figure 3 lists the various federal agencies involved in CZM. Since the inception of the Act, 28 of the 35 coastal states and territories have developed coastal zone programs. These programs are aided and reviewed by the National Oceanic and Atmospheric Administration (NOAA) within the U.S. Department of Commerce.

Until 1972, the separate branches of government placed more emphasis on different areas and activities of the coastal zones. This caused the overall planning efforts to become somewhat fragmented. For example, the state agencies usually concentrated more on the planning of major facilities and management of resources and recreation. In

Key Federal Agencies and Legislation Affecting the Coastal Zone

Agencies	Primary coastal management activities	Key authorizing legislation
Office of Ocean and Coastal Resource Management (OCRM within NOAA)	Implements coastal zone management program; works with states in developing and implementing their coastal zone programs	Coastal Zone Management Act (CZMA)
Federal Emergency Management Agency (FEMA)	Implements National Flood Insurance Program (NFIP); provides disaster assistance to coastal states and local governments	National Flood Insurance Act; Flood Disaster Protection Act; Stafford Disaster Relief and Emergency Assistance Act
U.S. Army Corps of Engineers (COE)	Technical assistance and funding of shoreline protection, beach renourishment; implements Section 404 wetlands permit program	Federal Flood Control Acts (of 1917, 1936, 1945, 1955, 1968 . . .); Clean Water Act
Environmental Protection Agency (EPA)	Oversees Section 404 wetlands permit program; establishes emission standards for air pollutants, effluent standards for water pollutants	Clean Water Act; Clean Air Act
National Park Service (NPS, within DOI)	Maintains and manages national seashores and national park system units; oversees Coastal Barrier Resources System (CBRS)	Coastal Barriers Resources Act (CoBRA)
U.S. Fish and Wildlife Service (USFWS, within DOI)	Enforces federal wildlife and endangered species laws; prepares and implements species recovery plans; establishes and maintains system of national wildlife refuges	Endangered Species Act (ESA)
National Marine Fisheries Service (NMFS within DOI)	Fisheries management; protection of marine mammals	Marine Mammal Protection Act

Figure 3. Federal Agencies and Legislation Affecting the Coastal Zone.

Source: Timothy Beatley, An Introduction to Coastal Zone Management.

the late 1950's and early 1970's an interest in developing a national approach to serve this national concern became more noted. Separate legislations were proposed to address the national concept of public lands management, and various preservation and conservation concepts. Figure 4 illustrates various elements of Coastal Zone Management activity. Finally legislation was created that could incorporate the sensitive concerns on our resources within the coastal areas with the previous concerns of national land use planning and management (Brower p. 3-4).

In this legislation, The Coastal Zone Management Act (CZMA) requires that the programs developed by states on coastal management contain three basic elements:

1. A geographic scope of the program must be defined by a boundary (the seaward boundary three mile territorial sea and the inland boundary is determined by the individual states).
2. The activities that are permissible within the designated coastal zone boundary must be indicated.
3. The legal authority for the state's policies must be specified, in addition to, a decision-making structure for the program (Brower p. 5).

Given the complicated nature of this environmental issue, the beginning legislation of this Act has been amended, and presumably will be in the future. Each state can amend or modify their management programs, but these modifications must ultimately be approved by the NOAA (Brower p. 6).

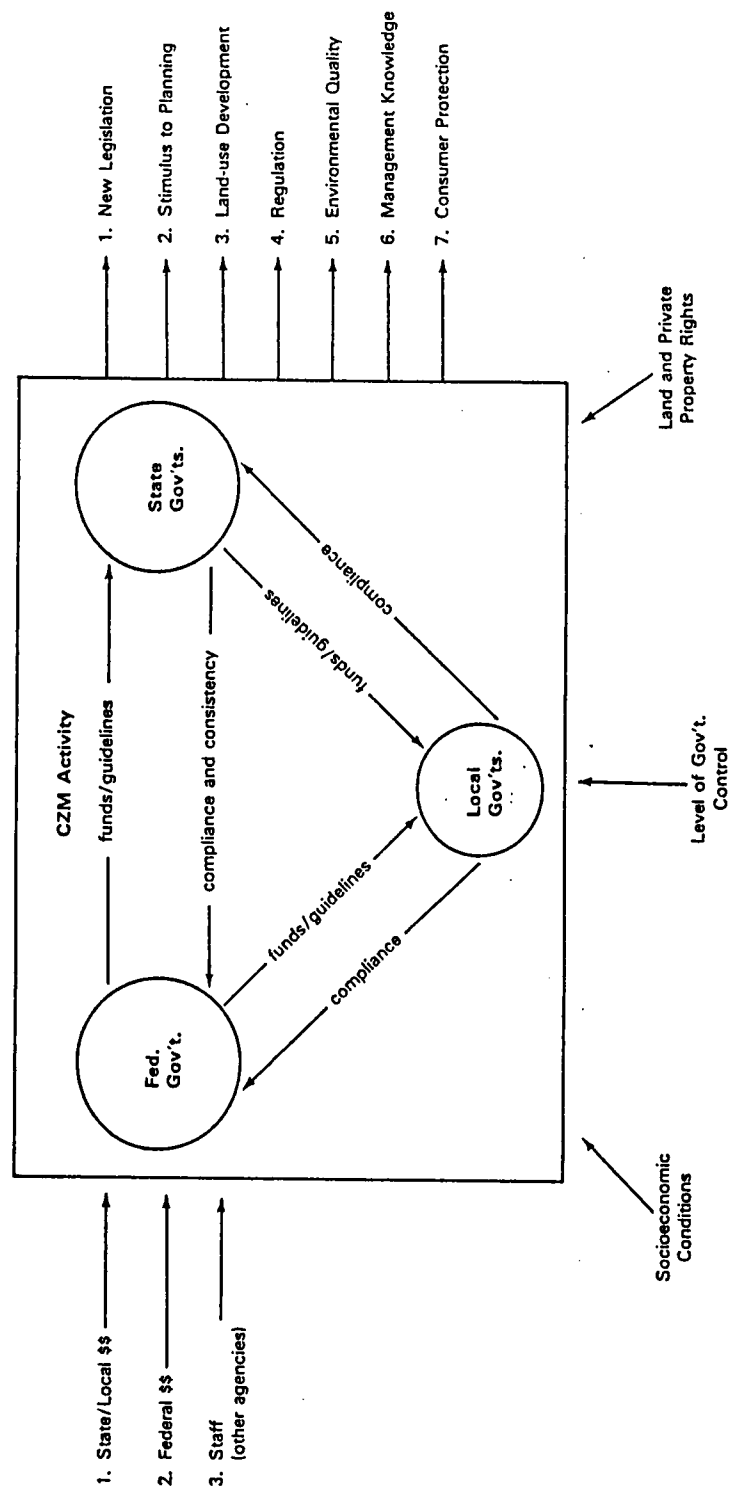


Figure 4. Inputs, Influences and Outputs of Coastal Zone Management Activity.

Source: National Planning Association, Coastal Zone Management as Land Planning.

One aspect of the CZMA is the flexibility that it allows the individual states to create its own management programs to address specific physical, social or political issues or circumstances. From local planning requirements, coastal wetlands protection, and unbuildable lots to ecosystem management, estuary programs and cumulative and secondary impacts, coastal management programs state in detail preservation and conservation guidelines that must be followed by potential development. Further in the next chapter, specific concerns of South Carolina's coastal management programs will be discussed in more detail to incorporate specifics with individual development strategies. Figure 5 provides a classification of the South Carolina Coastal Area.

Development Management Tools and Techniques

In the development of our urban and rural lands, the protection and conservation of sensitive areas is often a give and take process. There are, however, development management tools that can be initiated by both public organizations and private individuals or land owners. Both parties may combine simultaneous efforts in protecting these areas that prove to be beneficial to both. In the next section, several of these techniques will be discussed in detail to determine what advantages and disadvantages each pose for different parties involved. Different combinations of these tools may prove to serve more land use problems in the future.

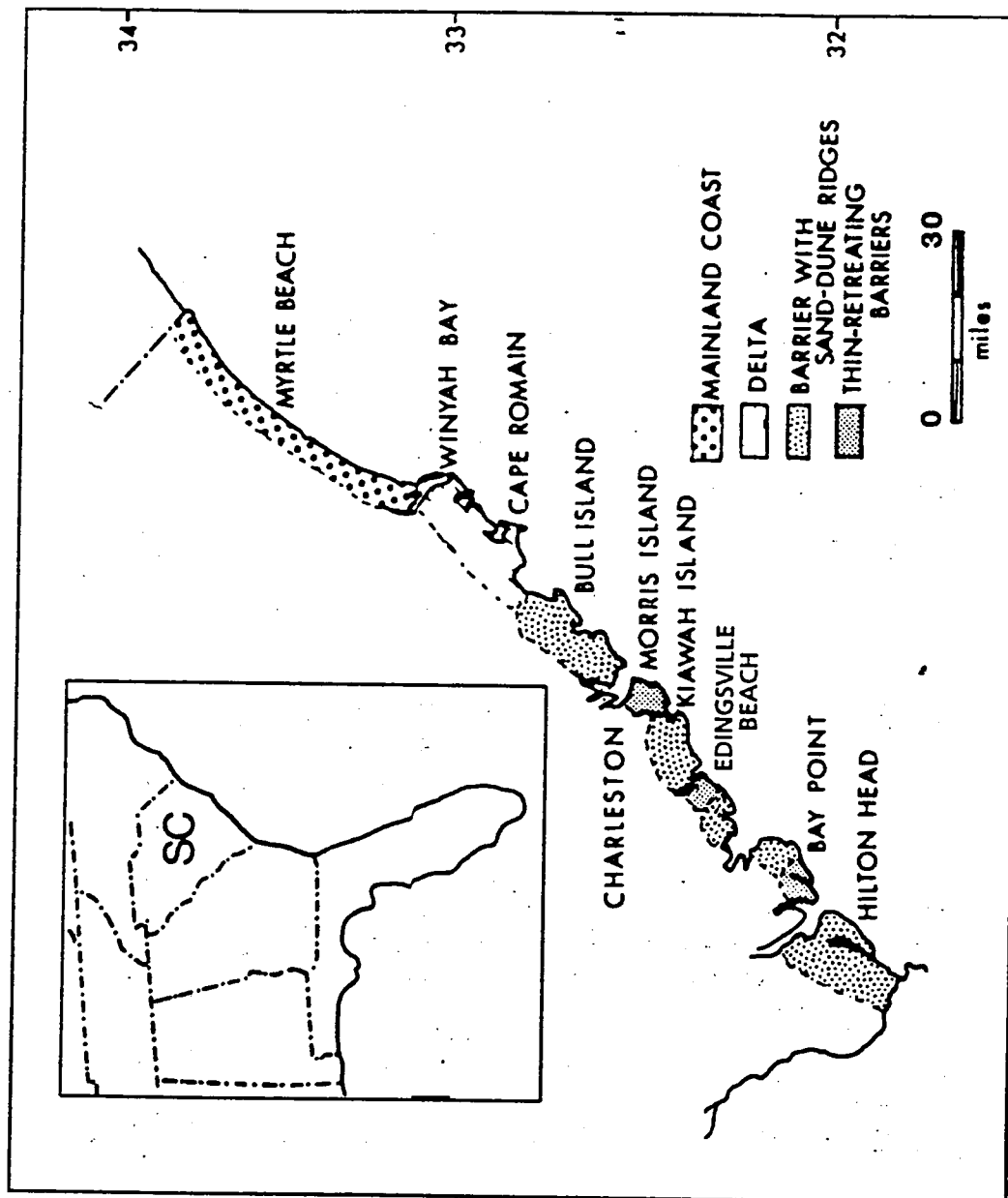


Figure 5. South Carolina Coast Classifications.

Source: Timothy Beatley, An Introduction to Coastal Zone Management.

Phased Timing

The first several management strategies that will be discussed are those that could be initiated by various local public agencies and organizations. The first technique is that of Development or Phased Timing. This strategy is enacted by local governments in efforts to regulate the pace of development. These regulations assure that sufficient plans, along with adequate public utilities and infrastructure and funds are in place before scheduled development is approved. With this correct scheduling, sensitive lands can be more carefully planned around and implications from insufficient infrastructure systems can be reduced.

The leverage that a community usually holds in these situations flour from the dependence that new developments have on government assistance. Infrastructure costs can often be very expensive at the beginning stages of a development and the community usually helps finance a portion of these costs. With development timing strategies in place, the community can have a significant influence on the rate and location of such development activities.

This strategic technique poses several advantages for each of the parties involved. From the community's perspective, development timing is a desired method of programming community improvements. This gives more decision making influence to the planning staff to better determine a community's needs and objectives prior to development proposals. Timing is also a way to avoid excessive pressures that can be placed upon them by vested interests groups. For the developer, this method can be a blessing in disguise of sorts. The developers can learn well in advance the areas in which

development is encouraged and what specific development types will be approved by the community. Because of this prior knowledge, developers can save themselves substantial time and money on investments.

For the community development timing also has its disadvantages. This concept is very dependent on the involvement and cooperation of the entire community for its success. Continued public support is required to sustain the long range goals and extended bond issues and tax strategies that will support the plan. In order to support the plan of development timing, the many taxpayers and voters must first fully understand the concepts behind it (IEE p. 91).

Environmental Impact Ordinance

The next development management strategy is one that is commonly used in planning agencies today. This technique is the use of an Environmental Impact Ordinance. This technique can be and is usually implemented through state and local governments. The ordinance is helpful in minimizing the environmental impacts of proposed developments by requiring a thorough environmental review process prior to approval. After this review, some agencies can require special design features to be incorporated within a potential development.

At its inception, the first environmental impact ordinance was implemented at the federal level in 1969 in the National Environmental Policy Act (NEPA), and has since been adopted by many state and local governments. In such an ordinance, all governmental construction plans are to be reviewed and potential impacts must be

recognized. In addition to the acknowledgment of environmental impacts, certain measures that must be taken to address these particular impacts must be outlined in the plans.

Some communities incorporate these ordinances within existing subdivision regulations or planned unit development regulations. Another alternative is to identify particular impacts of concern and to develop an individual community-wide ordinance that addresses such impacts. An example of such an impact would be stormwater runoff. In some communities "Critical Environmental Areas" are determined and before any development can occur in one of these areas, an environmental review must take place. Along the same lines as the designation of critical areas, many communities implement the impact ordinance by applying overlay zones or establishing special districts within the community that require permits to be granted before construction. This method is often used and has become a more structured technique of implementation.

One of the obvious advantages of the environmental impact ordinances is that through the environmental reviews, many of the damaging implications of development can be foreseen and planned for prior to construction. This eliminates much of what is generally called "crisis planning".

This method also incurs disadvantages. Providing the ability to accurately review environmental impacts of potential developments, planning staffs must be qualified to do so. This means that planning agencies must staff environmental experts to conduct these reviews in many cases. This may result in an increase in the cost of local government. Another disadvantage is that many times these processes are only required for

government funded projects and often do not apply to the general projects within a community(IEE p. 94).

Impact Fees and Exactions

The next method used by public agencies to protect environmentally sensitive lands is the use of Impact Fees and Exactions. These fees follow the same objective as the environmental impact statements, in that, the developer is held responsible for any environmental impacts that a development may impose on the land. The impact fees enacted by local governments, however, require the developer to pay for the added impact that the particular development places on certain things as public facilities and infrastructure systems.

With all additional development, a community's road systems and public utilities are more widely used, and eventually the capacity of the existing systems exceed the need for service. The impact fees are established to help in the financial improvement of these systems. This is due in part by the past tax increases and other related financial alterations of the community budget that were associated with the improvement of these systems. Community decision makers felt that they could no longer fund these improvements in the same manner as before, and decided to shift more of this financial burden to the developer.

The type of development combined with the projected impact on current public facilities determine a calculated charge as an impact fee that the developer would be required to pay. Impact fees are usually established within local governmental

ordinances, but exactions on the other hand are more often addressed on a case by case basis. In many cases local planning agencies may require the developer to contribute land, needed improvements, or money in exchange for rezoning, building permits or final plan approval. This land contribution, many times is required for the construction of a new public park or community school that may be needed as a result of a new development. Money contributions may be used to improve the capacity of existing sewer systems or to build or upgrade existing treatment plants to account for the additional use.

The implementation of these fees is a legal process, under the assumption that a particular rule is followed. In these cases, the parties that benefit are the ones that pay the fees. This idea is called "rational nexus", and follows the premise that the amount of the fees is directly associated with the amount of potential impact that will be placed on the community facilities.

One question that had arisen, however, is if a governmental body is so empowered as to legally use required fees for public improvements. Because of this indecision, many states have amended existing legislation to specifically state the authority given to the communities to do so.

Among the advantages of these impact fees and exactions, the individual developers are responsible for a large percentage, or many times the entire cost of new development instead of the taxpayers. This is an advantage for the residents of a community, as well as, the community as a whole by encouraging more compact and

creative design while ensuring that community facilities will have the capacity to sustain the new development.

The use of these fees, can also pose disadvantages. If these fees are calculated too high or inappropriately, a community runs the risk of legal challenge. Many times the community cannot defend its requirements if the fees and exactions are not calculated based on a comprehensive plan or capital improvements plan (IEE p. 97-98).

Subdivision Regulations

The final development management tool that is initiated by public organizations and local governments to be discussed is one that predominantly every community has developed. This technique of preservation is the use of Subdivision Regulations. Nearly all areas of development fall within someone's jurisdiction of subdivision regulation. In unincorporated areas, the subdivision of land is usually controlled by the county or perhaps an acting regional planning commission. Cities, on the other hand, may have ruling jurisdiction of within three miles of their established boundaries.

These regulations are established to protect the quality of life of all residents of new subdivisions. The overall objective of subdivision regulations is to regulate land-use planning, design and functional layout, and improvements of new subdivisions. This is accomplished by setting minimum requirements for design features. In most cases all subdivision of land requires the approval of the local planning commission by following the subdivision regulations. The regulation of the construction of roads, including the

grading and width are usually stated within these documents. The regulations also often include such tools discussed earlier, such as impact fees and exactions.

Subdivision regulations are among the most widely used regulatory tools, and are so because of certain advantages that they present to communities. Figure 6 illustrates how frequently some of these tools are used in practice. Adequate open space and space designated for pedestrian oriented activities is often required with new subdivisions, as well as, specifications for infrastructure such as water and sewer services. The factor of density is also a concern addressed by the subdivision regulations. With this section, planning commissions can classify land-uses and accompany them with designated maximum densities. The overall advantage of subdivision regulations is that sufficient land-use design and development standards will be used to better follow the overall goals and policies that are determined by a community.

One disadvantage of establishing subdivision regulations is the cost to all participants. Much time and money can be spent during the plan submittal and review process. Usually a series of steps must be followed by the developer to submit a plan for final approval, in which both the planning commission and usually the city council are involved (IEE p. 106-107).

The next several techniques that will be discussed are those that are initiated and implemented by individual developers or private organizations. These strategies are used in many different ways and for many different reasons. Sometimes incentives provided by the local and state agencies encourage these actions that will in turn protect natural resources or fragile environments. This thesis presents alternative strategies to help

<i>Development Management Measures in Order of Frequency Used^a</i>		
Type of measure	Survey communities using measure	
	Number	Percentage
1. Zoning ordinance	354	87.8
2. Subdivision ordinance	347	86.1
3. Comprehensive/land use plan	340	84.4
4. Evacuation plan	272	67.5
5. Shoreline setback regulation	218	54.1
6. Capital improvement program	216	53.6
7. Location of public structures and buildings to reduce storm risks	185	45.9
8. Dune protection regulations	152	37.7
9. Location of capital facilities to reduce or discourage development in high-hazard areas	126	31.3
10. Acquisition of undeveloped land in hazardous areas	118	29.3
11. Special hazard area ordinance	109	27.0
12. Hazard disclosure requirements in real estate transactions	103	25.6
13. Recovery/reconstruction plan or policies	87	21.6
14. Transfer of development potential from hazardous to nonhazardous sites	84	20.8
15. Hurricane/storm component of comprehensive plan	80	19.9
16. Construction practice seminars	62	15.4
17. Acquisition of development rights or scenic easements	56	13.9
18. Reduced or below-market taxation	44	10.9
19. Acquisition of damaged buildings in hazardous areas	12	3.0
20. Building relocation program	9	2.2
21. Impact taxes or special assessments	7	1.7

Figure 6. Development Management Measures in Order of Frequency Used.

Source: Timothy Beatley, An Introduction to Coastal Zone Management.

promote more environmentally sensitive development by the initiators of new development.

Conservation Easement

The first technique that can be used is the Conservation Easement. The primary objective of this easement is to provide legal protection to private property over a long-term. In this strategy, the individual land owner agrees to deed a portion of or entire property over to a special governmental or private conservation organization. This deeding of land complies with the definition of the legal ownership of land. During this technique, the land owner places an easement on the property, and essentially transfers various land ownership rights to the particular organization. These transferred rights are usually the mineral and development rights to the property. The organization would then acquire the management tasks, and the land is often monitored to ensure that the restrictions of the easement are being followed. After the easement, a landowner can reserve several rights to the property. However, most times these would include the right to use the property and privacy, or even the right to sell the land.

These easements have definite advantages, such as allowing a land owner to protect valuable resources or sensitive land and still retain ownership of the land. Even though the land could be sold after the easement is in place, these special areas can be protected regardless who owns the land by correctly writing the conservation deed. Another advantage of donating a conservation easement is the tax benefit. By donating land in this manner, the land owner usually receives substantial state and federal income

taxes, capital gains tax and estate tax benefits. Often times the property is reassessed after the easement is in place, and is usually assessed at a lower value. This will result in property tax benefits as well.

In order to receive benefits for donations, the owner must legally donate the land in perpetuity. From the time of the deed, the land owner can at no time reclaim the rights to the property that were transferred to the conservancy. This is seen as a disadvantage by some. This means that the owner can never decide to develop land and receive financial gain from it. A financial disadvantage is also placed upon the conservation organization at the time of the transfer. The conservancy must then spend their time and money managing and monitoring the land and enforcing the restrictions stated in the deed (IEE p. 11-12).

Land Trust

Another tool that individual land owners can use is called a Land Trust. The objective of the land trust is also to protect valuable and sensitive lands and cultural resources within a community. These trusts are most commonly used to protect areas such as important wildlife habitats, historic sites, ecologically sensitive areas, valuable public open spaces and recreational areas and coastal zones.

The land trusts are able to protect these lands because they are community-based, private and non-profit organizations. They acquire the rights to these lands through such devices as conservation easements as discussed earlier. The trusts are different from other organizations that receive conservation easements, in that, they acquire complete

and outright ownership of the land to ensure conservation and preservation goals. These land trusts are commonly called "conservancies", and through many different tools for implementation within the conservancy, they can specifically meet the individual needs of a particular conservation area.

There are many advantages in establishing a land trust. From a preservation standpoint, the trusts are commonly more associated with the community than other national or state organizations. Being an organization that is primarily run by local citizens, the sensitivity is usually greater for the community as a whole. From a financial standpoint, an advantage for the land trust is again tax related. Because conservancies are non-profit organizations, they are not responsible for paying taxes. For this reason, any donations that are received by the land trusts are tax deductible.

Land Trusts can also encounter disadvantages. Although being a non-profit organization can be an advantage, it can also cause problems with staff help. These trusts primarily rely on volunteer help to complete their staffs. Many times this results in insufficient funding problems. Much of this under funding is a result of a lack of community involvement which often stems from the community not understanding its objectives. To reduce this problem, many times trusts use a portion of their funds in educational activities that help involve and teach the community about the importance of the land trusts (IEE p. 14-15).

Limited Development

The practice of Limited Development is another opportunity a developer has to initiate a development management tool. With this technique, the developer is able to financially better afford the preservation of the sensitive areas of the land. One of the main problems land owners have with the preservation and conservation of fragile property is simply the cost. With limited development a developer only develops a portion of land with the best development potential, and with the help of organizations such as land trusts or other conservation agencies, donate the other portions of the land for financial assistance. Limited development strategies are also commonly known as conservation development strategies for its ability to balance developability with conservation.

The many advantages of practicing limited development include giving the developer a financial incentive to preserve valuable resources. Usually, as with several other management techniques, the developer is entitled to substantial tax incentives in return for his land donation. In this case, the developer is usually entitled to an income tax deduction that is equal to the value of the property donated or the conservation easement. An additional benefit of this technique is a reduction in the value of the land, which in turn, results in lower property taxes, and the developer may even be eligible for capital gains tax reductions upon the re-sale of the land.

From an ecological standpoint, some of the only disadvantages to the technique of limited development is that some of the land is developed at all, as opposed to the other forms of land donations. One of the other disadvantages is from the land owner's

perspective. The owner loses the right to fully develop the land, and perhaps not gain full financial potential for the property. Fortunately, for the owner, many times these losses are offset by the substantial tax benefits available through limited development (IEE p. 17-18).

Outright Donation

The final privately initiated management technique to be discussed entails the transfer of property to a conservation organization in the form of an Outright Donation. Much like the other forms of conservation land donations, outright donations are intended to preserve sensitive lands for long periods of time through conservation organizations. In this technique, the landowner works with governmental agencies or private organizations with such tools as land trusts, as explained earlier.

A landowner has several options within the outright donation technique. The donation can be established much like that of a reserved life estate. With this option a landowner can donate the property to a conservation agency and retains the right of lifetime use of the property. Another option an owner has is to set up the donation as a will. With this option, a deserving conservation organization is chosen to receive the land upon the death of the land owner.

An advantage of this donation is that a landowner can be certain of the long term preservation of a piece of land. As with other forms of land donation, the owner is also eligible for several income, estate and property tax incentives. From the conservation organization's standpoint, the land does not have to be purchased.

The apparent downside to this method is that the land owner does not receive any compensation for the donated property, however, some of this burden can be offset by the tax benefits. A financial burden is also passed on to the conservation agency that is the beneficiary of the property. With the donation of the land, the organization must assume the cost of managing the land (IEE p. 20).

Protecting the sensitive lands of our world has its advantages and disadvantages. Sometimes it comes down to the individual land owner and the decisions made by each. Hopefully society is becoming more concerned about preserving those precious and fragile ecosystem environments with every day, but much land will be lost in the interim.

As we can see, there are many strategies and techniques that can be used to protect our natural environment. Many agencies, both public and private have been established to try and do just that. As will be discussed in the next chapter, The Spring Island Company and all parties involved incorporated several of these ideas in the planning and development of Spring Island. The objective is to determine if these techniques were used in the correct manner and to encourage more developers to try to incorporate these efforts into their individual projects.

CHAPTER IV

THE PLANNING AND DEVELOPMENT OF SPRING ISLAND

Real Estate Development as a whole is viewed by most as a concept composed of one main desired end. This end is to make the largest profit, with the smallest risk and personal investment involved. This concept is true all over the United States, but especially in the concentrated areas of our nation's coastal shores. One of the hottest areas for this type of attraction is the coastal areas of South Carolina. With this enormous demand for progressive development, regulations and restrictions had to be adopted and enforced in order to monitor the threat of environmental and social destruction. This chapter will address the process which The Spring Island Company followed in their pursuit of the development vision of Spring Island. During this discussion, various governmental regulations and restrictions enforced by specific agencies in South Carolina will be identified. With the necessary steps to development addressed, the actual steps taken by The Spring Island Company will be analyzed from information obtained from several personal interviews with members of the development team.

The Spring Island Philosophy

With the majority of the development that was currently being constructed on the coast of South Carolina, much of the natural beauty of the coast was in danger of being engulfed into more tourism commercial centers and extensive golf resorts and hotels. The original plan for Spring Island was no different. As mentioned before, the original

design for this piece of sea island marshland was approved for 5,500 homesites and three golf courses. Fortunately, this plan was not implemented. Because of several problems throughout the development process, the original developers were unable to pursue their proposal, and the land was reclaimed.

During this time, a developer named Jim Chaffin possessed a unique vision. Being a member of the original development team of Hilton Head Island and Sea Pines Plantation not far from the site of Spring Island, Chaffin was very aware of the real estate marketability of this area of the coast. During an interview with Chaffin, he stated that the vision of Spring Island was a dream that well preceeded the purchase of the island. Chaffin had expressed an interest in the unique environmental attributes of special areas of the country for many years, but when he and his wife visited the island they new that no time would be more suitable for their dream than the present.

Their dream was simply to create a development that embraced the concern of enviromental stewardship as the main objective. As with most developments, amenities are very important components in the marketability of a project, and with Spring Island, nature was intended to be the most important of its amenities (Salveson, p. 67). By incorporating together several development strategies, The Spring Island Company began to research the possibility of a vision such as this.

Governmental Regulations and Ordinances

Located in the coastal county of Beaufort, several agencies and governmental organizations regulate development according to different criteria. Among the different

agencies mentioned in the text, many are responsible for development practices within the coastal zones. For this reason, most of the environmental regulations were enforced by agencies primarily involved in coastal zone management.

One of the most basic governing bodies that had to be studied was the local planning agency of Beaufort County. Although the zoning ordinances and regulations possessed fairly strict codes and restrictions that had to be followed during the planning approval process, Spring Island did not encounter much resistance during this process. Although the extent of detailed information could not be measured, merely proposing a plan of limited development for the site and downsizing the density was reason enough for the planning commission to grant Chaffin and Company their blessing.

Spring Island is located within what is termed in Beaufort County as a Rural Development District. Appendix A illustrates this district as shown in the Beaufort County Zoning and Development Standards Ordinance. According to the engineering and consulting firm of Davis and Floyd, Inc., which worked closely with The Spring Island Company through the planning and development process, several variances were applied for and granted by the planning commission. These variances pertained to various things such as road widths, and storm water drainage and retention. Although detailed information of the specifics of these variances proved to be unavailable, a spokesman from Davis and Floyd, recalled the variances being fairly common in nature.

The Office of Ocean and Coastal Resource Management

The next governmental agency that regulates development along the South Carolina coast is the Office of Coastal Resource Management. According to the South Carolina Coastal Management Act of 1977, the South Carolina Coastal Council was created and delegated the responsibility of protecting and enhancing the state's coastal zones and resources. In 1993, the legislation was amended and the Coastal Council merged with The South Carolina Department of Health and Environmental Control, which will be discussed further. Since this merger, the Coastal Council has become known as The Office of Ocean and Coastal Resource Management (OCRM).

Structured around the overall coastal zone management program, this department uses special regulations that can help better utilize and manage the state's fragile resources. According to the document of rules and regulations for permitting in the critical areas of the coastal zone, published by HDEC and OCRM, these rules and regulations are intended to accomplish three main tasks.

1. To aid developers and others in taking advantage of state-of-the-art techniques in developing projects compatible with the natural environment.
2. To insure consistent permit evaluations by the department; and
3. to serve as a stimulus for implementation of better and more consistent management efforts for the coastal zone.

One of the main areas of concern regulated by the OCRM that pertains to Spring Island is the permitting process of tidelands and coastal waters. These areas deemed "critical areas" by the department include some of the most fragile ecosystems associated with Spring Island. The saline marshes and estuaries that are commonly located around the island were a major concern throughout the permitting process.

The process for applying for an OCRM permit is described as one that requires several steps and plans for the developer to complete in order to obtain final approval. First, the department encourages developers to submit preliminary development plans for preliminary review to determine whether or not a permit is required. Upon the determination of permit requirement, the department committee assists the applicant in the application process. A complete permit application packet would include information such as:

- the applicant's name and address,
- a plan or drawing illustrating the proposal and the method intended for completion,
- a plat or copy of a plat of the specific area of development,
- a certified copy of the deed or lease with which the applicant legally claims the right to the development of the proposal,
- a list of all adjoining landowners and their addresses for protection of their public welfare rights,
- a brief summary of the proposal, including information regarding the type of proposed structure, type of construction methods and building materials,
- a copy of the newspaper notice required by the department informing the public of the proposal being submitted, and
- any additional information that may be required in certain instances by the department.

Upon receiving this required information, the application review process progresses with comments offered by the OCRM committee. This gives all interested federal and state agencies, any adjoining landowners, or local governmental units a thirty day period in which to submit comments to the department to be considered during the review process. After adequate review of the proposal submission, OCRM either grants or rejects the requested permit for development (OCRM p. 9-11).

In the development process of Spring Island, during the beginning phases, delineated saltwater wetland areas had been mapped by the state coastal commission, and areas of concern were acknowledged. According to Davis and Floyd, and the Anne DeBrosse, staff planner for the Spring Island Company, OCRM permits were applied for and obtained for development in the critical areas regulated by the OCRM prior to development.

South Carolina Department of Health and Environmental Control

A branch of the Office of Ocean and Coastal Resource Management that regulated many aspects of the development in the coastal areas of the state is the Department of Health and Environmental Control. DHEC is primarily concerned with the acts of stormwater management and sediment control for land disturbances. As another part of the coastal management program, DHEC issues permits for land disturbances in the coastal areas. This is usually one of the first permitting processes encountered by the developers.

According to the South Carolina Stormwater Management and Sediment Reduction regulations, and in compliance with other existing regulations, a stormwater management plan must be submitted for review for most development in South Carolina. DHEC and OCRM administer the review and approval process for these permits within the counties of Beaufort, Berkeley, Charleston, Colleton, Dorchester, Georgetown, Horry, and Jasper. These include primarily the counties located along the eastern coast.

In most of the state, not all projects require a stormwater management plan. Only the projects which disturb land in excess of two acres require plans, except for developments in the eight coastal counties listed above. For these counties, in addition to the projects disturbing more than two acres, the projects that are located within 1/2 mile of a receiving waterbody must also submit a plan (Environmental Quality Control p. 1).

The specific requirements for permitting vary in relationship to particular projects and the actual amount of land disturbance involved. According to the specifications for land disturbances for more than five acres, the department requires that stormwater management plans be produced by a certified professional engineer, landscape architect or Tier B surveyor. In this particular section of regulations, specific minimum standards on such things as retention basins, ponds or lakes are stated, and requires information describing the manner, location, and type of measures in which all stormwater runoff will be managed. Also within the regulations, specific design criteria for any construction concerning stormwater within close proximity to receiving waterbodies, bridge projects, golf courses, mines and landfills are also addressed (EQC p.19-20).

Water quality and damaging stormwater runoff was a definite concern when planning development strategies for Spring Island. According to Davis and Floyd, Inc., who supervised the stormwater management plans for the island, plans for review were produced and submitted for approval in beginning stages of the development process. Examples of such applications are illustrated as exhibits located in the Appendix B.

U.S. Army Corps of Engineers

In order to regulate development for the protection of certain areas of the critical zones, the acting enforcing agencies are also involved with certain federal agencies. The United States Army Corps of Engineers is one of these agencies. With regard primarily to freshwater wetland regulation and permitting in critical areas, the Corps requires applications to be submitted for any development or alterations to potential freshwater wetland areas.

The Corps of Engineers' involvement in the regulation of activities on the nation's waters since 1899, was authorized by the Rivers and Harbors Act of 1899 (U.S. Army Corps of Engineers p. 17). Their freshwater wetland regulation, however, has evolved from various national legislation such as the Clean Water Act and the Federal Water Pollution Control Act of 1972. As a result of this legislation and much controversy involved in it, The Corps was authorized to regulate all designated "waters of the United States" as termed by law. These waters make up primarily all bodies of waters located in the United States and their adjacent wetland areas (C.O.E. p. 1).

To assure that correct and adequate regulations were to be taken, the Charleston District of the Corps of Engineers, in conjunction with the OCRM and DHEC developed the South Carolina's Developer's Handbook for Freshwater Wetlands. According to this document, the state of South Carolina consists of over 5 million acres of designated freshwater wetlands. This number amounts to approximately 20% of the entire land area of the state (C.O.E. p. 4). Because of this impressive amount of freshwater wetland area, the majority of developments in this area would require the participation of the Corps in the permit approval process.

Because of the close affiliation between the COE and OCRM and DHEC, the applications for freshwater wetland permits are only submitted to the Corps. Activities that require such permits include:

- A. Filling Waters of the United States including Wetlands (for any purpose)
- B. Dredging in Navigable Waters
- C. Dredging and Draining Wetlands
- D. Mining in Freshwater Wetlands
- E. Creating Impoundments in Wetlands
- F. Managing Storm Water Runoff in Wetlands
- G. Constructing Docks, Bulkheads, and Boat Ramps
- H. Landclearing Activities in Wetlands (C.O.E. p. 6-7).

This process would usually begin with a general wetland deliniation, usually done by a local consultant, followed by Corps of Engineers specialists verifying the areas of

concern. This action is commonly done with larger developments, but is sometimes inappropriate for smaller projects (COE p. 15). As recalled by Jeffrey Poole, of Davis and Floyd, Inc. Consultants, these are the actions that were taken in the delineation of freshwater wetland areas for Spring Island. A local soil and wetland consultant conducted general flaggings of potential wetland areas and allowed the Corps to survey and confirm their findings with accurate sitings. Examples of a wetland submittal for an area of Spring Island is included in Appendix C.

The application process for permitting is the next step to be followed by the developer. Different development projects may require one or more different permits in order to complete the final approval process. In certain instances, an additional "Coastal Zone Management Program Consistency Certification" is required prior to issue of a federal or state permit. This certification is performed by OCRM to make sure that a development proposal is consistent with the policies of the South Carolina Coastal Zone Management Program and the South Carolina Stormwater Management and Sediment Control Act of 1991 (COE p. 26-27). Examples of these permit processes are illustrated in Appendix D.

The Development Process of Spring Island

Development Strategy

With the original vision of preservation came one of the most important concepts found in the project. This concept was limited development. As discussed in the previous chapter, limited development is a development management tool that is used by

individuals to protect fragile lands and still develop a property. In this case, limited development strategies could help make this dream of preservation and environmental stewardship a reality. At the beginning of the development stages, many steps were taken to attempt the feasibility of the project.

Market Research

In most development cases, the status of the current market is one of the main determinants of land use decisions. Market research can help determine the development strategies during the beginning stages of the process. With the success of the project so dependent on past and current market trends, financial gambles can be reduced with a thorough research plan. During such a plan, such studies and comparisons are done regarding current activity trends and economic activity as a whole, but in several instances a specific focus group can be focused on in marketing strategies. Economic feasibility studies are commonly the focus of such studies, by actually researching the targeted market on which the particular project will concentrate.

In the case of Spring Island, an accurate market research study was difficult. In a phone interview with Dianna Permar, the market specialist used by The Spring Island Company, she recalled that market information on such a unique project was hard to obtain. The reason for this was that the Spring Island Concept had never been attempted in this context. In attempts to find past developments to compare to the results were simply that no accurate comparison information could be found.

The research group concentrated on what was termed "Big Picture Trends", as explained by Permar. The concept behind these trends was that more and more people

are beginning to retreat and enjoy things that are natural instead of things that are manufactured. The findings of this research confirmed this idea and supported the fact that even though the rational behind what makes people do what they do might be hard to define, the facts are that people value what is natural. This idea more defined a target population for the company, but did not specify a certain focus group. The researchers were unable to target any one group of investors, so the market suddenly became a nationwide audience. No mass marketing and mailing strategy was thought to be successful because of the large range in which potential investors were scattered, therefore no traditional feasibility study was done because of the inability to conduct an accurate focus group interview.

According to Permar, the majority of the market research that is usually done for development projects such as this is done to submit to potential lenders for their files instead of to understand the market. This increases the concern for the actual success of a project. In the case of Spring Island, the evidence to support the potential success of a project such as this was not obtained from the research done, but according to Chaffin, personal advice was given by Permar. The response to the ultimate question of "will this project work?" was "I do not know if it will work", but she went on to suggest that if it were to be successful, complete dedication to the project would be imperative. To increase the chance of success, Chaffin was encouraged by his market research specialists to remain true to his vision and be willing to move to Spring Island from Colorado to live and breath it day in and day out, and it might have a chance.

Environmental Analysis

During the beginning stages of a development process, environmental factors must be inventoried to determine the developability of a piece of property. The usual inventories often include soils, hydrology, vegetation and land cover, slopes and topography, wildlife habitat, etc. As discussed in Chapter II, this inventory is the basis for much of the environmental planning process. Prior to the majority of the development process, a team of professionals, including a biologist, a naturalist, a forester, a landscape architect, an environmental scientist, and the former plantation manager, was compiled to conduct a study of the islands natural resources and environmental features. The team were able to create inventories of the soils, vegetation, geology, hydrology and wildlife. An example of these inventory maps prepared by the Environmental Consulting firm of Breedlove, Dennis and Associates of Winter Park, Florida are illustrated in Appendix E. This comprehensive study served as a map of areas of concern and development potential. In efforts to be consistent with the intended objective of the project, the next step taken by the company was to create a list of plant and wildlife species that were to be protected (Salveson, p. 67).

This information was used to form a comprehensive land management plan. The main purpose of this plan was to ensure a maximum diversity of plant and animal life, to make provisions to account for the needs and requirements of these species, and to create a pleasant environment for passive and educational recreation . In addition to environmental identification purposes, this land management plan also served another purpose. With the information mapped by these plans, the areas best suited for

development without overburdening and disturbing the fragile ecosystems of the island were determined. This step was the more accurate test of financial feasibility for the company. A critical mass of homes needed for economical feasibility had to be determined, and done in such a way that practiced environmental stewardship (Salveson p. 67-68).

The Design Process

A intricate part of the Spring Island philosophy was to add a sound and creative design phase to the development equation. Through this phase of the development process, preliminary design concepts are studied with several different objectives in mind. Much of this deliberation of design concepts relates directly to the economic design of the project. As with Spring Island, the primary planning objective was to create an environmentally sensitive development, but as with all developments, the ever evident economic objective was to fulfill this overall vision within a stable economic framework.

A creative and talented design team, in close contact with the developer, is a strong part of the success of a land planning project such as Spring Island. Often times, through group design sessions, many physical obstacles or problems can be changed into an innovative design idea.

Around the time of the purchase of the 3000 acre island, the development field was beginning to become aware of the need for more environmental sensitivity within design stages of development. Sharing the same vision, The Spring Island Company decided to test the idea that "an environmentally sensitive development was a good

business in terms of public acceptance and more rapid market absorption" (Dethero p. 116).

It has been stated in residential development literature that the developer who creates the environmentally sensitive development utilizes several principles.

1. The incorporation of open space to enhance the existing natural characteristics of the land.
2. The devising of mechanisms to conserve and protect the natural beauty of the site, while also retaining important areas for recreational use.
3. The design of storm drainage systems as an integral part of the development master plan, with a effort to locate these systems within the designated open space of natural drainageways.
4. The planting of vegetation, in the instance the land lacks sufficient vegetation for the control of such elements as temperature, sound and clean air, and maintaining such vegetation by creating a perpetual organization to manage open spaces as mandated by restrictive covenants (ULI p. 112).

To complement the vision of the development team, an equally sensitive design scheme for the island was another intrinsic part of Chaffin's recipe for Spring Island. The original design team included the Landscape Architecture and Planning firm of Ed Pinkney/Associates, Ltd. from Hilton Head Island, the Landscape Architecture and Site Planning firm of Robert E. Marvin and Associates, located in Walterboro, South Carolina and the Engineering and Consulting firm of Davis and Floyd, Inc. from Greenwood, South Carolina. Through design alternatives produced by this design team, a maximum

number of 500 homesites was decided upon with the amenities of an 18-hole golf course and other amenity areas. Through this process, preservation and conservation efforts were incorporated into a development plan that capitalized on the natural beauty and environmental splendor of the island. Figure 7 illustrates the Master Plan of the island with additional illustrations in Appendix F.

In preliminary attempts to master plan the island, there were several obvious preservation areas that were of major concern. The first area was of course the Old Tabby Ruins. This historical site was the home of George Edwards in the early 1800's, much of which still stands, and has been dated as one of the oldest existing tabby constructed ruins in all of the southeast. The preservation of what is left of the homesite is a process that requires special care, and much of the master plan of the island is planned around this site as its focus (Salveson p. 67).

A site that adds to the historical nature of the island is the Walker House. This too was a major focal point in the master plan of the island community. The home of Mr. and Mrs. Elisha Walker, occupants of the island after the Edwards family, is located in the area known as Walker Landing. This area also locates the information center with the staff offices of The Spring Island Company and community recreation facilities. The house itself has been fully restored and is now used as a restaurant and gathering house for the island community.

A site of historical significance located near the Old Tabby Ruins, is an outdoor chapel and sitting area built by the Walker family. In the chapel area, the Walkers erected a bronze statue of St. Francis of Assisi surrounded by several benches and

emersed within a grove of live oak trees. This serene area has been preserved and somewhat serves as a gateway to the Edwards Tabby Ruins (King p. 1).

In cooperation with these special areas of concern throughout the island, specific design techniques were also used in the planning and design of the areas designated for development. Such techniques include narrow unpaved roads throughout the island, deep setbacks for residential housing lots and the use of native plants for landscaping and the preservation of existing on-site vegetation were possible. With the idea of unpaved roads, the ability to design the road system around areas of concern and through existing natural forests with minimal disturbance was dramatically increased. The deep setbacks were included to better preserve natural vegetation, and to protect the areas along the existing waterfronts and marshes.

The design and layout of the residential lots on the island was one of the most important steps in the design process. According to Chaffin, the hierarchy of lot type value is:

1. lots with deep water frontage,
2. lots with tidal creek frontage,
3. lots with long marsh views,
4. lots with golf views over ponds,
5. lots with golf views,
6. lots with pond views, and
7. lots on the interior of the development

A clustering of residential lots in three specific areas complemented the limited development concept by concentrating development in certain suitable areas of high amenity quality while preserving a majority of the sensitive lands. By using the

clustering concept, the project could maintain financial feasibility by allowing a higher density in certain suitable sites, while reserving more land area for nature preserve. These clusters of cottage lots are grouped in the Bonny Shore area, the Golf House Area including the historic Old Tabby Ruins, and the Walker Landing Area including the historic Walker House. These three main "destination areas" as termed by Chaffin, were the only concentrated development areas in the plan, with all other homesites being estate lots.

Another important part of the design process was done by engineers, not by the land planners and designers. This part was the design of the water and sewer infrastructure systems. To begin dividing property into residential lots, a developer must first think of how to service these lots with water and sewer. The water service for Spring Island currently exists in the form of a community water system and well. This community system is intended to ultimately connect to the Beaufort-Jasper Public Water System when it is available. The proposed system will connect to Spring Island across the entrance bridge from Callawassie Island.

In the case of sanitary and storm sewer, a team of engineers and soil scientists were assembled to test the islands sewer capacity. With this information, The Spring Island Company could consider their options.

According to a preliminary engineering report for wastewater treatment done for Spring Island by Davis and Floyd, Inc., the original plan for wastewater treatment was to tie into or coordinate with the existing system for Callawassie Island. A reevaluation of this approach, however, suggested that this would place a burden on the existing

Callawassie system. One solution was the overall use of Individual On-site Disposal Systems (IODS). This solution solved the systems problem at Callawassie, but was not totally acceptable with SCDHEC. With this in mind, yet another option was considered.

In April of 1992, Spring Island reserved the services of Mr. Warren Stuck, of the Soil Conservation Service, to perform soil tests on the residential areas of the island. These soil tests were intended to determine the suitability of the soils to perform adequate on site disposal. With the help of island manager, Gordon Mobley, site soil borings were taken and studied. With this information, it was determined that large areas of Spring Island provided a unique setting for utilizing the IODS. The excellent soil properties, minimal ground slope and low seasonal groundwater table with a planned public water system proved to be more than adequate for on site disposal systems. To assure the quality of these systems, an agreement was made to allow the individual systems to be built and maintained by CUC, Inc., which is a licensed utility company. CUC agreed to maintain the systems in accordance with all South Carolina Department of Health and Environmental Control standards (Davis & Floyd p. 4-6).

Although much of the island could be serviced by on site systems, a certain portion of the island was designated to be serviced by a central collection system and an advanced treatment facility. An agreement was made to require that this system be built and in operation before a set date of October 1, 1997. Individual permits will issue temporary permits for on site disposal systems to service the residents within this area until the treatment system is available to them, at which time all residents will be required

to tie into the system. Illustrations found in the Preliminary Engineering Report for water and sewer design are included in Appendix G.

A major role in the financial feasibility of Spring Island was the golf course. According to Jim Chaffin, fifteen years ago a project with these objectives would not have been possible; at this time the possibilities exist, but only including a golf experience; and fifteen years from now a project such as Spring Island will be possible without the golf course as a major part of the development. With this fact of the existing marketability, a golf course was essential. The former approved plan proposed a total of three 18-hole golf course resorts, in addition to the 5,500 lots, but to remain consistent with the overall development objective, only 18 holes of golf was to be included in the development master plan. The 18-hole golf course was designed with the same environmental objectives as the other development areas. The design was done by Palmer Course Design Company from Ponte Vedra Beach Florida.

In the beginning stages of the design, Arnold Palmer and his partner and golf course architect, Ed Seay, made several visits to Spring Island to survey the route of the course. Fortunately, Palmer shared the same vision for this unique course as Chaffin. This vision was one of extreme sensitivity of the natural surroundings of the island. The majority of the golf holes were designed to follow the existing cotton fields of the former plantation and to weave throughout the existing forests with its unpaved cart paths as if to actually mesh within the fabric of the island in order to avoid clearing many trees and disturbing marsh areas (Hodges p. 46). The design resulted in 18 holes of golf with many views of the marsh and wildlife habitat.

Plan Implementation

With all of the thought and vision that the Spring Island Company had for this project, one piece of the puzzle remained evident as perhaps the main ingredient in the success of Spring Island. The plan implementation strategy would prove to be the tool that could assure Chaffin and Company that the original intent of the development would be followed. Several tools for implementation, some in the form of self-enforced, legal restrictions and regulations and some in the form of non-profit organizations took shape in the beginning stages of implementation.

Spring Island Trust

One of the main concerns shared by Chaffin and wife, Betsy was how to make sure that the designated 1,000 acres of nature preserve would be protected from future development pressures, after all, Spring Island is located in the center of one of the most popular tourist destination coasts in the entire United States.

As discussed in Chapter Three, there are several methods that can be initiated by individuals for the protection of environmentally sensitive lands. The first method initiated by the Spring Island Company that was discussed, was the concept of preservation through limited development, and the second was accomplished through the formation of a land trust.

In January of 1990 Chaffin, Light and LaMotte filed Articles of Incorporation with the State of South Carolina to create a non-profit organization called the Spring Island Trust. The Trust was created to serve three basic functions: (1) The first was to

manage the Nature Preserve and other open spaces, (2) to provide educational programs for guests, students and visiting civic groups as well as the members of the community, (3) to act as a consultant to the developer in order to promote sound developmental plans and to ensure sensitive land management practices, which would prove to protect the very aspects of the development that were embraced by the development team. One main objective of the Trust is to establish a program of land stewardship practices that could be used as a model for others in the future.

As an educational tool, the Trust provides a valuable source for environmental information and with its nature staff, proves to be very informative to the resident members. The Trust is staffed by Betsy Chaffin, as acting director and Bruce Lampright, who has served as island naturalist since 1991. As island naturalist, Bruce and his fellow naturalist John McKenzie, who joined the staff in 1995, have a full time job studying the diverse plant and wildlife existing on the island.

Perhaps one of the most interesting functions of the Trust is the interaction it shares with the resident members. With the ideal that every portion of the island makes up part of an important Spring Island ecosystem, the Trust spends much time educating the individual home owners about the island and its many environmental attributes. Every quarter, the Trust publishes a newsletter to inform the residents of the activities performed over the quarter. Some of the contents of this newsletter include naturalist observations and seasonal flora and fauna activity.

By promoting environmentally sensitive development, the Trust engages in consultations with the Spring Island Company to recommend sensitive development practices.

Land Management Plan

With the large amount of land under the management of the Trust, one of the first steps taken by the Trust was to develop a comprehensive Land Management Plan for the island. The approximately one thousand acres of preserve is primarily separated into the Chechessee Nature Preserve and the Colleton River Preserve, but also includes various open spaces throughout the island. The plan was intended to serve several objectives:

- Safeguard the environmental integrity of the island
- Provide maximum plant and wildlife diversity
- Ensure the needs of wildlife species be met
- Create an aesthetically pleasing environment
- Provide for low impact recreation (hiking, horseback riding, biking, bird watching, fishing, nature photography, kayaking and camping
- Provide education and research opportunities(Spring Island Trust p.1.1-1.2)

In defining the terms of a land management strategy, the Trust and Company asked themselves several questions, one of which was simply "What do we want the Island to look like for future generations?" The answer that was agreed upon was that island was in it's most facinating state when it was first discovered by the Company.

With that realization, the next step was to create a plan that could maintain those qualities while blending man's inhabitation with the island's pristine environment.

As mentioned in earlier sections, a team was assembled of biologists, a naturalist, forester, landscape architect, environmental scientist, and the past plantation manager to create just such a plan. The plan's main objective was to "provide for a maximum diversity of plants and animals and to ensure that the needs of a residential community with the needs of wildlife species be met" (Spring Island Trust p. 5.1).

The process taken by the management team began with base information about the natural resources, soils and topography of the island. After this information was mapped, the keystone animal species such as waterfowl, otter, fox and deer, were identified and their habitat requirements were studied. This detailed information of the habitat of these animals proved to be very helpful in the protection of wildlife. These requirements were then correlated with individual vegetation existing on the island that best served these habitat requirements, and these areas were also mapped.

With the previous information determined, a sound management strategy could be created. This plan not only recommends management techniques for the preserve areas, but perhaps more importantly, it provides recommendations for the more intensely developed portions of the island. Such techniques as prescribed burning, timber management, management of understory species, establishment of vegetation buffer zones in residential areas, and individual landscape plan requirements are just a few of the areas of management offered by the Land Management Plan.

Community Associations and Regulatory Tools

With a Land Management Plan established, and a Land Trust created to manage the nature preserves, the next question the development team encountered was what legal measures could be taken to protect not only the preservation areas of the island but the individual lots that were to be sold to the resident members. In the ideal of Chaffin and company, even the private lots of the homeowners were a part of the Spring Island ecosystem, and without sensitive homeowner decisions, the overall purpose of environmental stewardship and success of the project could be limited. The answer to this question was to establish a set of Covenants and Restrictions to regulate island construction practices, provide specific Design Guidelines for homeowners to follow, and to empower a committee of design professionals and residents to enforce these regulations and guidelines.

A Spring Island Property Owners Association was established by the company and a Declaration of Covenants and Restrictions was written. This document states:

These standards and this Declaration are consistent with and serve to complement the Subdivision Regulations of Beaufort County, South Carolina. To implement these Covenants, the Company shall, through the Architectural Review Board, establish and amend from time to time objective standards and guidelines which shall be in addition to and more restrictive than said governmental standards (Spring Island Property Owners Assoc. p. 13).

With the County Regulations as a pattern to create these restrictive covenants, as could be expected, the document of regulations is very substantial in length and covers in great detail the limits set for the construction of a new Spring Island home.

To complement the Declaration of Covenants, an adopted set of Spring Island Design Guidelines was produced to regulate the design of individual homesites. These guidelines include standards on the whole Spring Island habitat from landscape to architecture. Deep setbacks, building envelope standards, nature curtains, and vista restrictions are among the individual elements regulated by the Design Guidelines. Figures 8, 9, 10 and 11 offer examples of these regulations. From structural architectural standards to plant material selection, these guidelines provide a standard to which every resident member must follow in their own private Spring Island habitat.

Habitat Review Board

An enforcing committee was a necessary entity for the covenants and design standards. This committee is called the Spring Island Habitat Review Board (HRB). This Board is the Architectural Board as mentioned in the Declaration of Covenants and Restrictions and consists of a Spring Island Company officer, and members representing backgrounds in landscape architecture, architecture and construction. The main purpose of the HRB is to make recommendations, reviews and to approve architectural and landscape plans according to the design standards and covenants and restrictions. Each year, the Spring Island Property Owner's Association elects two property owners to serve a year term on the Board, which is advised by representatives of the Spring Island Trust (HRB p. 1.3).

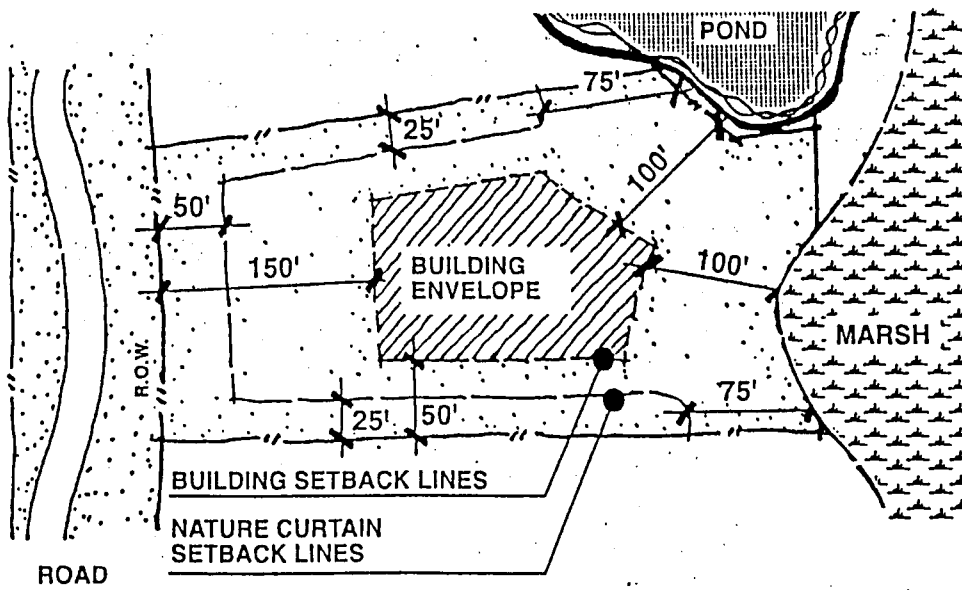


Figure 8. Example of Setbacks and Building Envelope.

Source: Spring Island Habitat Review Guidelines, August 1994

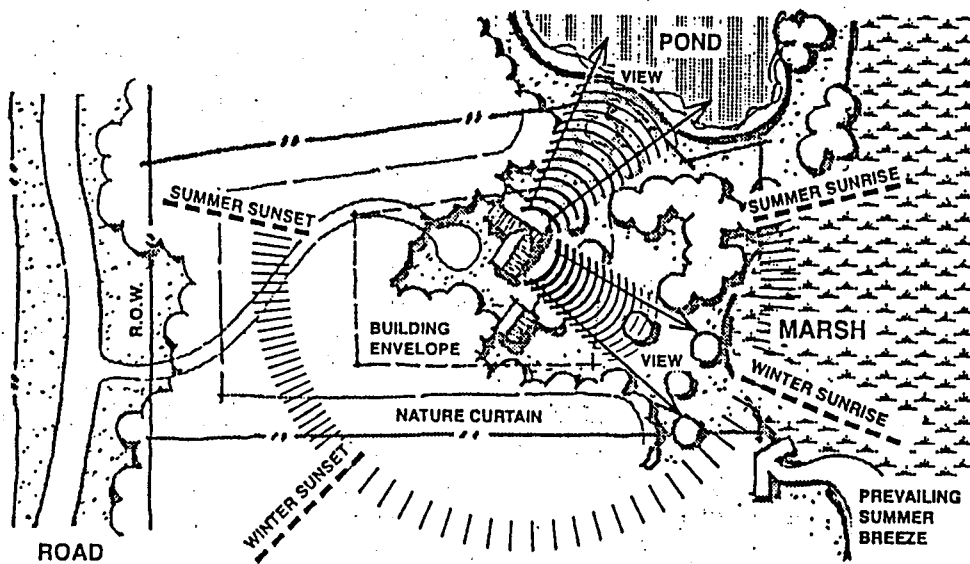


Figure 9. Siting of Residence.

Source: Spring Island Habitat Review Guidelines, August 1994

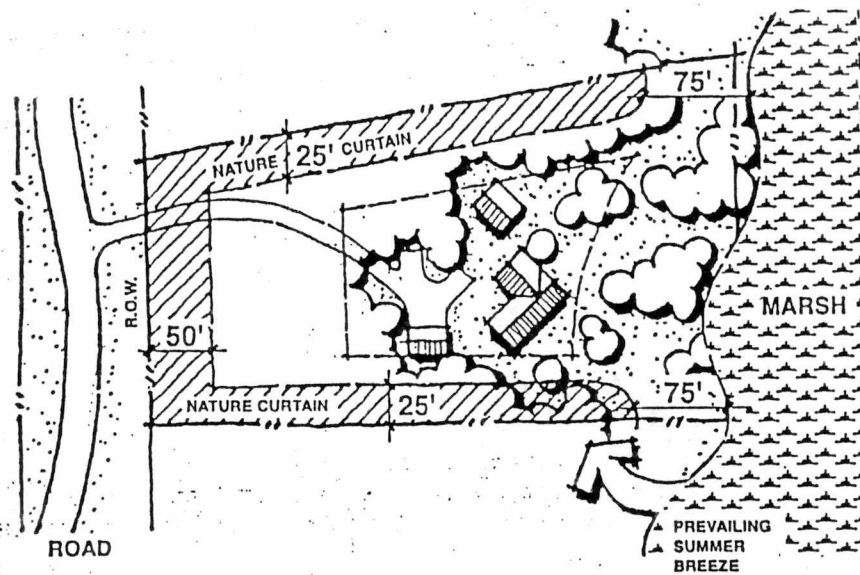


Figure 10. Example of the Nature Curtain.

Source: Spring Island Habitat Review Guidelines, August 1994.

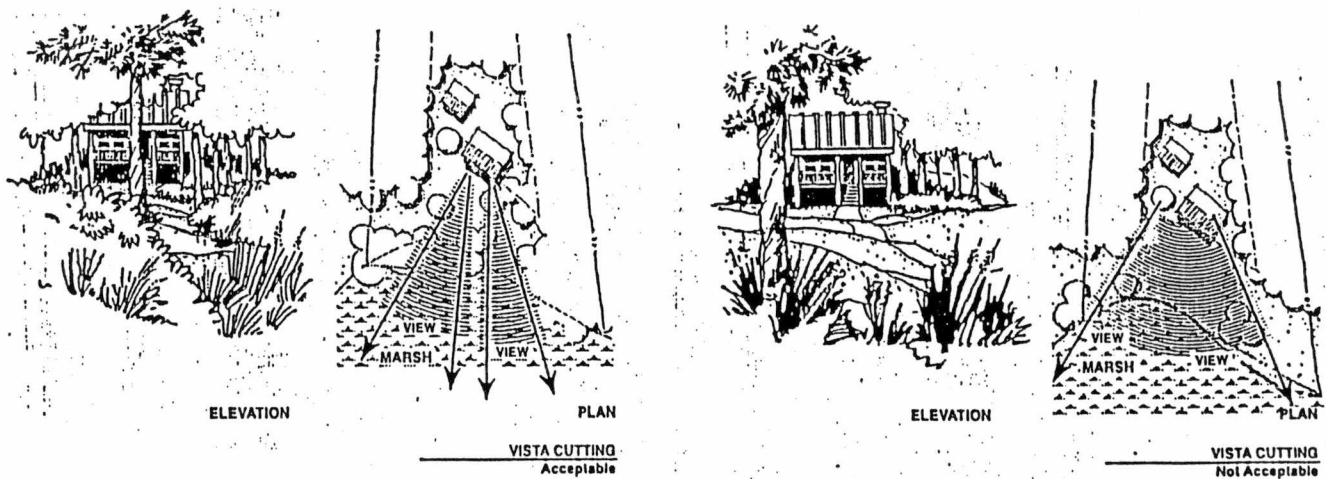


Figure 11. Example of the Vista Regulations.

Source: Spring Island Habitat Review Guidelines, August 1994.

Each homeowner must go through an approval process monitored by the Habitat Review Board before starting construction on their new home. According to the property owners design guidelines manual, an example of a typical approval process is as follows:

1. *Orientation Meeting:* An initial meeting and site visit with between the homeowner and the HRB *administrator* is scheduled prior to planning. Consultants of the resident, such as an architect and landscape architect are strongly encouraged to attend this meeting.
2. *Sketch Plan Review:* After the preliminary meeting to familiarize the homeowner and consultants with the required standards, a site analysis and schematic architectural plans are submitted to the HRB for review. The main concerns of the site analysis are views, solar orientation, landform and how the house relates to the site. This is an important step for the resident, because it gives the homeowner a feel for the design thoughts of the committee before spending much time and money with consultants.
3. *Preliminary Plan Review:* An additional submittal is required by the HRB to review the plans before final construction drawings.
4. *Final Plan Review:* Construction drawings are submitted with material samples to the HRB for review and approval.
5. *Construction Observation:* With final plan approval, in addition to a County building permit received by the owner, a signed letter of agreement stating compliance with the approved plans, and a refundable security deposit, the property owner is issued a Spring Island building permit. After several site

visits during construction, upon completion of construction the HRB provides a final inspection to give final approval before occupancy.

Appendix H contains examples of various Plan Review Forms used at Spring Island.

Economic Summary

The concept of limited development, is a concept that could financially aid the developer in several ways. The major financial benefit of practicing limited development is the dramatic decrease that the developer can experience in general infrastructure costs and estimated sales assumptions, as experienced by the Spring Island Company. In an interview with Chaffin he stated that when comparing limited development to a scheme that maximizes a development, the first thing to consider is the likelihood of selling a certain number of units at a certain price, emphasizing the rate at which the units will sell. He states, "velocity is key in community development". According to Chaffin, the whole idea of unpretentiousness and understatement shown in the plan for Spring Island also meant that there was less pressure to built elaborate facilities for the community, which was also financially beneficial. Market research also showed that with limited development practices, the developer is at a lesser risk to be at the mercy of the current economic market. Considering that the majority of the income would rely on homesite sales, several conceptual financial scenarios were reviewed to determine a sum of 500 lots to be the maximum number of lots needed to proceed (Salveson p. 68).

The creation of the Spring Island Trust was also a piece of the financial puzzle. With the use of the Trust, an assessment fee of 1.5% of all homesites and 1% of all

improved property is funded to the Trust. This funding is used for the management of the preserves and regular functions of the Trust, being a non-profit organization.

A key part of the donation of land to a nature conservancy is a tax benefit for the donar. In the case of Spring Island, the tax benefits were very minimal, if any.

According to Chaffin, the company filed a 201C-4 tax form when donating the land for the nature preserves. Hindsight proved to inform the company that if done differently, the benefit of filing for a 201C-3 tax form could have been much more substantial.

Chaffin said that was one of the procedures that was not necessarily done correctly by the company.

Detailed information and hard numbers of the economic planning stages of development proved to be unavailable, however, during an interview with Chaffin we had the opportunity to discuss a rough financial history of the project.

Site Acquisition

The financial acquisition of the island was possible through initial development partners Chaffin, Light and LaMotte, with the additional financial assistance of a Japanese company called Nippon Landic (Graber p. 1). According to Chaffin, the prior contract agreement between the family trust that owned the island and the previous developers was the basis for the purchase price. The fact that much less of the island was to be developed than in the previous plans was of no significance to the owners of the land, so in 1990 Chaffin and company purchased the island for approximately 17 million dollars.

Preliminary Cost Estimate

During our interview, Chaffin discussed a rough cost estimate created by the Spring Island Company and consultants including estimated development costs and future revenues. This estimate included the following:

(Development Costs)

1. Land Purchase - \$17 million.
2. Infrastructure/Amenities, etc. - \$43 million. This includes such costs as road and bridge construction, water and sewer services, amenity areas such as golf course, tennis courts, etc.
3. Annual Operating Expenses - \$40 million. This number would include operating the recreational facilities, the restaurant, and all other general operating expenses.
4. Loan Interest - \$12 million.

These estimated expenditures totaled approximately \$112 million to be incurred by the development of this plan for Spring Island and include both one-time and reoccurring costs throughout the development period.

(Estimated Revenues)

Being a primarily residential development, the majority of the project revenue will come from the sale of homesites with additional revenue from the golf course.

1. Homesite Lot Sales - \$140 million. This revenue is based on an average per lot cost of \$280,000 set by the company. These lots average in size from 1 to 10 acres, and range as mentioned earlier, depending on location and frontage.
2. Golf Course Memberships - \$14 million. The initiation fee for equity golf membership is \$35,000, and additional annual dues of \$3,600, and a homeowner association fee of \$1,000.

These numbers of \$112 million total development costs and \$154 million total expected revenue, provides for an expected profit of \$52 million. This profit is of course spread over the estimated build-out time of the project. In the case of Spring Island, the initial estimated build-out time was 8 years, but according to Chaffin, the actual time will be closer to 10 years, and lot sales are about 20% behind where he estimated they would be from a timing standpoint. A major cause for this is the decision that was made regarding project marketing techniques.

Project Marketing

Project marketing strategies for Spring Island are somewhat unorthodox in comparison to other related projects, especially those in similar locations. According to Chaffin and Bill Loffland, of the Spring Island marketing staff, the company chose to limit the marketing strategy to simply word of mouth exposure. One reason for this decision is the market that is targeted for the success of this project. The concentrated market for potential resident members of Spring Island is a relatively small isolated one. With this in mind, the strategy was that likely interests in this type of community would

hear of Spring Island from existing members or some literature or article written in magazines or papers.

Through this planning and development process, the Spring Island Company was faced with many decisions. As discovered during the study, some of the strategies and techniques practiced in this development were theories used by many developers in the past, but several methods of implementing the project were newly introduced in this context. Much can be learned from developments such as Spring Island. The concepts combined into the Spring Island Philosophy can act as a framework for similar developments in the future, and with case studies, such as this, information on certain applications can be made more available to the development community.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This thesis has discussed both environmental planning theory and how it applies to land development. One of the most valuable theories to this thesis, that was researched and discussed in previous chapters is the development theories for sensitive lands. After a review of these various concepts, it was interesting to see actually how the theory compared with practice. This chapter will focus on several findings that were uncovered during the course of the study, and will include conclusions and recommendations derived from the information.

Environmental Planning and Spring Island

The concepts of environmental planning theory, as discussed in Chapter II, proved to be somewhat similar to the literature, but because of the unique nature, scale and intensity of the Spring Island development, several components of the discussed theory did not apply. The concept of land capability, as mentioned in Chapter II was applied at Spring Island, although the term was not used in the interviews with the development team. The capability concept applied to Spring Island included environmental inventories of the geology, soils and wetland areas were used to provide a stormwater and wastewater plan and protection for the many environmentally sensitive areas of the island. As mentioned in the literature, the data received from these inventories was

translated into a land management plan, development standards and design guidelines for the island.

Suitability analysis, as described in Chapter II was also evident in the plan of Spring Island. The suitability of certain areas of the island to accommodate human activity was a major concern when planning the spatial concepts of the development plan. This information resulted most evidently in the preliminary engineering report, specific construction guidelines, formation of the Habitat Review Board and homeowners manual discussed in Chapter IV.

Two types of carrying capacity discussed in Chapter II were also applied to the Spring Island plan. The concept of environmental carrying capacity was evident in the separation of on-site waste disposal and sewer system usage throughout the island, which was largely based on the size and location of lots, as well as natural features.

Psychological carrying capacity, as termed by the literature, is described as the degree of environmental change that can occur before one's perception of the environment is altered also becomes evident in several ways. In order to protect the original intent of the resident perceptions of privacy, unpretentiousness and understatement, design criteria was developed requiring nature curtains, selected viewsheds and heavy landscape buffers and setbacks.

Perhaps the most evident environmental planning conclusion is how the process used by Spring Island relates to McHarg's environmental planning concept, as discussed in Chapter II. Because of the many contributing professionals involved this process, it is difficult to compare its consecutive steps to that of the standard McHarg method.

Research showed that several portions of the McHarg method were used in this process, but perhaps in slightly different sequences. The two processes included similarities in:

1. environmental inventory
2. land suitability analysis with maps that were overlaid to create master species and plant locations and habitat
3. economic inventory and preliminary cost analysis
4. criteria that was transformed into form and design
5. powers that were created to implement the land management plan

The environmental stewardship success of the Spring Island Development is supported by two environmental awards of merit that were awarded to The Spring Island Company. The first award received was the 1993 Conservation Award from the South Carolina Wildlife Federation, and the second was the 1994 South Carolina Land Development Stewardship Award administered by the South Carolina Resources Committee, and is in cooperation with several other organizations such as SC Association of Conservation Districts, SC Chapter of the American Society of Landscape Architects, Home Builders Association of SC and the SC Chapter of the American Society of Civil Engineers. This award is awarded based on several criteria including:

1. Water Quality Protection
2. Site Selection and Efficient Use of Available Natural Resources
3. Wildlife Habitat/Greenspace Protection
4. Scenic Protection/Beautification Enhancement
5. Historical/Archaeological/Cultural Protection

During the extent of this case study of Spring Island, several unique findings were documented. Much of the success, both environmentally and economically could be contributed to these unique attributes of the Spring Island Development.

1. The extent of educational literature that the Trust supplies to the residents. The quarterly newsletter is composed of a summary of the entire quarter's environmental happenings, from the wildlife and plant inventories, to the staff's experiences in the nature lab. This is extremely helpful in the participation of the entire community in stewardship and nature conservancy.
2. The Visiting Artist Program. This program is just another activity sponsored by the Trust to allow talented visual artists from all over the United States to experience the nature experience of Spring Island. This provides great exposure and educational opportunities for all parties involved.
3. The Prescribed Burning Standards. A tool used by the biologists to promote ecological diversity in vegetation, to stimulate the growth of preferred wildlife food plants, and to recycle nutrients tied up in older, woody vegetation. These recommendations are comprehensive and areas are mapped and documented annually.
4. Habitat Management Recommendations. These recommendations consist of separate and specific recommendations for birds, fish, deer, and individual plant species.
5. Environmental Maintenance Program for Old Tabby Links. Strict Standards are specified for such regimens as Pest Management, Pond Management, Naturalized Areas and Water Conservation. Each of these are very considerate of the

environmental implications of applications, and contain recommendations on recycling of wastewater for use on the course.

6. Backyard Habitat Recommendations. The Trust also offers literature on individual home landscaping and backyard wildlife habitats from the South Carolina Wildlife Federation. In these suggestions, are recommended structural and plant components that attract certain wildlife. Specific plants, what wildlife they attract, and certain tips on how to avoid nuisance wildlife are spelled out for the resident in this literature.

Appendix I contains examples of these recommendations.

7. Plant and Animal Inventories. A comprehensive list of all plant and animal species that inhabit the island has been created and is updated by the naturalists periodically.

Economic Conclusions

Although detailed economic information was unavailable during the research period, through interviews with members of the Spring Island staff and a rough cost estimate discussed with Chaffin in Chapter IV, several conclusions can be derived.

The first is that an environmentally sensitive development can be profitable for the developer. By reviewing the cost estimate offered by Chaffin, is very evident that Spring Island, as a financial investment, should profit substantially at estimated build-out. The question that should be asked in this conclusion is how often could a project of this nature be financially profitable for developers to be encouraged to follow this example. Further research must be done on similar projects to accurately analyze the success and profitability of environmental stewardship techniques by comparison. With Spring Island

being one of the first projects of its kind to be attempted, time will perhaps be an essential component in comparative studies of similar studies of the future. According to Chaffin, fifteen years ago, this development would not have been economically possible. With the population becoming more aware of their environmental responsibilities, today, the concept is a possibility, but only with golf included for the residents. In future years, the environmental awareness movement could become strong enough to support this concept in other parts of the country without a resort and golf experience.

The second conclusion is that the current real estate market dictates most of the "success" that is achieved by developers. Quality design is not enough to succeed in a majority of the development world. From past understanding, many developers do not invest in projects because of their quality design themes, but only the projects that are proven to sell real estate at the present time. The question to be asked here is at what time and in what kind of market can this type of development expect to be successful?

Considering the real estate market of the coastal region of South Carolina, at the time of the Spring Island plan, Chaffin and company somewhat pushed the edges of the real estate envelope. The timing and location of this proposal was perhaps the key to its potential success. The coastal communities of the state were experiencing strict environmental regulations enforcement and the general population was growing bored with the standard golf course resort communities. Although the real estate market was at a very high point, Spring Island was surrounded by a market that is unlike many others in the United States. The potential clientele targeted by Spring Island was very limited, ironically complementing the style of development. As a result of this, similar

developments located in a different region of the country and targeting a more middle class market would have a much more difficult time achieving the goals set by Spring Island.

Recommendations

Although as successful as Spring Island has proven to be in achieving its environmental and economic goals, several of the factors are still years away from being possible for many developers across the country. An objective of this study was to recommend techniques, learned from Spring Island to future developers that would encourage the incorporation of environmental stewardship and the protection of sensitive areas. Several techniques could be profitable for many developers to use.

The first is the use of the limited development concept. In Spring Island, this concept was attempted on a much larger scale than many developers will ever deal with, but the same advantages can apply. With the donation of a portion of the property to a conservation agency, the developer can reap substantial rewards in the form of tax benefits. These benefits, although seeming minor to the average resident, can prove to be very profitable in certain situations.

A second technique is incorporating cluster development concepts into the planning scheme. With this strategy, the element of preservation is balanced by growth. Many times in the development field density is the only thing that makes a project feasible. With cluster development concepts, the developer is granted the density that is required financially, and the environment is awarded the preservation areas needed. By

concentrating the areas of development, the developer can dramatically reduce the cost of infrastructure required for development, and by preserving open spaces, the developer makes the development more attractive to perspective buyers.

Another technique beneficial to the environment, is the adoption of specific guidelines and construction standards. By simply requiring the use of certain construction materials, a developer can reduce the negative impact it has on its surroundings. Such materials as asphalt shingles and paving materials, although not often noticed by residents can have a substantial affect on the environment and surrounding ecosystems.

It will be very interesting to see the future success of environmentally sensitive development throughout the country. With more and more exposure and regulation, environmental awareness is sure to advance. More research and comparative studies will have much insight on the advancement of developmental stewardship, and incentives provided through various agencies can further aid in developer cooperation. Although the future of environmentally sound development might not yet be an extensively practiced strategy, it is evident that Spring Island is doing its part in leading the way.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Beatley, Timothy, David J. Brower, and Anna K. Schwab. An Introduction to Coastal Zone Management. Washington D.C.: Island Press, 1994.
- Beatley, Timothy. Habitat Conservation Planning. University of Texas Press, 1994.
- Belknap, Raymond and John G. Furtado. Three Approaches to Environmental Resource Analysis. Washington, D.C.: The Conservation Foundation, 1967.
- Bookout, Lloyd W. Value by Design., 1994.
- Brower, David J. and Daniel S. Carol. Coastal Zone Management as Land Planning. Washington D.C.: National Planning Association, 1984.
- Burchell, Robert W. Development Impact Assessment Handbook. 1994.
- Chaffin, Betsy. Director, Spring Island Trust, Spring Island, South Carolina.
Interview, March 1997.
- Chaffin, Jim. President, Spring Island Company, Spring Island, South Carolina.
Interview, March 1997.
- DeBrosse, Anne. Staff Planner, Spring Island Company, Spring Island, South Carolina.
Interview, March 1997.
- Dethero, Boyd R. "Development Planning in Environmentally Sensitive Barrier Islands: A Case Study of Kiawah Island." Master's Thesis, The University of Tennessee, 1983.
- Graber, Scott. "Developers an atypical bunch". The Beaufort Gazette.
- Hendler, Bruce. Caring for the Land: Environmental Principles of Site Design and Review. Planning Advisory Service Report No. 328, 1977.
- Hite, Hames C. and Eugene A. Laurent. Environmental Planning: An Economic Analysis.
New York: Praeger Brothers, 1973.
- Hodges, Barbara B. "Where it's always spring: Nearby Spring Island is a natural". Hilton Head Monthly, August 1994, 46.

- Holly, Margaret. "The Rites of Spring". Beaufort Lowcountry, Holiday-Winter 1995-96, Vol. 4 No. 3, 25-29.
- Institute for Environmental Education. Common Groundwork: A Practical Guide to Protecting Rural and Urban Land. 1993.
- Johnson, E. Michael. "Spring Island, On an island untouched by time, Arnold Palmer and Ed Seay designed a Lowcountry Classic". The Country Club/Private, September October 1993.
- Jones, Mary Ella. "Spring Island: An Oasis of Nature and Time". Islander Magazine, October 1989.
- King, Adrian. "Spring Island: Best of Both Worlds?". The News and Courier, Charleston, SC, March 17, 1991.
- Lampright, Bruce. Head Naturalist, Spring Island Company, Spring Island, South Carolina. Interview, March 1997.
- Lane, James M. "Spring Island: As you really like it". Southern Links, Summer 1993.
- Loffland, Bill. Director of Marketing, Spring Island Company, Spring Island, South Carolina. Interview, March 1997.
- Martin, Chlotilde R. "The Copps and Spring Island". The News and Courier, Charleston, SC, January 4, 1931, 6-A.
- Marvin, Robert. Landscape Architect, Robert Marvin and Associates, Walterboro, South Carolina. Interview, March 1997
- McHarg, Ian L. Design With Nature. Philadelphia, PA: The Falcon Press, 1969.
- McKenzie, John. Staff Naturalist, Spring Island, South Carolina. Interview March 1997.
- Mitsch, William J. and James G. Gosselink. Wetlands. Van Nostrand Reinhold, 2nd ed., 1993.
- Morris, Ricky L. "A Case Study of the Cost Factors Associated With the Development of Gardner Matthews Plantation, Hilton Head Island, South Carolina: An Environmentally Fragile Area". Master's Thesis, The University of Tennessee, 1984.
- National Youth Advisory Board to the Environmental Protection Agency. Land Use

- and Environmental Protection. University of Tennessee Documents, 1974.
- Permar, Dianna. Marketing Specialist, Spring Island, South Carolina. Interview March 1997.
- Poole, Jeffery. Civil Engineer, Davis and Floyd, Inc., Greenwood, South Carolina. Interview, March 1997.
- Portney, Paul R.(editor). Public Policies for environmental Protection. Resources for the Future, 1990.
- Rando, Guy and Desmond Muirhead. Golf Course Development and Real Estate. Urban Land Institute, 1994.
- Salveson, David. "Preservation Through Limited Development". Urban Land, August 1994, 66-68.
- Schaenman, Philip S. and Thomas Muller. Impacts of Land Development. Washington D.C.: The Urban Institute, 1976.
- Simonds, John O. Earthscape: A Manual of Environmental Planning and Design. New York: McGraw Hill, 1978.
- Steiner, Fredrick. The Living Landscape. McGraw-Hill, 1990.
- Thomas, Lynn B., Jr. "A Case Study of the Effect of the 1976 Sanibel Island Comprehensive Land Use Plan." Master's Thesis, The University of Tennessee, 1987.
- Thurow, Charles, William Toner and Duncan Erley. Performance Controls for Sensitive Lands: A Practical Guide for Local Administrators. Planning Advisory Service Reports Nos. 307 and 308, 1975.
- Vista, Nancy. Golf Course Superintendent, Old Tabby Links, Spring Island, South Carolina. Interview, March 1997.

APPENDIX

Appendix A

Section 4.2

RDD - Rural Development District

Section 4.2.2

Permitted Uses

The following uses shall be permitted in any Rural Development District:

(A) Any single-family or multi-family residential use at a density not exceeding four (4) dwelling units per net acre of land. For a definition of "Net Acre" see Section 10.2

(B) Farm or establishment for the growing, care, processing, packing and handling of field crops, truck gardening products, fruit and/or nut trees, poultry and/or animals and livestock and includes aquaculture.

(C) Tree farm, timber area, or forest management area.

(D) Horticultural nursery.

(E) Church, cemetery, religious, eleemosynary, semi-public philanthropic institution or camp.

(F) Club, lodge, grange, union hall, community center or social center.

(G) Any publicly owned and operated building, facility or land.

(H) Unlighted, regulation size or par-three golf course.

(I) Docks, boat marina, boat house.

(J) Airfield, together with subordinate uses.

(K) Wildlife refuge including caretakers' dwellings and associated facilities.

(L) Radio and television station.

(M) Utility lines, substations, switching stations, pump stations and treatment plants.

(N) Customary home occupations established under the provisions of Section 5.3.

(O) Schools, private or public; day care centers; child nurseries.

(P) Public or private health care homes or nursing homes.

(Q) A horse riding school and/or horse training facility provided the site contains a minimum of three (3) acres and provided that there shall be a minimum area of one (1) acre for the first one (1) to two (2) horses approved for the facility, plus an additional one-half (1/2) acre for each additional horse approved for the facility. Stalls or stable areas should be one hundred forty-four (144) square feet for each horse.

(R) A solid waste transfer facility, site and accessory uses, including a recycling center, provided such facility is one hundred (100') feet or greater from any residential building and it meets the development standards of this Ordinance.

(S) A temporary office and/or storage building during a project involving construction but not to be used as a dwelling with the removal of same within 30 days upon project completion.

Section 4.2.3

Conditional Uses

(A) Seafood or shellfish packaging and processing shall be permitted in a Rural Development District provided that the following conditions are met:

(1) There shall be a setback of one-hundred fifty (150') feet from the perimeter of any residential zone or Planned Unit Development District.

(2) All packaging and/or processing of seafood, shellfish, or sea plants shall meet the provisions of Section 5.2.11 of this Ordinance as related to odor, noise, smoke, or waste disposal, etc.

(B) Wastewater/Sewage Sludge Disposal shall be permitted in a Rural Development District provided a Land Application Permit for sludge disposal is granted by the South Carolina Department of Health and Environmental Control in accordance with the Land Application of Sludge Guidance Manual, dated December 1987; the Water Classification and Standards, State of South Carolina, Regulation 6168; and the Classification of Waters, State of South Carolina Regulation 6169, dated June 28, 1985.

(C) Mineral extractions - sand, clay, gravel with adequate screening as provided for in this Ordinance.

(D) Telecommunications Towers Conditional Use. Telecommunications (transmission and receiving) towers provided the site plan complies with the requirements of Section 5.2.9(F): provided towers under two hundred (200') feet are painted silver or gray or retain galvanized finish in order to camouflage against the sky (unless the Federal Aviation Administration imposes other requirements); and provided no strobe lights are used (unless required by the FAA).

Section 4.2.4

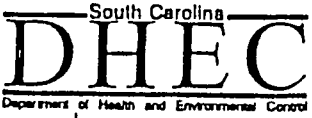
Other Requirements - Setbacks

(A) Minimum Front Yard Setback. Thirty-five (35') feet Major thoroughfare four-lane: fifty (50') feet. Major thoroughfare two-lane: seventy-five (75') feet.

(B) Minimum Side Yard Setback. Ten (10') feet.

(c) Minimum Rear Yard Setback. Ten (10') feet.

Appendix B

	STORMWATER MANAGEMENT SOUTH CAROLINA DEPARTMENT OF HEALTH & ENVIRONMENTAL CONTROL STANDARD APPLICATION FORM FOR CONSTRUCTION SITES DISTURBING MORE THAN 2 ACRES (See Reverse for Instructions)
Submission of this application constitutes notice that the party identified in Section 3 of this form intends to be authorized by a NPDES permit issued for storm water discharges associated with construction activity in the State of South Carolina. Becoming a permittee obligates such discharger to comply with the terms and conditions of the permit. ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.	
Section 1	
DATE _____	
1. FACILITY NAME OR PROJECT NAME _____ COUNTY _____ CITY/TOWN _____ LOCATION (also shown on location map) _____ LATITUDE _____ LONGITUDE _____ TAX MAP # _____ USGS QUADNAME _____	
2. NEAREST RECEIVING WATERBODY _____ DISTANCE TO NEAREST RECEIVING WATERBODY _____ ULTIMATE RECEIVING WATERBODY _____	
Section 2	
3. PROPERTY OWNER OF RECORD _____ ADDRESS _____ PHONE NO.: (DAY) _____ (NIGHT) _____ (MOBILE) _____	
4. PERSON FINANCIALLY RESPONSIBLE FOR THE LAND DISTURBING ACTIVITY (If different than above) _____ ADDRESS _____ PHONE NO.: (DAY) _____ (NIGHT) _____ (MOBILE) _____	
5. AGENT OR CONTACT PERSON (If applicable) _____ ADDRESS _____ PHONE NO.: (DAY) _____ (NIGHT) _____ (MOBILE) _____	
6. ENGINEER, TECHNICAL REPRESENTATIVE OR FIRM _____ ADDRESS _____ PHONE NO.: (DAY) _____ (NIGHT) _____ (MOBILE) _____	
7. CONTRACTOR OR OPERATOR (If known) _____ ADDRESS _____ PHONE NO.: (DAY) _____ (NIGHT) _____ (MOBILE) _____	
Section 3	
8. SIZE, TOTAL (acres) _____ SURFACE AREA OF LAND DISTURBANCE (acres) _____	
9. SIC CODE _____ (SIC code only required if site disturbs 5 acres or more) IS THE SITE LOCATED ON INDIAN LANDS? (If site disturbs 5 or more acres) _____	
10. TYPE OF PROJECT & FEES (please circle the type of activity) a. Federal - State - Local - School (EXEMPT FROM FEES) b. Industrial - Commercial - Residential (\$50 per disturbed acre, max. \$1,000 per project) (In addition a \$75 NPDES administration fee will be required on all Projects disturbing 5 acres or more) TOTAL FEE \$ _____	

11. START DATE _____ COMPLETION DATE _____

12. ARE THERE ANY FRESHWATER WETLANDS LOCATED ON THE PROPERTY? _____

IF YES, HAVE THE WETLANDS BEEN DELINEATED? _____

Section 4

CERTIFICATION

13. I HEREBY CERTIFY THAT ALL LAND DISTURBING CONSTRUCTION AND ASSOCIATED ACTIVITY PERTAINING TO THIS SITE SHALL BE ACCOMPLISHED PURSUANT TO AND IN KEEPING WITH THE TERMS AND CONDITIONS OF THE APPROVED PLANS. I ALSO CERTIFY THAT A RESPONSIBLE PERSON WILL BE ASSIGNED TO THE PROJECT FOR DAY-TO-DAY CONTROL. I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

PRINTED NAME
OWNER/PERSON FINANCIALLY RESPONSIBLE

OWNER/PERSON FINANCIALLY RESPONSIBLE

14. I HEREBY GRANT AUTHORIZATION TO THE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL AND/OR THE LOCAL IMPLEMENTING AGENCY THE RIGHT OF ACCESS TO THE SITE AT ALL TIMES FOR THE PURPOSE OF ON SITE INSPECTIONS DURING THE COURSE OF CONSTRUCTION AND TO PERFORM MAINTENANCE INSPECTIONS FOLLOWING THE COMPLETION OF THE LAND DISTURBING ACTIVITY.

PRINTED NAME
OWNER/PERSON FINANCIALLY RESPONSIBLE

OWNER/PERSON FINANCIALLY RESPONSIBLE

15. DESIGNER CERTIFICATION - FIVE COPIES OF THE PLANS, ALL SPECIFICATIONS AND SUPPORTING CALCULATIONS, FORMS, AND REPORTS ARE HEREWITH SUBMITTED AND MADE A PART OF THIS APPLICATION. I HAVE PLACED MY SIGNATURE AND SEAL ON THE DESIGN DOCUMENTS SIGNIFYING THAT I ACCEPT RESPONSIBILITY FOR THE DESIGN OF THE SYSTEM. FURTHER, I CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THE DESIGN IS CONSISTENT WITH THE REQUIREMENTS OF TITLE 48, CHAPTER 14 OF THE CODE OF LAWS OF SC, 1976 AS AMENDED, AND PURSUANT REGULATION 72-300.

SIGNATURE

S.C. REGISTRATION NUMBER

ENGINEER
TIER B, LAND SURVEYOR
LANDSCAPE ARCHITECT

S.C. DEPARTMENT OF HEALTH & ENVIRONMENTAL CONTROL
STORMWATER PERMIT CHECK LIST

SITES DISTURBING MORE THAN TWO (2) ACRES

The applicant must include the following items as part of the submittal package for a stormwater management permit:

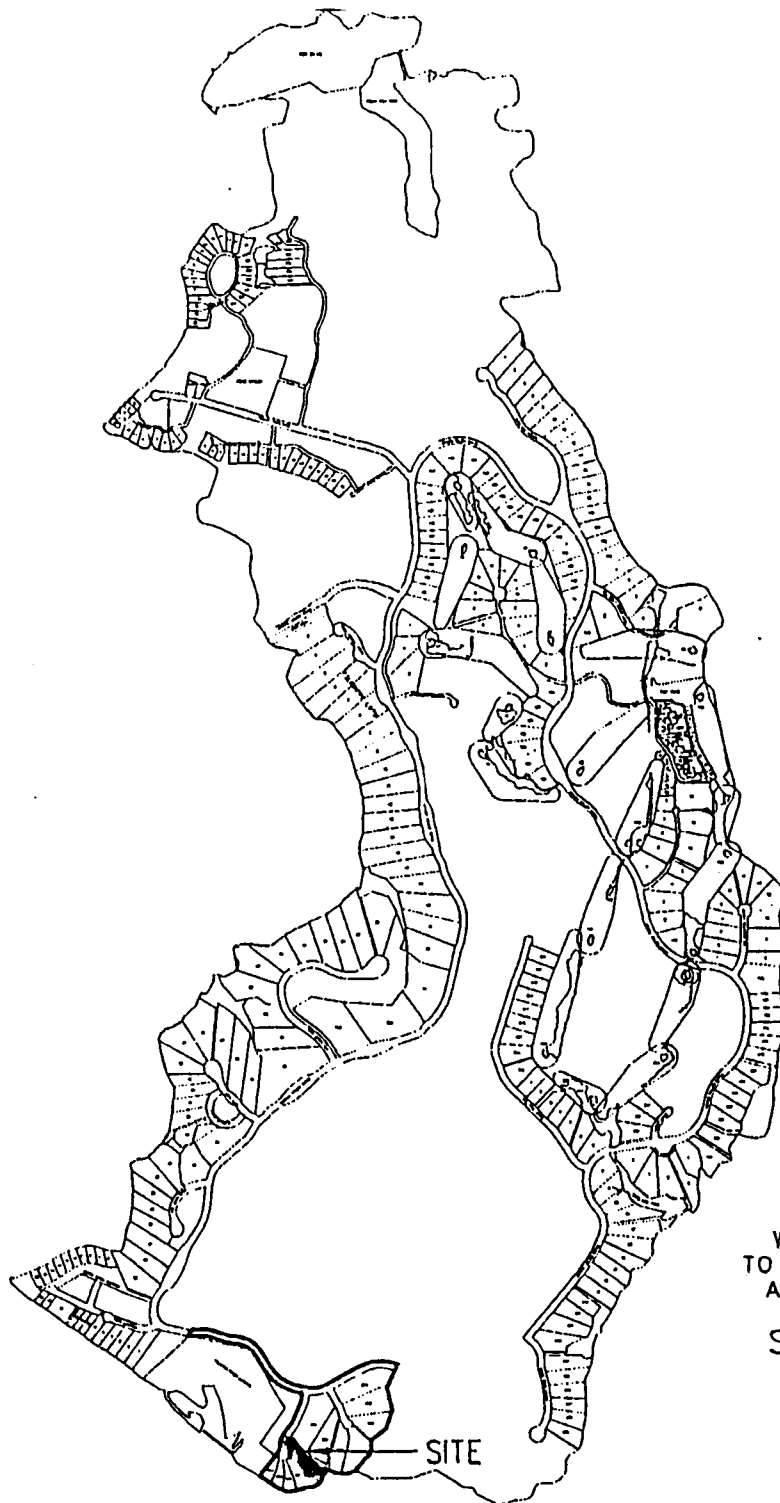
- ☐ 1. Site plans (24 X 36 preferred).
- ☐ 2. Copy of a 1:24,000 scale USGS topographic map with project outlined and the route of runoff offsite to the nearest receiving waterbody.
- ☐ 3. Permit fee of \$50/disturbed acre up to a maximum of \$1000 plus a \$75 annual NPDES administration fee.
- ☐ 4. Completed application form.
- ☐ 5. Project narrative (include brief overall description of project and pre- and post- development site conditions).
- ☐ 6. Project calculation to include proposed flows versus requirements, peak rate(s) of runoff/discharge, and inflow/outflow hydrographs at points of discharge. A *summary sheet* with the amount of impervious area (acres), pre- and post - development runoff rates (cfs), and the amount of storage required (acre-ft) must be included.
- ☐ 7. Existing and proposed contours on a current plat.
- ☐ 8. Wetland delineation (if applicable).
- ☐ 9. Sequence of construction operations.
- ☐ 10. Identification of all phasing.
- ☐ 11. Locations of stormwater and sediment control features.
- ☐ 12. Details of stormwater and sediment control features (to include cross section of ponds and swales, silt fence or hay bale detail, construction entrance detail, etc.).
- ☐ 13. A general description of the predominant soil types on the site.
- ☐ 14. A description of the maintenance program for stormwater management and/or sediment control facilities.
- ☐ 15. Sediment control notes to be included on the plans (as follows):

All sediment control measures shall be inspected at least once every seven calendar days and after any storm event of greater than 0.5 inches of precipitation during any 24-hour period. All sediment control features shall be maintained until final stabilization has been obtained.

Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased, unless activity in that portion of the site will resume within 21 days.

Residential subdivisions require erosion control features for infrastructure as well as for individual lot construction. Individual property owners shall follow these plans during lot construction or provide an individual plan meeting Section R.72-307 of the Stormwater Management and Sediment Reduction Act requirements.

Appendix C



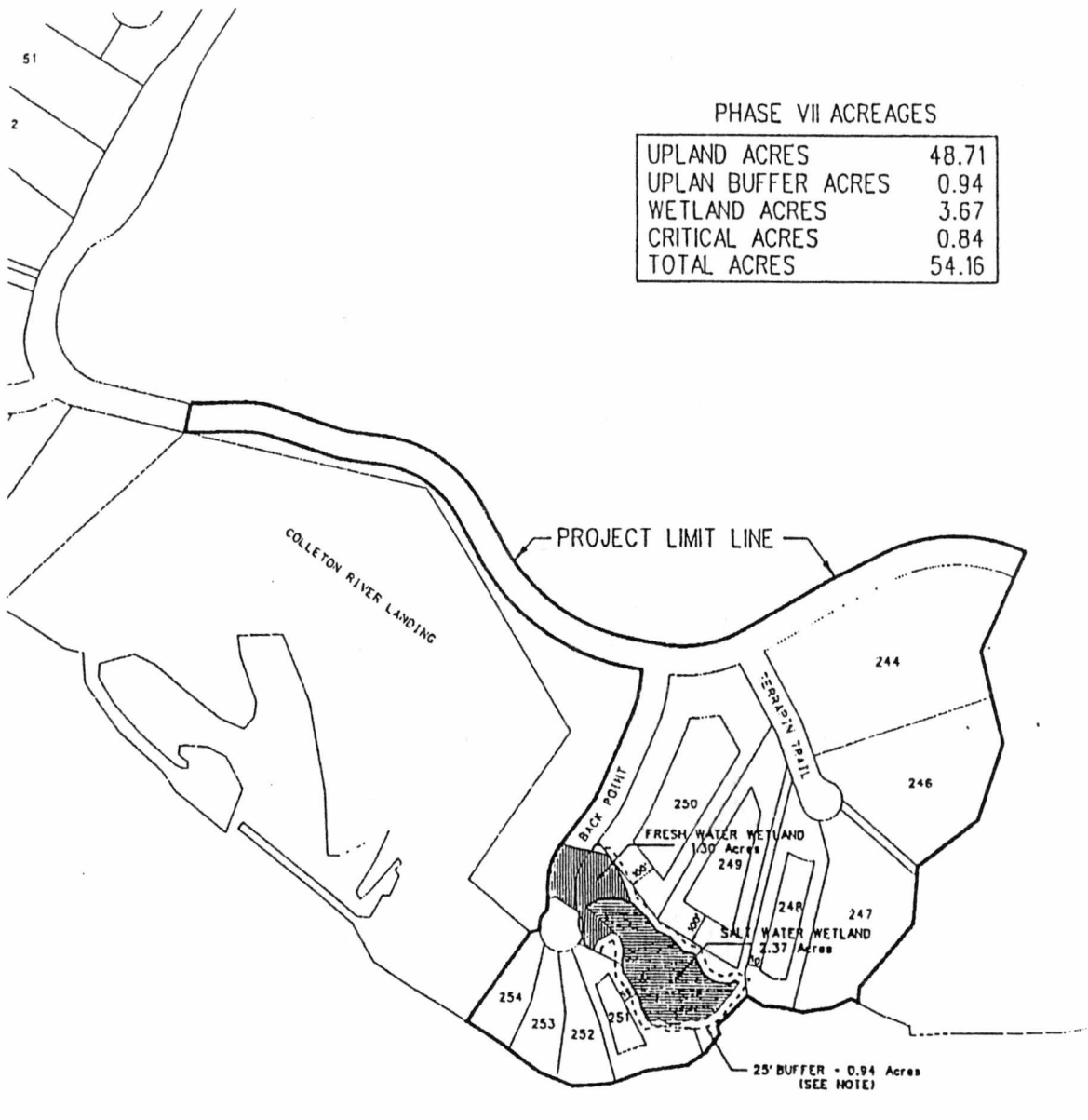
DAVIS & FLOYD, INC.
1319 RETHOLDS ST.
GREENWOOD, S. C. 29640

WETLAND TRIBUTARY
TO THE COLLETON RIVER
AT BACK POINT ROAD

FOR
SPRING ISLAND
PHASE 7

BY
DAVIS & FLOYD, INC.
GREENWOOD, SOUTH CAROLINA
APRIL 15, 1997

SHEET 1 OF 5



PHASE VII ACREAGES	
UPLAND ACRES	48.71
UPLAN BUFFER ACRES	0.94
WETLAND ACRES	3.67
CRITICAL ACRES	0.84
TOTAL ACRES	54.16

MARSHES OF THE
COLLETON RIVER

REVISION	DESCRIPTION	DATE
1	IMPROVED BUFFER & REVIEW	8/30/87
	019 TO MATCH RECORDS PLAT	

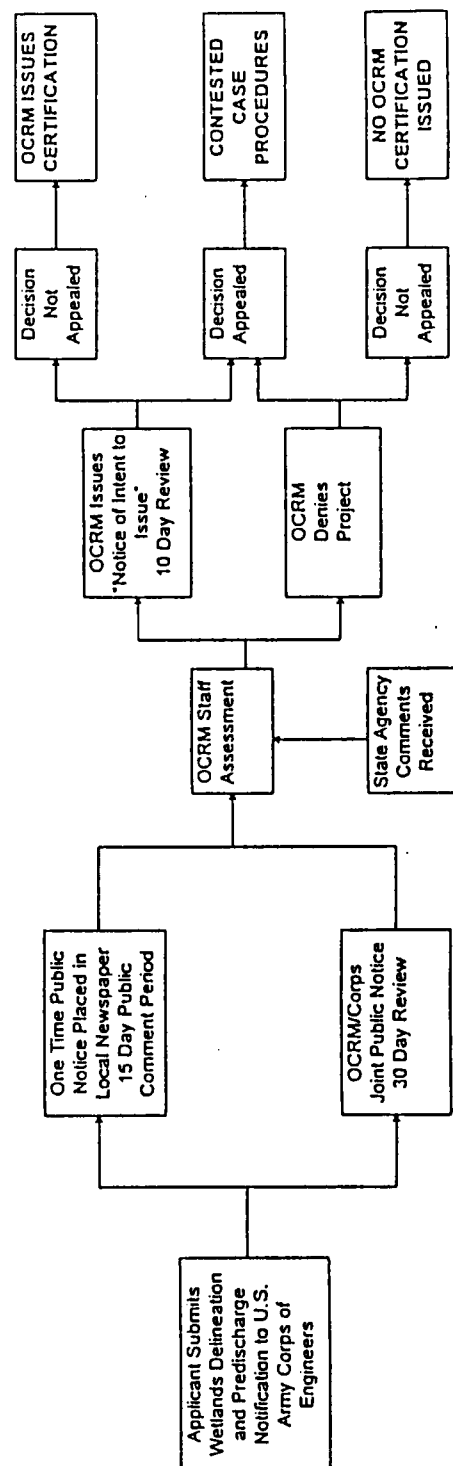
WETLAND TRIBUTARY
TO THE COLLETON RIVER
AT BACK POINT ROAD
FOR
SPRING ISLAND
PHASE 7

BY
DAVIS & FLOYD, INC.
GREENWOOD, SOUTH CAROLINA
APRIL 15, 1987

SHEET 2 OF 5

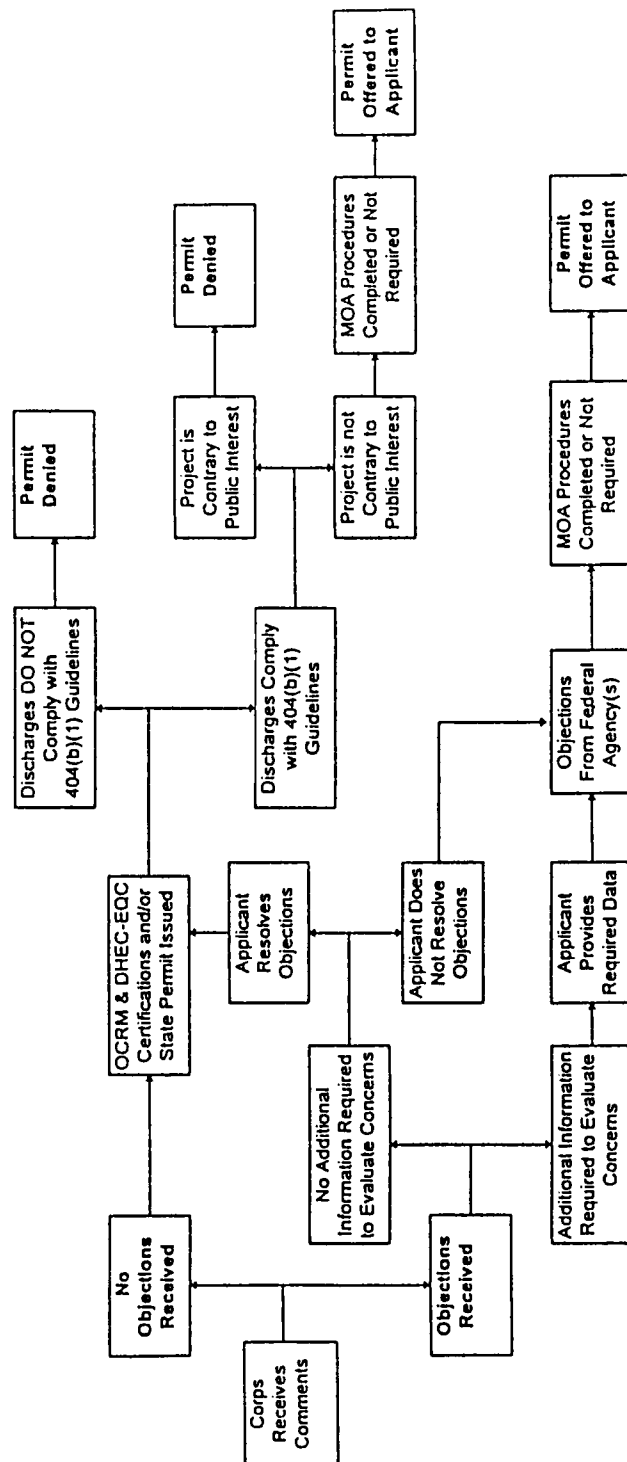
NOTES:
1) 25' BUFFER TO BE MAINTAINED AROUND SALT WATER WETLAND
WITH ALLOWANCE FOR VISTA PRUNING, AND DIKE, RISER, AND TRAIL UPKEEP.

SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT'S
PROCESS FOR NATIONWIDE PERMIT 26
For Projects Within the Coastal Zone

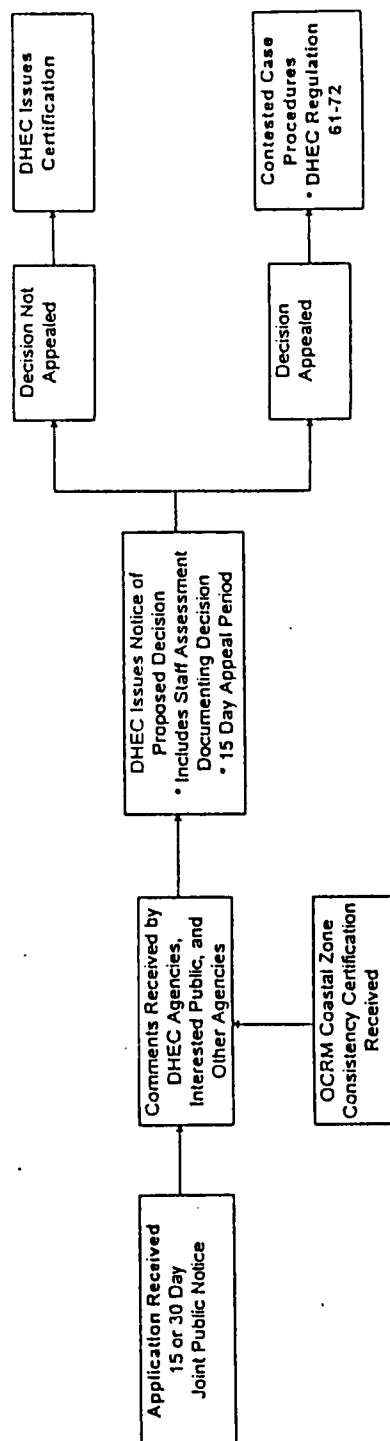


South Carolina's Developer's Handbook for Freshwater Wetlands

U.S. ARMY CORPS OF ENGINEER'S INDIVIDUAL PERMIT PROCESS

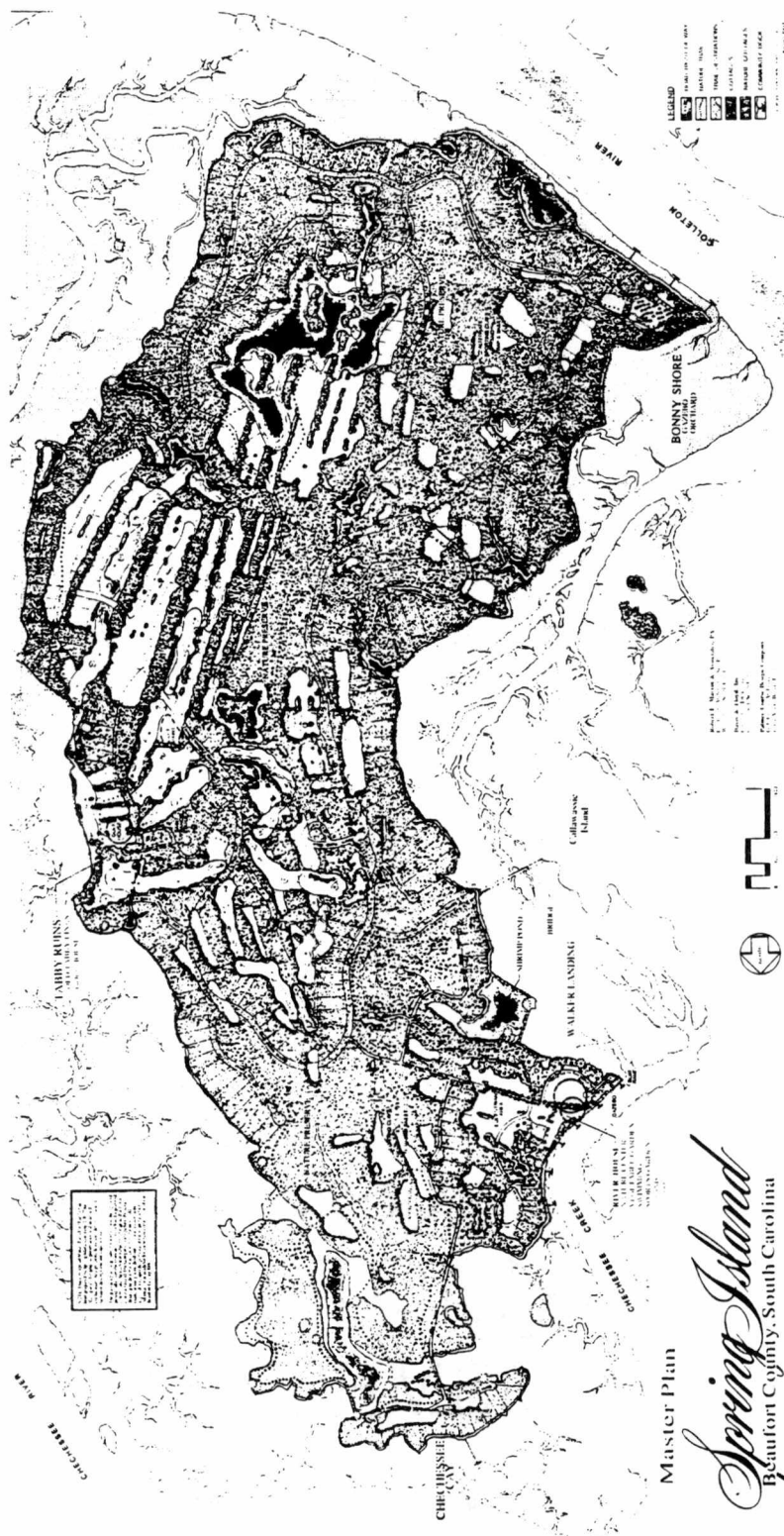


SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL WATER QUALITY CERTIFICATION PROCESS INDIVIDUAL PERMIT

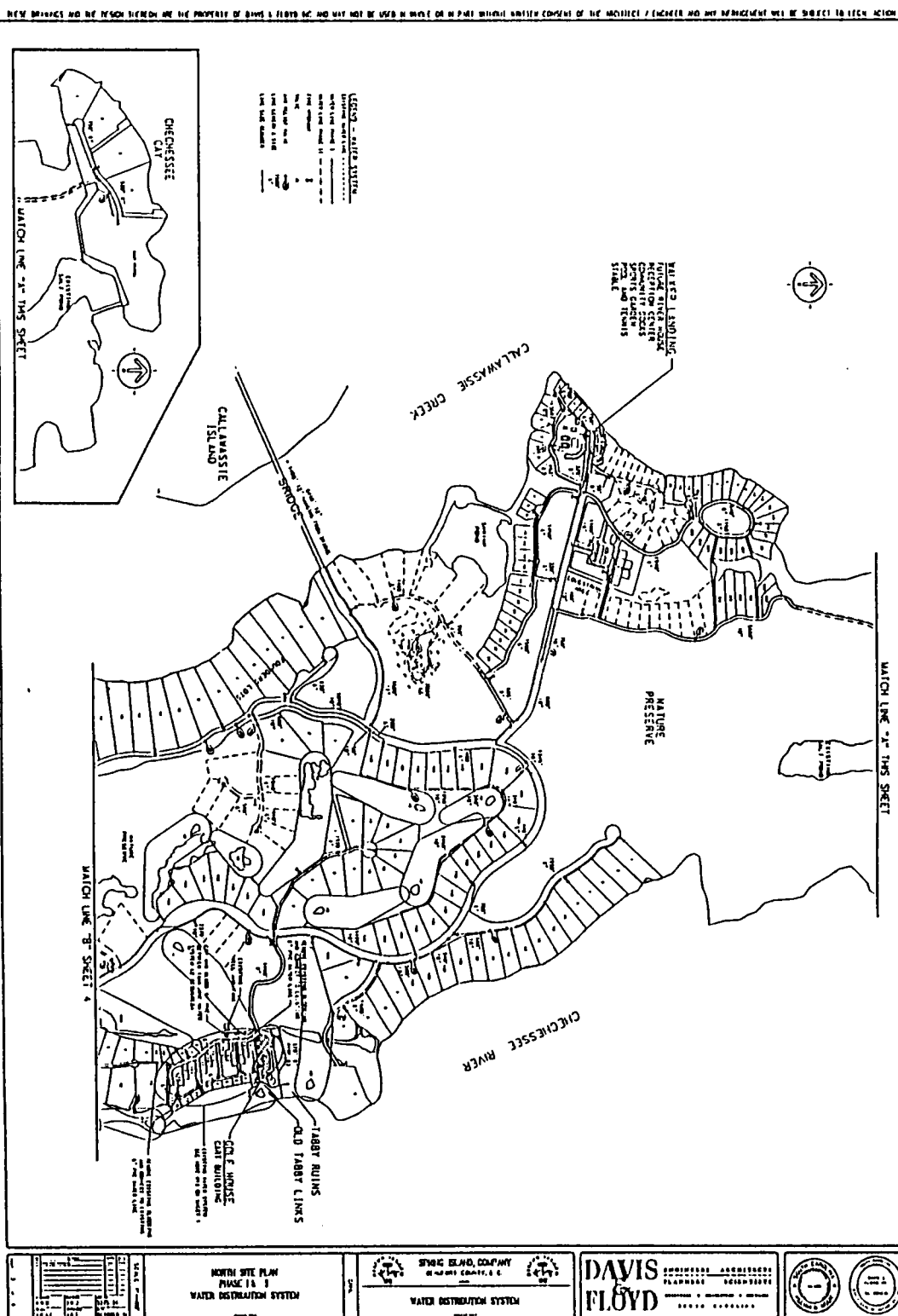




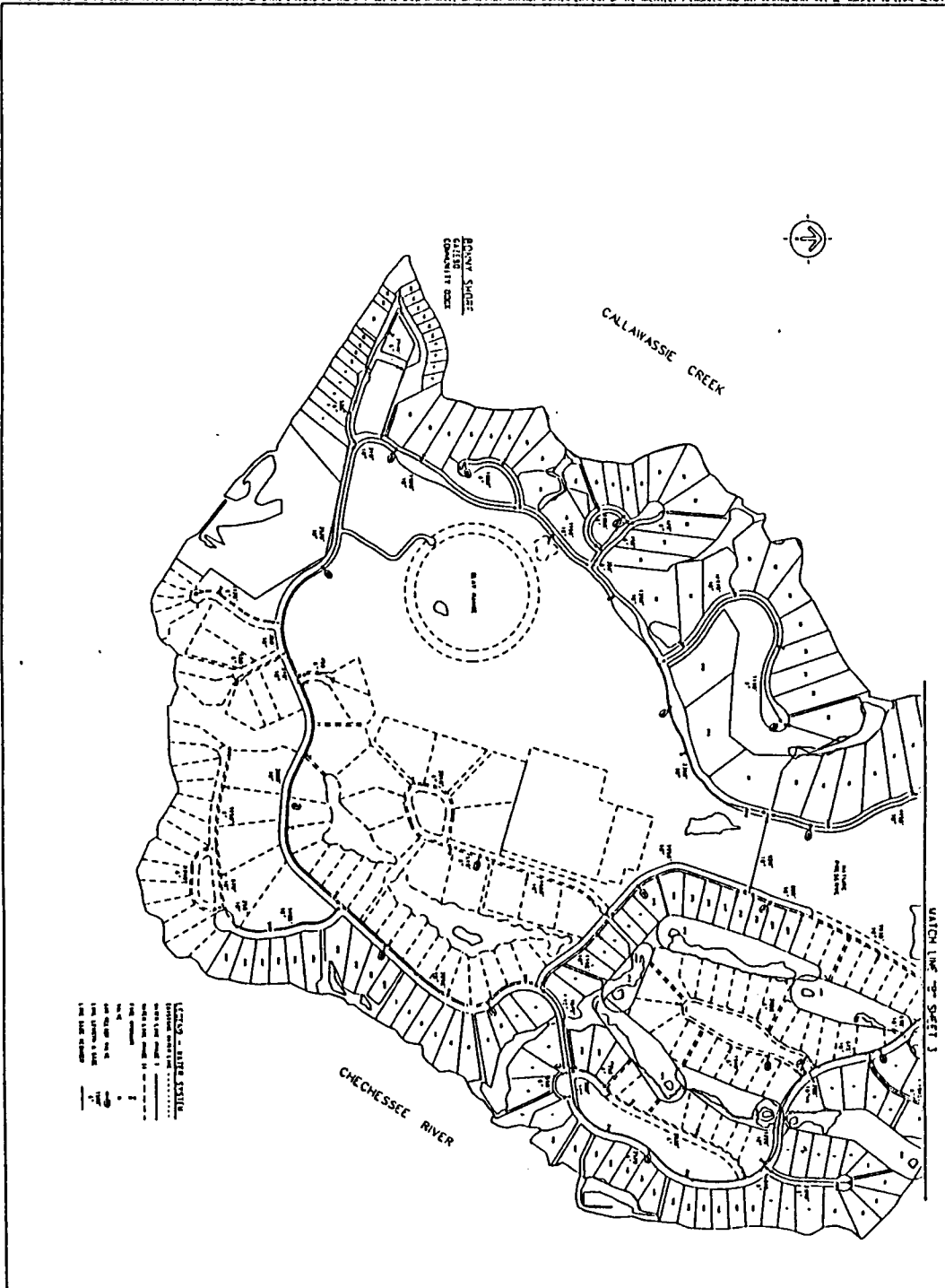
112



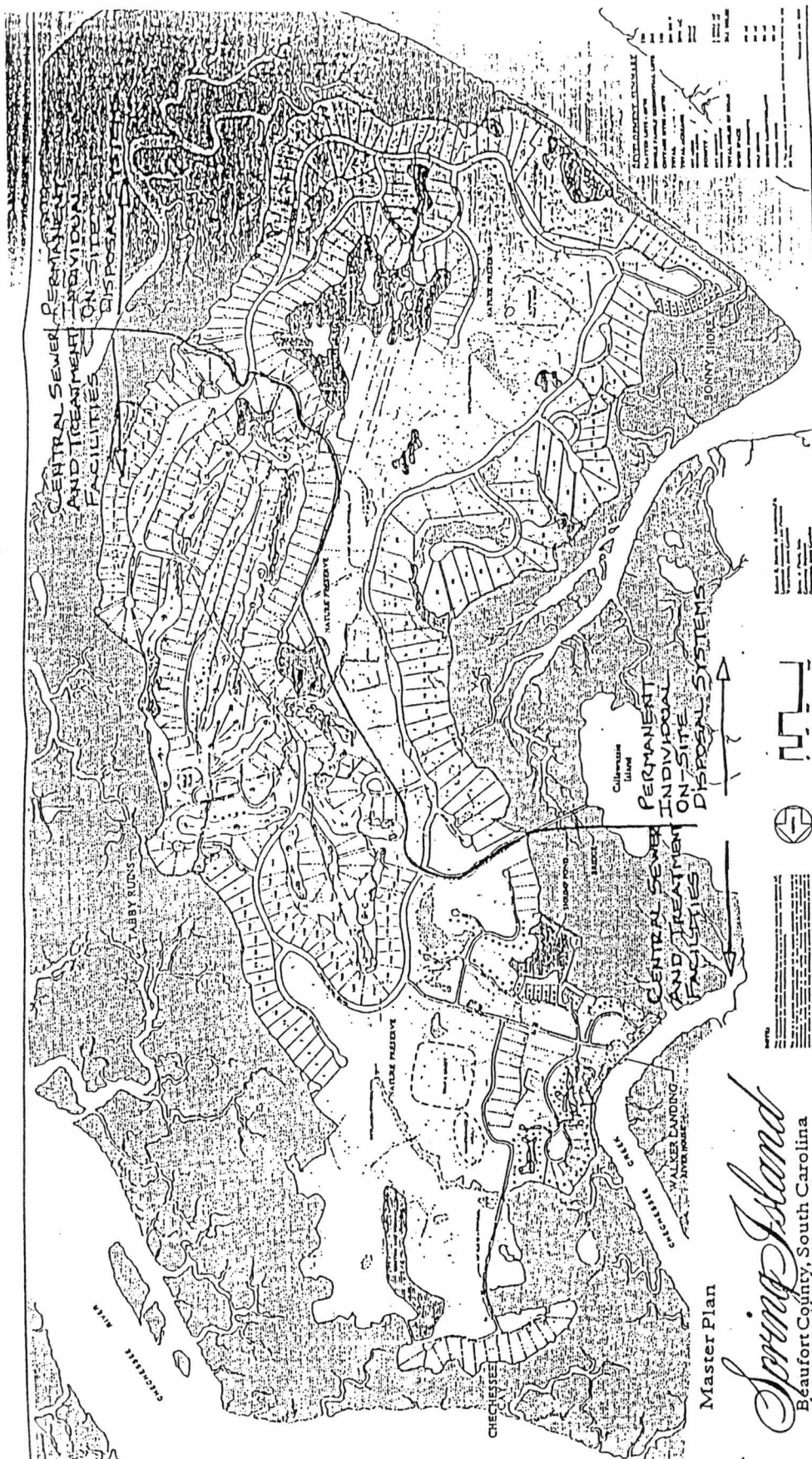
Appendix G

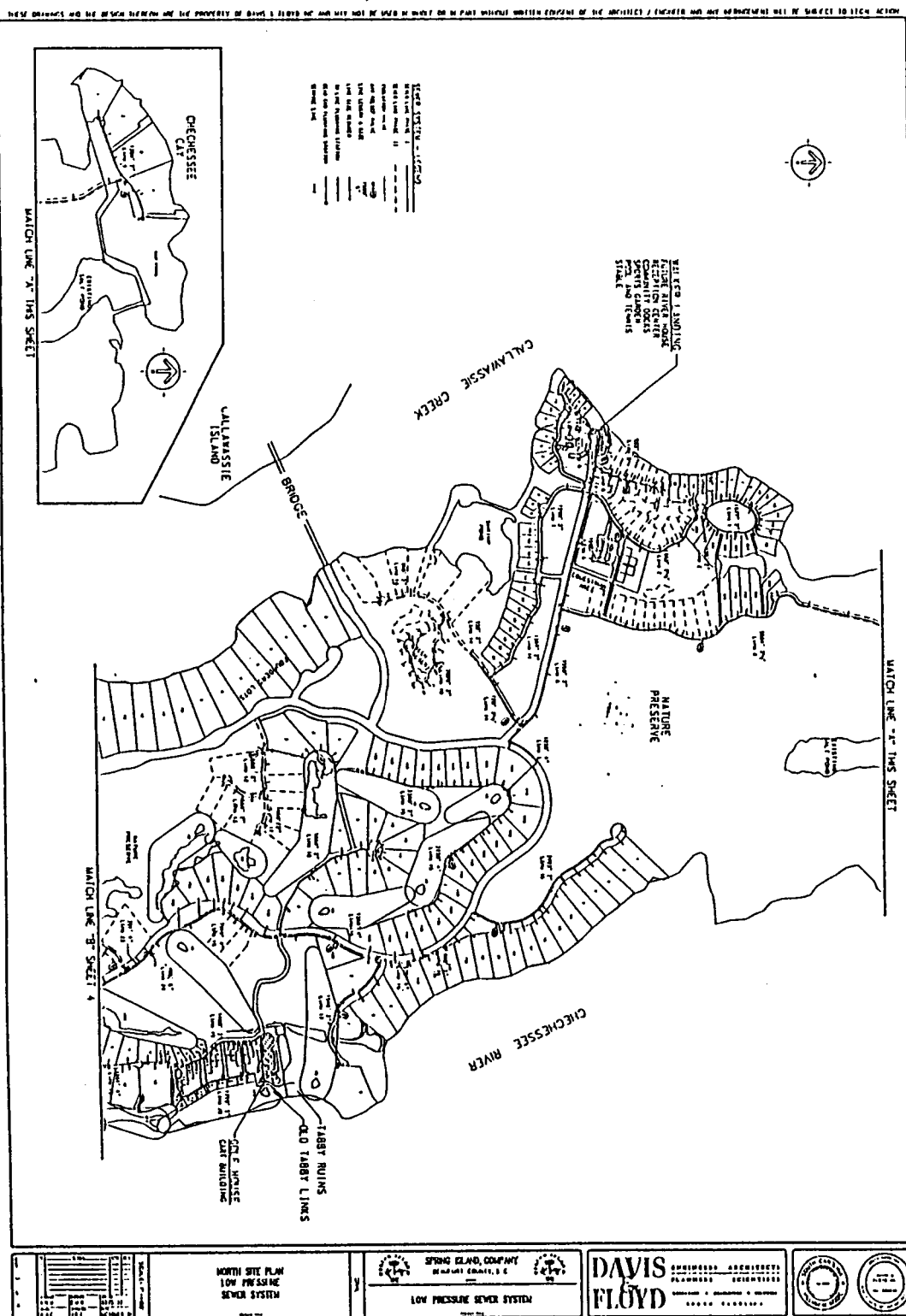


THESE DRAWINGS AND THE DESIGN THEREON ARE THE PROPERTY OF DAVIS & FLOYD INC. AND MAY NOT BE USED IN WHOLE OR IN PART WITHOUT WRITTEN CONSENT OF THE ARCHITECT / ENGINEER AND ANY VIOLATION MAY BE SUBJECT TO LEGAL ACTION



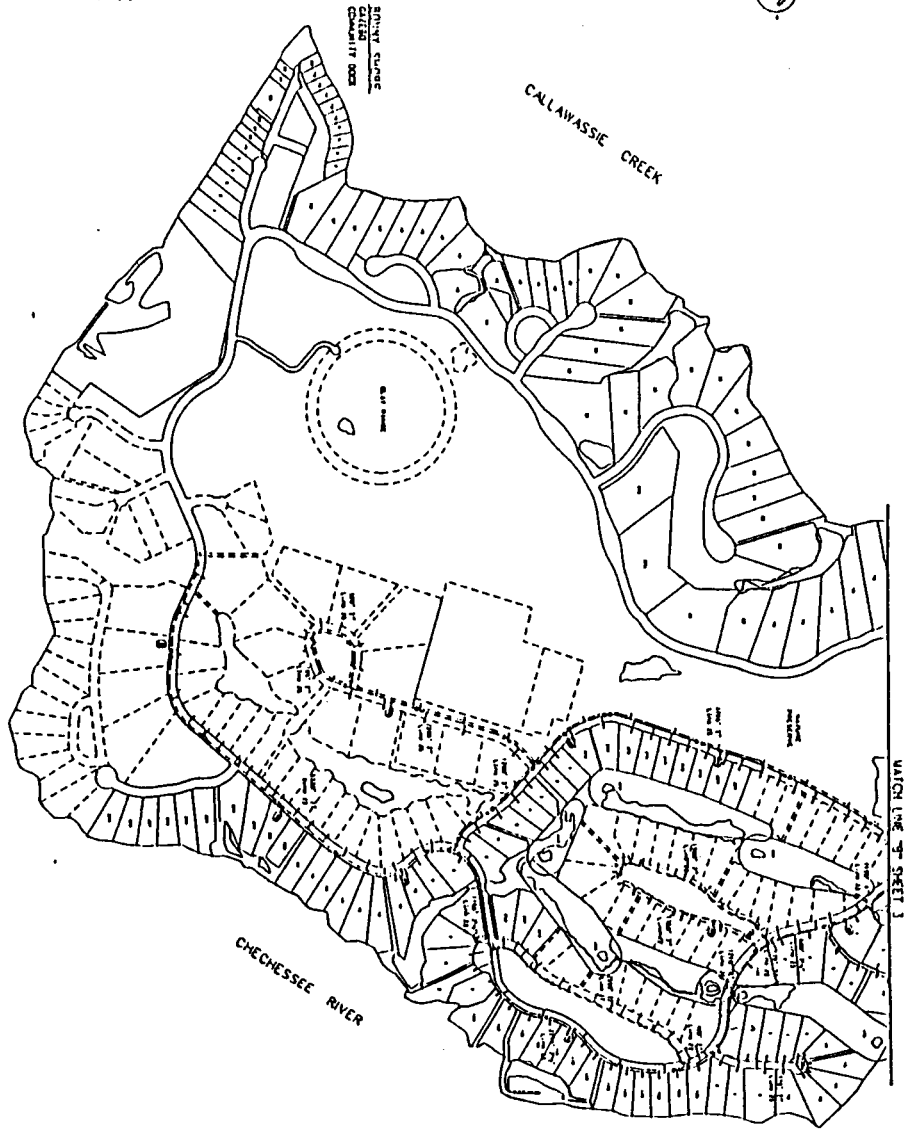
DATE: 11/11/11 DRAWN BY: J. L. FLOYD CHECKED BY: J. L. FLOYD APPROVED BY: J. L. FLOYD	SOUTH SITE PLAN PHASE 1 & 2 WATER DISTRIBUTION SYSTEM	SPRING ISLAND COMPANY DEPT. OF LAND & CONSTRUCTION, S. C. WATER DISTRIBUTION SYSTEM	DAVIS FLOYD ARCHITECTS - ENGINEERS PLANNERS - DESIGNERS	Professional Engineer Seal Professional Engineer Seal
---	---	--	---	---





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SEWER SYSTEM - 1500' W.D.
 SCALE LINE 1" = 100'
 SCALE LINE 1" = 100'
 ISOLATION VALVE
 AIR RELIEF VALVE
 LINE LENGTH & SIZE
 LINE SIZE 1500'
 LINE SIZE 1500'
 IN LINE PUMPING STATION
 RETAINING WALL PUMPING STATION
 SERVICE LINE



	DAVIS & FLOYD, INC. ENGINEERS - ARCHITECTS PLANNERS - SURVEYORS 1000 N. 10th St., Suite 100 Annapolis, MD 21403 (410) 293-1100	SPROUD BROS. COMPANY 1000 N. 10th St., Suite 100 Annapolis, MD 21403 (410) 293-1100	DAVIS & FLOYD, INC. ENGINEERS - ARCHITECTS PLANNERS - SURVEYORS 1000 N. 10th St., Suite 100 Annapolis, MD 21403 (410) 293-1100		
	SEWER SYSTEM - 1500' W.D. LOW PRESSURE SEWER SYSTEM				

Appendix H

FORM 1 SKETCH PLAN REVIEW

PROPERTY OWNER: _____
MAILING ADDRESS: _____
TELEPHONE: _____

DATE: _____
LOT NO. _____
STREET _____

ARCHITECT _____ FIRM: _____
ADDRESS: _____
TELEPHONE: _____ FAX: _____

LANDSCAPE PROFESSIONAL: _____ FIRM: _____
ADDRESS: _____
TELEPHONE: _____ FAX: _____

- Has the architect and landscape architect/designer visited the site? ☐ yes ☐ no
- This application must include THREE sets of the following:
 - ☐ Site Plan/ Site Analysis
 - ☐ Floor Plans with Square Footage Summary on plan
 - ☐ Elevations showing existing and proposed grade, height of ridge dimensioned
 - ☐ Tree & Topographical Survey (as base sheet for Site Analysis)
- Attached is a copy of the architect's current registration certificate, stamped with licensing seal.
- Application fee in the amount of \$750, payable to Spring Island HRB. Check # _____

SUBMITTED BY: _____ SIGNATURE: _____

Please submit to: SPRING ISLAND COMPANY • Attention HRB Administrator
Route 6, Box 284 • Ridgeland, SC 29936 • Tel. (803) 521-1807

PROPERTY OWNER: _____
MAILING ADDRESS: _____
TELEPHONE: _____

DATE: _____
LOT NO. _____
STREET _____

ARCHITECT _____
LANDSCAPE ARCHITECT _____

- Total area - heated & unheated _____ sq. feet
Total area - heated 1st Floor _____ sq. feet
 heated 2nd Floor _____ sq. feet
% of Lot covered by structures _____ %
Maximum height _____ feet

- This application must include **THREE** sets of the following:

Item	Remarks by HRB
SITE & DRAINAGE PLAN	
LANDSCAPE PLAN	
FLOOR PLANS	
HOUSE ELEVATIONS	
BUILDING SECTIONS	
EXTERIOR DETAILS	
EXTERIOR COLOR SPECS	
(color chips attached on board & material selections noted on elevation, see page 3 of FORM 3)	

SUBMITTED BY: _____ SIGNATURE: _____

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FORM 3
FINAL PLAN REVIEW
Page 1 of 3

PROPERTY OWNER: _____ DATE: _____
MAILING ADDRESS: _____ LOT NO. _____
TELEPHONE: _____ STREET _____

ARCHITECT _____
LANDSCAPE ARCHITECT _____

• This application must include THREE sets of the following:

- ☐ Site, Grading & Drainage Plan
- ☐ Landscape Plan
- ☐ Floor Plans
- ☐ House Elevations
- ☐ Exterior Details
- ☐ Mobilization Plan
- ☐ Exterior Color Specs
(samples attached on board, see page 3 of this form)

• One set of each of the following is submitted (optional).

- ☐ Black line stat of Front and Rear elevations sized to fit on an 11" x 17" sheet
- ☐ Black line stat of Floor Plan sized to fit on an 11" x 17" sheet

Please include the following information here and in the top right hand corner of the stats:

Total area - heated & unheated _____ sq. feet
Total area - heated 1st Floor _____ sq. feet
 heated 2nd Floor _____ sq. feet
% of Lot covered by structures _____ %
Maximum height _____ feet
Names of Architect and Builder _____

FORM 3 - FINAL PLAN REVIEW
Page 2 of 3

EXTERIOR MATERIALS & COLORS:

Item	Material	Color	Model or Manufacturer
Siding (Wood)	_____	_____	_____
Siding (Masonry)	_____	_____	_____
Siding (Other)	_____	_____	_____
Roofing	_____	_____	_____
Handrails	_____	_____	_____
Pickets	_____	_____	_____
Fascia, Trim	_____	_____	_____
Columns	_____	_____	_____
Shutters	_____	_____	_____
Front Door	_____	_____	_____
Exterior Doors	_____	_____	_____
Garage Door	_____	_____	_____
Windows	_____	_____	_____
Chimney	_____	_____	_____
Gutters	_____	_____	_____
Drive	_____	_____	_____
Walks	_____	_____	_____
Stairs	_____	_____	_____
Fences	_____	_____	_____
Foundation	_____	_____	_____
Other	_____	_____	_____

SUBMITTED BY: _____ SIGNATURE: _____

Please submit to: SPRING ISLAND COMPANY • Attention HRB Administrator
Route 6, Box 284 • Ridgeland, SC 29936 • Tel. (803) 521-1807

FORM 3 - EXTERIOR COLOR SPECS
Page 3 of 3

PROPERTY OWNER: _____ LOT # _____

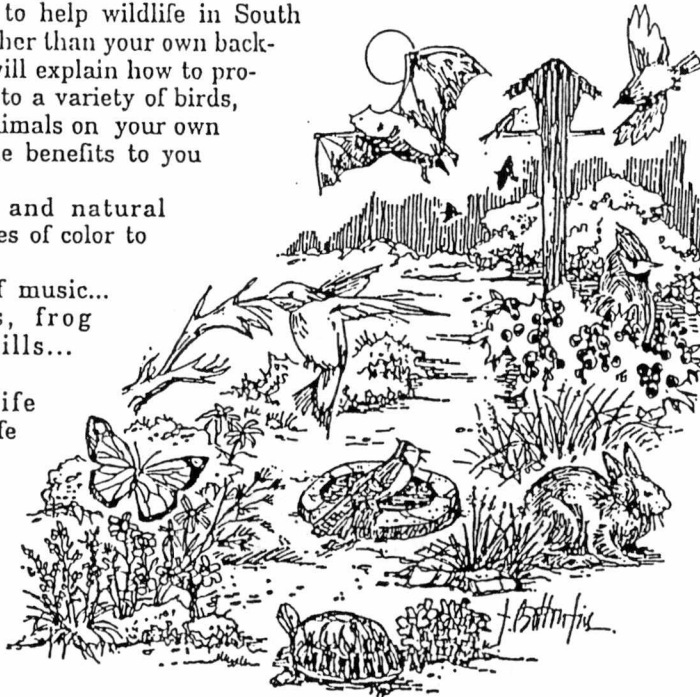
ARCHITECT: _____

INSTRUCTIONS: Mount this page on 8.5" x 11" foam core, and attach and label material & color samples proposed for the homes exterior. (example: roof, siding, trim, and foundation.)

HOW TO CREATE YOUR OWN BACKYARD WILDLIFE HABITAT

Want to do more to help wildlife in South Carolina? Look no further than your own backyard. This pamphlet will explain how to provide a natural habitat to a variety of birds, mammals and other animals on your own property. Consider the benefits to you and your family:

- Birds, butterflies and natural plantings splash flurries of color to the landscape.
- Enjoy the sound of music... spring bird songs, frog choruses, insect trills... through the seasons.
- Attracting wildlife brings the pageant of life right to your doorstep.
- What better place to learn about nature than your own home?
- Many animal species eat pests in your yard and dwelling.
- Best of all, attracting wildlife is easy!



GETTING STARTED

Consider your backyard from an animal's point of view. To survive, all wildlife needs food, water, cover and shelter for raising young. Now take a nature walk and study your property. Make notes:

- Have you provided enough plants with fruits, nuts, seeds and colorful flowers?
- Is there a mix of evergreens and deciduous vegetation for variety?

- Do you maintain a pool of water for birds?
- If you have a fence, consider attaching nesting boxes, or flowering vines.
- Is your soil fertile enough to support new plantings?
- Look for a low area that could be converted into a wetland garden.

Remember also to sit quietly and observe wildlife that passes by. The animals will show you where the beginnings of your backyard wildlife habitat already are.



THE SOUTH CAROLINA WILDLIFE FEDERATION
HOME CONSERVATION SERIES



A BACKYARD WILDLIFE HABITAT

Whether you live in the city, the suburbs or farm country, your property is one-of-a-kind. The illustration above is an example of some of the techniques described in this pamphlet. Use it for reference, but design your wildlife habitat to proudly display your personal touch. After all, it is your backyard.

- | | |
|---------------------|---------------------|
| 1. Nut-bearing tree | 8. Mulch pile |
| 2. Fruiting tree | 9. Fence with vines |
| 3. Evergreen tree | 10. Nest box |
| 4. Tall shrub | 11. Birdfeeder |
| 5. Low shrub | 12. Bird bath |
| 6. Butterfly garden | 13. Pool |
| 7. Grape arbor | 14. Meadow |

PLANTS FOR WILDLIFE

Trees:

Dogwood
Red cedar
Holly (American, Yaupon)
Sassafras
Red Bud
Cherry Laurel
Mimosa
Hackberry
Mulberry
Sweet Gum
Black Gum
Oaks
Hickories
Pecans

Magnolia

Persimmon
Cherries

Shrubs:

Waxmyrtle (Bayberry)
Elderberry
Pokeberry
Crabapple
Chinquapin
Viburnum
Pyracantha (Firethorn)
Eleagnus (Russian Olive)
Leucothoe (Fetter Bush)

Vines:

Virginia Creeper
Trumpet Creeper
Coral Honeysuckle
Cherokee Rose
Cypress Vine
Grape

Flowers:

Aster
Butterfly Weed
Blazing Star
Penstemon
Phlox

Impatiens

Petunia
Clovers
Dianthus
Zinnia
Marigold
Sunflower
Thistle
Yarrow
Coreopsis
Wild Pink
Bee Balm
Verbena
Speedwell
Chrysanthemum

VITA

Harold Boyd Clark, Jr. was born in Grenada, Mississippi on April 23, 1971. He attended elementary school in the same city and graduated from Kirk Academy high school in 1989. The following September he entered Mississippi State University, and in May of 1994 he received a Bachelor of Landscape Architecture Degree.

For the next year, he practiced a career as a Landscape Architect in Memphis, Tennessee for the firm of Reaves Sweeney Marcom, Inc. During this time, he specialized in site design and soon developed a greater interest in land development and urban and regional planning.

After gaining this private practice experience, he entered the Graduate School of Planning of the University of Tennessee in 1995. After the completion of all course work and a concentration in real estate development planning, he re-entered the private practice field as a landscape architect and land planner. He is currently an Associate Planner and Project Manager with the consulting firm of Barge, Waggoner, Sumner and Cannon, Inc. of Nashville, Tennessee. He received his Master of Science in Planning Degree in May, 1998.