TOWN OF MELBOURNE BEACH, FLORIDA

HABITAT RESTORATION AND PROTECTION INITIATIVE

FINAL REPORT

for

THE FLORIDA COASTAL MANAGEMENT PROGRAM

THIS DOCUMENT IS FUNDED IN PART BY A SUBGRANT THROUGH THE FLORIDA COASTAL MANAGEMENT PROGRAM, THE FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS PURSUANT TO NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AWARD #NA370Z0427.

SUBMITTED BY: THE MARINE RESOURCES COUNCIL OF EAST FLORIDA
GRANT, FLORIDA

PREPARED BY: KATHRYN FLAHERTY
AND
JANET R. MERKT
GRADUATE INTERNS, FLORIDA INSTITUTE OF TECHNOLOGY,
MELBOURNE, FL.

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Summary of Habitat Restoration and Protection Initiative Project

INTRODUCTION

The Town of Melbourne Beach, Florida received a grant from the Florida Coastal Zone Management Program for a Habitat Restoration and Protection Initiative. The objectives of this innovative project were to prepare a model ordinance, perform a revegetation project, present educational programs to the public, and to preserve native habitats. While the goal of this project was to protect and enhance all existing habitats on the barrier island, the Town of Melbourne Beach focused on enhancing existing scrub habitat, and creating greenways and wildlife corridors by the planting of scrub oaks and understory plants in selected areas.

ORDINANCE DATABASE/MODEL ORDINANCE PROJECT

The goal of the ordinance project was to preserve and enhance existing habitat on the barrier islands through the use of local laws and regulations. The first step was to provide an environmental ordinance database which municipalities and counties could use when updating or writing new environmental ordinances. The data base was complied using ordinances from coastal towns and created with the Alpha Four database management system. Ordinances were requested by letter from coastal cities and towns and their respective counties (Appendix A). Those municipalities not responding to the letter were contacted by either phone or a personal visit. Twenty-four (24%) percent of the 252 cities and counties solicited responded with ordinances. A total of fifty-four (54) cities and fifteen (15) counties replied to the request for ordinances. Each ordinance was analyzed and the information logged on a data sheet (Appendix B). Each data sheet was used to input ordinance information into the data base. Ordinance references can be retrieved from the data base by key word, type of ordinance, name of city or county and title of ordinance. Approximately 200 records are listed in the database. Appendix C contains the directions on operation of the database. Table 1 lists the twenty-five (25) major types of ordinances in the database.

Preparation of the model ordinance was phase II in the program for maintaining the barrier island habitats. Since habitat boundaries do not always coincide with political and legislative boundaries, consistency of habitat protection ordinances will assure intercommunity habitat protection. The intent of the model ordinance is to preserve existing native vegetation and habitat in several ways. Appendix D contains the model habitat protection and landscape ordinance and background references. Appendix E contains the model sea turtle habitat protection ordinance. The model

ordinances were reviewed by Diane Barile, Executive Director of Marine Resources Council; Reba Floyd of Brevard County Land Development Division; Ed Washburn, Town Manager of Melbourne Beach, and Paul Gougelman, Town Attorney.

REVEGETATION PROJECT

The goal of the revegetation project is to enhance the existing scrub habitat in Melbourne Beach by planting scrub oaks and understory plants in the neighborhoods and at the local elementary school. The project included presenting educational programs to Gemini Elementary School and the community as well as the revegetation of specific sites. The programs, presented by the Friends of the Scrub and the Native Plant Society, included information about the scrub habitat and the Florida scrub jay, protection measures and the purposes and intent of the revegetation project. The presentations were given to the school children at Gemini Elementary and their parents, and to the community at an Environmental Advisory Board workshop. Flyers about the workshop were handed out to residents who live along the revegetation sites (Appendix F). In addition, informational materials were distributed to residents at the town's annual Founder's Day Festival in May.

Site Choice and Preparation

To assure a successful planting, Dr. Richard Hillsinbeck, a botanist who serves on Brevard County's Scientific Advisory Group for the Scrub Habitat Conservation Plan, advised on the type and ratio of tree species normally found on the barrier island scrub habitats. The Natives, a plant nursery that specializes in natural community restoration projects was consulted with regard to tree survival rates, the optimum planting size, and their maintenance requirements. The nursery agreed to contract-grow those plants deemed optimum for the habitat restoration planting. Information from these two sources were used in choosing creating a landscape design and a plan for a successful planting. Appendix G contains a complete list of plants that were used.

Using aerial photographs and site visits, areas were selected for planting based on proximity to existing scrub areas. Consultants in the selection were the town's Environmental Advisory Board, a member of the Conradina Chapter of the Florida Native Plant Society, and a graduate student intern from Florida Institute of Technology.

A total of 5 sites were chosen for planting. The first area chosen was Gemini Elementary School. This site was chosen for several reasons. First, the site is across the street from a scrub area inhabited by a family of scrub jays. Second, a school situation was deemed an excellent vehicle for education of both the students

and parents as to the importance of habitat restoration and preservation. Two sites on the grounds of Gemini Elementary School were selected to be planted, on the north and the south end of the school. Mulch was laid to clear the landscape areas of grass and weeds.

A site was chosen to be planted along the rear fence line behind the ball fields at county-owned Flutie Park. This area was chosen because it affords ample planting area, creates a buffer for homeowners between their yards and the ball field and serves as a greenway corridor for the jays. The park area was rototilled, staked and irrigated by the county in preparation for the planting.

The right-of-way along Oak Street was originally chosen as a site but subsequently rejected due to buried stormwater and utility structures. Reevaluation of other possible sites revealed that Fir Avenue runs parallel to the park, and the combination of backyard vegetation and park vegetation would create a desirable greenway strip. The residents were originally contacted by letter with follow-up phone calls and personal visits to solicit participation in the project. Residents were asked to provide sites in their backyards for planting scrub habitat (Appendix H). A site was also chosen along the western fence line at St. Sebastian By-The-Sea Episcopal Church.

Sites that were planted are highlighted on Map 1. The revegetated areas will create a wildlife corridor between the scrub area at Flutie Park, some overgrown lots on Oak Street, and areas on Fir Avenue where scrub jay sightings have been reported. The scrub jay residential lots are circled on the map.

Planting the Site

Members of the Conradina Chapter of the Native Plant Society met with teachers, parents, and the principal to organize a planting day, for January 22, 1994. A slide presentation introducing the Florida scrub jay and its habitat was given to parents and students. The PTA solicited and received donations for additional trees and volunteers. On planting day, parents and schoolchildren planted one hundred twenty-five (125) scrub oaks and understory plants along with a dune fence for protection. Since the plants were contract grown, not all plants were of sufficient size to be planted. Therefore, the smaller plants will be planted later on in the fall.

The school is responsible for weeding, an irrigation system and water until the plants are firmly established, when they will not required supplemental water.

A second planting day was held on August 27, 1994. Approximately three hundred thirty-five (335) plants were planted along Flutie

Park, at the church and in one homeowner's yard. About 30 volunteers reported, representing such groups as the Rotary Club, Friends of the Scrub, the Native Plant Society, Melbourne Beach's Environmental Advisory Board, a local Boy Scout troop, Marine Resources Council, Maple Street Natives, Melbourne Eye Associates, and Brevard County Commissioner Nancy Higg's office. In the park, the planting was done in a "pod" manner, installing one or two trees with complementary understory plants adjacent. Several scrub jays live in close proximity to the planting area - one of the resident's sons has even named them! During the planting, two of the scrub jays appeared at the planting site, coming to light on the hands of the volunteers. Live oak trees (Quercus virginiana) were planted along the fence at the church and in one resident's yard. Planting equipment was provided by the volunteers and refreshments for the workers were donated by two local grocers.

A third planting was held on September 3, 1994 to establish scrub plants in the remaining resident's yards. Another forty-one (41) plants were obtained from two native plant nurseries and installed by ten (10) volunteers including four homeowners. One hundred percent (100%) of the residents on Fir Avenue agreed to have scrub plants installed in their yards and each homeowner has agreed to water, weed, and generally care for the plants until established. While clearing the area along the residential fences, other scrub plants, such as gopher apple, scrub oak, coral bean, and wax myrtle were discovered and carefully conserved. Plants installed included three types of scrub oaks (Quercus myrtifolia, Q. geminata, Q. chapmanii), beautyberry (Callicarpa americana), Indian blanket flower (Gaillardia pulchella), and dune sunflower (Helianthus debilis). The planting was also done in a "pod" manner. Several residents cleared exotic vegetation from the area to make room for the scrub plants. The Town council presented each resident with a "Certificate of Adoption" for their cooperative efforts in the planting project (Appendix J). In addition, each resident received a thank you letter for their participation in the project (Appendix K).

Finally, the last planting was held on September 17, 1994 to install the remainder of the plants at the school.

ECO-CALENDAR

The grant originally called for the preparation of an "Eco-Atlas", a pamphlet describing the natural habitats and their inhabitants in the Town of Melbourne Beach. However, after discussion by the Environmental Advisory Board, the Town Manager and other interested parties, an Eco-Calendar was substituted. A consensus was reached that a calendar would be more "user-friendly" - a resident was likely to keep a calendar the entire year, rather than a pamphlet that may be discarded after being read. Each month will have a featured animal, plant or event known to occur in that month - for example, sea turtle nesting in the spring months, etc. The artwork

was donated by a local artist. The text was written by several members of the Environmental Advisory Board, Marine Resources Council, and the Native Plant Society.

VIDEO

A video of the second planting done at the park and homeowner's yards was filmed by a member of the Environmental Advisory Board. Professional editing was the responsibility of the members and students of the film department at Phillips Junior College. Credits for the video include the Melbourne Beach Town Commission, the Melbourne Beach Advisory Board, the Marine Resources Council, the Conradina chapter of the Native Plant Society, and Friends of the Scrub.

CONCLUSIONS AND RECOMMENDATIONS

The model ordinance could be used by those barrier island communities wishing to conserve existing habitats and restore and reconstruct areas that have been compromised. The ordinance allows each town to make adjustments or modifications to meet their individual environmental, political and socioeconomic needs. A hard copy of the database can be printed out for those communities without facilities to run the computer program.

The 100% cooperation level of the residents was very encouraging. This shows that the town residents are concerned and willing to participate in habitat restoration. Especially refreshing was the enthusiasm displayed by the children who had named the scrub jays. It is hoped that this enthusiasm will carry into the care of the plants necessary for the jay's survival.

The eco-calendar could be a self-perpetuating concept. The calendar can be designed a little differently each year and a price set whereby the cost to produce the calendar was covered with a little extra left over. The money collected over and above the production cost of the calendar could be set aside for environmental activities, such as educational workshops, native plant giveaways, etc. In addition, the calendar can be a template for other communities who wish to raise money to conduct environmental awareness activities.

The video depicts what can be accomplished in habitat restoration, and can be used by towns or cities if they think they would like to do a similar project. It shows what can be achieved combining the joint efforts of towns, counties, and residents and illustrates the remarkable results that can be obtained in a just few short hours working with volunteers and informed, interested citizens.

MAP 1. Location of scrub jay sites and revegetation sites.

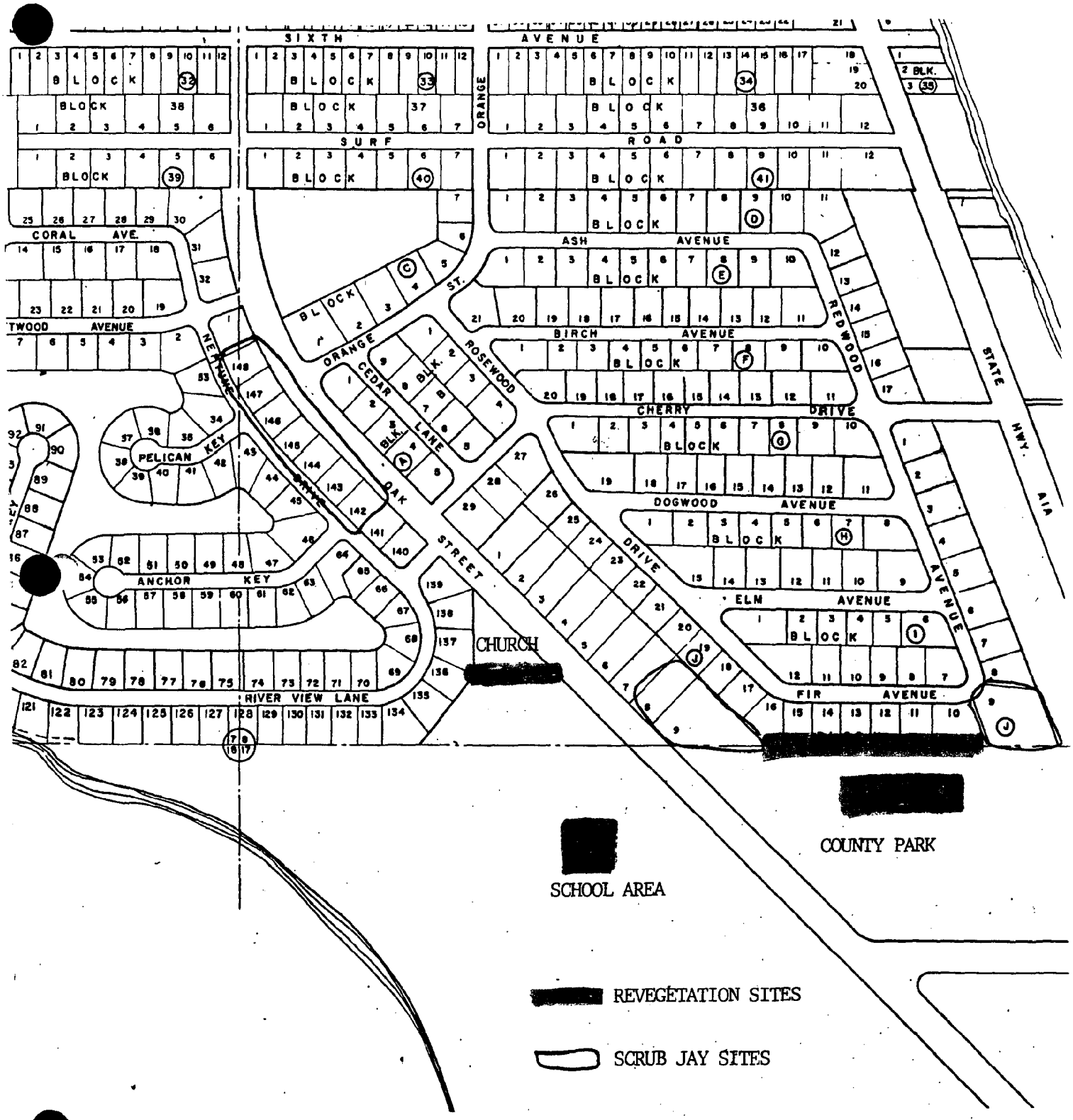

TABLE 1
TYPES OF ORDINANCES IN THE DATABASE

TYPE OF ORDINANCE	NO. OF RELATED ORDINANCES
Beach/dune protection	14
Bird protection	1
Coastal construction	10
Endangered/threatened species protection	1
Environmental protection	2
Environmentally sensitive lands	11
Habitat protection	12
Land clearing	13
Land development	17
Landscape	53
Manatee protection	2
Mangrove protection	1
Open space/natural preserves	1
Preservation of wildlife	1
Resource protection	4
Shoreline protection	2
Species protection	2
Stormwater	41
Tree	18
Tree protection	29
Turtle protection	12
Vegetation protection	3
Vegetation standards	1
Wetland	13
Wildlife protection	1

APPENDICES

APPENDIX A

MARINE RESOURCES COUNCIL OF EAST FLORIDA

Indian River Lagoon

December 14, 1993

City Clerk
City of South Daytona
P.O. Box 4960
South Daytona, FL 32021

Dear City Clerk:

Cities are facing problems with adequate habitat protection and rehabilitation regulations. Cities have begun to recognize the role they play in protecting the environment through developing ordinances such as new stormwater regulations, landscape and tree protection ordinances.

The Florida Coastal Management Program is sponsoring a project to provide a reference database of ordinances that can be used by cities and counties when preparing new protection ordinances or revising old ones. Marine Resources Council of East Florida is coordinating this project and we need your help. We know that your city/county has ordinances that are important and need to be included in this database.

These are the type of ordinances that are being collected:

environmental protection
habitat protection
habitat restoration
barrier island protection
landscape
land clearing
wetland protection
land development code
dune protection
sea turtle
mangrove
stormwater
native plant protection
tree ordinances

PO BOX 22892 MELBOURNE, FLORIDA 32902-2892 407-952-0102 407-952-0103 FAX
LOCATED AT 5890 US1 IN GRANT, FLORIDA

Please send copies of all these ordinances, or any others you deem appropriate for the management and protection of land, water and habitat resources, to the following address:

Katie Flaherty
Marine Resources Council
P.O. Box 22892
Melbourne, FL 32902-2892

Thank you for your time and for your ordinances to be included in the database, please respond by January 14, 1993.

The results and model ordinance database will be available by the end of 1995. This project will be a useful tool to share information and resources from around the state in order to advance awareness and knowledge of environmental ordinances.

Sincerely,

Diane D. Barile
Executive Director

APPENDIX B

ORDINANCE DATA SHEET

CITY/COUNTY_____ FAX( )_____

ADDRESS_____City_____State_____Zip

PHONE( )_____

CONTACT PERSON_____

TITLE OF ORDINANCE_____

DATE OF ADOPTION_____

KEY WORDS (circle all that apply):

native plants/vegetation
exotic plants/vegetation
buffer/setback vegetation
undesirable species
Brazilian pepper
melaleuca
mangroves
tree protection/preservation
sea turtles
beach
dune
artificial light
point system for landscaping
list of recommended landscaping plants
list of native species
list of non-native species
list of undesirable species
wildlife
permits
maintenance
enforcement
penalties
parking area
coastal construction
shorelines
vistas and views
tree removal
vegetative community protection
palms
roadway median and ROW
endangered habitats
tree replacement/relocation
revegetation requirements

TYPE OF ORDINANCE:
tree
landscape
lands clearing
land alteration
land development
stormwater
vegetation standards
tree protection
stream buffer/setback
wetland
parking area
coastal construction
turtle protection
beach/dune protection
minimum tree plantings
tree survival
shore structures
100 year storm
public access
drainage facilities
peak discharge
retention/detention
runoff
sedimentation/erosion
wetlands
site plan
permitted uses
prohibited uses

APPENDIX C

Directions to use the Ordinance Database

1. Change the directory to ALPHA4V2.
   C:> CD \ALPHA4V2

2. At the prompt type A4 \ALPHA4V2\ORDINANC.
   ALPHA4V2:>A4 \ALPHA4V2\ORDINANC

3. This puts you into the database. The database last used will be highlighted.
   The database holding all of the ordinances is named HABITAT.
   Highlight the HABITAT database and press ENTER.

4. The MAIN MENU is now displayed.
   Highlight VIEW/ENTER RECORDS and press ENTER.

5. The database records are displayed on the screen. There are 2 ways to display records on the screen. One is VIEW MODE which displays 1 record at a time. BROWSE MODE displays many records on the screen.
   VIEW MODE allows for more detail to be displayed at once so this may be preferable to the BROWSE MODE
   In order to use VIEW MODE (if it is not in that mode already) press V.

6. The records (ordinances) can be accessed in 2 different ways; by choosing an INDEX and using FIND or by using LOCATE A RECORD.

7. To find a record(s) by using 1 of the INDEXES, press I to select INDEX.
   A window of INDEXES appears, listing all of the INDEXES available for the HABITAT database.
   Ordinances can be accessed by using the following INDEXES: CITY/COUNTY, TYPE OF ORDINANCE or TITLE OF ORDINANCE.
   Highlight the INDEX wanted to look through and press ENTER.

8. After choosing an INDEX, press F to choose the FIND command.

9. Type the word you want to find and press ENTER.
   For CITY/COUNTY, type "City of ____" or "_____ county".

10. You can use the arrow keys to search up and down the list from the record that was located.

11. To find a record using the KEYWORDS field, the LOCATE A RECORD command must be used.
    Press O to select OPTIONS.

12. Press L to select LOCATE A RECORD.

13. Type the word you want to look for and press ENTER.

14. The FIELD SELECTION screen is shown. Highlight the field name KEYWORDS and press ENTER.
    An arrow appears next to the field name indicating a selected field. To de-select a field, press ENTER on a marked field and the arrow disappears.

15. Press F10 to begin the search.

16. The program stops when a match is found. Pressing ALT-M displays the KEYWORDS memo field.
    Pressing F10 returns to VIEW MODE.
    Pressing N selects the next record.
    A warning box is displayed when there are no further matches. Press ENTER to continue.

17. LOCATE A RECORD can be used for any of the fields in the database, not just KEYWORDS, but it is the only way to access the memo field of KEYWORDS.

18. When you are through with your search, press M for the MAIN MENU.

19. Highlight QUIT (or press Q) to exit the system.

APPENDIX D

MODEL HABITAT PROTECTION AND LANDSCAPE ORDINANCE

Introduction

A survey was conducted in the summer of 1993 in the City of Asheville and Buncombe County in North Carolina. The results were not surprising - PEOPLE LIKE TREES AND GREENSPACES AND WANT TO KEEP THEM!! (Price 1994). Tree protection has become one of the hottest, and often contentious environmental and planning issues. No longer limited to the agenda of extremist environmental groups, tree and open space conservation has become a mainstream concept.

Trees and vegetation however, are only one part of an ecological system - a system where biological and physical characteristics are intricately woven, producing a natural community. Such ecosystems provide habitat for wildlife, groundwater and aquifer recharge, and floodplain management. As urban development escalated, ecosystems begin to feel the impact.

It is well documented that vegetation has environmental value, aiding in climate moderation, erosion reduction, air filtering, and exchange of atmospheric gases. In addition, monetary value can be placed on vegetation for its value in abating city air and water pollution, noise attenuation, and soil erosion. A study recently done in Chicago, Illinois determined that the shading capacity of trees and their windbreak potential, lowered heating and cooling costs in the city. During 1991, trees in the Chicago area removed 6.145 tons of air pollutants, providing air cleansing valued at $9.2 million dollars. Compared with the cost of upkeep, the long-term tree benefits were more than twice the cost (McPherson, et al.,1994). A landscape buffer can shield adjacent areas from traffic noise and pollution (Figs. 1 and 2). It has been estimated that a 100 foot buffer strip of trees along a major road can reduce the noise level by six to eight decibels (Bullard 1980).

Perhaps just as important, the aesthetic values of plants and wildlife must not be overlooked. Unlike the monetary and environmental values, one cannot always put a quantifiable value on the visual and aesthetic ways ecosystems benefit mankind. No one will argue, however, the great effect plants and attracted birds and butterflies has on the mind and body. Several studies show the commotion and noise of cities can cause psychological as well as physical stress. A University of Delaware professor, Roger Ulrich, found that, over a nine-year period, the recovery time for gallbladder patients was shorter for those who could see trees outside their window rather than a blank wall. In addition, "tree-viewers" required fewer painkillers than their "blank wall-viewer" counterparts. (Duerksen et al.) A UNESCO project is examining the needs of city children, and interviews of children world wide have shown that "the hunger for trees is outspoken and seemingly universal" (Lynch in Duerksen et al. 1993). Another study in England is focusing on schoolyard trees and landscaping and how

they can benefit the learning environment.

During the early and mid 1980's, relatively few communities in the United States had adopted ordinances that addressed tree protection on private property. The states of Florida and California were forerunners, with the bulk of existing tree ordinances occurring in these states. Recently, however, tree protection and conservation laws have been emerging in other states, notably Illinois, Texas, Missouri, and other heartland states.

Developers are a group most often affected by landscape regulations, and were historically opposed to this type of regulation because of associated costs. However, developers are now becoming more amenable to reasonable and flexible regulations as they find the value of their project is usually enhanced. Some developers find it easier and ofttimes cheaper to clear cut before building, planting trees later. Others prefer to save existing trees and work around them. In both cases, builders are finding that homes offered with landscaping and plant material in place command an average of five to ten percent (5-10%), and in some cases, twenty percent (20%) over non-landscaped homes (Grey et al., 1992). Those developers who have preserved existing trees will enjoy even higher monetary gains, as consumers prize shade trees and major evergreens, and are willing to pay for them (Figs. 3 and 4).

In one project, tree protection measures added about two percent (2%) to the average cost of a home, but homes in that development have been outselling those in comparable developments, the higher price of the treed/landscaped homes notwithstanding. The developer is enjoying profits exceeding twenty percent (20%) per unit (Duerksen, 1993). The economic value of trees and vegetation as reported by J.J. Kielbaso in "Economic Values of Trees in the Urban Locale" relates a situation whereby a home with a 300 year old elm tree on the property was listed for sale. An offer-to-buy of $24,000 was made on the home prior to a hurricane. The hurricane destroyed the tree but the home itself was undamaged. The property subsequently sold for only $15,000. It was thus concluded that the tree was added $9,000 to the property's value (Grey et al., 1992). Although it may be argued that the tree alone was not entirely responsible for the difference in price, it has been documented that lots with trees sell faster and at higher prices than properties without trees. In addition, a survey in Hampton, Virginia noted that over 80 percent of the respondents preferred shopping at a business with substantial landscaping (Duerksen, 1986) (Figs. 5 and 6).

The importance of trees and landscaping has been firmly established. The next logical step is the conservation of established parks and open space, and the prevention of further

destruction of native habitats, needed for the survival of both man and wildlife.

A habitat protection and landscape ordinance, written with these perspectives in mind, can be developed for any size city or town. Ordinances written for a town are often copied from another town's ordinances. However, every town has different environmental, geographical and socioeconomic needs, and statutes right for one city do not always apply to another. Much has been written about barrier island and coastal habitats but few ordinances directly address barrier island habitat protection. Urban and suburban areas have traditionally been thought of as primarily commercial and industrial development, residential houses and infrastructure with a park scattered here and there - the manmade overwhelming the natural. However, urbanized areas may also be considered as potential wildlife habitat and greenway creation material.

This model ordinance takes a slightly different approach than traditional landscaping ordinances. The ordinance was developed from an ecosystem perspective, with habitat protection and restoration the key components of the ordinance. Tree protection and landscape requirements are also included but from an ecosystem approach.

Of the nearly 200 ordinances reviewed for this model ordinance, only a relatively small number was used in compiling the model. Ordinances unique to and specifically addressing habitat conservation and restoration were utilized as were regulations applicable to specific habitat areas such as beach and dune systems, mangrove and seagrass areas, etc. This report outlines the approach, rationale, and intent for each section of the ordinance.

General

The model ordinance addresses landscape regulations and tree and habitat protection in light of the needs, rights, and desires of several interest groups. Historically, many environmental regulations generally did not apply to single family homeowners. Homesites were exempt from landscaping, tree conservation, and set-aside regulations. More recently, however, ordinances are becoming applicable to the developers, builders, and the homeowner as well.

It should be remembered that this ordinance is designed to be a **model**. Not every part of the ordinance will be applicable or suitable for every barrier island community. The model ordinance is meant to be tempered for each town's unique needs.

The attached ordinance was drafted in keeping with the police powers of local government in protecting the safety, health, and

general welfare of the citizens. Where exceptions to a regulation exist, it will usually be found to come under the above mentioned police powers. Habitat restoration and ecosystem conservation is more likely to be accepted by the general public if citizens understand the importance of the ecosystem for stormwater protection, water supply, and the economic benefits the system conveys.

Section 1. Intent

The intent section sets the goals and objectives for the ordinance. In a court of law, ofttimes the presiding judge will refer back to the "intent of the law" to aid in deciding a case. Where the intent of the ordinance is clearly defined, ambiguity is diminished, and judgement will often be made in accordance with the goals and objectives of the ordinance.

Section 2. Definitions

Definitions are used to clarify technical and complex terms as well as attach specific meaning to everyday words. For example, the term "DBH" is not a term that everyone readily understands and falls into the former category. On the other hand, the word "tree" is a prime example of a case of the latter. Whenever possible, illustrations are used to clarify complex ideas. Communities should refine definitions to meet their unique needs.

Section 3. Applicability

This section addresses who is bound and affected by the jurisdiction of the ordinance. The model ordinance applies to single family, commercial, and industrial lands. Exceptions are listed for certain bona-fide businesses and provisions are made for areas that previously did not fall under the law, but are now subject due to reconstruction or additions.

Municipal areas such as streets, rights-of-way, medians, etc. are not addressed. Such public areas are usually addressed in separate ordinances. However, habitat restorations can be planned and coordinated with easements for power, storm and waste water, and telephone utilities. Each utility has requirements for optimal types and placement of vegetation to facilitate reliable, uninterrupted services to residents and to avoid problems arising from root spreading, crown growth, etc.

Section 4. General Permit Provisions

Clear cutting is a major source of habitat and ecosystem loss. Therefore, the ordinance requires a permit for this activity. When it is permitted, a landscaping plan must be presented, indicating the intentions and design for replanting the site.

The ordinance prohibits speculative grading for all parcel types. In a survey of Buncombe County, North Carolina residents conducted by Mark West of the University of North Carolina, 81 % of the respondents replied that speculative grading should be prohibited (Price, 1994). The practice is done to supposedly make the land more attractive for a potential buyer. However, residents no doubt realized that the vegetation was being removed, and it was possible that the lot would not be sold for quite some time (Figs. 7 and 8). Meanwhile, the habitat value of the parcel was rendered useless.

Section 5. Applications

This section states the information requirements for the application. The information portion (Subsection c) is designed to provide the approving authority all information needed to review the permit. The evaluation portion (Subsection d) is designed to provide a basis upon which the approving authority will make a decision as to the environmental soundness and feasibility of the project.

Section 6. Native Habitat Preservation Areas

This section addresses the setting aside of a portion of the development parcel as a native habitat preservation area. The amount and location of the habitat area is planned so that the area becomes an integral part of and contributes to open space, greenways, recreation, landscape, stormwater, and parking areas.

A single-family home may be sited on a very small city lot where space is at a premium and a set-aside regulation may be unduly restrictive. However, for a single-family house built on a larger parcel, it may be reasonable to set aside habitat preservation areas. Multi-family, commercial, and industrial developments with their larger sites are more likely to fracture or destroy habitat and vegetative communities. They often have more space as well as money at their disposal to set aside parcels of land for habitat restoration, and are often less affected by parcel set-aside regulations. A sliding scale method is used to obtain an equitable method of determining how much land will be set aside. Land owners with large parcels are required to set aside a higher percentage of the total parcel than owners with small parcels (Figs. 9 and 10).

A management plan is required in this section so that the preservation area will be maintained for its intended use: a viable integration of human and natural systems. The plan delineates (1) how exotic species will be handled, (2) controlled burning for designated ecosystems, (3) vegetation preservation and restoration, and (4) litter and debris removal.

In large developments, landowners may find due to other restrictions (set-backs, easements, parking lot regulations, etc.) that the entire parcel be designated for use. In this case, provisions have been made to allow mitigation on another site. Landowners may own other tracts of land that are not as suitable for a development but have environmental, ecosystem or historical significance and are able to mitigate off-site. The landowner is also afforded an option to pay the municipality a fee should they choose not to set-aside a portion of their parcel or mitigate off-site. These funds would allow the municipality to purchase land for natural corridors, open spaces, species protection, or floodplains. Creating options for the developer may mean the difference between gaining or losing an economically desirable enterprise for the community.

Section 7. Permit Conditions

The tree replant requirement minimizes the loss of trees from clearcutting. There are specific requirements for permitted plantings. The regulations encourage the replant of trees similar to the trees originally on the site but does not require replanting the same species of tree removed. This flexibility allows the landowner to replant preferred trees (the planting of natives to replace pre-existing non-natives, for example) instead of being forced to plant species existing on-site prior to development.

It is the intent of the ordinance for canopy and specimen trees to be saved. However, if significant loss of such trees occurs, the ordinance requires the replant of trees larger than the minimum DBH requirement. There is a monetary incentive for protection rather than replacement of trees. Installation and maintenance standards of replant trees are designed to prevent the practice of planting trees to meet requirements and later removing them after the Certificate of Occupancy or Certificate of Completion is obtained.

Plant selection is generally left to the landowner, subject to the municipality's Plant List. The approved list helps ensure that plants selected are compatible to the local conditions, will thrive, and require minimum maintenance. In addition, many of Florida's residents are "transplants" from other parts of the country, and may not always be familiar with Florida's plants. The plant list should be prepared with assistance from local growers, The Florida Native Plant Society, Agricultural Extension Service, Florida Natural Areas Inventory, and other experts.

The Florida Exotic Pest Plant Council's list of exotic plants is included in the ordinance to prevent further infestation of invasive, non-native plants (Appendix I). There are three categories of restricted plants in the most recent list:

- Category I includes species "widespread in Florida with an established potential to invade and disrupt native plant communities."

- Category II includes species "localized but have a rapidly expanding population, or have shown a potential to invade and disrupt native vegetation in other areas, or in other countries with climates similar to Florida."

- Category III includes species "widespread and can form dense monotypic populations, but primarily on disturbed sites such as roadsides, agricultural lands, and canal embankments."

The ordinance specifies that no species from Category I may be planted. It is at the discretion of the municipality to prohibit planting species from Categories II and III that currently are, or in the future may prove to be, a problem in their community.

Section 8. Grubbing/Land Clearing Provisions

Trees and understory plant material are equally important to a viable ecosystem. The removal of both or either (termed "grubbing") can negatively impact an ecosystem. This section delineates the rules, stipulations and permit requirements for grubbing.

A visual description of the property is required to assist the permitting official to make an informed decision regarding the current vegetative status of the property. Aerial photographs are often the best way of obtaining such information if the official is experienced in photo interpretation. The photos can often include vegetation of nearby areas so officials can ascertain whether nearby systems may be affected by development on the parcel under review. Single family and duplex homes are exempt from the aerial requirement due to the cost consideration. Smaller parcels of land or single lots can be easily videotaped.

Historical and specimen trees and wetlands are provided protection under this section. Dead, damaged, and fallen trees are also provided protection, as these trees serve a vital function for bird nesting and roosting, as well as cover and shelter for other wildlife (Figs. 11 and 12). There are provisions for removal of all or portions of trees which pose a hazard, as certified by officials or in emergency situations.

Stabilization requirements are included to protect the site during construction from erosion, sediment transfer, and to minimize airborne dust. These protective measures help insure the survival of preserved vegetation on the property during construction.

The ordinance includes a list of several non-native invasive species found almost ubiquitously throughout Florida. Removal of the prohibited species noted in this section is encouraged. It is therefore simple for landowners and homeowners to remove these plants without the permitting process.

Section 9. Site Protection

Site protection minimizes impacts on existing vegetation from the stresses resulting from construction. Construction machinery and materials can eliminate on-site vegetation that was intended for preservation. For example, sand pines become severely stressed and cannot tolerate excessive motion on the ground (walking, driving, etc.) around their root systems. Regulations prohibit activities with an adverse impact and require protective measures to insure the vegetation's survival.

Section 10. Landscape Requirements

Minimum standards for landscape plants, materials, and maintenance and installation are presented for both commercial and residential projects. In general, standards are established to ensure only healthy specimens are installed and that the species to be planted are consistent with the local growing conditions. After the project, vegetation must be maintained in a viable state in accordance with defined criteria.

A required landscape plan is the graphic presentation of how the standards and intent of the section are met. Landscape architects are trained in the use of plants in creating a pleasing and functional space, enhancing both the environmental and the aesthetic aspects of the project (Fig. 14). A landscape architect registered in the state of Florida is likely to be familiar with Florida's native vegetation. The seal requirement is waived for single-family and duplex homes due to the cost of obtaining such.

Minimum landscaping requirements are based on the amount of land being developed or improved. Large areas are required to have more trees and understory vegetation, but in all cases, one-hundred percent (100%) of the parcel (less impervious surface areas) must be covered with a living vegetative material. Preserved trees have a greater point value than planted trees, encouraging developers to preserve as many existing trees as possible. Economically as more trees are preserved, there is less need for purchase.

A point system is established for determining the amount of vegetation necessary for a parcel based on the parcel size. Large trees are given more points than small trees and palms, and natives are given more point value than non-natives. Point values can be changed dependent on the needs of the municipality (ie., increasing

loss of canopy trees, etc.) Points are also given for preservation of environmentally sensitive areas, and/or parcels that contain rare, endangered, or threatened plant species.

The ordinance sets a maximum area of lawn grass that may be installed (or preserved) for two reasons. First, lawn grass requires more water than trees, shrubs, and understory plant materials. During droughts and water shortages, water demands will be minimized in communities with limited lawn coverage. Second, lawn grass provides no significant wildlife habitat and contributes little towards the intent of the chapter -namely, habitat restoration.

The planting of native species is encouraged throughout the ordinance. However, many non-native, non-invasive species also have ornamental use. Flexibility in the use of ornamental and native plants is an integral part of the ordinance.

Biodiversity is important to the stability of all ecosystems. Diversity of vegetation in the ordinance is encouraged to prevent monocultures or urban environments with only a few species. In the late 1960's, Dutch elm disease swept through Midwestern and Eastern states, killing entire stands of trees, and leaving landscapes barren of major trees. In some communities where elms made up 90% of the total tree population, the disease left tragic scars (Grey et al. 1992). In order to circumvent another decimation, species diversity is required when planting large numbers of trees on a parcel (Fig. 15 and 16).

Canopy trees are preferred for shade and habitat value, and thus larger numbers of canopy trees are required than ornamental trees and palms.

Nursery grown stock or plant grown from seed are required to avoid harvesting plants from natural areas to fulfill landscaping requirements. In some cases, communities have areas such as right-of-ways that need to be kept clear and mown. Homeowners can harvest or rescue these plants from such community designated areas, and replant them in areas where they will thrive and contribute to the creation and restoration of viable habitat. However, taking plants from viable habitat and moving them to another location simply to fulfill the replant requirements does not fulfill the goals of the ordinance. The goal to be obtained is no net loss of habitat or biodiversity on each site.

A performance bond is required to assure that the required vegetation will be kept in a living, viable condition; that it will not be planted to fulfill the requirements and then ignored. Standards listed in this section must be met before a Certificate of Occupancy or Certificate of Completion is issued. However, in some cases, the timing of the construction does not coincide with the optimum time for planting. In such cases, the certificates may

be issued if a performance bond is posted. Should the landowner not install the landscaping, the municipality can then use the performance bond money to complete the landscape plan on site.

Section 11. Plant Materials and Installation Standards

This section addresses the minimum requirements for plant materials and installation. All installed plants must meet the standards of the State of Florida Department of Agriculture and Consumer Services according to the guide "Grades and Standards for Nursery Plants". This publication is designed to set industry standards for plant materials. The ordinance requires plants meet or exceed the minimum standards for Florida Number One.

Anti-transpirants and organic mulches are not required in the ordinance but are suggested for use. Anti-transpirants are useful in reducing the transpiration rate of plant material during the installation process, but since it resembles water, application is difficult to detect and enforcement would be impossible. Hence, if it was required on all landscape projects, a problem may arise from disreputable installers, and compliance inspectors would find it difficult to ascertain compliance. Therefore, it is encouraged, but not required. Colloidal phosphate is a water retention aid, added to the soil to enhance the establishment of newly installed plant material. Organic mulches reduce weed growth and also aid in water retention. Both substances are important for healthy plant growth and their use is encouraged.

Section 12. Maintenance Standards for Cultivated Landscape Areas.

Maintenance standards and inspections are required for cultivated landscaped areas. Inspections by code enforcement or other officials make sure that required landscaped areas are kept healthy from exotics and weeds, as well as safe for residents (hazardous trees and branches removed, etc.) The ordinance requires a maintenance bond be posted with the municipality. Should the landowner fail to maintain the vegetation, the municipality has recourse.

The ordinance sets forth general standards for pruning, mowing, edging, watering, and weeding to maintain a healthy landscape environment.

Section 13. Irrigation Design Standards

Irrigation systems and can be very beneficial if used properly. The ordinance requires those landowners using irrigation

systems to meet certain criteria. Irrigation of reestablished native areas is only permitted during plant establishment. Irrigation is prohibited for existing natural plant communities, maintained in their natural state. The zoning of irrigation systems requires that nozzles for high water demand areas be separate from low water requirement areas. Systems with timers and moisture sensing devices are encouraged for use. The ordinance also requires that where practical, systems be set to avoid water overthrow onto impervious surfaces.

Water which does not meet drinking standards can be used for lawn and landscape watering. The ordinance requires this "reclaimed" water be used in areas where it is available.

Section 14. Xeriscape Principles.

Xeric plants thrive on limited amounts of water, and xeriscaping is the practice of using plant materials that require a minimum amount of water for survival. The use of xeric native plants is encouraged in the ordinance to promote water conservation. Site design standards for water conservation are included in the ordinance. Lawn grass (sod) takes higher amounts of water to thrive than do understory and other types of ground cover, and minimizing lawn areas not only saves water but mowing efforts as well. Therefore, the ordinance contains maximum use requirements for lawn grass. Shade trees help lower understory plants retain their moisture by shading and reducing transpiration (water loss) from understory leaves.

The ordinance suggests the use of pervious paving materials where possible. The use of pervious materials provides a rigid pavement while at the same time reducing run-off that carries oil, gas, and other pollutants.

Section 15. Vehicular Use Area Landscaping Requirements.

Landscape for parking lots serves the public in numerous ways. Most people perceive parking lots as unattractive, necessary evils. However, attractive plants and trees can make a barren, unsightly lot shadier, cooler, and more aesthetically pleasing. The ordinance requires a landscape buffer around the perimeter of a parking lot, reducing noise, pollution and headlight glare in adjacent areas (Fig. 17).

The ordinance stipulates a certain percentage of the lot be devoted to landscape planting. Some parking lot ordinances dictate there must be a landscape island for every certain number of parking spaces. However, if a landowner has a stand of trees he would like to protect, the ordinance maintains the flexibility to allow this type of conservation. The provision in the ordinance

that no parking space be more than a certain distance from a landscape area gives the landowner flexibility allowing him to preserve that stand of trees if he so chooses. He can then design and construct his parking area with this in mind (Fig. 18).

Plants able to withstand extreme conditions of automobile exhaust, dirt, and soot need to be included on the municipality's Plant List. The owners of large commercial and industrial parking lots often do not have the time nor the inclination to devote a lot of time to parking lot landscape maintenance. Therefore, a mixture of native and xeric plants is made a requirement due to the fact that after established, they require relatively low maintenance.

Compliance is required by the ordinance before a Certificate of Occupancy or Certificate of Completion is issued. This requirement ensures that all landscaping will be in place as required. Non-conforming existing lots are "grandfathered" unless and until the parking lot is expanded. If the lot is expanded, at least 50% compliance is required. This clause prevents increasing the area of the lot little by little without installing landscaping. Again, a performance bond is required to assure compliance.

Section 16. Environmentally Significant Lands.

Open space in the community may consist of one or more, or none of the ecosystems commonly found on the barrier island. Healthy, viable ecosystems support a variety of vegetation and wildlife, co-dependent on each other. Birds consume seeds and berries, and act as dispersal mechanisms for those seeds, allowing the plants to repopulate. Other similar relationships exist - the animals and the plants are intertwined.

Protection of endangered, threatened and species of special concern is overseen by various agencies making it a crime to kill, harm or harass those species on its list. The ordinance requires applicants to provide an assessment, verification, or permits from these agencies prior to the municipality's review of the project.

Beach and dune systems of the municipality are afforded protection by the ordinance with the establishment of a "Dune Stabilization Setback Line". The ordinance specifies activities allowed and prohibited seaward of this line. The ordinance addresses requirements for dune walkover structures, allowance for disturbance of the dune system and associated vegetation, motorized vehicle prohibitions and methods for beach cleaning. Native dune vegetation is required for all restoration and stabilization projects. Seagrass bed protection is also addressed in the ordinance.

The ordinance includes mangrove regulations, indicating the conditions and the degree to which mangroves may be trimmed,

altered, or removed, as well as disposition of the debris. Leaves and small branches of mangrove are deposited back into the system, mimicking normal dropping of branches and leaves, returning the organic material to the system for recycling. Larger branches (those that would not fall off under normal circumstances) are deposited upland so as not to interfere with the natural movement of water through the system. Removal of mangroves for vehicular access and "reasonable use of property" is permitted by the ordinance under specific circumstances. The ordinance prohibits herbicide and chemical defoliant use to prevent damage to adjacent vegetation.

Wetlands are regulated by the U.S. Army Corps of Engineers as well as by the state Department of Environmental Protection and jurisdictional water management districts. Therefore, they have the primary authority over activities in wetland areas. The ordinance allows the municipality to approve or deny a permit based on other agencies findings. Should the other agencies approve a project, the ordinance also allows the municipality the option to prohibit the project or activity. Mitigation plans are required by the ordinance and ratios are kept high to encourage keeping existing wetland habitats intact.

Native oak scrub and maritime forests are already non-existent in some communities and are quickly disappearing in others. Both ecosystems are home to a myriad of species, including the threatened Florida scrub jay and gopher tortoise who both need scrub habitat to survive. The ordinance allows extra points for landowners who preserve such habitats, and all land clearing and landscaping regulations in the ordinance are applicable to development activities on these lands.

The ordinance requires upland buffers to protect shorelines from adjacent development impacts that may cause degradation of water quality.

Section 17. Variances and Waivers.

Variances and waivers are included in the ordinance to provide for unseen circumstances and other situations where strict adherence to the ordinance would cause undue and/or unreasonable hardship, or have an adverse affect on the health, safety, and welfare of the public.

Section 18. Emergencies.

The ordinance makes waiver provisions for emergency situations where immediate action is necessary to avoid public harm.

Section 19. Revocation.

This clause is included in the ordinance to allow the authorities to revoke an issued permit for fraud, misrepresentation, or violations of the conditions of the ordinance. This prevents an applicant from presenting the necessary paperwork (landscape plans, etc.), obtaining a permit, and not performing the work as set forth. The municipality then has the authority to place a cease work order on the development site.

Section 20. Appeal.

The procedures to appeal a decision made by the municipality are detailed in this section of the ordinance. In the appeal process, the applicant presents his/her case to the Board of Adjustment who makes a binding decision based on the material facts of the case.

Section 21. Penalties.

This section describes the penalties involved for violation of the provisions of the ordinance. Monetary and jail fines are stipulated for offenses. One drawback to monetary fines is that the amount of the fines may often be viewed by a large developer as simply a cost of doing business and not a real deterrent. Consent is provided for in the ordinance to be used if the landowner decides he does not like the species of tree presently existing on the parcel and wishes to plant other types. This gives the owner the flexibility to plant species he prefers, as long as they are listed on the municipality's Plant List. When it becomes necessary to place a monetary value on the vegetation, the value of a particular tree or shrub must be determined. This is done by determining the price of the vegetation by averaging values obtained from two local nurseries.

The ordinance provides for any monies received in the way of fines to be placed in a separate escrow account and used for the purchase of environmentally sensitive lands and the restoration of native habitats on public lands. Should the landowner fail to comply with the scope and intent of the ordinance by landscape or habitat degradation, the fines levied will help offset this loss. The municipality can use the monies to purchase lands that might have been otherwise financially unobtainable.

Section 22. Severability.

This section states that if one part of the ordinance is found by a court to be invalid or unable to be upheld, the rest of the ordinance is not affected.

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MODEL HABITAT PROTECTION
AND
LANDSCAPE ORDINANCE

MODEL HABITAT PROTECTION AND LANDSCAPE ORDINANCE

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MODEL HABITAT PROTECTION AND LANDSCAPE ORDINANCE

SECTION 1. INTENT

It is the intent of this chapter to protect and enhance the existing habitat and wildlife of the barrier island by creating habitat preservation areas and preserving native vegetative communities through tree protection and landscaping practices. It is also the intent of this chapter to promote water conservation through xeriscape practices, to maintain open areas for groundwater recharge, to reduce air and water pollution through the filtering capacities of vegetation, to promote energy conservation through the creation of shade, and to provide physical and psychological benefits to the public by reducing noise and glare, and improving the appearance of a developed community.

SECTION 2. DEFINITIONS

Unless specifically defined in this section, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most effective application, in consideration of its stated intent.

Adverse impact: Any direct or indirect action likely to cause, or actually causing, a measurable decline in the stability, natural function, or natural diversity of a natural resource system; or in the quiet, peaceful, safe, or healthful use or occupancy of any property.

Bracing: To provide upright support to a newly planted tree or shrub, accomplished in such a fashion as to not girdle, scar, perforate or otherwise inflict damage to the tree or shrub.

Bona fide agricultural purposes: Good faith commercial or domestic agricultural use of the land. In determining whether the proposed agricultural use of the land is bona fide, the following factors shall be taken into consideration by the administrator:

(1) Whether the property could qualify as a bona fide agricultural purpose within the meaning of Florida Statute Section 193.461(3)(b);

(2) The relationship of the property to the municipality/ county comprehensive plan;

(3) The zoning of the property. The current zoning of the property shall be agricultural (Au).

Botanical garden: Any publicly owned real property used for the cultivation of plants for display or scientific research.

Buffer, perimeter landscape: A continuous area of land which is required to be set aside along the perimeter of a property line in which landscaping is used to provide a transition between and to reduce the environmental, aesthetic, and other impacts of one type of land use upon another.

Caliper: The trunk diameter of a tree measured three (3) feet above the average ground level at the base of the tree. Provided however, if the tree forks above three and one-half (3 1/2) feet above ground level, it is measured below the swell resulting from a double stem. Caliper also refers to the instrument used in the process of measuring the diameter of a tree or log.

Canopy: The area shaded by the crown of a mature tree, consisting of the limbs, branches, and leaves.

Citrus grove: A collection of trees used for the purpose of producing fruit, provided such groves are used for bona fide agricultural purposes only.

Commercial nursery or tree farm: A licensed plant or tree farm in relation to those trees planted and growing on the premises of said licensee, which are so planted and growing for the sale or intended sale to the general public in the ordinary course of said licensee's business and land use category.

Crown: Main mass of branching of a plant above ground.

Cultivated landscape area: Planted areas that are frequently maintained by mowing, irrigating, pruning, fertilizing, etc.

Developer: Any person undertaking any development or development activity (as defined below) subject to an application as described in this chapter.

Development or development activity:

(1) The construction, installation, alteration, demolition or removal of a structure or an impervious surface.

(2) Clearing, scraping, grubbing or otherwise removing, altering or destroying the vegetation of a site.

(3) Adding, removing, exposing, excavating, leveling, grading, digging, burrowing, dumping, piling, dredging, or otherwise significantly disturbing the soils or altering the natural topographic elevations of the site.

Development permit: The formal permission to perform any development or development activity within the municipality /county.

Diameter at Breast Height (DBH): The diameter of the tree trunk of a tree measured four and one-half (4 1/2) feet above natural or development grade. In the case of a tree with multiple main stems, the diameter shall be the sum of the diameter of the stems.

Dripline: An imaginary, perpendicular line that extends downward from the outermost tips of the tree branches to the ground.

Ecosystem: A characteristic assemblage of plant and animal life within a specific physical environment, and all interactions among species, and between species and their environment.

Effectively remove: To trim or prune to the extent that a plant's natural function is severely altered, and its viability is compromised to the extent that death of the plant is likely.

Endangered, threatened or species of special concern: Plant or wildlife species listed as endangered, threatened or of special concern by any one of the following agencies and/or jurisdictions:

(1) U.S. Fish and Wildlife Service;
(2) Florida Game and Freshwater Fish Commission;
(3) Florida Department of Agriculture and Consumer Services;
(4) Florida Committee on Rare and Endangered Plants and Animals;
(5) The jurisdictional water management district;
(6) Florida Department of Environmental Protection; and/or
(7) The jurisdictional municipality/county.

Environmentally Significant Lands: Geographic areas which are certified or designated to contain native habitat and/or endangered, threatened, or species of special concern.

Exotic plant(s): An alien plant, brought in from the part of the world where it was native, either purposefully or

accidentally. It then escaped into the wild in Florida where it reproduces either sexually or asexually. It may become invasive, competing against native plants for water, nutrients, and light.

Ground cover: Low-growing plants, other than turf grass, sod, or deciduous varieties, installed to form a continuous cover over the ground and reaching an average maximum height of not more than twenty-four (24) inches at maturity.

Grubbing: The effective removal of understory vegetation from a site.

Habitat: The physical environment which supports and is integrated with the coexisting natural plant and animal communities.

Hedge: A landscape barrier consisting of a continuous, dense planting of shrubs with a minimum height of twenty-four (24) inches measured from ground level at the time of planting.

Historical tree: A particular tree or group of trees designated by competent authority to have notable historical interest and value to the municipality/county because of its unique relationship to the history of the region, state, nation, or the world.

Irrigation system: A permanent, artificial watering system designed to transport and distribute water to plants.

Landscape tree: A tree which is a minimum caliper of one and one-half (1 1/2) inches and eight (8) feet tall at time of planting and is a Florida Department of Agricultural Nursery Grade No. 1 or better.

Landscaping: Any combination of living plants (such as grass, ground cover, shrubs, vines, hedges, or trees) and nonliving landscape material (such as rocks, pebbles, sand, mulch, walls, fences, or decorative paving materials), as well as preserved vegetation.

Management plan: A formally written instrument that describes the means or becomes the device to accomplish the desired preservation and maintenance of a specific tract of land and/or its inhabitants including the ongoing control of all invasive non-native plant species.

Mangrove: A tidal or salt water wetland containing any rooted trees or seedlings, of any size, comprised of the following species: White mangrove (Laguncularia racemosa), Red mangrove (Rhizophora mangle), Black mangrove (Avicennia germinans) and associated species Buttonwood (Conocarpus erectus). This

definition is to include all subspecies and varieties of the listed species as well as their synonyms.

Mulch: Nonliving organic and synthetic materials customarily used in landscape design to retard erosion and retain moisture.

Native Florida ecosystem: A self-organized ecosystem, consisting of living organisms (plants, animals, microorganisms) and non-living components (soil, water, air, etc.) that functions as a dynamic whole through organized energy flows which are characteristic of the communities existing in Florida prior to European colonization and containing predominantly native species. Native Florida Ecosystem is not to be confused with original Florida communities. Ecosystems, containing listed species, which exist on previously altered land also fall into the definition; a parcel which has been altered may still support listed species or regenerate to native community, although the ecosystem may differ from that which was originally on site.

Native habitat preservation/restoration area: An area that is free of development and is set aside as open space to provide natural habitats for wildlife and vegetation.

Native vegetative communities: Native vegetative communities are those plant communities naturally occurring in the State of Florida. Native vegetative communities shall include but not be limited to coastal strand, hammock, mangrove forest, pine flatwoods, xeric scrub, wetlands, beach, dunes, maritime hammock, sand pine scrub, marine seagrass beds, etc.

Non-native plant(s): See definition for "exotic plant(s)".

Open space: All areas of natural plant communities or areas replanted with vegetation after construction, such as: revegetated natural areas, tree, shrub, hedge or ground cover planting areas and lawns.

Ornamental: A shrub or deciduous tree planted primarily for its ornamental value or for decorative purposes.

Palm: An evergreen, compound leafed tree belonging to the Palmaceae family.

Parcel: A unit of land within legally established property lines. If, however, the property lines are such as to defeat the purposes of these regulations or lead to absurd results, a parcel may be as designated for a particular site by the appropriate authority.

Person: Any landowner, lessee, building contractor, developer or other entity involved in the use of real property, including agents, employees, independent contractors or others in privity with any of the above, whether natural persons, corporations, partnerships, joint ventures, governmental bodies, agencies or officials.

Plant community: A natural association of plants that are dominated by one or more prominent species, or a characteristic physical attribute.

Plant material: Plants which conform to the standards for Florida No. 1, or better, as given in the existing "Grade and Standards for Nursery Plants," State of Florida, Department of Agriculture, Tallahassee or equal thereto at the time of purchase of plant material.

Plant species, prohibited: Those plant species which are demonstrably detrimental to native plants, native wildlife, ecosystems, or human health, safety, and welfare.

Prescribed burning: The process of periodically and deliberately burning a pineland or scrub community in a controlled manner under specified weather and understory moisture conditions for the purpose of maintaining the pineland or scrub community in a natural condition and for promotion of pine regeneration and wildlife habitat enhancement; required to be permitted and coordinated with the municipal/county fire department.

Preserve area: An area designated and set aside for the protection of natural resources; that portion of native vegetation which is required to be set aside from development or other alteration activities, protected from the removal of any native tree or understory or ground cover species, managed to maintain viability for wildlife habitat, and maintained free of all non-native invasive exotic plant species.

Protective barrier: A physical structure limiting access to a protected area, composed of wooden and/or other suitable materials which assures compliance with the intent of this chapter. Options and/or variations of these methods may be permitted upon written request if they satisfy the intent of this chapter.

Remove or removal: The actual removal of vegetation by digging up or cutting down, or damage of the vegetation or alteration of a site through the application of herbicides or other chemical agents.

Shade tree: A self-supporting woody plant of a species normally growing to a mature height of at least twenty (20)

feet, and is well-shaped, well-branched, and well-foliated, normally developing an average mature spread of crown greater than 20 feet.

Shrub: A self-supporting woody plant of low to medium height characterized by multiple stems and branches continuous from the base, arising from the main root. Usually not more than 10 feet in height at its maturity

Site plan: A graphically drawn plan view of a site which shows all proposed or existing man-made improvements which includes buildings, parking areas, utility lines, stormwater and drainage systems, drives, roads, topographic changes, and natural features.

Site specific planting: The selection of plant material that is particularly well suited to withstand the urban soil conditions.

Size classification for trees: Trees shall be classified as follows:

(1) Large trees - average mature height of a minimum of twenty-five (25) feet to over sixty (60) feet and above.

(2) Medium trees - average mature height of a minimum of twenty (20) feet.

(3) Small trees - average mature height of a minimum of ten (10) and less than twenty (20) feet.

(4) Palms - all heights of clear wood, measured from the natural or development grade.

Specimen tree: A tree which has been determined by the judgement of a suitable professional registered in the State of Florida or other duly recognized person to be of high aesthetic, ecological, noteworthy, and/or historical value because of its type, size, age or other professional criteria.

Specimen tree stands: A contiguous grouping of trees which has been determined to be of high aesthetic, ecological, noteworthy, and/or historical value by the judgement of a suitable professional registered in the State of Florida or other duly recognized person. Determination is based upon the following criteria:

(1) A relatively mature even aged stand; or

(2) A stand with purity of species composition or of a rare or unusual nature; or

(3) A stand with exceptional aesthetic quality; or

(4) A stand which provides wildlife habitat diversity which is important for species existence; or

(5) A stand of trees deemed to be of noteworthy or historical value.

Speculative grading: The clearing and/or grading of a parcel or site by the owner or his agent with no intention of commencing any development on the lot, but simply to make it more appealing to a potential buyer.

Structure: Anything constructed or erected, the use of which requires a permanent location on the ground or attachment to something having a permanent location on the ground.

Tree: Any self-supporting woody plant which has a DBH of two (2) inches or more and which normally grows to an overall height of at least six (6) feet at maturity.

Tree inventory: A drawing of the appropriate scale, which provides the following information: Location of trees protected under the provisions of this chapter, plotted by accurate techniques; common and scientific (botanical) names of all trees; and diameter breast height of each tree.

Understory: Assemblages of natural low-level woody, herbaceous and ground cover species which exist in the area below the canopy of the trees.

Upland buffer: A continuous area of land required to be set aside immediately adjacent to a shoreline which is used to protect shoreline vegetation, wildlife and water quality from adjacent land development.

Vegetation, native: Any plant species with a geographic distribution indigenous to the local community.

Vehicular use area: Shall be construed to mean and include all areas used for the circulation or parking of any and all types of vehicles or heavy construction equipment, whether self-propelled or not, and all land upon which vehicles traverse as a function of the primary use.

Viable: A tree, shrub, or other type of plant that is capable of sustaining its own life processes, unaided by man, after one year.

Wetland: Shall mean all those waters, fresh, brackish and/or saline, or areas which are inundated or saturated by surface or groundwater at a frequency and duration sufficient to

support, and that under normal circumstances do support, a prevalence of vegetation and/or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction. The methodilogy for determining the limits of the landward extent of wetlands shall be consistent with that currently employed by the State of Florida which includes vegetative indicators, soil type indicators and hydrology. Such wetland vegetative indicators shall be those species listed in the Florida Administrative Code. Wetlands include, but are not limited to, rivers, lakes, streams, springs, impoundments, swamps, marshes, bogs, wet meadows, sloughs, mud flats, hydric hammocks, estuaries, cypress heads, mangrove forests, bayheads, bayous, bays, and open marine waters, including sea grass beds, whether on private or public lands and whether they are man-made or natural. Wetlands shall not include stormwater retention ponds.

Xeriscape: Landscape methods which conserve water through the use of drought tolerant plants and planting techniques.

SECTION 3. APPLICABILITY

(a) General. The terms and provisions of this chapter shall apply to all zoning categories for both developed and undeveloped land and property and for building permits for major renovation. Botanical gardens, citrus groves, city and/or county licensed commercial nurseries and tree farms as defined herein are exempt from the requirements of this chapter. Lands zoned agricultural use (AU) shall be exempt if being used for bona-fide commercial or domestic agricultural use as herein defined.

(b) Existing Non-Conforming Parcels. All existing parcels which do not comply with the requirements of this chapter shall be required to comply whenever development or construction results in a twenty-five percent (25%) or more increase in the existing structure or development footprint. All landscaping for the improved/altered structure or footprint shall comply with all requirements of this chapter.

SECTION 4. GENERAL PERMIT PROVISIONS

(a) General. On any developed or undeveloped parcel, any person as defined, subject to the exemptions herein, wishing to conduct development activity, remove, effectively remove, or relocate a tree with a trunk diameter of two (2) inches or greater, measured at DBH, remove vegetation in an upland buffer easement, perform land clearing or grubbing, remove, trim or prune wetlands, specimen tree(s), or specimen tree stand(s), or conduct any activity which may have a detrimental effect on protected vegetation as herein defined under the provisions of this chapter, shall make

application and obtain a development permit/order as required under the provisions of this chapter. Failure to obtain a such permit/order shall be a violation of this chapter.

(b) Speculative grading. Speculative grading shall be strictly prohibited and no permit will be issued for such activity.

SECTION 5. APPLICATIONS

(a) Procedure. The applicant shall be required to file a written permit application with the appropriate authority and pay a fee established by the appropriate authority necessary to cover the costs of processing. Applications for a permit under the provisions of this chapter shall be submitted simultaneously with applications for land development or renovation permits or approvals if material alteration including, but not limited to, the removal, relocation or replacement of any vegetation or habitat is necessitated by land development/renovation. The time for approving or denying the permit shall be subject to the same time limitation as a development/renovation permit. All applications shall be accompanied by a written statement giving reasons for alteration of vegetation, fees designated, and required application data. If the applicant is not the owner of the property, the applicant must submit a notarized written authorization from the owner of the property authorizing the applicant to submit and/or represent the application. Applications shall be field verified by the appropriate authority.

(b) Exceptions. If the application evaluation criteria of Section 5(f) shows no significant adverse impact and if one (1) or more of the following conditions exist, no permit is required:

(1) The vegetation is located in an area where a structure, utility easement, stormwater and/or drainage structures or improvements is to be placed according to an approved community utility plan and:

(2) The vegetation is deemed hazardous by the appropriate authority, located within three (3) feet of an existing or proposed structure, interferes with existing utility service or creates unsafe visual obstruction to traffic circulation.

(c) Information. The applicant may be required to submit any or all of the following information at an appropriate scale to the appropriate authority:

(1) The survey of the parcel, together with the existing and proposed locations of utilities, wells, structures, and improvements, if any.

(2) Locations and dimensions of all setbacks and easements on the survey or required by the reviewing agency.

(3) A topographical survey sealed by an appropriate professional registered in the State of Florida, indicating grade changes proposed for the site.

(4) An inventory of existing vegetative communities, understory, trees and wildlife habitat on site, including both native and exotic species.

(5) A statement and drawing showing how vegetation will be protected during land clearing and construction (i.e., a diagram and notation of a protective barrier as defined herein).

(6) All proposed replants of trees or other vegetation, by amount, species, and size, along with the type of ground cover to be installed, including the proposed new location for such trees, together with a survey showing the number of trees to be protected and how such trees are to be protected during land clearing and construction activity.

(7) The location of native vegetative communities or buffers and habitat areas which are on or within ten (10) feet of the property line of the parcel being developed.

(8) A list of known animals known to inhabit or otherwise utilize the site for food, nesting, or cover, including any endangered, threatened and species of special concern located on site.

(9) A soils map of the area.

(10) A map showing the natural drainage of the area and if applicable, wetlands, shorelines of streams, canals, estuaries, or drainageways, gulf and ocean waters and the mean high water line.

(11) A statement indicating that the activity to be undertaken is consistent with the policies of the local comprehensive plans.

(d) Additional site plan or plat approval requirements. Applicants for sites requiring site plan or plat approval, as required by the subdivision regulations, shall submit a survey sealed by an appropriate professional registered in the State of Florida, which shows the information required in Section 5(c)(1) through (11) and an aerial photograph of suitable quality and scale or a video, to facilitate application review. A vegetation, habitat and tree inventory will be required on all areas for which

permit authorization is being requested other than areas previously approved.

(e) Information waiver. In the event there are no trees or vegetation located on or within ten (10) feet of the property line of the parcel to be developed which are protected under the provisions of this chapter, the applicant shall so state in his application for a development permit. If the statement is substantiated by the appropriate authority, the applicant shall then vegetate the area according to the landscape requirements designated in this chapter.

(f) Evaluation criteria. In addition to the other requirements of this chapter, the appropriate authority shall consider the following in granting or denying a permit:

(1) Soil stabilization: Whether the removal of tree(s) or other vegetation will result in uncontrollable and/or substantial erosion of soils into surface waters, or adjacent properties.

(2) Water quality and/or aquifer recharge: Whether the removal of tree(s) or other vegetation will lessen the ability for the natural assimilation of nutrients, chemical pollutants, heavy metals, silt and other noxious substances from ground and surface waters.

(3) Noise pollution: Whether the removal of tree(s) or other vegetation will significantly increase ambient noise levels to the degree that a nuisance is anticipated to occur.

(4) Wildlife habitat: Whether the removal of tree(s) or other vegetation will significantly reduce available habitat for wildlife existence and reproduction, or are likely to result in the emigration of wildlife from adjacent or associated ecosystems.

(5) Aesthetic degradation: Whether the removal of tree(s) or other vegetation will have an adverse affect on community scenic views and vistas or on other existing vegetation or wildlife habitat in the vicinity.

(6) Comprehensive plan: Whether the Habitat Protection and Landscape plan is consistent with the policies of the municipality/county's comprehensive plan.

(7) Endangered, threatened and species of special concern: Whether the removal of tree(s) or other vegetation will significantly affect endangered, threatened, or species of special concern when reasonable scientific judgement indicates:

a. The tree(s) or vegetation provides a function including nesting, reproduction, critical food source, critical habitat or cover for these species; or

b. Vegetation within the plant community itself is endangered, threatened, or a species of special concern.

(8) Whether final grade (elevation) changes will have a significant effect, either adverse or positive, on the viability of both existing and proposed vegetation.

(g) Denial. The appropriate authority shall specifically state the basis for denial of a permit and shall notify the applicant of the basis for denial using the criteria listed in this section. The authority shall also state the applicant's right to appeal, or provide alternative methods in order to maintain compliance with this chapter.

SECTION 6. NATIVE HABITAT PRESERVATION /RESTORATION AREAS

(a) Purpose. It is the purpose of a native habitat preservation/restoration area to provide for the conservation of viable wildlife habitats and representative native vegetation communities. The protection of these areas will help to ensure that adequate feeding, nesting and cover necessary for the continued survival of native wildlife species is available while protecting naturally occurring vegetative communities. The areas also provide visual screening, improved water quality, water conservation, groundwater recharge and climate moderation.

(b) Criteria. Any multifamily, commercial or industrial development shall preserve a minimum of twenty-five percent (25%) of the native habitat and vegetative community area of a parcel as a preservation area. Development of single and two-family homes on sites of five (5) acres or more shall preserve a minimum of twenty-five percent (25%) of the parcel as a preservation area. Single and two family homes developed on sites of less than five (5) acres but at least one-half (1/2) acre shall preserve a minimum of fifteen percent (15%) of the parcel as a preservation area. Single and two family homes developed on sites of less than one-half but greater than one quarter (1/4) acre shall preserve a minimum of ten percent (10%) of the parcel as a preservation area. Single and two family homes on less than one quarter (1/4) acre are exempt from the preservation requirement. The preservation area shall be protected during and after site development. The preservation area for one (1) or more parcels may be provided on one (1) or more other parcels if all parcels are contiguous and are considered as a single, master planned development under unified control.

(c) Required management plan. For all areas of required preserved plant communities, the owner shall submit for the approval of the municipality/county, a narrative management plan indicating the manner in which the owner will preserve the native plant communities for habitat protection or restoration. The narrative shall include:

(1) Whether or not the existing vegetation is to be preserved in the existing species composition.

(2) If applicable, the manner in which the composition of existing plant material is to be preserved (hand removal of invasive species, prescribed burning, etc.).

(3) The maintenance schedule for the removal of invasive exotic species.

(4) The maintenance schedule for the removal of debris.

(5) Other information required by the municipality/county which is reasonable and necessary to a determination that the management plan meets the requirements of this chapter.

(d) Parcel location. The preserved/restored native habitat parcel area shall be located in a manner which maximizes the contiguity and retention of native vegetation including understory vegetation.

(1) Where wetland vegetation exists and buffers are provided, the preservation area shall, wherever feasible, be contiguous to the buffer. Upland buffers required pursuant to Section 16 (h) shall be credited toward the applicable percentage (25%, 15%, or 10%) criterion of this section. Upon submittal of a development order, the appropriate authority shall inspect the parcel and use the criteria of Section 5 (f) to evaluate the native habitat and vegetative community area(s) of the parcel.

(2) Where preservation of the required percentage of the native community on-site is not feasible given site specific characteristics, the municipality/county shall permit off-site preservation and/or habitat creation (type-for-type) as an alternative to the on-site preservation requirement. As an incentive to preserve contiguous tracts which provide more habitat value than isolated pockets of set-aside areas, the municipality/county shall allow a percentage reduction to a minimum of ten percent (10%) of the cumulative native plant community acreage, for those preserve areas that are set aside as a contiguous tract.

(e) Maintenance of natural plant communities

(1) General. All open space areas that are to be preserved as natural plant communities shall be thinned a minimum of once a year of all exotic vegetation, lawn grasses, trash and other non-native or exotic debris.

(2) Mechanical equipment shall not be used. There shall be no use of mechanical equipment in accomplishing the maintenance of preserved plant communities unless specifically authorized in the management plan or approved by the appropriate authority.

(3) Natural plant communities. All natural plant communities shall be managed in order to maintain the native vegetation indigenous to the ecosystem designated to be preserved, ie. xeric scrub communities, coastal strand, dunes, mangroves, coastal/tropical hammocks, pine flatwoods, etc.

a) Set aside areas as required by this chapter shall be preserved in viable condition with intact canopy, understory, and ground cover, and shall be protected by the filing of a conservation easement.

b) Annually, the appropriate authority shall make periodic inspections of the natural areas to verify the owner's adherence to the approved management plan as specified in Section 6(c).

(f) Monetary remuneration in lieu of preservation. Development projects proposed for lands currently consisting of native upland plant communities may, as an alternative to the required percentage of preservation of the on-site community, pay a fee equivocal to (the assessed value of one acre of the project site) X (the number of acres of habitat type that would otherwise have been set aside as the required percentage of preservation). This fee shall be payable to the municipality/county prior to the issuance of a land development permit and shall be used by the municipality/county for acquisition of comparable native habitat preserve areas and for management of such lands.

(g) Credit towards other requirements. The preserved set aside area(s) shall be allowed as a credit toward other municipal land development regulations such as landscape, buffer, and open space requirements, and minimum yard setback requirements.

SECTION 7. PERMIT CONDITIONS

The appropriate authority may attach any or all of the following conditions to a permit provided the conditions further conservation and restoration of natural habitat areas.

(a) Tree and understory replant requirements.

(1) During development the applicant shall be required to relocate the tree(s) and understory being removed where practical. If it is not practical to relocate the tree(s), the applicant shall be required to replace the trees up to a maximum of inch-for-inch, measured at DBH, providing that after construction, adequate planting space remains to allow for proper development of the tree(s). If it is impractical to relocate understory plants, the applicant shall be required to replace the understory plants in an amount at least equal to the square footage of the understory that was removed.

(2) More than one (1) replant tree may be used to replace a removed tree provided that the combined diameters thereof are at least equivalent to that tree which is to be removed.

(3) Every effort shall be made to replant the same species of removed tree or understory plant providing it does not appear on the Florida Exotic Pest Plant Council's (EPPC) Category I list. Removed trees and/or understory plants that appear on the EPPC Category I list shall be replaced with species appearing on the municipality/county's Plant List.

(4) When it is determined there is significant loss of natural tree canopy or specimen trees on a particular site, the size of replacement trees may be increased by up to twice the minimum DBH.

(5) The actual number of tree replants shall be determined based upon replant tree size and species, location of planting, existing trees on or near the site and open space availability.

(6) Priority will be placed on saving specimen trees.

(7) Replant vegetation species shall:

a. Be compatible with soil conditions and adjacent native plant communities.

b. Trees shall have at least equal shade potential and other characteristics comparable to trees removed. This means that canopy trees shall not be replaced with understory trees, for example.

(8) All required replant tree(s) and understory must be maintained in good condition and planted in locations with adequate open space to allow mature tree canopy development.

(9) Each replant tree classified as small shall be planted within a minimum five foot by five foot landscape area. Large

and medium trees shall be planted within a minimum ten foot by ten foot landscape area. For those species with known large root systems, the minimum required landscape area will be increased to a size necessary for proper root formation for that particular species.

(10) Wherever possible, replant trees shall be located to avoid underground and overhead utilities. To ensure proper development of the tree's crown, no shade tree shall be planted closer than fifteen feet (15') on center.

(11) Where new trees are installed, they shall be braced to provide sufficient time for their root systems to become firmly established, after which such bracing shall be removed. To ensure survival of the tree, the Tree Protection Manual for Builders and Developers (FL Department of Agriculture), shall be used as a guide to best management practices. Failure to plant or maintain required replant trees in good condition for one (1) year will be a violation of this chapter on a per tree basis.

(12) Existing trees on-site which meet the minimum standards of a replant tree in terms of size, species, quality, and location will count toward the replant requirements.

(b) Special design criteria. Where topographic grade changes necessitate such, the applicant shall provide special construction techniques and designs where necessary to increase oxygen exchange and water and nutrient availability to trees and understory such as but not limited to tree wells, turf or paving block, aeration systems and stem walls.

(c) Plant Selection

(1) The municipality/county shall maintain a Plant List identifying plants compatible with local soils and climatic conditions including salt tolerance, sun and heat exposure, and mean low temperature. All required landscape plants must be selected from the Plant List. Plant material shall be selected that is best suited to withstand the soil and physical growing conditions on the project site. Plant species that are freeze and drought tolerant are preferred. Protection and preservation of native species and natural areas is encouraged.

(2) The municipality/county shall utilize the Florida Exotic Pest Plant Council's (EPPC) most recent published list of Florida's most invasive plant species. No plants listed as Category I may be planted. It shall be at the discretion of the municipality/county as to the inclusion of species listed in Category II and/or III as prohibited species.

SECTION 8. GRUBBING/LAND CLEARING PROVISIONS

(a) Grubbing. Upon application, review and approval of a development order, grubbing shall be permitted subject to the provisions of this chapter. For all developments, with the exception of single family dwellings and duplexes, an aerial photograph of suitable quality and scale of the property or a video of the property shall be required along with a visual inspection by the appropriate authority before grubbing will be authorized. Single family and duplex homes are exempt from the aerial photograph requirement but are required to submit a set of photographs and/or a video accurately and completely describing the property before a permit for grubbing will be authorized. As herein defined, no tree with a DBH of two (2) inches or greater shall be removed unless an exemption has been approved.

(b) Preliminary land clearing. Upon application, review, and issuance of a development permit, limited land clearing only shall be permitted within the designated building footprint and seven (7) feet from the footprint area as depicted on a preliminary plan, as required pursuant to the subdivision regulations.

(1) Wetland vegetation. All mangroves and other wetland vegetation are recognized to be of special ecological value. No wetland vegetation shall be removed, trimmed, pruned, chemically treated, filled upon or altered unless executed and completed in accordance with Section 16(d)(e)(i) and applicable State and Federal regulations.

(2) Specimen tree/specimen tree stands. It shall be unlawful to remove, trim, prune, or alter a specimen tree or a specimen tree stand which has been designated as such under the provisions of this chapter without a permit issued under this chapter.

(3) Historical Trees. It shall be unlawful for any person to cause, suffer, permit or allow the removal of any historical tree without first obtaining a waiver from the appropriate authority to conduct the removal.

(4) Stabilization. All sites grubbed or cleared pursuant to the provisions of this chapter shall be temporarily stabilized using devices including, but not limited to silt screens, turbidity screens, hay bales and any other best management practices to accomplish stabilization during and upon completion of such grubbing or clearing in a manner to minimize airborne dust, erosion and off-site sediment transfer.

(5) Maintenance of dead or damaged trees for habitat preservation. Dead or damaged trees which contain bird nests

or otherwise provide natural habitats shall be subject to the provisions of this chapter. Such dead or damaged trees must be maintained for habitat preservation purposes unless deemed by appropriate authority as hazardous to the health, safety, and welfare of the public.

(6) Prohibited plant species. The exotic plant species listed below are considered undesirable vegetation due to their growth characteristics which may result in human health problems and the elimination of habitat for more desirable native vegetative species. Every site on which development activity occurs shall be cleared of the following species as a condition of permitting pursuant to this chapter. Effective removal of these trees, however, shall not require a permit pursuant to this chapter.

Common Name	Botanical Name
Brazilian pepper	Schinus terebinthifolius
Australian pine	Casuarina spp.
Melaleuca	Melaleuca leucadendron
Laurel fig	Ficus microcarpa

(c) Exceptions. In the event of a natural disaster the provisions of this chapter may be waived by the appropriate authority. In circumstances causing immediate danger to life and/or property, verbal authorization by the authority shall be sufficient. Such verbal authorization shall later be confirmed in writing by the authority.

SECTION 9. SITE PROTECTION

(a) Vegetation protection during construction

(1) Placement of solvents, material, construction machinery, or soil. It shall be unlawful for any person engaged in development activity or land clearing to place solvents, construction material, construction machinery, or soil deposits within six (6) feet of the trunk or the dripline, as defined herein, whichever is greater, of any tree with a DBH of two (2) inches or greater or within six (6) feet of other vegetation as required per the provisions of this chapter.

(2) Protective barriers. Prior to land development activity or land clearing, the owner or his agent shall erect a suitable protective barrier(s) for all protected vegetation and plant communities. Placards shall be posted on the barricades, indicating the purpose of the barriers and the penalties for unauthorized removal. The protective barrier(s)

and placards shall remain in place until completion of final lot grading and placement of final ground cover.

(3) Attachments. No attachments or wires shall be attached to any tree or other protected vegetation.

(4) Burning. No person shall permit any unnecessary fire or burning within thirty (30) feet of the dripline of a protected tree.

SECTION 10. LANDSCAPE REQUIREMENTS

It is the purpose of this chapter to establish minimum standards for the provision, installation, and maintenance of landscape in order to achieve a healthy, aesthetically pleasing and safe community by the following means:

1. Water conservation through xeriscape principles: Promote the conservation of potable and non-potable water by requiring the preservation of existing plant communities, and the planting of natural or uncultivated areas, specifying the use of site specific plant materials, and establishing techniques for the installation and maintenance of landscape materials and irrigation systems.

2. Aesthetics: Improve the aesthetic appearance of all areas through the incorporation of open space into development in ways that harmonize and enhance the natural environment.

3. Environmental quality: Improve environmental quality by recognizing the numerous beneficial effects of landscaping upon the environment, including: (1) improving air and water quality through such natural processes as photosynthesis and mineral uptake; (2) maintaining permeable land areas essential to surface water management and aquifer recharge; (3) reducing and reversing air, noise, heat and chemical pollution through the biological filtering capacities of trees and other vegetation; (4) promoting energy conservation through the creation of shade, reducing heat gain in or on buildings or paved areas, and (5) reducing the temperature of the microclimate through the process of evapotranspiration; and encouraging the conservation of limited fresh water resources through the use of site specific plants and various planting and maintenance techniques.

4. Land values: Maintain and increase the value of land by requiring landscaping to be incorporated into

development, thus becoming in itself a valuable capital asset.

5. Human values: Provide direct and important physical and psychological benefits to human beings through the use of landscaping to reduce noise and glare, and to break up the monotony and soften the harsher aspects of urban development.

6. Preservation of vegetation: Preserve existing natural vegetation and the incorporation of native plants, plant communities, and ecosystems into landscape design.

7. Removal of nuisance species: Eradicate or control certain exotic plant species which have become nuisances because of their tendency to damage public and private works, to have a negative effect upon public health, or to disrupt or destroy native ecosystems.

8. Improved design: Promote innovative and cost-conscious approaches to the design, installation and maintenance of landscaping, encouraging water and energy conservation.

(a) Landscape plan required; landscape permit

(1) General. Prior to the issuance of any building permit, a landscape plan shall be submitted to, reviewed by, and approved by the municipality/county.

(2) Nature of required plan. A landscape plan for each development shall be prepared by and bear the seal of a Florida Registered Landscape Architect. Single and two-family dwellings are required to prepare and submit a landscape plan, but are exempt from the seal requirement.

(3) Contents of landscape plans. The landscape plans shall:

a. Be drawn to scale, including dimensions and distances.

b. Delineate the existing and proposed parking spaces, or other vehicular areas, access aisles, driveways, and similar features.

c. Indicate the location of sprinklers or water outlets, and irrigation plan to be used (hand watering, irrigation systems, etc.).

d. Designate by name and location the plant material to be installed or preserved in accordance with the requirements of this chapter.

e. Identify and describe the location and characteristics of all other non-living landscape materials to be installed.

f. Show all landscape features, including areas of vegetation required to be preserved, in context with the location and outline of existing and proposed buildings and other improvements on the site, etc.

g. Include a tabulation clearly displaying the relevant statistical information necessary for the municipality/county to evaluate compliance with the provisions of this chapter. This includes gross acreage, area of preservation areas, number of trees to be planted or preserved, square footage of paved areas, and such information as the municipality/county may require.

h. Include a program to eradicate and prevent the reestablishment of prohibited plant species as listed in Section 7(c)(2) and Section 8(b)(6).

i. Contain such other information that may be required by the municipality/county that is reasonable and necessary to determine that the landscape plan meets the requirements of this chapter

(b) Landscape design standards

The following standards shall be considered the minimum requirements for the installation of all plant materials within the municipality/county.

(1) Minimum landscaping requirements. One-hundred percent (100%) of the parcel must be covered with vegetative cover, excluding principal structures, accessory structures, vehicle use areas, and pedestrian walkways. Non-living ground cover is permitted within planting beds/flower beds provided such beds do not occupy more than ten percent (10%) of the lot less excluded impervious areas.

(2) Point system. The minimum landscaping requirements shall be based upon a point system. For each acre, or fraction thereof, of the buildable area of the property proposed to be developed. The applicant must show evidence of an accumulation of four hundred eighty (480) points per acre or prorated portion thereof. Said accumulation of four hundred eighty (480) points per acre shall include at least two hundred forty (240) points for trees with the landscaped associated area and two hundred forty (240) points for general landscaping. When

sod is utilized, credit shall not be given for more than thirty-five percent (35%) of the total landscaping requirements.

(3) Native vegetation requirements. Of the required four hundred eighty (480) points per acre, at least two hundred forty (240) shall be accumulated through use of native vegetation, as defined herein.

(4) Point schedules. Points may be accumulated by preserving existing trees and certain native vegetation on site or planting new trees, or both, under the provisions set forth herein.

a. Point schedule for preserved trees.

Points for preserved trees shall be accumulated toward satisfaction of the four hundred eighty (480) points requirement, with the required minimum landscaped area provided, as follows:

Species Size At Maturity	DBH	Credit Points
Large/Medium	Up to and including 4"	15
	Greater than 4" up to and including 8"	30
	Greater than 8" up to and including 16"	45
	Greater than 16"	60
Small	Minimum height 6 feet	10
Palms	Minimum height 6 feet	10

b. Required landscape area. For each tree preserved on site, a minimum associated landscape area must be provided as follows:

1. Large/medium species classification - One hundred (100) square feet of associated landscape area.

2. Small species classification - Twenty (20) square feet of associated landscape area.

3. Palms - fifty (50) square feet of associated landscape area.

4. These required minimum associated landscape areas shall not be used to accumulate points other than for trees preserved or planted, as specified herein.

c. Point schedule for planted trees. Where trees are planted, rather than preserved, to fulfill the four hundred eighty (480) points requirement, the following schedule of points shall apply.

Species Size At Maturity	Points	Required Associated Landscaped Area
Large/Medium Trees		
Native	10	100 square feet
Non-Native	5	
Small Trees	5	20 square feet
Palms	5	50 square feet
Landscaping Materials		
Sod	5/100 square feet	
Hedges or Shrubs	10/100 square feet	
Native Vegetation	10/100 square feet	

(5) Tree requirements. Trees used to fulfill the landscaping requirements herein, whether preserved or newly planted trees, shall meet the following overall height, diameter (DBH) and spread requirements, at planting, by species classification.

For Single-Family Residential:

a. Large and Medium Species - Six (6) feet tall with one (1) inch diameter (DBH) minimum and two (2) foot spread.

b. Small Species - Six (6) feet tall with one inch diameter (DBH) minimum and two (2) foot spread.

c. Palms - Six (6) feet tall.

For Multi-Family, Commercial and Industrial:

a. Large and Medium Species - Ten (10) feet tall with one and one-half (1 1/2) inch diameter (DBH) minimum and two (2) foot spread.

b. Small Species - Six (6) feet tall with one (1) inch diameter (DBH) minimum and two (2) foot spread.

c. Palm - eight (8) feet tall.

(6) Vegetation of special concern. Points shall be accumulated toward satisfaction of the four hundred eighty (480) point per acre requirement for the preservation on site of any of the following vegetation of special concern:

a. Rare, endangered or threatened plant species as listed in Volume 5, Plants, Rare and Endangered Biota of Florida, University Presses of Florida, Gainesville, Florida, available at the offices of the municipality/county, and as listed in Section 581.185, Florida Statutes. Points credited for use of these types of vegetation shall be doubled. No species of mangroves shall be eligible for points under this subsection.

b. For each one hundred (100) square feet of vegetation classified as Hardwood Hammock, Barrier Island Scrub, Wetlands, Cypress Domes, or Sand Pine Scrub Associations, preserved on site, a credit of thirty (30) points shall be given. These credit points shall apply only when:

1) The vegetative community is preserved intact, and

2) The vegetative community preserved comprises an area of no less than one hundred (100) square feet with no dimension less than ten (10) feet.

c. For each one hundred (100) square feet of vegetation classified as Barrier Island Association, landward of the coastal setback line, a credit of 20 points shall be given. These credit points shall apply only when:

1) The vegetative community is preserved intact, and

2) The vegetative community preserved comprises an area of no less than one hundred (100) square feet with no dimension less than ten (10) feet.

d. For each one hundred (100) square feet of native vegetation preserved adjacent to, and within fifty (50) feet of a designated scenic vista or roadway, twenty points shall be given. These credit points shall apply only when:

1) The vegetative community is preserved intact, and

2) The vegetative community preserved comprises an area of no less than one hundred (100) square feet with no dimension less than ten (10) feet.

e. If mangroves do not presently exist contiguous to lagoonal waters and are planted, they shall receive seven (7) points per tree. The minimum size of newly planted mangroves shall be twelve (12) inches in height.

(7) Native Species. A minimum of 75% of planted trees shall be native species or hybrids or cultivars of native species.

(8) Species Diversity. In situations where a large number of trees are required, in order to encourage species diversity and prevent monocultures, a variety of species shall be planted in accordance with the following table:

Required Number of Trees	Number of Species
11 - 20	2
21 - 30	3
31 - 40	4
over 40	5

(9) Planting Ratios. After the minimum canopy tree requirement has been met, ornamental trees and palm trees may be planted. However, the total canopy tree and understory population are subject to the following planting ratios:

a. a minimum of 50% canopy trees
b. a maximum of 50% understory
c. a maximum of 25% ornamental trees and palms

(c) Shrubs, ground covers, and vines. At least 25% of the site's total required landscape and preserved areas shall be covered by shrubs, ground covers, or vines.

(d) Sod and lawn grasses. The use of sod or lawn grasses will be limited to no more than thirty-five percent (35%) of the required landscape and preserved areas. Sods and grasses used to stabilize berms and swales necessary for installation of approved drainage plans and on-site wastewater disposal systems are not included in this limitation.

(e) Use of site specific planting materials. Plants used in the landscape design pursuant to this chapter shall to the greatest extent be:

(1) Appropriate to the soil, drainage and climatic conditions in which they are to be planted.

(2) Have non-invasive growth habits.

(3) Encourage low maintenance native vegetation.

(4) Be otherwise consistent with existing or pre-existing vegetation.

(f) Use of adapted plant materials. The use of plant materials adapted to the vicinity of the development is encouraged in order to reduce water consumption, general maintenance, the dependence on fertilizers and insecticides, and increase vegetative habitat and wildlife corridors.

(g) Procurement of native plant material. When native plant material is required, it is prohibited to remove plants from a preservation/restoration site. It is permissible to transplant plants obtained from a community approved "rescue site" or a community approved area to fulfill planting requirements. A rescue site is one in which the area is required to be kept mown and/or cleared from trees and understory plants for utility or safety reasons, but where such plants are known to take seed and grow. Plants that are not transplanted from such areas must be either nursery grown stock or have been started from seed.

(h) Replacement requirements. Vegetation which is required to be planted or preserved by this chapter shall be replaced with equivalent vegetation if it is not viable within one year. A performance bond, to be held for one (1) year, shall be posted to assure compliance with this requirement. The amount of the bond will be determined by the appropriate authority based on the number and types of plants covered by the bond.

(i) Prohibited plant species. Under no circumstances shall any species from category I of the EPPC's most recent list of invasive species may be planted.

(j) Synthetic plants. In no event shall synthetic plants, such as man-made, plastic, rubber, or silk, be used to satisfy any of the landscaping requirements herein.

(k) Compliance. The above planting standards listed in Section 10(a) through (j) and Section 11 must be satisfied before a Certificate of Occupancy or a Certificate of Completion will be issued. However, if it is determined by the appropriate authority that circumstances indicate that the planting of trees or vegetation prior to the issuance of a Certificate of Occupancy or Certificate of completion would not be prudent, such as an improper time of year for the planting of trees, the applicant may post a performance bond with the Board of Commissioners of the

municipality/county, in a form acceptable to the jurisdiction. Said performance bond, if posted, shall be in the amount no less than one hundred twenty five percent (125%) of the estimated cost of all trees and vegetation to be planted plus labor, pursuant to the requirements of this section. Said performance bond shall be received and accepted by the municipality/county prior to the issuance of said Certificate of Occupancy or Certificate of Completion.

SECTION 11. PLANT MATERIAL AND INSTALLATION STANDARDS

(a) General.

(1) Minimum requirements. The following standards shall be considered the minimum requirements for the installation of all landscaping within the municipality/county.

(2) Standards and inspections. All landscaping shall be installed in a manner of sound workmanship and according to accepted and proper planting procedures with the quality of plant materials as hereinafter described. A representative of the municipality/county shall inspect all landscaping and no certificate of occupancy will be issued unless the landscaping meets all requirements.

(b) Plant quality standards. Plants installed pursuant to this chapter shall conform to or exceed the minimum standards for Florida Number One as provided in the most current edition of "Grades and Standards for Nursery Plants, Part I and II," prepared by the State of Florida Department of Agriculture and Consumer Services. Another accepted standard may be used if it equals or exceeds the quality of Florida Number One.

(c) Plant ball sizes. Ball sizes on all transplanted plant materials shall conform to or exceed the minimum standards as noted in the most current edition of "Grades and Standards for Nursery Plants, Part I and II" prepared by the State of Florida Department of Agriculture and Consumer Services.

(d) Anti-transpirants.

(1) General. In order to reduce the transpiration rate of plant material during the installation process, the use of anti-transpirants is encouraged. Anti-transpirants reduce the amount of water loss through the leaves of plant material during installation, thereby reducing the amount of water required for the survival of the plants.

(e) Use of planting soil. All required landscape materials shall be installed using planting soil of a type appropriate to the individual plant material and the soil conditions in which the

planting is occurring. Colloidal phosphate shall be added to the soil as a water retention aid where soil type is considered to be subject to rapid percolation.

(f) Use of organic mulches.

(1) General. The use of organic mulches reduces the growth of weeds and adds nutrients to the soil as well as retains moisture over the root zones of plant materials.

a. Application specifications. A minimum of three (3) inches of organic mulch shall be placed over all newly installed tree, shrub, and ground cover planting areas.

b. Types of mulch. The use of leaf compost or melaleuca, rather than cypress (or other valuable species) mulch is encouraged.

c. Mulch placement. Mulch shall be placed at a minimum of three inches (3") from the trunk of trees to discourage rot.

(g) Amending existing soil prior to sodding or seeding. The organic content of the top four (4) inches of the lawn bed for all areas to be seeded or sodded shall be a minimum of five (5) percent.

SECTION 12. MAINTENANCE STANDARDS FOR CULTIVATED LANDSCAPE AREAS

(a) General. The owner or assigns of land subject to this chapter shall be responsible for the maintenance of said land in good condition so as to present a healthy, safe and orderly landscape area.

(b) Maintenance of mulch layers. The required mulch layer as specified in Section 11 (f)(1)a. shall be maintained on all landscape projects.

(c) Maintenance of plants, replacement. All required plants on the site, whether preserved or newly planted must demonstrate health and viability one (1) year after issuance of a Certificate of Occupancy or Certificate of completion.

(d) Inspections. The municipality/county may perform a "courtesy inspection" of the landscaping within ninety (90) days after the issuance of the Certificate of Occupancy or Certificate of Completion. If the vegetation appears to be under stress, the staff shall notify the property owner. A second inspection may be

performed six (6) months after the issuance of the Certificate of Completion or Certificate of Occupancy. If the vegetation is not viable at that inspection, notice shall be given to the property owner and he/she shall be responsible for replacing that dead vegetation with equivalent points of landscape material. A follow-up inspection shall be made twelve (12) months after the issuance of the Certificate of Completion or Certificate of Occupancy to assure that no unauthorized removal of protected trees and vegetation has occurred.

(e) Failure to maintain required vegetation. Failure to have viable landscape material consistent with the approved landscape plan in place at the twelve (12) month inspection from the date of the issuance of the Certificate of Occupancy or Certificate of completion, shall constitute a violation as described under the Penalties section of this ordinance. A maintenance bond, cash bond, or letter of credit shall be required to be collected in conjunction with the application fee for multi-family, commercial and industrial projects equal to twenty-five percent (25%) of the cost of vegetation other than sod. This maintenance bond, cash bond or letter of credit shall be forfeited if required vegetation is not maintained in a viable state.

(f) Pruning.

(1) General. All pruning should be accomplished according to acceptable horticultural standards.

(2) Pruning of trees. Trees shall be pruned only as necessary to promote healthy growth and prevent hazardous conditions. Unless special approval is provided by the municipality/county, trees shall be allowed to attain their normal size and shall not be severely pruned or "hat-racked", in order to permanently maintain growth at a reduced height. Trees may be periodically pruned or thinned in order to reduce the leaf mass in preparation for tropical storms. Trees may also be pruned by utility companies when necessary to ensure uninterrupted service for residents.

(g) Mowing. Grass shall be mowed as necessary in order to encourage deep root growth, thereby preserving irrigation water. To accomplish this, mowers should be set at three (3) inches or above.

(h) Edging. All roadways, curbs and sidewalks shall be edged when necessary in order to prevent encroachment from the adjacent grassed areas. Trees will be protected in areas edged or trimmed by weed-eaters since improper or careless use can remove bark, causing the deterioration and eventual death of the tree.

(i) Weeding. To accomplish the removal of weeds and other undesirable invasives, hand weeding is recommended and encouraged. Chemical herbicides can also be effective in controlling weeds. However, such herbicides can also severely stress and often cause the death of newly planted vegetation, including trees. Therefore, herbicides are not recommended for use in controlling weeds and other undesirable plants.

(j) Watering.

(1) General. All watering of planted areas shall be managed so as to:

a. Maintain healthy flora.
b. Make plant material more drought tolerant.
c. Avoid excessive turf growth.
d. Minimize fungus growth.
e. Stimulate deep root growth.
f. Minimize leaching of fertilizer.
g. Minimize cold damage.

(2) Watering of grass lawns. Watering of grass lawn areas shall be accomplished on an as needed basis as indicated by turf wilt. The amount of water applied in each application shall be as indicated in Section 13(e), so as to promote deep root growth.

(3) Promoting deep root growth of trees and shrubs. Watering of plants and trees should always be in a sufficient amount to thoroughly soak the root ball of the plant and the surrounding area, thereby promoting deep root growth and drought tolerance.

(4) Operation of automatic irrigation systems. Automatic irrigation systems shall be operated between the hours of midnight and 6:00 a.m., or as designated by the municipality/county. Irrigation during these hours reduces fungus growth and loss of water due to evaporation.

(5) Maintenance of irrigation systems. Irrigation systems shall be constantly maintained to eliminate waste of water due to loss of heads, broken pipes or misadjusted nozzles.

SECTION 13. IRRIGATION DESIGN STANDARDS

(a) Irrigation systems. Irrigation systems can be beneficial in efficiently adding water to the cultivated landscape. The following practices shall be implemented by those developing or maintaining irrigation installations.

(1) Irrigation of existing plant communities. Existing plant communities and ecosystems, maintained in a natural state, do not require and shall not have any additional irrigation water added in any form.

(2) Reestablished native plant areas. To become established, native plant areas, supplemental to an existing plant community or newly installed for the permitted project, may initially require additional water. Where newly planted native areas or habitats have been installed in soils appropriate to the proposed native system, additional irrigation water (after the period of establishment) is unnecessary and may be harmful. The water required during the establishment period shall be applied from a temporary irrigation system, a water truck or by hand watering from a standard hose bib source.

(3) Cultivated landscape areas. Irrigation systems, either manual or automatic, may be used for the cultivated landscape areas. Application of water through a properly maintained and regulated irrigation system may be an efficient method of watering the landscape.

a. Small irrigation systems. Small residential and commercial areas may be irrigated with a manually controlled irrigation system if sufficient time and labor is committed for its operation. Landscape plantings and lawns shall be watered on an as needed basis only.

b. Large irrigation systems. When irrigated, cultivated areas in larger residential, commercial and industrial areas shall be irrigated by the use of an automatic irrigation system with controllers set to apply water as noted in this section. Wherever practical, high water and low water use areas shall be designed as noted below. Rainfall or moisture sensing devices should be used to avoid operation of the system during periods of increased rainfall.

(b) Zoning of irrigation systems. The water demand of lawn areas is significantly greater than the water demand of most shrubbery or ground cover areas. Typical residential irrigation system design does not provide for the option of irrigating lawn or other high water demand areas on a separate schedule from that of shrubbery or other reduced water demand areas. This results in the irrigation of the entire controlled area at a rate higher than most of the landscape plant materials require. Therefore, the following standards shall be considered the minimum requirements for landscape irrigation design.

(1) Sprinkler zoning. Wherever feasible, sprinkler heads irrigating lawns or other high water demand landscape areas shall be designed on a separate zone or zones from those irrigating trees, shrubbery or other reduced water requirement areas.

(2) Control systems. Automatically controlled irrigation systems shall be operated by an irrigation controller capable of watering high water requirement areas on a different schedule from low water requirement areas.

(c) Elimination of overthrow onto impervious areas. Landscape irrigation systems shall be designed so that, to the greatest extent practical, water being applied to impervious areas is eliminated.

(1) Impervious areas. Sprinkler heads shall be placed as required to reduce direct overthrow onto impervious areas.

(2) Wind control. The use of low trajectory spray nozzles is encouraged in order to reduce the effect of wind velocity on the spray system.

(3) Low volume systems. As technology for underground and low volume applicators of water is improved, their use is encouraged.

(4) Moisture sensing devices. As technology for moisture sensing devices is improved, their use is encouraged.

(d) Use of non-potable/reclaimed water. Use of non-potable or reclaimed water for use in the irrigation of lawn and plant material is required when available.

(e) Water application rates. Since deep watering promotes deep root growth and healthier plant material, water shall not be applied at an application rate of less than one-half (1/2) inch per application.

SECTION 14. XERISCAPE PRINCIPLES

It is the intent of this chapter to assist the municipality/county in achieving water conservation through proper plant selection, installation and maintenance practices. The following xeriscape principles serve as the primary means of achieving water conservation:

1. Appropriate planning and design.

2. The use of soil amendments to improve water holding capacity of the soil.

3. Efficient irrigation systems.

4. The use of drought-tolerant plants.

5. The use of mulches, where appropriate.

6. Limiting turf areas to locations where it provides functional benefits.

7. Appropriate and timely maintenance.

(a) Site design standards

(1) Creative site development concepts for water conservation. Creative site development concepts shall be used in order to promote water conservation. Water requirements may be reduced by providing for:

a. The preservation of existing native and xeric plant communities.

b. The reestablishment of native plant communities.

c. Limited amount of lawn grass areas.

d. The use of site specific plant materials (see definitions)

e. The use of shade trees to reduce transpiration rates of lower story plant materials.

f. Site development that retains stormwater runoff on site.

g. The use of pervious paving materials.

h. Other environmentally sensitive site development concepts.

(2) Lawn grass areas.

a. Water demands for lawns. A major portion of water demand used for landscape purposes is required for the irrigation of lawn areas. In order to reduce water demand, portions of landscaped areas that have been customarily designated as lawns should be:

1. Preserved as natural plant communities.

2. Planted as redeveloped native areas.

3. Planted in traditional mixes of trees, shrubs, and ground covers. Properly managed non-grass landscape developments of site specific plantings will typically be able to survive on reduced water requirements and drought conditions better than lawn areas.

b. Maximum use requirements for allowable lawn grass. No more than thirty-five percent (35%) of the total landscaped and preserved areas shall be planted in lawn grass.

SECTION 15. VEHICULAR USE AREA LANDSCAPING REQUIREMENTS

All development permit applications which propose vehicular use areas with more than three (3) parking spaces shall conform to the minimum landscaping requirements defined below. Trees planted in conformance with this section may count toward the tree replant requirements of Section 7(a) and may be required to adhere to special design criteria specified in Section 7(b). All requirements of Section 11 shall be a condition of the granting of a permit under this chapter. In instances where healthy plant material or viable habitat exists on a site prior to its development, in part or in whole, for purposes of off-street parking or other vehicular use areas, the appropriate authority shall adjust the application of the below-mentioned standards to allow credit for such plant material if such an adjustment is in keeping with and will preserve the intent of this chapter.

(a) Perimeter buffer landscaping. The exterior perimeters of all vehicular use areas adjacent to residentially zoned property or public right-of-way shall be landscaped with a strip of land which is at least five (5) feet in width. Within this landscape strip, a buffer strip consisting of native plants shall be installed which at the time of planting shall be at a minimum twenty-four (24) inches in height and allowed to grow to and be maintained at a maximum height of thirty-six (36) inches. Such plants, where required, shall be planted and maintained so as to form a continuous, unbroken, solid visual screen. Spacing of plants shall be no more than two and one-half (2 1/2) to three (3) feet on center, depending on the species or in natural patterns typical of adjacent or pre-existing natural habitat type.

(b) Landscape Plan/Open Space. An area equal to ten (10) percent of the total vehicular use area shall be devoted to landscape open space for planting of landscape habitat. There shall be a minimum

of one (1) landscape tree for each two hundred (200) square feet or fraction thereof of required landscape open space.

(1) All existing shade trees shall be preserved if possible and applied as a credit to this requirement. Each landscape tree shall be planted within a minimum five-foot by five-foot (5'X 5') open space planter for small trees. Large and medium trees shall be planted in a minimum ten foot by ten foot (10'X 10') planter.

(2) Landscape areas shall be distributed so that no parking space is more than 120 feet from a portion of landscaped open space required by this section. Every separate landscaped area shall be a minimum of fifty (50) square feet and shall have a minimum dimension of at least five (5) feet and shall include at least one (1) tree having clear trunk of at least five (5) feet, with the remaining area adequately landscaped with shrubs, ground cover or other authorized landscaping material not to exceed three (3) feet in height.

(c) Xeriscape Requirements. A minimum of fifty percent (50%) of plant material used in vehicular-use area landscape design shall be drought resistant. A minimum of seventy-five percent (75%) of planted material shall be a combination of native and drought tolerant species.

(d) Protection of landscaping. Vehicular use landscaping shall be protected by wheel stops, bumper stops or curbs located in a manner which prevents vehicular encroachment and overhang into landscape material.

(e) Vehicular use landscape plan approval. Prior to the issuance of any permit for paving which is included under the provision of this ordinance, the developer must submit for approval by the appropriate authority a combination site plan and landscape plan, hereinafter referred to as a "vehicular use landscape plan."

(1) The vehicular use landscape plan shall be submitted to the appropriate authority and shall contain the following information: The name, address and telephone number of the owner and designer; a site plan drawn to an acceptable scale as determined by the appropriate authority, indicating all dimensions and property lines, northpoint, clearly delineated existing and proposed easements, utility lines, stormwater and drainage systems, parking spaces, access aisles, driveways, sidewalks, wheel stops, curbs and other vehicular use controls; irrigation system; proposed planting areas; decorative or screen walls; existing trees and plant community types (including those slated for removal); natural features such as boulders, rock outcroppings, etc.; all related buildings. Proposed planting areas

must indicate the quantity, spacing, size and name of proposed plant material.

(2) No permit shall be issued for such building or paving unless such plot complies with the provisions hereof, and no certificate of use and/or occupancy shall be issued until the landscaping is complete. It shall be unlawful to occupy the premises unless the landscaping is installed in accordance with the approved plot plans and the requirements hereof.

(f) Irrigation requirements. The irrigation requirements of Section 13 shall apply to vehicular use areas.

(g) Plant installation and maintenance requirements. All plant materials used shall be in compliance with Section 10(b)(7) and (8), Section 10(e) through (j), and Section 11. Maintenance of all installed and existing plant materials shall be in compliance with Section 12.

(h) Sight distance restrictions at intersections. All landscape plant material shall be planted in accordance with sight distance restrictions determined by the appropriate authority, using Florida Department of Transportation standards.

(i) Existing nonconforming parking lots. Existing parking lots which do not comply with this Section shall be required to conform at least fifty percent (50%) with the parking lot requirements of this ordinance when one of the following condition occur:

(1) Any lot enlargement or additional paving.

(2) Any alterations or additions which would contribute to a net increase of at least five percent (5%) of gross floor area to the building which would result in an increase in the number of parking spaces as required by zoning ordinance that are assigned to that particular building and/or business.

(j) Failure to maintain existing vegetation. The destruction, elimination, neglect, or lack of maintenance of any existing landscape shall require full compliance with this Section. Vegetation which is required to be planted or preserved by this Section shall be replaced with equivalent vegetation if it is not viable within one year. A performance bond, to be held for one (1) year, shall be posted to assure compliance with this requirement. The amount of the bond will be determined by the appropriate authority based on the number and types of plants covered by the bond.

SECTION 16. ENVIRONMENTALLY SIGNIFICANT LANDS

(a) Introduction

Barrier islands are unique in their landscapes; an island may have as many as 6 distinct ecosystems, depending on its size, elevation, geographical location and level of urban development. Barrier island ecosystems enjoy a variety of plant and animal species often not found in mainland areas. Estuarine areas support seagrasses, mangroves, and salt marsh grasses, all of which provide nursery and feeding areas for fish and shellfish. In addition, these plants provide stabilization for shorelines, as well as nesting areas for native and migratory birds. It is for these reasons habitat preservation is deemed necessary for the continued success of environmentally sensitive ecosystems and their inhabitants.

(b) Protection of Endangered and Threatened Species and Species of Special Concern.

Upon field review and determination that a site contains plant and/or animal species which have been listed as "Endangered", "Threatened", or "Species of Special Concern" by any of the agencies listed in the definitions in Section 2, the applicant must provide to the appropriate authority, an assessment, verification or permits from the listing agency. The municipality/county may require documentation from more than one agency, depending on how many listing agencies are involved. The authority may utilize this information as a basis for determining the development activity to be allowed. The applicant shall then provide proper protection to such species as required by state and federal permit requirements and to the satisfaction of the municipality/county.

(c) Beach and dune systems

The beach and its associated dune system are the first line of defense against storms that batter coastal cities and towns. The root systems of dune vegetation help retard erosion by anchoring the beach sand in place, while the leaves, stems and stalks act as a sand collector and help provide organic nutrients to the beach system. The density of the plants helps provide a buffer between storm surges and coastal structures. As dune vegetation disappears, and the sand begins eroding away, the protection of the coastline is severely compromised. In view of this important service to coastal residents, the main dune bluffs and associated vegetation shall be preserved through the following restrictions.

(1) Establishment of Dune Stabilization Setback Line. The municipality/county hereby adopts the Coastal Construction Control Line (CCCL) as set by the Florida Department of Environmental Protection as the municipality/county's Dune Stabilization Setback Line (DSSL). Development, other than approved activities involving shore protection, beach

restoration, dune crossovers or activities related to beach safety shall not be permitted seaward of this line.

(2) Dune walkover structures required. All owners of ocean front property shall be required to erect elevated dune walkover structures over any sand dune located on the owner's property. The term owner as applied to property in which the developer has turned over control to a condominium association or homeowner's association shall mean the non-profit corporation which constitutes the condominium association or homeowner's association.

a. New development. For new development, the construction of the walkover shall be concurrent with the construction of the building. No Certificate of Occupancy or Certificate of completion shall be issued until such structure is completed.

b. Existing development. For existing development, owners will have a twelve month period with which to comply with the regulation, such time to commence from date of receiving due notice from the municipality /county. Upon inspection by the appropriate authority, a Certificate of Compliance shall be issued upon completion of such structure.

(3) Disturbance or ingress. Encroachment or ingress onto or any disturbance of the main dune or natural vegetation seaward of the DSSL is prohibited, including encroachment or disturbance caused by individuals upon foot or by vehicle of any kind. Ingress by foot seaward of the DSSL must be associated with an approved dune crossover structure if such ingress is within five hundred (500) feet of such structure.

(4) Motorized vehicles. Motorized vehicles, including but not limited to, automobiles, trucks, bulldozer, graders, cranes, motorcycles, dune buggies, minibikes, and all-terrain vehicles, shall not be allowed seaward of the DSSL without prior approval from the Florida Department of Environmental Protection and the municipality/county. Vehicles being operated by an officer of any agency of the state or of a political subdivision of the state in the furtherance of official duties or those operations which have received the express authorization of the municipality/county shall be exempt.

(5) Storage of vehicles. The parking or storage of automobiles, trailers, motor homes, recreation and like vehicles is prohibited seaward of the DSSL. Boats may be stored seaward of the DSSL if stored, located, and moved in a manner that does not disturb, damage, or destroy the existing dune, associated dune vegetation, and in a manner that does

not interfere with the natural processes and reestablishment of the dune or its associated vegetation.

(6) Mechanical beach cleaning. All mechanical beach cleaning shall be subject to regulations found in Section 7 of the Sea Turtle Habitat Protection Ordinance, and in addition, shall be subject to all applicable regulations contained in Section 16(c) of this ordinance.

(7) Vegetation disturbance. Beach dune vegetation found seaward of the DSSL including, but not limited to, grass, seagrapes, sea oats and tree development shall not be altered, removed or changed without prior authorization and the appropriate permits subject to the following criteria:

a. Pruning, trimming, removal or relocation of dune vegetation shall be prohibited between December 1 and February 15; Fall is the recommended time for such activities.

b. All cuts shall be made cleanly and at the base of the branch or limb of the vegetation, or at branch points of the stalk of the vegetation, except when done with respect to the shaping of a hedge.

c. The planting of sod grass and ornamental landscaping shall be prohibited seaward of the DSSL with the exception of a five-foot (5') wide pathway from the access structure to the residence, as necessary. In no case shall the sod be allowed to cross the primary dune area.

d. Grasses, shrubs, shrub trees, or other similar dune vegetation may be maintained or trimmed up to four (4) feet above existing grade, provided such trimming does not result in the death or destruction of the vegetation. On larger species, such as mature seagrapes, palms, and other similar species, the removal of the lower branches or limbs for view may be permitted, provided no such alteration results in significant damage or death of the vegetation. Sea oats may not be removed or altered in any way.

e. The planting of palm trees, including native sabal palmettos or other trees is discouraged in active beach areas of frequent storm wave attack. Such vegetation may become damaging projectiles under hurricane conditions. Planting of such palms must be approved by the appropriate authority in areas of high beach areas, beach restoration projects, areas adjacent to walkover structures, or landward of existing coastal protection structures. However, all palm trees so planted must be

anchored with an approved anchorage system designed for hurricane conditions.

f. All dead, decaying, injured or diseased vegetation may be trimmed without a permit, provided that:

1. The trimming constitutes only dead or diseased vegetation, and no live portions of vegetation are trimmed.

2. No root material is to be trimmed or destroyed. No native dune vegetation may be uprooted or removed.

3. The applicant must notify the municipality /county's planning/ environmental planning department prior to commencing any work. The planner/environmental planner shall inspect the property prior to authorization of permit exemption. Failure to notify the environmental planning section prior to any removal work will constitute a violation of Section 8.

4. No existing dune vegetation shall be removed by the root system with the exception of non-native, nuisance species as described in Section 8(b)(6), or as authorized by the planning department.

5. The provisions of this section shall not preclude the undertaking of approved shoreline stabilization projects or the location and construction of approved dune crossover structures and similar minor structures.

6. Any request to alter or remove any existing vegetative cover seaward of the Dune Stabilization Setback Line shall be accompanied in writing by a dune revegetation plan, to be approved by the planning/environmental planning department.

(8) Use of natural, native dune vegetation. The use of natural dune vegetation, native to Florida, shall be required for any beach or dune preservation, stabilization and/or restoration project. The design and/or operation of sprinkler systems to promote or sustain growth of dune vegetation shall:

a. Be approved by the jurisdictional municipality/county prior to installation.

b. Be timed and operated so as not to interfere with the normal development of sea turtle eggs in the nests or adversely affect emergent hatchlings where such sprinkler

systems are located in areas of known or suspected sea turtle nesting activity.

c. Not broadcast water seaward of the primary dune.

(9) Design and/or positioning of structures. In areas of known or suspected sea turtle nesting, buried, emergent, or above ground structures shall be designed and/or positioned such that they do not have the potential to act as traps to adult sea turtles or their hatchlings or significantly reduce useable areas of nesting habitat.

(10) Restored beaches. Restored beaches shall, to the maximum extent possible, resemble the characteristics of preexisting or adjacent natural beaches in terms of sediment grain size, compaction, retractivity and beach slope.

(11) Restored, stabilized dunes. Restored and stabilized dunes, shall, to the maximum extent possible, be similar in appearance to the preexisting or adjacent natural dunes in terms of profile, vegetation and sediment characteristics. In areas of known or suspected sea turtle nesting, they shall be designed in such a manner that the reconstructed dune profile does not effectively exclude access by nesting sea turtles.

(12) Exceptions. Nothing in this section shall be construed to prohibit the undertaking of coastal construction projects seaward of the CCCL, when such project has been approved by the Bureau of Beaches and Shores of the Department of Natural Resources of the State of Florida, and the applicant can demonstrate to the municipality/county that the project is in the public interest or is necessary to protect contiguous real property improvements; provided that any such coastal erosion control project which includes beach sand renourishment shall also include provisions for dune restoration. Such program for restoration shall include both dune revegetation, using salt tolerant and native plant material which is both suitable and appropriate for dune revegetation.

(13) Penalties. The Florida Department of Environmental Protection (DEP) is empowered to assess civil fines against persons who damage or destroy beach vegetation seaward of the coastal construction control line. Such acts are considered a misdemeanor and may be penalized as such by the DEP in addition to penalties that are imposed by the municipality/county as stated in Section 21.

(d) Seagrass beds

(1) Without an express written permit, it shall be unlawful for any person, group, company, organization or agent thereof

to remove, destroy, damage, or alter to the point of imminent destruction, any known or identified seagrass area.

(2) Docks, boat ramps, mooring poles, and other similar waterfront structures, including marinas and all permitted waterfront accessory uses, shall be designed and located in such a manner that all adverse impacts to any known and/or identified seagrass beds shall be minimized. The presence of seagrass beds shall not prohibit the location of these structures, provided that no objections or permit denials are issued by any additional reviewing agencies with appropriate jurisdiction. However, mitigation shall be required for all damaged or displaced seagrass areas in a minimum ratio 3:1 (created to lost habitat).

(e) Mangroves Mangrove trees perform many roles vital to the ecology of the estuary and its shoreline. Their root systems help stabilize the shoreline by reducing erosion created by shoreline dynamics. In addition, they provide important habitat areas for wildlife, including nursery and feeding areas for shellfish and fish. Over 90% of Florida's sport and commercial fishery species utilize and are dependent upon the nursery function of these systems. In addition, mangroves provide nesting areas for birds and a winter resting ground for migratory birds, as well as providing an essential function in maintaining the quality of surface waters.

(1) The selective trimming and/or removal of mangroves may require a permit from the Florida Department of Environmental Protection and is always subject to FDEP regulations. If such permit is required, it shall be obtained by the applicant and a copy of such made available to the permitting agency of the municipality/county before the any issuance of any municipal permit for mangrove trimming and/or removal. A municipal/county permit is also required for the trimming, alteration, or removal of any mangrove tree. The municipality/county shall take into consideration the approval of the state and federal permits when issuing a development permit, but state and federal approval shall not automatically constitute municipality/county approval. Any permit issued by the municipality/county will be subject to the following standards.

(a) Selective Trimming. The trimming of mangroves along man- made bodies of water need not have a stated purpose. However, trimming of mangroves along natural waterways and bodies of water and in wetlands shall be permitted only for any of the following purposes, subject to approval by the appropriate authority.

i. To provide reasonable access from an upland site to a body of water or wetland.

ii. To maintain reasonable navigability in a navigable waterway.

iii. To ensure safety.

(2) Conditions for issuance of a mangrove trimming permit.

a. Selective trimming of mangroves shall be permitted only during the months of October, November, December and January, February and March. Annual maintenance pruning requires subsequent permits.

b. The configuration of a mangrove tree attained by selective trimming may be maintained except during the one year period immediately following the initial selective trimming.

c. Selective trimming of mangroves is limited to the use of hand held tools. No sealing or treating of cut mangrove ends is permitted. No pruning paint shall be utilized.

d. No approval shall be granted for the trimming or alteration of any mangrove which serves as an active nesting site for migratory birds or a breeding areas for a colony of birds.

e. No more than twenty five percent (25%) of the lateral limbs in the lower half of the canopy of any mangrove tree shall be cut; none of the upper half of the canopy shall be cut. Mangroves cannot be reduced in height.

f. No prop roots or pnuematophores may be removed or cut.

g. No mangrove tree smaller than six (6) feet in height above the ground or water level shall be trimmed.

h. No trunk, limb, or branch greater than one (1) inch in diameter at the point of attachment shall be cut.

i. Trunks, limbs or other branches less than one-half inch (1/2") in diameter with associated leaves, shall be cut into one-foot lengths and placed in the waters where the trimming is performed.

j. Trunks, limbs or other branches greater than one-half inch (1/2") in diameter with associated leaves shall be properly disposed of in an upland location so as not to impede or restrict water movement or create a hazard to navigation.

k. Leaves not attached to trunks, limbs or other branches shall be placed in the waters where the trimming is performed.

l. The use of herbicides or chemical defoliants shall not be permitted.

m. No bark stripping or girdling of limbs shall be permitted.

(3) Removal of Mangroves. The removal of any mangrove tree shall be limited to the minimum necessary to achieve the following.

i. To provide reasonable access from an upland site to a body of water or wetland.

ii. To maintain reasonable navigability in a navigable waterway.

iii. To ensure safety.

iv. To implement an approved development permit that includes an approved mitigation plan.

a. Removal of mangroves is limited to the use of hand held tools, unless mechanical removal is expressly authorized by the appropriate authority of the municipality/county.

b. Debris from removed mangroves shall be disposed of in the same manner as debris from trimmed mangroves, as stated in Section 16(e)(1)i through k.

(4) Vehicular access. An approval shall be granted for the removal and/or alteration of mangroves to provide vehicular access to property, subject to the following guidelines.

a. The applicant must demonstrate that no other access alternatives exist.

b. Appropriate environmental agencies, including but not limited to County Soil and Water Conservation Districts, Florida DEP,etc. must review and comment in writing regarding the proposed removal and/or alteration as to its appropriateness as the least damaging alternative.

c. The applicant must submit a proposal for reforestation and/or mitigation.

(5) Reasonable use of property. An approval shall be granted for the removal and/or alteration of mangroves when such removal and/or alteration is necessary to make any reasonable use of the property, subject to the following guidelines.

a. The applicant must demonstrate that there is insufficient upland area or non-mangrove area to make any reasonable use of the property.

b. The guidelines outlined in Section 16(e)(4) above must be met.

(6) Utilities Operations and Maintenance. An approval shall be granted for the removal and/or alteration of mangroves within a dedicated utility easement or road right-of-way to provide public utilities as defined in Section 366.02, Florida Statutes (1987), with reasonable access, subject to the following guidelines.

a. The width of the mangrove areas affected by the accessway shall not exceed six feet (6').

b. The applicant must demonstrate that no other access or alternatives exist.

c. The accessway should be designed and located in such a manner that the least amount of damage to the mangroves is assured.

d. The applicant must submit a proposal for reforestation.

e. Appropriate environmental agencies, including the County Soil and Water Conservation District, must review and comment in writing regarding the proposed removal and/or alteration as to its appropriateness as the least damaging alternative.

f. An approval shall be granted for the maintenance of existing facilities of public or private utilities and public drainage systems; provided that no other alternative exists, and that the alteration will be the minimum necessary.

(f) Oak Scrub

Oak scrub is an environmentally significant ecosystem that is becoming scarce due to urban development pressures. To maintain viable scrub, the area must be allowed to burn naturally or prescribed burning must take place. Heavily urbanized areas cannot maintain large viable scrub habitats without prescribed burning, and such burning is often difficult to accomplish when scrub areas

are in close proximity to residences and businesses. Scrub is home to the Florida scrub jay, Florida mouse, gopher tortoise, lizards, and sand and blue-tailed mole skinks. The scrub jay, sand and mole skinks are federally listed as threatened species. Destruction of their habitat directly affects the viability of these species. Therefore, any person applying for a building permit in these areas shall be subject to all regulations for land clearing, grubbing and pruning as set forth in this ordinance. All applicable provisions of this ordinance shall be met before any building or development permit is issued. All requirements of Section 6 shall be met and adhered to.

(g) Maritime Forests

This ecosystem, being located furthest from the salt spray of the ocean, is the most varied in flora and fauna of the barrier island ecosystems. This system is characterized by amphibians, birds, mammals, and trees such as red maples, palmettos, tupelos, pines, and hardwood trees. Any person applying for a building or development permit in these areas shall be subject to all applicable regulations as set forth in this ordinance. All applicable provisions of this ordinance shall be met before such permit is issued. All requirements of Section 6 shall be met and adhered to.

(h) Upland buffers adjacent to shorelines

(1) Purpose. It is the purpose of an upland buffer to further protect shorelines, their associated vegetation, wildlife, and water quality attributes from adjacent development impacts. Such impacts include siltation, erosion, surface water runoff and human and domestic animal intrusion. Upland buffers also provide for the preservation of upland wildlife habitat.

(2) Upland buffer requirements. Upland native vegetation buffers shall be required immediately adjacent to a shoreline and shall extend landward a distance of twenty-five feet (25') from the mean high water line. The upland buffers shall be required upon submittal of land clearing application, building permit application or preliminary plan application. The buffers must be shown on the appropriate application as well as the mean high water line and must be preserved during and after site development. Platted lots and sites with building permits approved prior to the adoption of this chapter shall meet the requirements of this section. Activities listed in Section 16 (3)(a) through (g) shall be prohibited within ten feet (10') of the mean high water line.

(3) Prohibited activities within upland buffers. The following activities within a buffer shall be prohibited unless a variance or waiver under Section 10 has been issued;

variances and waivers shall be reviewed based on the evaluation criteria within Section 5(f):

a. Placement of a structure, road or utilities, stormwater and drainage systems.

b. Planting of prohibited vegetation.

c. Removal of native vegetation including mowing or trimming without a permit.

d. Fill with dirt, topsoil, sand, gravel or other similar material or any alteration of elevations without a permit.

e. Excavation.

f. Storage of equipment, supplies, materials, machinery, portable buildings, etc.

g. Application of herbicides; pesticides; fertilizers; or chemical agents injurious to vegetation.

(i) Wetlands

Wetland areas are necessary as habitat and nurseries and crucial in aquifer recharge and fresh water conservation. Such areas are also regulated by the Florida Department of Environmental Protection the jurisdictional water management district, and the U.S. Army Corps of Engineers, as well as the municipality/county.

(1) Identification of Wetlands. Wetlands shall be as defined in Section 2. However, in circumstances where the natural boundary of wetland vegetation is unclear, the line of demarcation may be approximated at a surveyed elevation measured at a location in the same wetland where the natural line is clear. In the event an undeveloped area has been recently cleared of all vegetation, the wetland boundary may be determined by a study of the soils, aerial mapping, photography, hydrology, and other historical information as appropriate.

(2) Boundary lines. The exact limits of wetlands may also be determined by a field-surveyed boundary line sealed by a Florida Registered Surveyor and approved by the Florida Department of Environmental Protection, the jurisdictional water management district, and the U.S. Army Corps of Engineers. Any wetlands boundary delineation intended for permitting purposes must have the prior approval of the applicable regulatory agencies as well as indicate the name of the individual and agency signing off on the boundary, and the date the field survey was conducted or the signoff made. The

most restrictive wetland boundary as determined by the other permitting agencies shall be accepted by the municipality /county.

(3) Utilization. Wetlands may be utilized as follows:

a. Scenic, historic, wildlife, or scientific preserves.

b. Timber catwalks and walking trails.

c. Commercial or recreational fishing.

d. Constructing fences where no fill activity is required.

e. Stormwater discharge or treatment in accordance with all applicable federal, state and local regulations.

f. Dockage or marinas.

g. New riprap or similar structures where all required state and county permits have been received. However, a combination of riprap and natural vegetation rather than riprap alone shall be the preferred shoreline stabilization design.

h. Maintenance, dredging, and maintenance or replacement of stormwater facilities.

i. Construction, replacement, or widening of bridges.

j. Installation of subaqueous transmission and distribution lines for water, wastewater, electricity, communication cables, oil or gas.

k. Recreational activities.

(4) Encroachment. The encroachment upon wetlands by structures or other development activity shall only be permitted under the following circumstances:

a. The public benefits of the activity substantially outweigh the adverse environmental effects, as determined by the appropriate federal, state and/or local agencies, **AND**

b. The appropriate federal, state and/or local agency examines the alternatives and determines that strict denial would effectively deprive the owner of all reasonable use of the land due to its unusual size, shape, topography, natural conditions, and location, or that an alternative would be technically impractical in

terms of engineering, design and construction practices, **AND**

c. A compensatory wetland mitigation plan subject to the standards in subparagraph (6) below, is approved by the appropriate federal, state and/or local agency.

(5) Protective measures. Other protective measures may be instituted or required as follows:

a. Maintaining natural drainage patterns.

b. Limiting the removal of vegetation to the minimum necessary to carry out the development activity.

c. Stabilizing banks and other unvegetated areas.

d. Minimizing the amount of fill and requiring the use of pilings.

e. Disposing of dredged soil at specified locations.

f. Prohibiting the use of septic tanks in areas with a high groundwater table.

g. Using deed restrictions and conservation easements to protect and maintain the wetland.

h. The use of silt or erosion screens, hay bales and/or similar erosion control techniques determined by best management practices.

i. Restoration of wetlands damaged during construction.

(6) Review criteria. In determining whether the development is permissible under the provisions of this section, the municipality/county shall consider, but not be limited to the following criteria:

a. The ability of the wetland to receive, store and discharge surface water run-off so as to contribute to hydrological stability and control of flooding and erosion.

b. The ability of the wetland to recharge the groundwater as demonstrated by reliable available information.

c. The ability of the wetland to provide filtration and nutrient assimilation from surface water run-off.

d. The ability of the wetland to provide habitat and significant ecological function in the life cycle for flora and fauna.

e. The ability of the wetland to function as an integral part of any water(s), water body, or watercourse.

f. The cumulative impacts of the proposed development on the wetland system in combination with other developments which have been or shall be proposed in the same drainage basin.

g. The technical feasibility of any proposed wetland mitigation plans and the likelihood of their success in restoring or replacing the environmental benefit altered by the development.

h. The capacity of the existing wetland to provide environmental benefits because of factors such as size, maturity, degree of prior alteration, physical relationship to other water systems, and adjacent land uses.

i. The degree or magnitude of the impact of the proposed alteration/development on the wetland and how such impact shall be minimized through mitigation measures, either off-site or on-site, or both, and recommendations concerning the appropriate location of said mitigation.

j. Whether, and the extent to which a proposed project must be located within a wetland or water body in order to perform the project's basic functions.

k. Whether the wetlands impacted by the proposed activity are protected or used in a manner which does not adversely impact their beneficial functions.

(7) Minimum standards for mitigation. Compensatory wetland mitigation shall entail the following minimum standards:

a. The compensatory wetland shall be of the same wetland type as that destroyed or degraded.

b. A mitigation plan is required to include at least:

1. A description of wetland and buffer to be created or restored, which shall include but not be limited to the type and functions of the wetland, the proposed mitigation ratios, species present or to be planted, plant density, anticipated source of plants, soils and hydrologic regime.

2. A plan for monitoring the success of a created or restored wetland.

3. A detailed written estimate of the cost of the mitigation, including costs associated with earth moving, planting, consultant fees, and monitoring.

4. A detailed plan describing the monitoring and methods of control and maintenance of exotic or nuisance vegetation.

5. Monitoring and replacement to assure a survival rate of eighty percent (80%) wetland vegetation for a minimum of three (3) years.

6. An upland habitat as an adjacent buffer on mitigated sites as provided for in Section 16(h).

c. An acceptable mitigation plan shall be reasonably and technically feasible. Mitigation through restoration of other degraded wetlands is preferred over wetland creation.

d. Mitigation should take place on-site or in close proximity thereto if feasible.

e. An applicant who carries out a compensatory mitigation plan shall grant a conservation easement on the newly-created or restored wetland and buffer to protect it from future development. A legal mechanism other than a conservation easement may be deemed appropriate on a case-by-case basis to carry out the purposes of the subsection.

f. A mitigation plan approved by a federal, state or regional agency shall be presumed to be acceptable to the municipality/county, provided however, if no such mitigation plan is required by the approved permit from the federal, state or regional agency, then the municipality/county may require a mitigation plan in compliance with this section.

g. Mitigation should not contribute to the production of mosquitoes by creating mosquito larval habitat or by eliminating habitat for predatory fish.

(8) Mitigation ratios. In determining the replacement acreage ratios for restored or created wetlands, the municipality/county shall consider, but not be limited to the following criteria:

a. The length of time that can be expected to elapse before the functions of the impacted wetland functions have been restored or offset.

b. Any special designation or classification of the water body, including but not limited to Outstanding Florida Waters, Aquatic Preserves, or Class II waters.

c. The type of wetland to be created and the likelihood of successfully creating that type of wetland.

d. Whether or not the impacted wetland is functioning as a natural, healthy wetland of that type.

e. Whether the wetland is unique for that watershed.

f. The presence or absence of exotic or nuisance vegetation within the wetland and adverse effects those plants have on the beneficial functions of the wetlands.

g. Whether the proposed project eliminates or changes the wetland from one type to another.

h. The amount and quality of upland habitat preserved as conservation areas or buffer.

i. Whether the applicant chooses to allocate funds to the municipality/county as provided for in Section 21.

(9) Minimum ratios. Except as provided in Section 16 (i)(7)f, the mitigation ratio for created or restored wetlands shall not be less than four to one (4:1), (created/restored to lost).

(10) Buffer requirements. For the purposes of this Section, a buffer is defined as an area reserved as open space, free of structures, impervious surface, roadways, storage, and other enclosures or appurtenances.

a. A buffer of not less than twenty-five feet (25') in width shall be established adjacent to and surrounding all wetlands. Wetland buffers greater than twenty-five feet (25') in width may be required if the upland activity adversely impacts the wetlands beneficial functions.

b. The buffer shall be measured from the mean high tide or wetland jurisdictional line, whichever is greater.

c. The use of native vegetation as a buffer shall be used where such vegetation exists.

d. Development activities or construction which do not have a significant adverse effect on the natural function of the buffer may be allowed within the buffer. Proposed activities within the buffer may be permitted in accordance with the requirements of this section. The activities or construction which may be permitted include, but are not limited to pruning or planting of suitable native vegetation, removal of exotic and nuisance pioneer plant species, and the creation and maintenance of walking trails.

e. The following shall be exempt from the wetland and shoreline buffer requirement.

i. Water dependent uses or activities.

ii. Catwalks, boardwalks, and walkways.

iii. Public recreation facilities.

f. The Board of Appeals may grant a variance to allow encroachment upon this buffer in accordance with the adopted review standards for hardship.

(11) Issuance of permits. The issuance of wetland activity permits are subject to the following conditions.

a. If the application meets the requirements of this section, the municipality/county shall issue the permit based upon approval by the appropriate authority, as provided in this section and may attach such appropriate conditions to the said permit in order to comply with the standards of Section 16(i)(6). The authority may deny the permit if it does not meet such standards, stating the reasons thereof and appeal procedures.

b. The authority may approve a Wetlands Alteration Permit, which shall incorporate the general and specific conditions which were made part of the permit from federal, state, or regional agencies. Provided, however, before the issuance of the Wetlands Alteration Permit, said federal, state, or regional permit application when available shall be submitted to the authority. Concurrent applications to the local government and any federal, state, or regional agency shall be encouraged. Provided, however that the authority is not prevented from approving additional conditions to the said permit in order to comply with the standards of section 16(i)(6)a. through k.

SECTION 17. VARIANCES AND WAIVERS

The Board of Adjustment/Appeals may upon appropriate application in writing, vary or waive the terms and provisions of this chapter in specific cases due to unreasonable hardships, overriding public interest, and/or general public welfare.

SECTION 18. EMERGENCIES

In case of emergency conditions including, but not limited to hurricanes, windstorms, floods, freezes or other disasters, the requirements of these regulations may be waived by the appropriate authority, upon finding that such waiver is necessary to ensure that public or private work to restore order in the municipality/county will not be impeded.

SECTION 19. REVOCATION

The appropriate authority may revoke any permit issued pursuant to this chapter for fraud, misrepresentation or violation of conditions imposed pursuant to the permit, or other good cause. In the event the authority chooses to revoke a permit, written notice of the intent to revoke such permit shall be provided to the applicant, setting forth the specific reasons for the revocation. The applicant shall have the right to appear before the authority at a time and date specified in the notice to show cause why the permit issued to the applicant should not be revoked.

If the authority determines to revoke a permit issued pursuant to this chapter, after the notice procedure as provided above, the applicant shall immediately cease all work on the site. The applicant shall have the right to appear before the commission in accordance with Section 20 to show cause why the permit issued to the applicant should be reinstated.

SECTION 20. APPEAL

Any person may appeal a decision denying a permit required by this chapter within fifteen (15) days from the date of the decision. Appeal shall be made to the appropriate authority by filing a written notice of appeal with the municipal/county clerk in duplicate along with a fee to cover the cost of publishing the notice of hearing the appeal. The appeal shall concisely state the grounds for the appeal. The Board of Adjustment shall hear and consider all facts material to the appeal and shall render a decision within fifteen (15) days from hearing the appeal. This decision shall be final except for appeals to the courts of the state.

SECTION 21. PENALTIES

(a) Whoever shall violate the provisions of this chapter shall be subject, upon conviction in a court of competent jurisdiction, to a fine not exceeding the sum of five hundred ($500.00) dollars, or imprisonment in jail not exceeding sixty (60) days, or both such fine and imprisonment. Each day of the violation of the provisions of this chapter shall constitute a separate offense.

(b) In the event of a violation of this chapter, the offender may choose resolution by imposition of fines and/or imprisonment, consent, or monetary reimbursement. If consent is chosen, the appropriate authority may require the replacement of destroyed plant and tree species on a three (3) to one (1) basis. Reimbursement to the municipality/county shall be made in money equivalent to the value of the species destroyed. Value shall be based on two (2) estimates at wholesale price by averaging same.

(c) Further, in the event destruction of the plant, wildlife, or lands herein protected shall occur after work has commenced on a parcel of land prior to or after a building permit has been issued, the appropriate authority shall have the right and power to enter an order enjoining or terminating any work or activity on site with such order remaining in effect until removed by the commission or by a court of competent jurisdiction; provided, however, said authority shall present to the Commission within ten (10) days of date such order is entered, all facts sustaining same with copy thereof furnished to the offender; and the Commission shall resolve the issues at a public hearing no later than twenty-five (25) days from date the original order is entered with a minimum of five (5) days written notice thereof to the offender.

(d) All of the monies received by way of fines shall be held in a separate account and used by the municipality/county solely for the purchase of environmentally sensitive lands or the restoration of native habitats on public lands. All acquisitions made through this program shall be voluntary acquisitions.

SECTION 22. SEVERABILITY.

If any section, paragraph, sentence, clause, phrase or word of this ordinance is for any reason held by the court to be unconstitutional, inoperative, or void, such holding shall not affect the remainder of this ordinance.

APPENDIX E

MODEL SEA TURTLE HABITAT PROTECTION ORDINANCE

MODEL SEA TURTLE HABITAT PROTECTION ORDINANCE

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APPENDICES

A. INFORMATION FORM TO ASSESS AND REDUCE IMPACTS TO MARINE TURTLES (FDNR)

B. MODEL LIGHTING ORDINANCE (STATE OF FLORIDA, CHAPTER 16B-55)

MODEL SEA TURTLE HABITAT PROTECTION ORDINANCE

SECTION 1. INTENT AND PURPOSE

In recognizing the unique characteristics of the sea turtle nesting cycle, this ordinance is promulgated to prevent or minimize the hazards adversely impacting nesting females and their hatchlings from any or all of the following: coastal construction activity, beachfront lighting, beach/dune preservation, stabilization and restoration projects, mechanical beach cleaning, and other coastal activities disruptive to the nesting cycle.

SECTION 2. DEFINITIONS

Unless specifically defined in this section, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most effective application, in consideration of its stated intent.

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

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

Beach access point: Any path through or over the dune used by the general public; or, with respect to private property, by the owners or with the owner's permission, for the purpose of gaining access to the beach.

Beachfront lighting: All artificial lighting within the jurisdictional boundaries of this section.

"Bug" type bulb: Any yellow colored light bulb that is marketed as being specifically treated in such a way so as to reduce the attraction of bugs to the light.

Coastal construction: The carrying out of any activity within jurisdictional boundaries to modify or improve site conditions including, but not limited to, building, clearing, filling, excavation, beach/dune preservation, stabilization and restoration projects, mechanical beach cleaning, grading or planting of vegetation, or the making of any material change in the size or use of any structure or the appearance of site

conditions, or the placement of equipment or material upon such sites.

Cumulatively illuminated: Illuminated by numerous artificial light sources that as a group illuminate any portion of the beach.

FDEP: The Florida Department of Environmental Protection.

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

Frontal dune: The first natural or man-made mound or bluff of sand which is located landward of the beach and which has sufficient vegetation, height, continuity, and configuration to offer protective value. Also known as primary dune.

Ground-level barrier: Any vegetation, natural feature or artificial structure rising from the ground which prevents beachfront lighting from shining directly onto the beach-dune system.

Hatchling: Any species of sea turtle, within or outside of a nest, which has recently hatched from an egg.

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

Mechanical beach cleaning: Any mechanical means by which debris is removed from the beach.

Nest: The area in and around a place in which sea turtle eggs are naturally deposited or relocated beneath the sediments of the beach/dune system.

Nesting season: The period from May 1 through October 31 of each year for all counties except Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward. In areas of known leatherback nesting, (Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties), the nesting season will be the period March 1 through October 31 of each year.

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

Nighttime: The locally effective time period between sunset and sunrise.

Permitted agent of the state: Any qualified individual,

group, or organization possessing a permit from the Florida Department of Environmental Protection to conduct activities related to sea turtle protection and conservation.

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

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

Primary dune: See Frontal Dune

Sea turtle(s): Any specimen belonging to the species Caretta caretta (loggerhead turtle), Chelonia mydas (green turtle), Dermochelys coriacea (leatherback turtle), Eretmochelys imbricata (hawksbill turtle), or any other marine turtle using the beaches of the jurisdictional boundaries as a nesting habitat. For purposes of this ordinance, sea turtle is synonymous with marine turtle.

Turtle walk: Any organized, educational, public awareness program expressly formed for the purpose of observing nesting or hatching sea turtles.

SECTION 3. STATE REQUIREMENTS FOR COASTAL CONSTRUCTION

(a) Application. Pursuant to Section 370.12 (3) (D), Florida Statute, effective July 1, 1991, any application for a department permit or other type of approval for an activity that affects marine turtles or their nests or habitat shall be subject to conditions and requirements for marine turtle protection as part of the permitting or approval process. Submission of the Information Form to Assess and Reduce Impacts to Marine Turtles (FMRI 33-718, last rev. 6/27/91) is required as a completion item for permit applications under Section 161.041 and 161.053, F.S. (Sample application listed in Appendix A). The application shall be required for all activities requiring a Coastal Construction Control Line (CCCL) permit, including but not limited to:

(1) All coastal construction involving the installation of permanently maintained light fixtures.

(2) All coastal construction conducted during the nesting season, seaward of the primary dune or landward of the primary dune where sea turtles are known to nest.

(b) FMRI Application Requirements:

(1) Site plans (map view and profile view) showing the location of all exterior lighting fixtures. Two (2) copies of each site plan are required and all shall be drawn to scale and include a north arrow. For multiple story structures, a site plan is required for each floor. If each floor incorporates identical lighting plans, this will be so indicated and only one site plan shall be submitted depicting a representative floor. Distinctive and clearly marked symbols shall be utilized to show the location of each type of proposed fixture. A detailed description of each fixture (cut sheet) shall be included. A table with the columns shall accompany the site plans:

SYMBOL
FIXTURE (name or stock number)
NUMBER OF FIXTURES
BULB WATTAGE AND TYPE (e.g., 40W yellow "bug" lamp)
TYPE OF MOUNT (e.g. wall, pole, bollard)
MOUNTING HEIGHT

(2) Status of all other permits, including permit or file number, date applied for and date issued.

(3) Site information, including city and county location, street address, legal description of the parcel referencing FDEP monuments, and linear feet of shoreline affected.

(4) Project description, including a specific description of the project, and photographs of the project site. Standard print photographs shall be labelled and marked appropriately to clearly indicate specific aspects of the proposed project.

(5) Construction information checklist, indicating the type of facilities and/or activities proposed for the project.

(6) Proposed construction schedule, including vehicles, equipment and materials to be used seaward of the landward toe of the primary dune (if applicable).

(7) Points of access to the construction site. If beach access points are to be used, methods and routes to move equipment and material to and from the project site via the beach will be noted. Location of beach access points and distance from the project site will be noted.

(8) Any other mitigative and/or protective measures to eliminate project impacts to marine turtles will be so noted.

SECTION 4. GENERAL STANDARDS FOR COASTAL CONSTRUCTION

(a) Application approval. Prior to the issuance of a building permit or approval of a site plan, the standards set forth herein must be met. Approval of the FDEP form FRMI does not relieve applicants from complying with all other applicable conditions set out in this section or from mitigating against subsequent negative impacts to sea turtles, their nests or eggs, resulting from the approved activity.

(b) Timing considerations. Coastal construction shall be limited to the maximum extent possible to the non-nesting season (November 1 through April 30 for all species other than leatherback areas. November 1 through February 28 in leatherback nesting areas). Coastal construction (other than government approved hydraulic filling activities) occurring during any portion of the nesting season shall be conducted during daylight hours only.

(c) Coastal construction seaward of the primary dune during the nesting season. Appropriate protective/mitigative measures for sea turtles, developed pursuant to this section, shall be implemented for all coastal construction seaward of the primary dune during the nesting season.

(d) Restrictions on nighttime security lighting. Temporary nighttime security lighting should be limited to the fewest number of lights necessary to provide adequate security and shall be restricted as follows:

(1) Shall be mounted not more than fifteen feet (15') above the ground.

(2) Shall not illuminate areas outside of the subject property.

(3) Shall not directly illuminate areas seaward of the primary dune, unless protective/mitigative measures for lighting impacts are developed pursuant to this section.

(e) Protective/mitigative measures. These measures shall include, but not be limited to, the following, as applicable:

(1) Nest relocation. A permitted agent of the state shall conduct a preliminary site survey and relocate all sea turtle nests to a safe habitat during the nesting season.

(2) Exemption of preliminary site survey. Construction activity in progress on or before the first day of nesting season of each year shall be exempt from a preliminary site survey but shall implement daily nesting surveys pursuant to Section 4(e)(5) below.

(3) Delay of construction. If nests are known to be present during a preliminary site survey and cannot be relocated and/or removed to a safe habitat, commencement of construction shall be postponed for sixty (60) days or until all potentially affected nests have hatched.

(4) Prevention of construction delays. Person(s) anticipating construction starts during the nesting season may obtain the services of a permitted agent of the state to mark all nests on a daily basis as set out in FDEP guidelines, beginning no later than the first day of nesting season of each year. The nests may be relocated by the permitted agent of the state after all permits have been obtained.

(5) Daily nesting surveys. A permitted agent of the state shall conduct daily nesting surveys of construction areas seaward of the primary dune and shall cage sea turtle nests or relocate the nests to a safe habitat.

SECTION 5. LIGHTING REGULATIONS

(a) New Development.

(1) For new development, construction and building and electrical plans for construction of single or multifamily dwellings, commercial or other structures including electrical plans associated with parking lots, dune walkovers, or other outdoor lighting for real property, if lighting is associated with such construction or development and can be seen from the beach, the lighting shall be in compliance with the following:

a. Exterior artificial light fixtures shall be designed and positioned so that:

1. The point source of light of any reflective surface of the light fixture is not directly visible from the beach;

2. Areas seaward of the frontal dune are not directly or indirectly illuminated; and

3. Areas seaward of the frontal dune are not cumulatively illuminated.

b. Exterior artificial light fixtures within direct line-of-sight of the beach are considered appropriately designed if:

1. Completely shielded down-light only fixtures or recessed fixtures having low-wattage (ie. 50 watts

or less) "bug" type bulbs and non-reflective interior surfaces are used. Other fixtures that have appropriate shields, louvers, or cut-off features may also be used if they are in compliance with Section 5(a)(1), (2), and (3) above.; **and**

2. All fixtures are mounted as low in elevation as possible through the use of low-mounted wall fixtures, low bollards, and ground level fixtures.

c. The use of outdoor lighting for safety and security purposes shall be limited to the minimum number required to achieve their functional roles. Floodlights, decorative landscape or accent lighting shall be prohibited.

d. Pole lighting shall be shielded in such a way that light will be contained within an arc of three (3) to seventy-three (73) degrees on the seaward side of the pole and shall not illuminate the beach or dune area on the seaward side of the pole.

e. Low profile luminaries shall be used in parking lots and dune crosswalks and shall be positioned or shielded so that no light illuminates the beach.

f. Temporary security lights will be erected under the provisions of Section 4(d).

(b) Existing Development.

(1) It is desired that artificial sources of light from existing structures are not directly visible from the beach and do not directly illuminate the area seaward of the primary dune. To further this intent, the following shall apply:

a. Lights illuminating buildings or associated grounds for decorative or recreational purposes shall be shielded or screened such that they are not visible from the beach, or turned off between 9:00 p.m. and 6:00 a.m. during the nesting season of each year.

b. Lights illuminating dune crosswalks of any areas oceanward of the dune line shall be turned off between 9:00 p.m. and 6:00 a.m. during the nesting season of each year.

c. Security lighting shall be permitted throughout the night as long as low-profile luminaries are used and screened in such a way that those lights do not illuminate the beach.

d. To prevent interior lights from illuminating the beach during nesting season, one (1) or a combination of the following window treatments are required on all windows of single and multistory structures.

1. Blackout draperies or shade-screens

2. Window tint/film with a shading coefficient (the percent of incident radiation passing through a window) of 0.37 to 0.45.

3. The turning off of all unnecessary interior lights.

4. Rearrangement of lamps and other moveable fixtures away from windows.

(c) Publicly Owned Lighting.

(1) Lighting for pedestrian traffic.

a. Beach access points, dune crossovers, beach walkways, piers or any other structure on or seaward of the primary dune designed for pedestrian traffic shall use the minimum amount of light necessary to ensure safety.

b. Lighting for pedestrian traffic shall be of low intensity and recessed or shielded so that the source light is not directly visible from the beach.

(2) Street and park lighting.

a. Streetlights shall be located so that the bulk of their illumination will travel away from the beach. These lights shall be equipped with shades or shields that will prevent backlighting and render such lights not visible from the beach.

b. Lights at parks and other public beach access points shall be properly positioned or shielded so that no light illuminates the beach.

(3) Other light sources.

a. Parking lots and roadways, including any paved or unpaved area upon which motorized vehicles will operate, shall be designed and/or positioned such that vehicular headlights do not cast light on the beach. This shielding may be accomplished by the use of hedges, dune vegetation and or other ground level barriers.

b. All other publicly owned lighting not specifically mentioned in the above sections that has the capability of illumination of the beach must either be:

1. Retrofitted with screening, shielding, or repositioned so that no light is illuminated onto the beach, or

2. Turned off between the hours of 9:00 p.m. and 6:00 a.m. during the nesting season.

(d) Retrofitting. Should it be determined that existing exterior lighting is not in compliance, one or a combination of the following measures shall be taken to reduce or eliminate the negative effects of existing exterior artificial lighting:

(1) Repositioning fixtures so that the point source of light or any reflective surface of the light fixture is no longer visible from the beach.

(2) Replacement of fixtures having an exposed light source with fixtures containing recessed light sources or shields.

(3) Replacement of traditional light bulbs with yellow "bug" type bulbs not exceeding 50 watts.

(4) Replacement of non-directional fixtures with directional fixtures that point down and away from the beach.

(5) Replacement of fixtures having transparent or translucent coverings with fixtures having opaque shields covering an arc of at least one hundred and eighty (180) degrees and extending an appropriate distance below the bottom edge of the fixture on the seaward side so that the light source or any reflective surface of the light fixture is not visible from the beach.

(6) Replacement of pole lamps with low-profile, low-level luminaries so that the light source or any reflective surface is not visible from the beach.

(7) Replacement of incandescent, fluorescent, and high intensity lighting with the lowest wattage low pressure sodium vapor lighting possible for the specific application.

(8) Planting or improvement of vegetation buffers between the light source and the beach to screen light from the beach.

(9) Construction of a ground level barrier to shield light sources from the beach. Ground-level barriers must not interfere with marine turtle nesting or hatchling emergence, or cause short- or long-term damage to the beach/dune system.

(10) Permanent removal or disabling of any fixture which cannot be brought into compliance with the provision of these standards.

SECTION 6. PROHIBITION OF ACTIVITIES DISRUPTIVE TO SEA TURTLES

(a) Prohibition of horseback riding, campfires, and bonfires. Horseback riding, campfires, and bonfires shall be prohibited on or seaward of the primary dune during the nesting season. Areas of prohibition for these activities are also extended to all areas landward of the primary dune where sea turtles are known to nest.

(b) Prohibition of the operation of motorized vehicles. The operation of motorized vehicles, including but not limited to cars, off-road vehicles (ATV's), and motorcycles, is prohibited during nesting season times in those areas listed in Section 6(a). This restriction shall not apply to emergency and law enforcement vehicles or those permitted on the beach for bona-fide FDEP approved marine turtle conservation and/or research.

(c) Prohibiting disturbance or touching of sea turtles. Person(s) wishing to observe sea turtle nesting and/or hatching are encouraged to join a FDEP approved public awareness "turtle walk". Groups or individuals conducting public awareness turtle walks must obtain a permit from FDEP and follow FDEP guidelines. Any disturbing, touching, harassing, killing or taking of any sea turtle, hatchling, egg, or part of same is strictly prohibited.

SECTION 7. STANDARDS FOR HAND AND MECHANICAL BEACH CLEANING

A permit is required from both FDEP and the municipality /county for all mechanical beach cleaning activities designed to remove debris (both natural and manmade) from the beach, alter beach profiles, or disturb more than the upper two (2) inches of beach sediment through the use of motorized vehicles or other mechanical means. No permit is required for hand beach cleaning accomplished to remove litter, natural and man-made debris. When issuing a permit, the municipality/county shall take the conditions listed below into account. A permit may be denied if it is deemed by the appropriate authority that the mechanical beach cleaning process is not in compliance with such conditions.

(a) Equipment, methodologies and points of access shall be consistent with long term beach/dune preservation policies established by the municipality/county and state.

(b) Both hand and mechanical beach cleaning shall be confined to daylight hours (6:01 a.m. to 8:59 p.m.) during the specified nesting season.

(c) Any person engaging in mechanical beach cleaning activities during any portion of the nesting season shall prepare and submit a FDEP Information Form to Assess and Reduce Impacts to Marine Turtles (FMRI) in accordance with conditions set forth in Section 3(b) above.

(d) All mechanical beach cleaning operations shall be coordinated through the FDEP to ensure that these operations do not interfere with FDEP-sanctioned scientific studies of sea turtle nesting activities.

(e) In the aftermath of a natural event, such as a major storm or red tide, mechanical raking may occur if the beach area affected has been part of a sea turtle monitoring program and a bona fide research agency, with a Florida Department of Environmental Protection Turtle Permit, has certified that mechanical raking will not disturb any identified sea turtle nest and a copy of the required Florida Department of Environmental Protection field permit, for mechanical raking, has been filed with and approved by the municipality/county, and state, or the appropriate agencies.

SECTION 8. COMPLIANCE

(a) State compliance.

(1) The Information Form to Assess and Reduce Impacts to Marine Turtles shall be completed as stated in Section 3. The application will be reviewed by the Florida Department of Environmental Protection, Division of Beaches and Shores. Upon approval, the applicant will be issued a permit, such permit to incorporate marine turtle nesting conservation measures and special permit conditions (if any). A copy of the approved application and permit shall be provided to the municipality/county prior to commencement of construction.

(2) The applicant shall provide to the municipality/county copies of all permits related to the coastal construction, including, but not limited to, permits issued by the state and/or federal Department of Environmental Protection, and the United States Army Corps of Engineers

(b) Beachfront lighting approval.

(1) Prior to the issuance of a Certificate of Occupancy (CO) or final building approval, each construction activity will be inspected for compliance as follows:

a. Upon completion of construction activities, a registered Florida architect or certified professional

engineer or their designee shall conduct a site inspection, which includes a night survey with all beachfront lighting turned on.

b. The inspector shall prepare a report of the inspection findings attesting that all applicable exterior lighting installed in conjunction with the new construction complies with the standards set forth in Section 5(a).

c. The inspector shall sign and seal the inspection report, which includes a certification to and for reliance on by the municipality/county that:

1. The beachfront lighting has been constructed in accordance with both state and local ordinances.

2. The beachfront lighting does not illuminate areas seaward of the primary dune at the time of night inspection.

3. The beachfront light sources are not directly visible from the beach at the time of night inspection.

d. Failure to meet lighting standards contained in this section shall be cause for denial of CO or final building approval.

(c) Approval not exclusive. Approval of the state's FMRI application shall not relieve person(s) from complying with all other applicable conditions set out in this chapter or from mitigating against subsequent negative impacts to sea turtles, their nests or eggs, resulting from the approved activity.

(d) Periodic compliance inspections. Periodic nighttime lighting inspections shall be performed from the beach to determine the extent of compliance with this ordinance. These inspections shall be performed at least annually prior to the commencement of the main portion of the marine turtle nesting season and at least once during the marine turtle nesting season by a qualified agent of the municipality/county or a qualified person appointed or contracted by the municipality/county. Inspections shall include both public and private properties within jurisdictional boundaries.

SECTION 9. ADMINISTRATIVE EXEMPTIONS, VARIANCES, WAIVERS

(a) Authority to grant exemptions. It is the policy of the Board of City/County Commissioners to minimize artificial light illumination of the beach within their jurisdictional boundaries.

However, the Board of City/County Commissioners recognizes that the protection of sea turtles must be balanced with the health, safety and welfare interests of persons which may warrant more light or additional beach activity along some beaches. In recognition of the need to balance the interests of the sea turtle with interests of public safety, upon written application, the administrator shall have the authority to exempt any lighting or activities affected by this chapter from any or all provisions of this chapter.

(b) Criteria for granting exemption. In reaching a decision on a written application for exemption, the administrator shall make the following determinations:

(1) It shall be determined that there will be no significant adverse effect upon the surrounding lands and waters.

(2) It shall be determined that there will be no significant adverse effect upon the environmental quality of the area.

(3) It shall be determined that public safety will be adversely affected to a significant degree should the exemption not be granted.

(4) The exemption, if granted, shall be the minimum exemption that will make possible reasonable protection of both the sea turtles and the public safety concerns.

(c) Application. Application for exemption under this Section shall be made in writing on a form provided by the administrator, and shall include:

(1) A plan which shall depict the site, the location of all buildings or structures on the site, and the location of all lighting on site.

(2) An aerial photograph at a scale of one inch (1") equals three hundred feet (300').

(3) The nature of the exemption requested, and the limit of activity to take place on said parcel.

(4) Written reason(s) why the exemption should be approved.

(5) Any additional necessary or appropriate items which the administrator may require.

(d) Denial. If the administrator denies the exemption, the applicant may file an appeal of the administrator's written decision.

SECTION 10. EMERGENCIES

In the case of emergency conditions including, but not limited to hurricanes, windstorms, floods, freezes or other disasters, the requirements of these regulations may be waived by the appropriate authority, upon finding that such waiver is necessary to ensure that public or private work to restore order in the municipality/county will not be impeded.

SECTION 11. APPEALS

Any person may appeal a decision denying a permit required by this chapter within fifteen (15) days from the date of the decision. Appeal shall be made to the Board of Adjustment/Appeals by filing a written notice of appeal to cover the cost of publishing the notice of hearing the appeal. The appeal shall concisely state the grounds for the appeal. The Board shall hear and consider all facts material to the appeal and shall render a decision within fifteen (15) days from hearing the appeal. This decision shall be final except for appeals to the courts of the state.

SECTION 12. PENALTIES

(a) Whoever shall violate the provisions of this chapter shall be subject, upon conviction in a court of competent jurisdiction, to a fine not exceeding the sum of five hundred dollars ($500.00), or imprisonment in jail not exceeding sixty (60) days, or both such fine and imprisonment. Each day of the violation of the provisions of this chapter shall constitute a separate offense.

(b) In the event destruction of the plant, wildlife, or lands herein protected shall occur after work has commenced on a parcel of land prior to or after a building permit has been issued, the appropriate authority shall have the right and power to enter an order enjoining or terminating any work or activity on site with such order remaining in effect until removed by the commission or by a court of competent jurisdiction; provided, however, said authority shall present to the Commission within ten (10) days of date such order is entered, all facts sustaining same with copy thereof furnished to the offender; and the Commission shall resolve the issues at a public hearing no later than twenty-five (25) days from the date the original order is entered with a minimum of five (5) days written notice thereof to the offender.

(c) All of the monies received by way of fines shall be held in a separate account and used by the municipality/county solely for public education programs and maintenance of sea turtle habitat.

SECTION 13. SEVERABILITY

If any section, paragraph, sentence, clause, phrase, or word of this ordinance is for any reason held by the court to be unconstitutional, inoperative, or void, such holding shall not affect the remainder of this ordinance.

Florida Department of Natural Resources
INFORMATION FORM TO ASSESS AND REDUCE IMPACTS TO MARINE TURTLES

Please read the entire form and supporting documentation carefully before making entries. This form provides information to the Department regarding how the proposed project will impact marine turtles. This form also provides guidelines that will enable the applicant to modify the proposed project, if necessary, to reduce impacts to marine turtles. Unless otherwise determined by the Department, this form must be approved for all activities requiring a Coastal Construction Control Line (CCCL) permit.

Applicants are strongly encouraged to submit this form early in the CCCL application process to reduce the possibility of permitting delays. If, after reviewing this application, the applicant is still unsure about using the guidelines contained herein, the services of an environmental consultant familiar with sea turtle conservation should be secured to act as an agent for the applicant in developing the form.

Please mail the completed original form and all supporting documentation to the address below. Forms will be processed in the order they are received and incomplete forms will be returned for additional information. Notification of form approval or denial will be submitted to the Division of Beaches and Shores (DBS) project engineer. Unless otherwise requested, a copy of this notification will be sent concurrently to the applicant listed on Page 4.

RETURN COMPLETED FORM TO:
Bureau of Coastal Engineering and Regulation
Florida Department of Natural Resources
Division of Beaches and Shores
Mail Station 310
3900 Commonwealth Boulevard
Tallahassee, FL 32399
(904) 487-4475

AGENCY USE ONLY	
DBS/CCCL File Number:	
Date Received (DBS):	Initials:
Date Returned for Revision (DBS):	Initials:
Date Revision Received (DBS):	Initials:
Date Completed (DBS):	Initials:
Date Sent to DMR:	Initials:
Date Received (DMR):	Initials:
Date Approved:	Initials:

CCCL PROJECT GUIDELINES TO REDUCE IMPACTS TO MARINE TURTLES

SECTION 161.053(5)(C) FLORIDA STATUTE. The department may condition the nature, timing, and sequence of construction of permitted activities to provide protection to nesting sea turtles and hatchlings and their habitat, pursuant to s. 370.12, and to native salt-resistant vegetation and endangered plant communities.

SECTION 370.12(3)(D) FLORIDA STATUTE. Any application for a department permit or other type of approval for an activity that affects marine turtles or their nests or habitat shall be subject to conditions and requirements for marine turtle protection as part of the permitting or approval process.

CONSTRUCTION TIMING

The specific timing of all construction shall be included in the completed form. Construction or repair of any structure on the sea turtle nesting beach (e.g., dune walkovers, seawalls or other revetments, sandbags, groins or jetties, piers, etc.) or any other activity requiring beach disturbance (e.g., placing fill, dune revegetation, excavation, etc.) is strongly discouraged during the main portion of the nesting season, May 1 to October 31 (in areas of known leatherback nesting, special conditions may be imposed beginning March 1). Proposals to conduct such activities during the nesting season will require extended review by Department Staff and are unlikely to be approved unless emergency circumstances are demonstrated. These proposals may also require the applicant to contract the services of an entity possessing a special marine turtle permit to perform work involving marine turtles. Projects which result in permanent modification of nesting habitat may require the evaluation of long-term (multi-year) impacts on nesting activity.

Please Remember: Any construction activity that disrupts a nesting marine turtle, disrupts or destroys a sea turtle nest, or results in the injury or mortality of a marine turtle may subject the applicant to prosecution under the U.S. Endangered Species Act and Florida Statutes.

LIGHTING

General Information

The negative effects of beachfront lighting on marine turtle hatchlings and nesting females are well documented. Hatchlings emerge during hours of darkness, allowing them to make their journey to the sea when sand temperatures are low and terrestrial, avian, and aquatic predators comparatively few. Proper hatchling orientation depends largely on a visual response to light. Under natural conditions, the ocean presents the brightest and most open horizon, and this serves as a cue to hatchlings in their ocean-finding behavior. Artificial lights disrupt this behavior and attract hatchlings as they emerge from their nests. Visible light sources and the reflection or "glow" resulting from the cumulative effects of coastal lights both contribute to this problem. Instead of making their way to the ocean, hatchlings become misoriented and may wander extensively on the beach. Even for those hatchlings that eventually reach the ocean, unnecessary wandering increases their vulnerability to predation and expends limited energy stores. In addition, hatchlings may wander landward through beachfront property or across parking lots and highways toward light sources. Most die from desiccation, direct exposure to the morning sun, or contact with vehicles. Furthermore, beachfront lighting has been documented to negatively affect nesting females and often results in reduced or abnormal nesting activity.

General Guidelines

To prevent hatchling misorientation and adverse impacts to nesting turtles, installation of exterior lighting is strongly discouraged. If exterior lighting is proposed, the following general guidelines shall be followed. Adherence to these guidelines will help in developing an acceptable lighting plan. However, in some cases, specific site conditions may warrant more stringent lighting restrictions.

1. Lights should not be placed on the seaward side of the subject property or in any location visible from the nesting beach.

2. Lights positioned seaward of the landward toe of the dune (or its equivalent) are prohibited.

3. The light source or any reflective surface of the light fixture must not be visible from any point on the nesting beach. Illumination of any area of the nesting beach, either through direct illumination, reflective illumination, or cumulative illumination is prohibited.

4. Completely shielded downlights without interior reflective surfaces are preferred. All proposed fixtures shall be appropriately shielded, louvered, and/or recessed.

5. Fixtures shall be low mounted through the use of low bollards, ground level fixtures, or low wall mounts.

6. Lights proposed for the seaward side of the subject property must incorporate either shielded low pressure sodium lamps or low wattage (i.e., 50W or less) "bug" type bulbs. Exceptions may be granted for extremely low wattage bulbs (e.g., 5W).

7. Lights for purely decorative or accent purposes shall not be used on the seaward side of the subject property and, if proposed for the landward side shall be limited in number and intensity. The use of uplights is strongly discouraged and in most cases cannot be approved.

8. High intensity lighting, such as that proposed for roadways, shall utilize shielded low pressure sodium lamps. The number of fixtures shall be kept to a minimum and shall be positioned and mounted in a manner such that the point source of light or any reflective surface of the fixture is not visible from any point on the nesting beach. Light emanating from these fixtures may not directly or indirectly illuminate the nesting beach.

9. Only low intensity lighting shall be utilized in parking areas that are visible from any point on the nesting beach. This lighting shall be set on a base which raises the source of light no higher than 48" off the ground and shall be positioned and shielded such that the point source of light or any reflective surface of the light fixture is not visible from any point on the nesting beach. The light emanating from such fixtures may not directly or indirectly illuminate the nesting beach.

10. Parking lots and roadways, including any paved or unpaved area upon which motorized vehicles will operate, should be designed or positioned such that vehicular headlights do not cast light toward or onto the nesting beach. Hedges, native dune vegetation, and/or other ground-level barriers should be utilized to meet this objective.

11. During construction, temporary security lighting during the main portion of the sea turtle nesting season (May 1 - October 31) is strongly discouraged. If absolutely necessary, these lights shall be limited to the fewest number necessary. Security lights shall be completely shielded and low-mounted. Low pressure sodium vapor lamps or low wattage yellow "bug" type bulbs shall be utilized. Under no circumstances shall these lights directly or indirectly illuminate any area of the nesting beach.

12. Tinted glass or window film that meets a transmittance value of 45% or less (inside to outside transmittance) shall be utilized on all windows and glass doors visible from any point on the nesting beach.

Application Requirements

The applicant shall provide site plans (map view and profile view) plainly showing the location of all exterior lighting fixtures. Two copies of each site plan are required and all shall be drawn to scale and include a north arrow. For multiple story structures, a site plan is required for each floor. If each floor incorporates identical lighting plans, please indicate this and include only one site plan depicting a representative floor. Distinctive and clearly marked symbols shall be utilized to show the location of each type of proposed fixture. A detailed description of each fixture (cut sheet) shall be included. A table with the following column headings shall accompany the site plans:

SYMBOL	FIXTURE (name or stock number)	NUMBER OF FIXTURES	BULB WATTAGE AND TYPE (e.g., 40W yellow "bug" lamp)	TYPE OF MOUNT (e.g., wall, pole, bollard)	MOUNTING HEIGHT

PART ONE - APPLICANT INFORMATION

Please Type or Print.

CCCL Permit Applicant:
Agent of Applicant (if applicable):
Applicant (or Agent) Address:
Applicant (or Agent) Telephone Number(s):

Signature of Applicant or Agent	Date

CERTIFICATE OF CCCL PERMIT APPLICANT'S AUTHORIZATION

If this form is to be completed by an agent of the CCCL permit applicant of record, the agent shall submit this certificate by which the CCCL permit applicant authorizes the agent to act on his behalf for the purpose of completing this form.

I hereby authorize_____
to complete this form and to act in my behalf in matters pertaining to this form.

_____
Signature of CCCL Permit Applicant

_____
Printed or Typed Name of CCCL Permit Applicant. Also Name and Title of Person Signing if Representing a Corporation or Firm.

CAUTION: Providing information in this permit application or certification which you know to be false is a misdemeanor of the second degree pursuant to Section 837.06, Florida Statutes; and is punishable as is provided in Section 775.082, 775.083, or 775.084, Florida Statues.

PART TWO - PERMIT INFORMATION

PLEASE INDICATE THE STATUS OF THE FOLLOWING PERMITS.

	Permit or File Number	Date Applied	Date Issued
FDNR - DBS/CCCL			
Army Corps Engineers			
Dept. Environmental Reg.			
Water Management District			
Other (Specify):			

PART THREE - SITE INFORMATION AND PROJECT DESCRIPTION

City and County of Subject Parcel:_____

Street Address of Subject Parcel or Distance and Direction from Closest Established Street Address:

_____

_____

Legal Description of Subject Parcel Referencing DNR Monuments:_____

_____

_____

_____

Linear Feet of Shoreline Affected:_____

PLEASE GIVE A SPECIFIC DESCRIPTION OF THE PROJECT. ATTACH ADDITIONAL SHEETS IF NECESSARY. PHOTOGRAPHS OF THE PROJECT SITE ARE ALSO REQUESTED. STANDARD PRINT PHOTOGRAPHS SHALL BE LABELLED AND MARKED APPROPRIATELY TO CLEARLY INDICATE SPECIFIC ASPECTS OF THE PROPOSED PROJECT.

_____

_____

_____

_____

_____

_____

_____

_____

_____

PART FOUR - CONSTRUCTION INFORMATION

PROJECT SUMMARY. PLEASE CHECK APPROPRIATE ACTIVITY(IES).

Private Single Dwelling	[ ]	Commercial Structure	[ ]
Private Multi-Dwelling	[ ]	Beach Renourishment	[ ]
Public Works Project	[ ]	Dune Crossover/Access	[ ]
Beach/Dune Project	[ ]	Erosion Control Structure	[ ]
Beach Cleaning	[ ]	Other Construction	[ ]

SPECIFIC PROJECT INFORMATION. PLEASE CHECK THOSE ITEMS BELOW WHICH ARE PROPOSED FOR THE PROJECT. EACH ITEM CHECKED MUST BE INCLUDED ON THE APPROPRIATE SITE PLAN.

1. Buildings
   - a. New [ ]
   - b. Renovation/Addition [ ]
2. Recreational Facilities
   - a. Tennis Court [ ]
   - b. Swimming Pool [ ]
   - c. Other [ ]
3. Pedestrian Traffic Ways
   - a. Internal Walkway [ ]
   - b. Beach Walkway [ ]
   - c. Beach Access Point [ ]
   - d. Dune Crossover [ ]
   - e. Pier [ ]
   - f. Deck [ ]
   - g. Other Structure [ ]
4. Parking Lot/Roadway [ ]
5. Ground Level Barriers
   - a. Increasing Dune Height [ ]
   - b. Revegetation [ ]
   - c. Hedges [ ]
   - d. Privacy Fences [ ]
6. Dune Vegetation Sprinkler System [ ]
7. High Intensity Lighting [ ]
8. Low Intensity Lighting
   - a. Wallmount Fixtures [ ]
   - b. Landscape Fixtures [ ]
   - c. Balcony Fixtures [ ]
   - d. Parking Lot Lighting [ ]
   - e. Dune Crossover Lighting [ ]
9. Glass Doors or Windows [ ]

IF THERE ARE ANY OTHER ITEMS PROPOSED, BUT NOT ON THE PRECEDING CHECKLIST, PLEASE DESCRIBE BELOW.

DESCRIBE PROPOSED CONSTRUCTION SCHEDULE.

Construction Activity (please be specific)	Start Date	End Date

DESCRIBE VEHICLES, EQUIPMENT, AND MATERIALS TO BE USED SEAWARD OF THE LANDWARD TOE OF THE PRIMARY DUNE (IF APPLICABLE).

DESCRIBE POINTS OF ACCESS TO THE CONSTRUCTION SITE. IF BEACH ACCESS POINTS ARE TO BE USED, PLEASE DESCRIBE METHODS AND ROUTES PROPOSED FOR MOVING EQUIPMENT AND MATERIAL TO AND FROM THE PROJECT SITE VIA THE BEACH. PLEASE INCLUDE LOCATION OF BEACH ACCESS POINTS (IF APPLICABLE) AND DISTANCE FROM PROJECT SITE.

PART FIVE - ADDITIONAL INFORMATION

DESCRIBE ANY OTHER PROPOSED PROTECTIVE MEASURES TO ELIMINATE PROJECT IMPACTS TO MARINE TURTLES.

FLORIDA DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

Tom Gardner, Executive Director

Lawton Chiles
Governor

Jim Smith
Secretary of State

Bob Butterworth
Attorney General

Gerald Lewis
State Comptroller

Tom Gallagher
State Treasurer

Bob Crawford
Commissioner of Agriculture

Betty Castor
Commissioner of Education

Dear Applicant:

Pursuant to Section 370.12(3)(D), Florida Statute, effective July 1, 1991, any application for a department permit or other type of approval for an activity that affects marine turtles or their nests or habitat shall be subject to conditions and requirements for marine turtle protection as part of the permitting or approval process.

Submission of the Information Form to Assess and Reduce Impacts to Marine Turtles DNR FMRI 33-718 1/26/90, rev. 3/1/90, 4/6/90, 6/27/91 is required as a completion item for permit applications under Section 161.041 and 161.053, F.S.

The information provided on the form shall be used to assess impacts on marine turtles and to incorporate into the permit, marine turtle nesting conservation measures and special permit conditions within the Chapter 120, F.S. permit review time frame.

If you have any questions regarding the form or in general, please contact me at (904) 487-1262, or at the letterhead address, Mail Station 315.

Sincerely,

DIVISION OF BEACHES AND SHORES

M. W. Sole, Environmental Specialist
Office of Beach Management

/mws

CHAPTER 16B-55
MODEL LIGHTING ORDINANCE FOR MARINE TURTLE PROTECTION

16B-55.001 Purpose and Intent.
16B-55.002 Definitions.
16B-55.003 Marine Turtle Nesting Areas.
16B-55.004 General Guidance to Local Governments.
16B-55.005 Prohibition of Activities Disruptive to Marine Turtles.
16B-55.006 Model Standards for New Beachfront Lighting.
16B-55.007 Model Standards for Existing Beachfront Lighting.
16B-55.008 Proposed Enforcement and Penalties.
16B-55.009 Monitoring and Reporting Guidance.

16B-55.001 Purpose and Intent. The purpose of this rule is to implement Section 161.163, Florida Statutes, which requires the department to designate coastal areas utilized, or likely to be utilized, by sea turtles for nesting, and to establish guidelines for local government regulations that control beachfront lighting to protect hatching sea turtles. This rule is intended to guide local governments in developing ordinances which will protect hatchling marine turtles from the adverse effects of artificial lighting, provide overall improvement in nesting habitat degraded by light pollution, and increase successful nesting activity and production of hatchlings.
Specific Authority 161.163 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.002 Definitions.

(1) "Artificial light" or "artificial lighting" means the light emanating from any human-made device.

(2) "Beach" means the zone of unconsolidated material that extends landward from the mean low water line to the place where there is a marked change in material or physiographic form, or to the line of permanent vegetation, usually the effective limit of storm waves.

(3) "Bug" type bulb means any yellow colored light bulb that is marketed as being specifically treated in such a way so as to reduce the attraction of bugs to the light.

(4) "Coastal construction activities" means any work or activity that is likely to have a material physical effect on existing coastal conditions or natural shore and inlet processes.

(5) "County" means Bay, Brevard, Broward, Charlotte, Citrus, Collier, Dade, Dixie, Duval, Escambia, Flagler, Franklin, Gulf, Hernando, Indian River, Jefferson, Lee, Levy, Manatee, Martin, Monroe, Nassau, Okaloosa, Palm Beach, Pasco, Pinellas, St. Johns, St. Lucie, Santa Rosa, Sarasota, Suwanee, Taylor, Volusia, Wakulla, and Walton Counties.

(6) "Cumulatively illuminated" means illuminated by numerous artificial light sources that as a group illuminate any portion of the beach.

(7) "Department" means the Florida Department of Natural Resources.

(8) "Directly illuminated" means illuminated as a result of glowing element(s), lamp(s), globe(s), or reflector(s) of an artificial light source which is visible to an observer on the beach.

(9) "Dune" means a mound or ridge of loose sediments, usually sand-sized, lying landward of the beach and deposited by any natural or artificial mechanism.

(10) "Frontal dune" means the first natural or man-made mound or bluff of sand which is located landward of the beach and which has sufficient vegetation, height, continuity, and configuration to offer protective value.

(11) "Ground-level barrier" means any vegetation, natural feature or artificial structure rising from the ground which prevents beachfront lighting from shining directly onto the beach-dune system.

(12) "Hatchling" means any species of marine turtle, within or outside of a nest, that has recently hatched from an egg.

(13) "Indirectly illuminated" means illuminated as a result of the glowing element(s), lamp(s), globe(s), or reflector(s) of an artificial light source which is not visible to an observer on the beach.

(14) "Local government" means any county listed in (4) above and any municipality, community development district, or special taxing district within those counties.

(15) "Marine turtle" means any marine-dwelling reptile of the families Cheloniidae or Dermochelyidae found in Florida waters or using the beach as nesting habitat, including the species: *Caretta caretta* (loggerhead), *Chelonia mydas* (green), *Dermochelys coriacea* (leatherback), *Eretmochelys imbricata* (hawksbill), and *Lepidochelys kempi* (Kemp's ridley). For purposes of this rule, marine turtle is synonymous with sea turtle.

(16) "Nest" means an area where marine turtle eggs have been naturally deposited or subsequently relocated.

(17) "Nesting season" means the period from May 1 through October 31 of each year for all counties except Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward. Nesting season for Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward counties means the period from March 1 through October 31 of each year.

(18) "Nighttime" means the locally effective time period between sunset and sunrise.

(19) "Person" means individuals, firms, associations, joint ventures, partnerships, estates, trusts, syndicates, fiduciaries, corporations, and all other groups or combinations.

(20) "Tinted glass" means any glass treated to achieve an industry-approved, inside-to-outside light transmittance value of 45% or less. Such transmittance is limited to the visible spectrum (400 to 700 nanometers) and is measured as the percentage of light that is transmitted through the glass.

Specific Authority 161.163 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.003 Marine Turtle Nesting Areas. Scientific investigations have demonstrated that marine turtles can nest along the entire coastline of the state. Historical data are not sufficient to exclude any county as an area utilized by marine turtles for nesting. For the purposes of this rule, however, the coastal areas of the state utilized, or likely to be utilized, by marine turtles for nesting include all beaches adjoining the waters of the Atlantic Ocean, the Gulf of Mexico, and the Straits of Florida and located within Bay, Brevard, Broward, Charlotte, Collier, Dade, Duval, Escambia, Flagler, Franklin, Gulf, Indian River, Lee, Manatee, Martin, Monroe, Nassau, Okaloosa, Palm Beach, Pinellas, St. Johns, St. Lucie, Santa Rosa, Sarasota, Volusia, and Walton Counties; and all inlet shorelines of those beaches.
Specific Authority 161.63 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.004 General Guidance to Local Governments.

(1) The responsibility for protecting nesting female and hatchling marine turtles should be a joint responsibility of local government and the department. Local governments are encouraged to adopt, implement, and enforce the guidelines provided herein to assist in that responsibility. Local governments that have adopted less stringent regulations should consider amending existing ordinances to provide greater protection to nesting marine turtles and hatchlings. In the process of implementing these guidelines, the following management goals should also be considered by local governments:

(a) Public Awareness. Any person submitting an application for coastal construction activities within the jurisdictional boundaries of the local government should be informed of the existence of and requirements within the local government's ordinances concerning artificial lighting and marine turtle protection.

(b) Local Government — Department Communication. Upon adoption of these guidelines, a system of communication between the local government and the department should be developed if it does not already exist. Protection of marine turtle nesting habitat, nesting females, and hatchlings is greatly enhanced when local governments manage their beaches and coastal activities in a manner consistent with prudent marine turtle conservation strategies. The department is ready to assist local governments by providing such conservation information and other technical assistance.

(c) Inter-Governmental Cooperation. Upon adoption of these guidelines, local governments should develop a system for receiving copies of permits issued by the department, the Department of Environmental Regulation, or the United States Army Corps of Engineers for any coastal construction within the local government's jurisdiction. Activities permitted by these agencies should be assessed for compliance with the local government's lighting ordinance.

(d) Enforcement. Local governments should develop a process for the consistent and effective enforcement of adopted guidelines. This process should include at least one compliance inspection of the beach conducted at night prior to the commencement of the main portion of the marine turtle nesting season and one compliance inspection conducted during the marine turtle nesting season.

(2) The department considers the provisions of this Chapter to be minimum guidelines for the protection of nesting habitat, nesting females, and hatchling marine turtles from the negative effects of artificial lighting. More stringent standards for marine turtle protection may be adopted by local governments. Prior to adoption of any additional standards, local governments are encouraged to consult with the department to ensure that the proposed standards are consistent with the guidelines set forth herein and with all other applicable department rules.
Specific Authority 161.63 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.005 Prohibition of Activities Disruptive to Marine Turtles. The following activities involving direct illumination of portions of the beach should be prohibited on the beach at nighttime during the nesting season for the protection of nesting females, nests, and hatchling marine turtles:

(1) The operation of all motorized vehicles, except emergency and law enforcement vehicles or those permitted on the beach for marine turtle conservation or research.

(2) The building of campfires or bonfires.
Specific Authority 161.63 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.006 Model Standards for New Beachfront Lighting. In order to provide the highest level of protection for nesting marine turtles and their hatchlings, local governments should adopt all of the following standards for artificial light sources on all new coastal construction:

(1) Exterior artificial light fixtures shall be designed and positioned so that:

(a) The point source of light or any reflective surface of the light fixture is not directly visible from the beach;

(b) Areas seaward of the frontal dune are not directly or indirectly illuminated; and

(c) Areas seaward of the frontal dune are not cumulatively illuminated.

(2) Exterior artificial light fixtures within direct line-of-sight of the beach are considered appropriately designed if:

(a) Completely shielded downlight only fixtures or recessed fixtures having low wattage (i.e., 50 watts or less) "bug" type bulbs and non-reflective interior surfaces are used. Other fixtures that have appropriate shields, louvers, or cut-off features may also be used if they are in compliance with subsection (1)(a), (b), and (c) above; and

(b) All fixtures are mounted as low in elevation as possible through use of low-mounted wall fixtures, low bollards, and ground-level fixtures.

(3) Floodlights, uplights or spotlights for decorative and accent purposes that are directly visible from the beach, or which indirectly or cumulatively illuminate the beach, shall not be used.

(4) Exterior lights used expressly for safety or security purposes shall be limited to the minimum number and configuration required to achieve their functional role(s). The use of motion detector switches that keep lights off except when approached and that switch lights on for the minimum duration possible are preferred.

(5) Only low intensity lighting shall be used in parking areas within line-of-sight of the beach. Such lighting shall be:

(a) Set on a base which raises the source of light no higher than 48 inches off the ground; and

(b) Positioned or shielded so that the light is cast downward and the source of light or any reflective surface of the light fixture is not visible from the beach and does not directly or indirectly illuminate the beach.

(6) Parking areas and roadways, including any paved or unpaved areas upon which motorized vehicles will park or operate, shall be designed and located to prevent vehicular headlights from directly or indirectly illuminating the beach.

(7) Vehicular lighting, parking area lighting, and roadway lighting shall be shielded from the beach through the use of ground-level barriers. Ground-level barriers must not interfere with marine turtle nesting or hatchling emergence, or cause short- or long- term damage to the beach/dune system.

(8) Tinted glass shall be installed on all windows and glass doors of single or multi-story structures within line-of-sight of the beach.

(9) Use of appropriately shielded low pressure sodium vapor lamps and fixtures shall be preferred for high-intensity lighting applications such as lighting parking areas and roadways, providing security, and similar applications.

(10) Temporary lighting of construction sites during the marine turtle nesting season shall be restricted to the minimal amount necessary and shall incorporate all of the standards of this section.
Specific Authority 161.63 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.007 Model Standards For Existing Beachfront Lighting. In order to provide the highest level of protection for nesting marine turtles and their hatchlings, local governments should adopt all of the following standards for existing artificial beachfront lighting sources:

(1) Existing artificial light fixtures shall be repositioned, modified, or removed so that:

(a) The point source of light or any reflective surface of the light fixture is not directly visible from the beach;

(b) Areas seaward of the frontal dune are not directly or indirectly illuminated; and

(c) Areas seaward of the frontal dune are not cumulatively illuminated.

(2) The following measures shall be taken to reduce or eliminate the negative effects of existing exterior artificial lighting:

(a) Reposition fixtures so that the point source of light or any reflective surface of the light fixture is no longer visible from the beach;

(b) Replace fixtures having an exposed light source with fixtures containing recessed light sources or shields;

(c) Replace traditional light bulbs with yellow "bug" type bulbs not exceeding 50 watts;

(d) Replace non-directional fixtures with directional fixtures that point down and away from the beach;

(e) Replace fixtures having transparent or translucent coverings with fixtures having opaque shields covering an arc of at least 180 degrees and extending an appropriate distance below the bottom edge of the fixture on the seaward side so that the light source or any reflective surface of the light fixture is not visible from the beach;

(f) Replace pole lamps with low-profile, low-level luminaries so that the light source or any reflective surface of the light fixture is not visible from the beach;

(g) Replace incandescent, fluorescent, and high intensity lighting with the lowest wattage low pressure sodium vapor lighting possible for the specific application;

(h) Plant or improve vegetation buffers between the light source and the beach to screen light from the beach;

(i) Construct a ground level barrier to shield light sources from the beach. Ground-level barriers must not interfere with marine turtle nesting or hatchling emergence, or cause short- or long- term damage to the beach/dune system;

(j) Permanently remove or permanently disable any fixture which cannot be brought into compliance with the provisions of these standards.

(3) The following measures shall be taken to reduce or eliminate the negative effects of interior light emanating from doors and windows within line-of-sight of the beach:

(a) Apply window tint or film that meets the standards for tinted glass;

(b) Rearrange lamps and other moveable fixtures away from windows;

(c) Use window treatments (e.g., blinds, curtains) to shield interior lights from the beach; and

(d) Turn off unnecessary lights.
Specific Authority 161.63 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.008 Proposed Enforcement and Penalties. Enforcement, appeal, and remedy of matters related to this Chapter should be regulated pursuant to procedures established under local ordinances. Penalties for non-compliance should be established and should be sufficient to discourage violations. Enforcement capability should be adequate to respond to possible violations within

the timeframe necessary to prevent continued and prolonged impacts to marine turtles and hatchlings.
Specific Authority 161.63 FS. Law Implemented 161.163 FS. History—New 3-30-93.

16B-55.009 Monitoring and Reporting Guidance. The following information should be compiled on an annual basis and submitted to the department.

(1) Number of lighting applications reviewed;
(2) Number of potential violations reported;
(3) Number of potential violations investigated;
(4) Disposition of all potential violations including results of enforcement actions and amounts of penalties assessed;
(5) Results of compliance checks conducted prior to and during the marine turtle nesting season; and
(6) Status of local lighting ordinances and any amendments to those ordinances.
Specific Authority 161.63 FS. Law Implemented 161.163 FS. History—New 3-30-93.

APPENDIX F

TOWN OF MELBOURNE BEACH

MELBOURNE BEACH REVEGETATION PROJECT
SCRUB JAY PROGRAM

WHERE: COMMUNITY CENTER

WHEN: THURSDAY, FEBRUARY 24 AT 7:00PM

BE A PART OF THE ONGOING EFFORT TO HELP SAVE THREATENED AND ENDANGERED WILDLIFE.

COME LEARN ABOUT THE THREATENED SCRUB JAY, WHERE THEY LIVE, AND HOW YOU CAN HELP PROTECT AND RESTORE THEIR HABITAT RIGHT HERE IN MELBOURNE BEACH.

KIM ZARILLO OF THE FLORIDA NATIVE PLANT SOCIETY WILL PRESENT A SLIDE SHOW ABOUT SCRUB HABITAT AND THE FLORIDA SCRUB JAY.
DAVE CLAY OF THE ENVIRONMENTAL ADVISORY BOARD WILL DESCRIBE THE TOWN'S HABITAT RESTORATION AND PROTECTION PROJECT, FUNDED BY A GRANT FROM THE FLORIDA COASTAL MANAGEMENT PROGRAM, THAT WILL INVOLVE REVEGETATING SOME AREAS OF THE TOWN WITH SCRUB PLANTS.

REFRESHMENTS WILL BE PROVIDED

WE LOOK FORWARD TO YOUR INVOLVEMENT IN THIS EXCITING PROJECT!

IF YOU HAVE ANY QUESTIONS PLEASE CALL:

KATIE FLAHERTY
MARINE RESOURCES COUNCIL
952-0102

ED WASHBURN
TOWN MANAGER
724-5860

507 OCEAN AVENUE, MELBOURNE BEACH, FL 32951-2523 • (407) 724-5860 FAX: (407) 984-8994

APPENDIX G

VEGETATIVE SPECIES USED IN
MELBOURNE BEACH HABITAT RESTORATION PROJECT

Tree species

Trees	Scientific Name
Myrtle oak	Quercus myrtifolia
Sand live oak	Quercus geminata
Chapman oak	Quercus chapmanii
Live oak	Quercus virginiana

Understory species

Small trees and shrubs	Scientific Name
Tough bumelia	Bumelia tenax
French mulberry	Callicarpa americana
Varnish leaf	Dodonaea viscosa
Hercules club	Zanthoxylum clava-herculis
Coral bean	Erythrina herbacea

Groundcover species

Groundcover	Scientific Name
Wire grass	Aristida stricta
Dune sunflower	Helianthus debilis
Indian blanket flower	Gaillardia pulchella

APPENDIX H

NOTE: This letter was prepared on Melbourne Beach letterhead and signed by the Town Mayor.

August 10, 1994

Larry Beaulier
209 Fir Avenue
Melbourne Beach, FL 32951

Dear Mr. Beaulier:

The Town of Melbourne Beach is the recipient of a state grant to do an area neighborhood revegetation project. This project consists of planting trees and understory shrubs on residential properties, thereby restoring native habitat for butterflies, scrub jays and other birds, while providing a buffer between the park and the homeowner's property.

The neighbors on Fir Avenue and adjacent lots are being asked for their participation in this project. Oak trees as well as some understory plants will planted in each neighbor's backyard. There is no cost to you - the grant provides for the plants, volunteers will provide the labor, and the town will provide the mulch. We do ask two things of the participants - that they provide a specific location for us to plant and that they will provide watering once or twice a week for the plants until they become established. A watering schedule will be provided to each resident.

We ask for your participation in this project - what better way to beautify your yard with free plants while helping to restore some of Melbourne Beach's natural habitat.

We will be contacting people shortly to obtain their permission to plant in their yards. As you are not currently listed in the directory, we would appreciate you contacting Ed Washburn, Town Manager at 724-5860, or Janet Merkt at 952-0102. Either person will be able to answer any questions you may have. We look forward to your cooperation!

Sincerely,

James M. Kelley

Mayor

APPENDIX I

EXOTIC PEST PLANT COUNCIL'S 1993 LIST OF FLORIDA'S MOST INVASIVE SPECIES

Category I - Species that are widespread in Florida and have an established potential to invade and disrupt native plant communities.

Abrus precatorius [rosary pea]
Acacia auriculiformis [earleaf acacia]
Ardisia elliptica [=*A. humilis*] [shoebutton ardisia]
Casuarina equisetifolia [=*C litorea*] [Australian pine]
Casuarina glauca [suckering Australian pine]
Cinnamomun camphora [camphor-tree]
Colubrina asiatica [lather leaf]
Cupaniopsis anacardioides [carrotwood]
Dioscorea bulbifera [air potato]
Eichhornia crassipes [water hyacinth]
Ficus microcarpa [=*F. nitida*; =*F. retusa* var. *nitida*] [laurel fig]
Hydrilla verticillata [hydrilla]
Ipomoea aquatica [water spinach]
Jasminum dichotomum [Gold Coast jasmine]
Lantana camara [lantana]
Lonicera japonica [Japanese honeysuckle]
Lygodium microphyllum [Old World climbing fern]
Melaleuca quinquenervia [melaleuca]
Melia azedarach [Chinaberry]
Mimosa pigra [catclaw mimosa]
Neyraudia reynaudiana [Burma reed; cane grass]
Paederia foetida [skunk vine]
Panicum repens [torpedograss]
Pistia stratiotes [water lettuce]
Pueraria montana [=*P. lobata*] [kudzu]
Rhodomyrtus tomentosus [downy myrtle]
Sapium sebiferum [popcorn tree; Chinese tallow tree]
Scaevola taccada var. *sericea* [=*S. frutescens*; =*S. sericea*] [scaevola; half-flower]
Schefflera actinophylla [=*Brassaia actinophylla*] [schefflera]
Schinus terebinthifolius [Brazilian pepper]
Solanum viarum [tropical soda apple]

Category II - Species that are localized but have a rapidly expanding population, or that have shown a potential to invade and disrupt native vegetation in other areas, or in other countries with climates similar to that of Florida.

Adenanthera pavonina [red sandlewood]
Agave sisalana [sisal hemp]
Albizia lebbeck [woman's tongue]
Alternanthera philoxeroides [alligator weed]
Antigonon leptopus [coral vine]
Asparagus densiflorus [asparagus fern]
Asystasia gangetica [Ganges primrose]
Bauhinia variegata [orchid tree]
Bischofia javanica [bischofia]
Callisia fragrans [inch plant, spironema]
Calophyllum calaba [=C. inophyllum of authors] [mast wood; Alexandrain laurel]
Casunarina cunninghamiana [Australian pine]
Cereus undatus [night-blooming cereus]
Cestrum diurnum [day jasmine]
Colocasia esculenta [taro]
Cryptostegia grandiflora [Palay rubber vine]
Dalbergia sisso [Indian dalbergia, sissoo]
Dichrostachys cinerea ["aroma" in Cuba]
Enterolobium contortisiliquum [ear-pod tree]
Epipremnum pinnatum cv. *Aureum* [pothos]
Eugenia uniflora [Surinam cherry]
Ficus altissima [banyan tree]
Ficus benjamina [weeping fig]
Ficus elastica [Indian rubber tree]
Flacourtia indica [governor's plum]
Flueggea virosa [flueggea]
Hibiscus tiliaceus [mahoe]
Hygrophila polysperma [green hygo]
Hyptage benghalensis [hyptage]
Imperata brasiliensis [cogon grass]
Imperata cylindrica [cogon grass]
Jasminum fluminense [jasmine]
Jasminum sambac [Arabian jasmine]
Leucaena leucocephala [lead tree]
Ligustrum sinense [privet]
Lygodium japonicum [Japanese climbing fern]
Macfadyena unguis-cati [cat's claw]
Manilkara zapota [sapodilla]
Melinis minutiflora [molasses grass]
Merremia tuberosa [wood rose]
Murraya paniculata [orange-jasmine]
Myriophyllum spicatum [Eurasian water-milfoil]
Nephrolepis multiflora [Asian sword fern]
Ochrosia parviflora [=*O. elliptica*] [kopsia]
Oeceoclades maculata [ground orchid]
Oryza rufipogon [red rice]
Paspalum notatum [Bahia grass]
Pennisetum purpureum [Napier grass]
Pittosporum pentandrum [pittosporum]
Pouteria campechiana [canistel]
Psidium guajava [guava]
Psidium littorale [=*P. cattleianum*] [strawberry juava]
Rhoeo spathacea [=*R. discolor*] [oyster plant]
Sansevieria hyacinthoides [=*S. trifasciata*] [bowstring hemp]
Solanum torvum [turkey berry]
Syngonium podophyllum [arrowhead vine]
Syzygium cumini [jambolan; Java plum]
Syzygium jambos [rose apple]
Tectaria incisa [incised halberd fern]
Terminalia catappa [tropical almond]
Thespesia populnea [seaside mahoe]
Triphasia trifoliata [lime berry]
Wedelia trilobata [wedelia]

Category III - Species that are widespread and can form dense, monotypic populations, but primarily found on distrubed sites such as roadsides, agricultural lands, and canal embankments.

Achyranthes indica [Devil's horsewhip]
Brachiaria mutica [Pará grass]
Cassia coluteoides [= Senna pendula] [climbing cassia]
Catharanthus roseus [Madagascar periwinkle]
Cynodon dactylon [Bermuda grass]
Dactyloctenium aegyptium [crowfoot grass]
Eremochloa ophiuroides [centipede grass]
Eucalyptus camaldulensis [Murray red gum]
Furcraea cabuya [Central American sisal]
Hyparrhenia rufa [jaraguá]
Indofera spicata [creeping indigo]
Kalanchoe pinnata [life plant]
Mucuna pruriens [cow itch]
Nephrolepis hirsutula cv. *superba* [petticoat fern]
Panicum maximum [Guinea grass]
Rhynchelytrum repens [Natal grass]
Ricinus communis [castor bean]
Rottboellia cochinchinensis [= R. exaltata] [itch grass]
Russelia equisetiformis [firecracker plant]
Selaginella willdenovii [peacock fern]
Sesbania emerus [= *S. exaltata*] [bequilla]
Solanum diphyllum [solanum]
Solanum tampicense [Tampico soda apple]
Spathodea campanulata [African tuplip tree]
Spermacoce verticillata [sensu Herndon, not sensu Wunderlin] [spermacoce]
Sporobolus jacquemontii [smut grass]
Stenotaphrum secundatum [St. Augustine grass]
Urena lobata [Caesar's weed]
Zebrina pendula [zebrina]

The Exotic Pest Plant Council was formed to focus attention on:

- the need to maintain biodiversity and the impacts exotic pest plants have on the diversity inherent in impacted systems;
- the impact of exotic plants on the integrity of native plant community composition and function;
- habitat losses due to exotic plant infestations;
- the impacts of exotic plnats on endangered species primarily due to habitat loss and alteration (e g . Cape Sable seaside sparrow);
- the need to prevent habitat loss and alteration by comprehensive management of exotic pest plants;
- the socioeconomic impacts of exotic pest plants (e.g., increased wildfire intensity and frequency in Melaleuca);
- changes in the seriousnesss of pest plants and to indicate which are the worst problems; and
- informing and educating resource managers about which species deserve to be monitored, and to help managers set priorities for management.

APPENDIX J

Certificate of Adoption

It is recognized that by the planting of trees and shrubs, our Town can acquire:

- Buffers from noise, dust, pollution, and lights
- Urban habitats for a variety of wildlife, including endangered species
- Improved air quality
- Improved climate and energy savings, as trees provide shade, block glare and release moisture to ease heat build-up

This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Congregation at St. Sebastian-By-The-Sea Episcopal Church

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

Oak Street

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor	City Manager	Chairman, EAB

APPENDIX K

MARINE RESOURCES COUNCIL OF EAST FLORIDA

Indian River Lagoon

September 9, 1994

The Green Family
211 Fir Avenue
Melbourne Beach, FL 32951

Dear Folks:

Thank you so much for participating in the Habitat Restoration Project in Melbourne Beach. Did you know that 100% of the residents on your block have participated in the project? Each resident has planted some trees and understory plants in their yards, and these combined with the plants put in the ballfield area will eventually create a greenway space. This space will provide a buffer from the ballfield areas, help reduce noise and pollution, provide shade and create a viable habitat for butterflies and birds.

In order to allow your plants to get a good start, they will need to be weeded, and watered about once a week (twice a week if the weather is very dry) until they are firmly established, after which time, they will need no supplemental water.

Please do not hesitate to call should you have any questions. Again we thank you (as do the birds!) for creating this wonderful legacy for both present and future generations to enjoy.

Sincerely yours,

Janet Merkt
Project Coordinator

PO BOX 22892 MELBOURNE, FLORIDA 32902-2892 407-952-0102 407-952-0103 FAX
LOCATED AT 5890 US1 IN GRANT, FLORIDA

APPENDIX L

MONDAY, July 18, 1994

FLORIDA TODAY

LOCAL

SECTION B

Melbourne Beach project targets wildlife areas

By Lou Misselhorn
FLORIDA TODAY

Melbourne Beach is using state money, volunteers and some creative planning to restore scrub land and find ways to protect it and other wildlife habitat on the south end of the barrier island.

The planning comes in the form of a model ordinance aimed at protecting and improving the town's wildlife areas, which range from sand dunes to hammocks.

Protecting the areas will allow the city to save some important residents, namely threatened scrub jays and endangered sea turtles that nest on the town's beaches each summer.

ENVIRONMENT

"We're pretty much built-out in Melbourne Beach, so anything we can do to help nature come back is important," said Town Manager Ed Washburn, whose community has received $18,760 from the state Department of Community Affairs for the project.

So far, community groups and young children have planted about an acre of vegetation at Gemini Elementary School.

Next month, the town will ask volunteers to plant vegetation in nearby Flutie Park and on residential properties. Workers also will plant scrub around a retention pond at St. Sebastian-By-The-Sea Episcopal Church.

Besides promoting wildlife, the newly planted areas are pleasing to the eye, scientists say.

"We have a generation that thinks open space is a ballfield," said Diane Barile of the Marine Resources Council, whose group is drawing up the ordinance for Melbourne Beach.

"I have nothing against ballfields, but there's something to be said for climbing a tree. We all know we have developed land, but that's not to say you can't have nature in your backyard," Barile said.

The idea has been popular. Curtis Byrd, chairman of the town's Environmental Advisory Board, said he has gotten about 50 volunteers to help with the project.

Among them have been the Friends of the Scrub, the Native Plant Society and the Rotary Club.

SCRUB NEWS

Fall 1994 Volume 3 Issue 3

CALENDAR

October 7, 8 & 9th
Environmental Expo -Orlando Expo Ctr.
FRIENDS OF THE SCRUB Booth #416

October 13th
Brevard Scrub Habitat Conservation Plan
Public Hearing of Preserve Alternatives.
7:00 PM, Viera, Bldg. C.

October 20th No FRIENDS OF THE SCRUB Meeting.
Special meeting details below.

October 21st , 7:00 PM
FRIENDS OF THE SCRUB meet with Audubon Society, Details below.

November 17th
FRIENDS OF THE SCRUB Meeting,
Speaker: Pat Loll, "The Gopher Tortoise"

December 15th
FRIENDS OF THE SCRUB Meeting,
Speaker : Hilary Swain, Ph.D.
"Compiling Data For Scrub Habitat Conservation Plan"

Scrub Vegetation Planting Project, Flutie Park, Melbourne Beach Photo By Martin Merkt, Story on Page 2.

TABLE OF CONTENTS

Habitat Conservation Plan ..... Page 2
Scrub Planting Projects ..... Page 2,3
Scrub Art & Essay Contest ..... Page 2
Legislative Alert ..... Page 3

FRIENDS OF THE SCRUB Meets With Audubon, Florida Native Plant Society and Sierra Club Friday Evening, October 21st, 7:00 PM Rockledge Presbyterian Church

FRIENDS OF THE SCRUB will not meet for the regularly scheduled meeting on October 20th in order to participate in an exciting joint meeting of local environmental organizations. Indian River Audubon Society is graciously hosting this meeting featuring Guest Speaker, **Charles Lee, legal council for Florida Audubon Society.** Mr. Lee will speak on the subject of private property rights and the Endangered Species Act. In addition, each organization will give a brief presentation describing the purpose and activities of their organization. Displays from each group will be set up. Cookies and punch will be provided. Rockledge Presbyterian Church is located at 921 Rockledge Drive (Corner of Orange Ave. & Rockledge Dr. along the Indian River Lagoon.) If you would like a map please call the SLT Office at 726-4126 and leave a message including your address or fax number.

Friends of the Scrub
3660 N. Riverside Drive
Indialantic, FL 32903
Phone: (407) 777-0839
Fax: (407) 726-4061

FRIENDS OF THE SCRUB meets the third Thursday of each month at St. Mark's United Methodist Church, at 7:30 PM, 2030 North A-1-A, Indialantic in the Community Room

BREVARD SCRUB CONSERVATION AND DEVELOPMENT PLAN

On September 15th, the Scientific Advisory Group presented design options for a county scrub sanctuary network to the Citizen Steering Committee.

A Public Hearing will be held on October 13th, at 7:00 PM in Building C at the County Government Center. The public is encouraged to provide their comments of the design alternatives to the Citizen Steering Committee.

For background information on the Scrub Conservation and Development Plan process and goals, a slide show produced by the Steering Steering Committee is available in video format in County Public Libraries. In addition, members of the Steering Committee are available to make presentations to interested groups. For further information contact Tami Townsend of the Brevard County Office of Natural Resources management at (407) 633-2016.

WILL THERE BE A CONTEST THIS YEAR?

FRIENDS OF THE SCRUB has been asked this question by art and science teachers whose students participated in the Art/Creative Writing CELEBRATE THE SCRUB contest in 1992 and 1993. The answer is yes and no! There will not be an Art contest in 1994 because we would like for students and teachers to learn more about the SCIENCE of the scrub ecosystem.

We have supplied the School Board's Media Center in Viera with four videotapes which can be borrowed or copied to give teachers and students some background information and inspiration. In order to give teachers time to work this into their class planning, we notified the assistant principals of each school in late August that we would have a SCIENCE CONTEST in the SPRING OF 1995. Teachers are to notify us of their interest by January 31, 1995 and we will send out contest instructions in early February.

We invite teacher input at any time. We are working with teachers at two schools which now have units on scrub ecology, and would like to encourage any schools located in scrub areas, with sandy soils which support scrub vegetation, to allow students to plant and care for scrub oaks and other scrub plant species. The first step is to find out how this fascinating ecosystem works by viewing the scrub videos available.

For additional information or teacher input, contact Friends of the Scrub Education Chair, Margaret Broussard, (407) 777-0839. If you do not have access to the School Board Media Center, videos can be borrowed from FRIENDS OF THE SCRUB.

IN MEMORY OF
JOY & BERT SNELL

FRIENDS OF THE SCRUB extend our sympathy to the Snell Family for the untimely passing of Burt & Joy. We thank their family, friends and business associates for the contributions made to FRIENDS OF THE SCRUB in their memory.

SCRUB JAY HOTELS UNDER CONSTRUCTION

Brevard County's barrier island scrub jay population needs your help! Due to rapid development, the native scrub ecosystem has been severely impacted, to the extent that dispersing scrub jays have difficulty foraging and finding protective cover. As some of the students at beachside schools can tell you, scrub jays need scrub oaks and other scrub vegetation to hide from hawks, to nest in, and for food supply. Each scrub jay harvests and "plants" 6,000 to 8,000 acorns each fall, to dig up for food in the winter.

FRIENDS OF THE SCRUB and the Condradina Chapter of the Florida Native Plant Society have assisted the Marine Resources Council, the Town of Melbourne Beach Environmental Advisory Committee, and Gemini Elementary School in re-vegetation projects along Oak Street, Flutie Park and Gemini Elementary. Scrub vegetation was purchased by a state grant from the Florida Department of Community Affairs, Coastal Management Program. Community volunteers planted the vegetation on August 27th. Special thanks goes to all the volunteers and organizations involved. The scrub jays quickly showed their approval by flying over and perching in the newly planted oaks.

Satellite Beach is the next in line to construct some scrub jay hotels. Church properties and residences will soon be planted with scrub vegetation. We have learned from experience that property owners must commit to the proper care and maintenance of the plants, especially within the first two years after they are planted. Churches, schools and residences must promise long-term maintenance before FRIENDS OF THE SCRUB and other participating organizations will invest time, money and effort in re-vegetation.

Re-vegetation projects are being targeted in neighborhoods presently inhabited by scrub jays. If you or your organization are interested in participating, please contact Margaret Broussard at 777-0839 or Christine Panico at 726-4126.

APPENDIX M

LIST OF FIGURES

Black and White Photos

1. This homeowner has planted evergreens and an oak tree, providing a buffer between his house and a busy road, reducing noise and visual pollution.

2. A buffer of trees and understory plants was installed in this rural community to shield the view of a small utility plant from the road. When the vegetation reaches full maturity, the utility plant should be virtually hidden.

3. and 4. These homeowners enjoy the shade of mature trees that reduce home cooling costs and add beauty to their landscape.

5. and 6. The revitalization of this downtown area included planting and preserving existing trees, creating an inviting area to shop.

7. This lot was clear cut before development. Although not visible in this picture, the entire quarter (1/4) acre lot is devoid of trees or shrubs. The only existing vegetative cover is turf grass.

8. This developer left pine tree stands on the lot, clearing only the minimum necessary for construction.

9. This natural areas is located next to a City Hall complex. Bird nests have been spotted in the dead tree located in the middle of the picture.

10. This building lot was cleared, leaving natural vegetated areas in the rear and on both sides of the lot.

11. and 12. The dead tree stands interspersed with live vegetation serve a vital role in bird nesting and roosting. Large osprey nests are often observed in these areas.

13. This site lacks vegetative cover between the tree stands and the pond. During heavy rains, erosion occurs and rivulets are seen to appear in the barren area as the soil washes into the pond.

14. Even tree stumps can serve a decorative purpose. A creative sculptor fashioned dolphins rising from the wood.

15. This monoculture of pine trees does not contribute as much to the biodiversity of the areas as does the vegetative area in Fig. 16.

16. A more biodiverse habitat, able to support a larger number of both animal and plant species.

17. Hedges are used as buffers between the road and parking lot to reduce headlight glare, soot, and noise pollution.

18. Canopy trees are used in this parking lot, providing shade and aesthetic appeal.

Color Photos

The self-explanatory photographs document the planting done at Flutie Park, the Episcopal Church and the homeowners' backyards. They are displayed in general order from preparation of the site to the finished result.

FIG 1

FIG. 2

FIG 3

FIG 4

FIG 5 ←

FIG 6 →

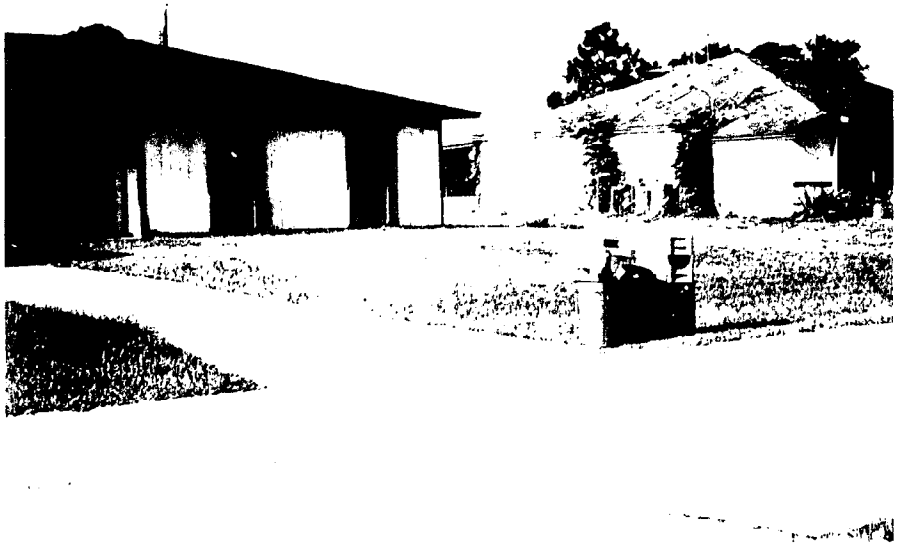


FIG 7 ←

FIG. 8 →

FIG 9 ←

FIG 10 →

FIG 11 ←

FIG 12 →

Fig 13

Fig 14

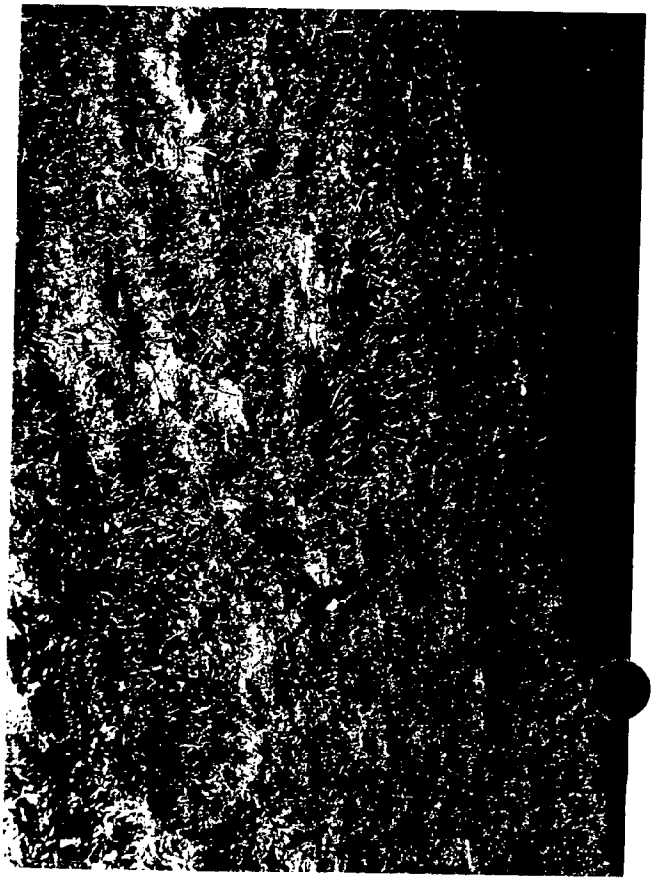
Fig. 15

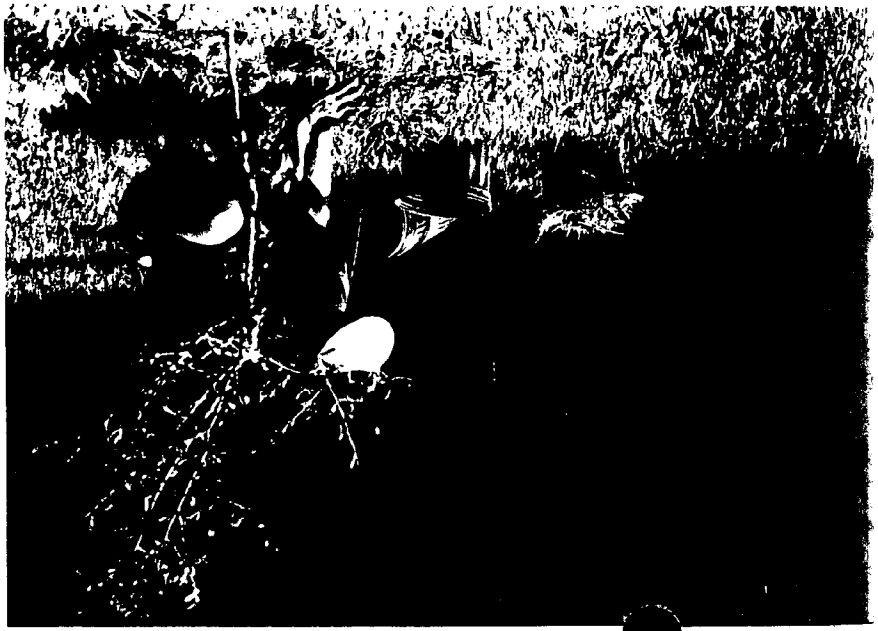
Fig 16

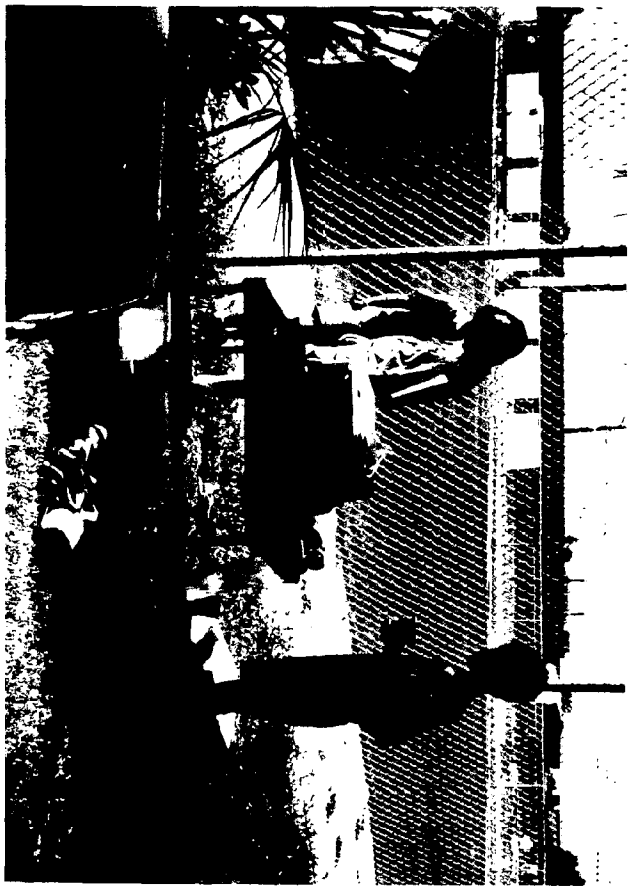
FIG 17

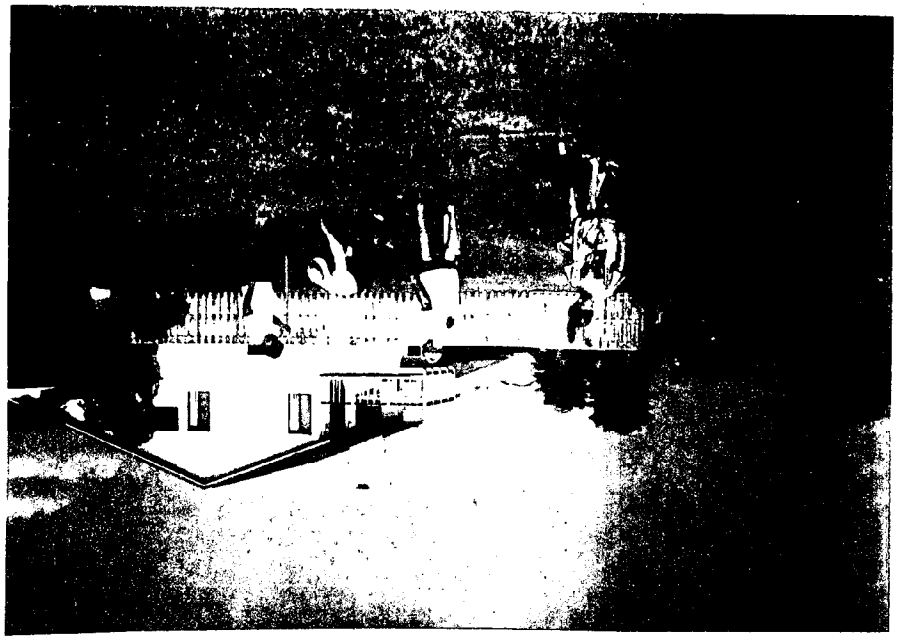
FIG 18

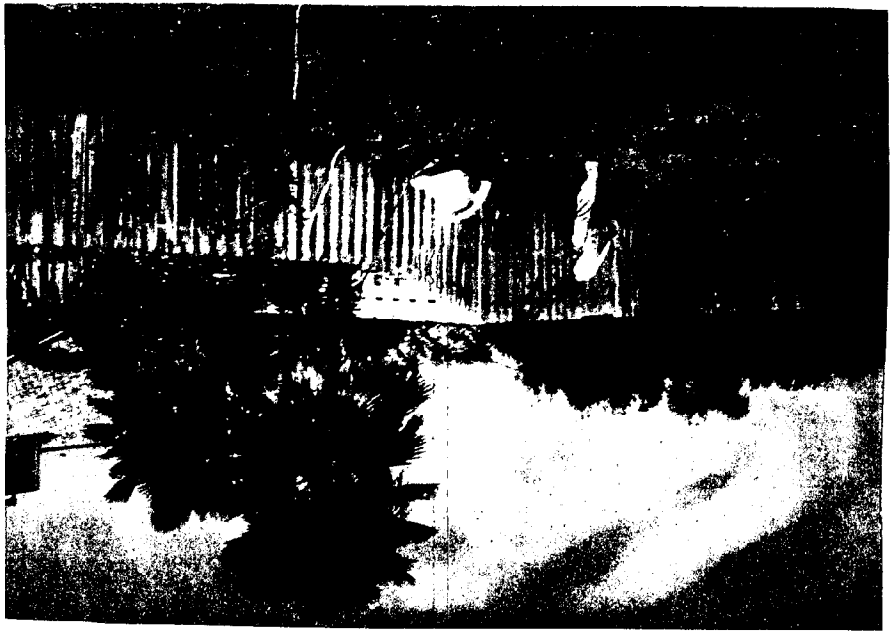
ST SEBASTIANS
BY THE SEA
EPISCOPAL CHURCH











MRC WELCOMES SUMMER INTERNS

This summer five graduate students from Florida Tech are working as interns at the Marine Resources Council (MRC). Kelli Karpick, Steve Tisa, and Mike Cacioppa, Master's degree students in Environmental Resource Management; Dan Popek, former Ph.D. student in Geological Oceanography; and Janet Merkt, Master's degree student in Coastal Zone Management.

MANAGEMENT PLAN FOR WETLANDS

Last year the MRC wrote a grant on behalf of St. Lucie County for matching funds from the Florida Communities Trust to acquire 350 acres of impounded mangrove area known as Bear Point Sanctuary. The MRC is further assisting the county with preparation of a wetlands management plan to incorporate greenways, mosquito control, public access, education, recreation, habitat restoration and protection. The plan would be a model for similar areas.

ST. LUCIE LAND PROPOSAL

Working on two acquisition proposals are DAN POPEK, Annette Barnard, and Diane Barile. Jim David and David Mook of St. Lucie Mosquito Control District are providing support for the project. The Fish House Cove site is a 167 acre impoundment with mangroves and a tropical upland hammock usually found farther south. The second site, 27-acre Ocean Bay, is south of the nuclear plant and extends from ocean to lagoon, including maritime hammock. Jane Brooks is assisting with the surveys.

MELBOURNE BEACH HABITAT

This project, funded by a grant from the Florida Coastal management Program involves restoration and protection. While restoring habitat for Scrub Jays the Melbourne Beach Environmental Advisory Board and the city staff are educating citizens. The Friends of the Scrub and the Conradina Chapter of the Florida Native Plant Society are providing expert guidance and help. The students at Gemini Elementary have established Scrub Jay habitat on their campus. A Model ordinance dealing with scrub, turtle beaches, hammocks, and other natural areas is in final draft with Kelli Karpick assisting.

Katie Flaherty completed her work on this project, earned a degree at Florida Tech, and was married on June 18th in Ohio. Best wishes, Katie!

WILL CLAMS CLEAN THE LAGOON?

The MRC has embarked on a project that may answer a question being debated in communities along the Lagoon. The residents of South Patrick Shores began an experiment in June '92 with the cooperation of Dan McLister, Manatee Bay Shellfish, Inc. to grow clams in their residential canals to improve the water quality. Jim Conner, Pres. of South Patrick Residents Assoc. had learned of such a program in Chesapeake Bay. To further the project Conner called MRC who obtained the services of STEPHEN TISA and MICHAEL CACIOPPO, graduate students at Florida Tech, who are now implementing a program in finger canals in South Patrick Shores. First, a team of experts walk the neighborhood, making land use recommendations to the homeowners in an effort to reduce their impact upon the Lagoon. (Brevard Co. Surface Water Improvement Div. is installing pollution abatement structures in the area). Clams will be planted in some of the canals; other canals will be controls. A permanent water quality monitoring system will be installed, monitoring every 2 weeks for the next 12 months. Data entered into the database should indicate whether clams improve water quality, and what effect land use improvements have on water quality. Results will be published and distributed to the homeowners.

Want to help? Call Jim Conner.

ECO-SCHOOL PROJECT

Following the successful program at Hans C. Anderson and Gemini schools, Palm Bay Elementary is next. JANET MERKT will be working with James Padula, Principal, and Blair Edwards, teacher, to set sound resource management in classroom, cafeteria, and playground. Composing, recycling, landscaping with natives, butterfly and wildlife gardening, bird houses and an osprey platform are some of the activities. Funds are short and donations are needed for landscaping, bird houses, educational materials, etc.

To find out how to help please call JANET at (407) 952-0102.

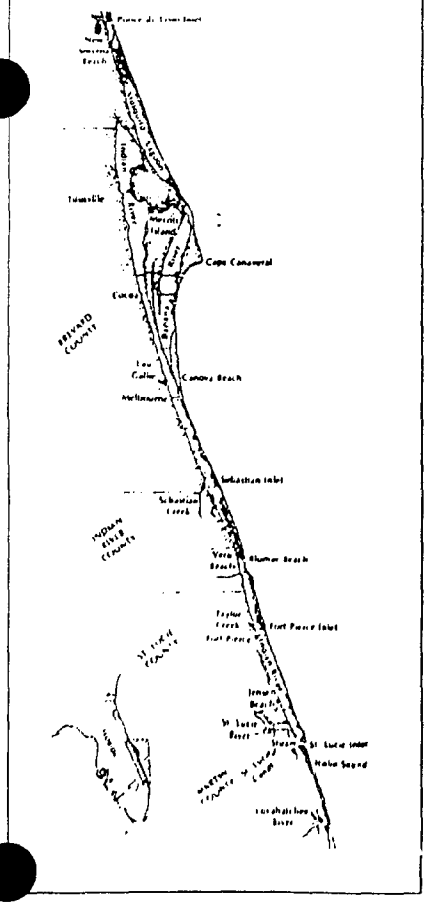
Volume Nine, Number Four

Sept. 1994

MARINE RESOURCES COUNCIL OF EAST FLORIDA
Indian River Lagoon

The Marker

Dedicated to the enhancement of marine systems for the economic, recreational, and aesthetic benefit of all.



MRC WINDSURFING REGATTA

Sat. October 1, 1994, Conchy Joe's - Melbourne

The second annual MRC Wind-surfing Regatta is Oct. 1st in Melbourne. A fund-raiser for MRC (Marine Resources Council of East Florida) the event is administered by the South Brevard Sailboarding Club, said Tom Saam, Board Member of SBBC.

This year's regatta, a nationally sanctioned south-east series event, is expected to top last year's very successful one when more than 30 entrants raced in a number of classes. Many trophies and prizes will be awarded in various events that are open to all.

Landlubbers can enjoy the free colorful show plus a 1 p.m. performance by the Eau Gallie H.S. Jazz Band. No admission charges all day.

Advance registration is $15 for U.S. Boardsailing Assn. members or SBBC members. For others it is $20. Advance checks payable to SBBC must be received by Regatta Chairman, Pat Pinchera, by Sept. 30th at 6320 Anchor Lane, Rockledge 32955. For more info pls call 407-632-WIND.

Registration is $25 for all and open from 8:30 a.m.- 10 a.m Skippers meet at 10:30 a.m. The first race is scheduled for 11 a.m. Awards are at 4:30 p.m.

Free mini-lessons in windsurfing and open-deck kayak with a certified instructor will be available, using equipment provided by NORM'S SPORTS of Indian Harbor Beach. Tyros will be able to watch and learn from racing notables including Dick Tillman, international celebrity and member of the U.S. Olympic Committee and Laser racing senior champ; also Olympic candidate Beth Powell; and Greg Winkler, a skilled sailor and candidate for the U.S. Windsurfing Association Board.

Demonstrations of Water Quality Monitoring, and displays to promote environmental awareness of the Lagoon will be provided by the MRC, said Steve Chalmers, member of the MRC Board.

Janet Bonder, MRC Chair for Fund Raising is seeking sponsors for the event at $100 to provide much-needed support for operating expenses of the MRC. Donations are tax deductible. Donors receive a photo of their assigned racers and an MRC acknowledgement. Checks should be payable to MRC and mailed to P.O. Box 22892, Melbourne 32902-2892. Regatta expenses are covered by registrations. (See SPONSORS page 2)

SPECIAL EVENT

The Brevard County Brazilian Pepper Task Force will host a workshop Thurs. Sept. 29th from 8:30 a.m. to 4 p.m. at the Brevard County Agricultural. Center in Cocoa. You are invited to come to see how an exotic nuisance can be controlled and eradicated.

You will see hands-on demonstrations by a panel of experts, find out what herbicides are recommended and how to use them. This workshop is for home owners, maintenance personnel, land clearers, and all interested others. The $10 fee includes a barbecue lunch.

For information or registration call 407-952-0102 or 407-633-1700.

MORE DATES TO NOTE

Sat. October 22nd

"Make A Difference Day" (See story page 3)

Sat. Oct. 22nd evening

MRC Banquet and Awards (See story page 2)

Sat. Oct. 1st - 10 a.m. to ?

MRC Sailboarding Regatta Conchy Joe's Melbourne (See story page 1)

Every Friday noon at 12

Fisherman's Park in Grant MRC Brown Bag Lunches (See schedule page 2)

BREVARD BRAZILIAN PEPPER WORKSHOP

Thursday September 29 1994

A workshop with indoor demonstrations of severalcontrol methods will be at the Brevard County Extension Service - 3695 Lake Drive, Cocoa. The panel of expert instructors will show how to eradicate the pesky trees. Brazilian Peppers were introduced by nurseries for ornamental use. As is often the case with exotics, noone apparently researched the "downside" of the species.The Brazilian Pepper, a close relative of poison ivy, produces great quantities of seeds which readily take root.

If not controlled they grow into dense thickets that crowd out our mangroves and other good native trees and shrubs. Mangroves are essential links in the food chain of the lagoon. Peppers contribute nothing to the lagoonal system.

The workshop is from 9:30 a.m. to 4:30 p.m. The fee is $10 which includes a BBQ lunch. Checks should be payable to BREVARD COUNTY PEPPER BUSTERS.

Call 633-1700 for more information.

PEPPER BUSTERS MAKE A DIFFERENCE

You can be a Pepper Buster on Oct. 24th which is **USA Weekend Make a Difference Day**. Imagine how much habitat we could restore along the IRL if we all worked together to remove the invasive Brazilian Peppers from the scene. We can get Mangroves growing again, and improve water quality and fisheries that are so important to recreation and the economy.

So look around your yard and neighborhood and join groups working on endangered shorelines and parks. Let's show the nation how people in four counties in Florida care about where they live and how they do MAKE A DIFFERENCE.

Mike Cacioppo, an MRC intern from Florida Tech is working on the project with the Brevard County Task Force for Brazilian Pepper eradication.

ALSO don't forget the Brazilian Pepper seminar from 9 to 4 p.m at the Cocoa Brevard County Agricultural. Center Sept. 29th. Call MRC for more info - 407-952-0102.

INDIAN RIVER LAGOON GREENWAYS

Good news! St. Lucie county has adopted a resolution to modify their Comprehensive Land Use Plan (CLUP) to include greenway systems on the north fork of the St. Lucie River, the Savannas, and the Barrier Island.

St. Lucie has the largest stretch of open space on the Barrier Island between Canaveral and Miami. On November 6th the citizens of that county will vote on a referendum to buy environ- mentally endangered lands.

Brevard and Indian River counties are pushing for more land acquisitions for the Archie Carr National Wildlife Refuge on the Barrier Island. The Brevard Environmentally Endangered Lands (EEL) program has acquired 130 acres; U. S. Dept. of the Interior, Bureau of Fish and Wildlife, 18 acres; the State of Florida 171 acres. This totals 319 acres, and is in addition to existing county and state parks. These beaches have the highest density of sea turtle nesting in the Western Hemisphere.

Volusia and Martin counties also have active EEL programs. Greenway programs adopted in the comprehensive planning process can link open space, recreation, wildlife habitat, and help in infrastructure planning.

ECO-NEIGHBORHOOD SCRUB HABITAT RESTORATION

Melbourne Beach Project

More than 30 volunteers from eight environmental and civic groups including Native Plant Society, Melbourne Beach's Environmental Advisory Board, a Boy Scout troop, and MRC planted about 300 trees, shrubs, and ground cover on August 27th at Flutie Park and St. Sebastian-by-the-Sea Episcopal Church. The following Saturday 10 volunteers and homeowners planted another 40 plants in homeowner's yards, adjacent to plantings in the park.

The following resident families agreed to plant and nurture scrub plants in their yards. Mehta, Miller, Thomas, Greene, Heimintoller, Jaffee, Whitlow, and Marjorie McArthur. They will receive a "Certificate of Adoption" from the Town Mayor. Plants in the backyard and in the park will produce a greenway strip behind the ballfields, creating a buffer from noise, lights, and pollution, and also a much needed scrub habitat for the birds, butterflies, and other wildlife.

Most exciting during the planting was a visit by several Scrub Jays! Chris Jaffe said he sees them regularly and has named them Chipper and Inspector. Many photos were made, one with a bird sitting in the tree that had not yet been planted.

Refreshments were donated by Summer Jasser, Mgr., Melbourne Beach Supermarkets, and by AM-PM Food Town. Many, many thanks to them and to all the volunteers that made the project a success.

Janet Merkt, FIT Graduate Intern

FRIENDS OF THE SCRUB

a not-for-profit organization

July 26, 1994

RECEIVED

JUL 29 1994

TOWN OF MELBOURNE BEACH
BY

Mr. Ed Washburn, Town Manager
Melbourne Beach Town Hall
507 Ocean Avenue
Melbourne Beach, FL 32951

Dear Mr. Washburn:

Here's the completed script, as promised. I'll use it for the first time next week, Thursday, August 4, at 7:00 p.m. at the Melbourne Public Library. I'll be substituting for Jim Angy at a Florida Trail Association meeting that evening. The public is invited, and you and any others you think would like to see those slides are very welcome to come if you can.

I stopped to look at the plantings around Gemini yesterday, and was pleased to see them coming along nicely. We have some potted scrub oaks to give away; if you would like some, call me at 777-0839.

Sincerely,

Margaret

Margaret Broussard

3660 N. RIVERSIDE DRIVE • INDIALANTIC, FLORIDA 32903 • (407) 777-0839

PRINTED ON RECYCLED PAPER

JIM ANGY'S SLIDE SHOW

1. Logo: "Friends of the Scrub"

2. MRB: "Presents"

3. JA: "Wildlife Photographer (and Respiratory Therapist) Jim Angy"

4. Scrub: "and the Creatures of Brevard County's Barrier Island Scrub Habitat: a selection from twenty years' worth of slides."

5. Dune Sunflowers: "This is typical scrub habitat, plants that you'll find out in the scrub near the ocean."

6. Cactus: "You probably know this as Prickly Pear Cactus. A lot of the animals in the scrub make use of this plant. The gopher tortoise will eat both the flowers and the red fruit, and even the fleshy stems, which look like leaves. Some animals will take shelter among the thorns, to escape predators."

7. Sand live oak: "This sand live oak is typical of scrub all over the state, and was common on the barrier island. It's important for shelter and food for many birds and other animals."

8. Anole: "This is the American Green Anole, a-n-o-l-e. Many people call it a chameleon, but it's not a true chameleon. It does have the ability to go from a real bright green color to a dark, almost black, brown color, for camouflage. Its closest cousin is the iguana. It gets only about six inches long, from the tip of the nose to the tip of the tail, and loves to eat insects."

9. Fence Lizard: "This is a fence lizard. Some people call it a pine lizard. It's the only lizard we know of around here which has rough scales like the horned toad lizard, in the deserts out west. It lives in certain types of scrub habitat."

10. Fence Lizard from front: "... and the males have a real bright blue chin and belly patch. They eat a lot of insects."

11. Fence lizard on tree: "See if you can find this camouflaged fence lizard. It's usually found on the ground, but it can climb. It gets about 6-8 inches in length."

12. Six-lined racerunner: "This is the fastest lizard we have out in the scrub: the six-lined racerunner. It can get about 8 to 9 inches long. These males also have a lot of blue, or turquoise, along the belly and under the chin. Females have a white belly."

13. Blue-tailed skink: "This is a young five-lined skink. When they're young, they have this bright blue tail. The tail will turn brown when they get older. They live in leaf litter, and if a bird gets hold of the tail, it'll break off and the lizard will grow another one. Some old-timers call this a 'blue-tailed scorpion,' and think they can sting with their tail! There are no venomous lizards that live in Florida, but if you were to chew on this one, it'd make you pretty sick. Warn your cat. Cats often get sick from eating lizards. (I wish they'd get sick from eating birds!)"

14. Brown skink: "This is the little brown skink. Only gets about three inches in total length. Very tiny lizard, barely has legs. Has what we call vestigial legs, especially in the front. You can hardly see that little leg hanging down off the lizard. But there is a lizard here in Florida which has no legs at all..."

15. Glass "snake": "Most people call it the glass snake, but it's not a snake at all; it's a true lizard. It gets about 2 feet long. It has the capability of blinking its eye, like a true lizard. A snake has an optical scale that goes across its eye which will not allow it to blink. This harmless lizard can blink."

16. Glass snake head: "The glass snake has an exterior ear hole, right between the yellow spot and the stripe there; no snake has an exterior ear, as a true lizard does. It's called glass because its tail breaks off so easily, like other lizards. It will grow back, though it will look a little different. It does have tiny bones left over from when its ancestors had legs, and the tail begins right after those bones, which are where a pelvis was. If you see one, maybe on a sidewalk, you will notice that it can't wiggle away as fast as real snakes can. That's because it has smooth lizard scales on its belly instead of snake scales, and lizard muscles instead of snake muscles. It does fine in the grass, and is sometimes called a grass snake."

17. Rough green snake: "This is a rough green snake. There's also a species called the smooth green snake, but it's not found in Central Florida. The rough green snake gets about 3, 3 1/2 feet long. It's a very good climber. You often see them in shrubbery, even around your house. They blend in quite well, almost like an anole."

18. Green snake head: "If you look closely at this snake's eye, you'll see that the pupil is round, like your eye, and my eye. This is typical of MOST harmless snakes. We'll look at the venomous snakes' eyes in a few minutes."

19. Eastern garter snake: "Do you think this snake is venomous, or harmless?" "a lot of people think this is a venomous snake. This is the Eastern garter snake. It has no venom (that would hospitalize you). It does have teeth; all snakes have teeth, and all snakes will bite to defend themselves. Many of the harmless snakes in this area can flare their jaw muscles out and make themselves look venomous. It's a bluff, to try to scare you away. Unfortunately, when they do this, people kill them, and say that they've killed a poisonous snake, because of the shape of that head. This is simply a harmless garter snake in a defense posture. He's just trying to make himself look dangerous. so you'll leave him alone. Instead, people kill him, thinking he's a pygmy rattler or a water moccasin or something, and all they've killed is a harmless garter snake."

20. Ribbon snake: "This is a ribbon snake, a thin version of the garter. It's arboreal, which means it's more likely to be found in trees. If you see any snake in a tree, you can be sure it's not venomous. Venomous snakes are not climbers. Climbers have to have constrictor muscles, to climb, and venomous snakes don't need constrictor muscles to kill their prey, because they use poison."

21. Ribbon snake: "See how long and thin this ribbon snake is?"

22. Red rat snake: "This snake, commonly called a corn snake, also a red rat snake, is a very good climber. Corn snakes get over five feet long, and were given the name rat snake because of their ability to kill and eat rodents. They love to eat rats and mice, and farmers like to have rat snakes living in and around their barns. They are constrictors; they throw coils around their prey and squeeze until the prey can no longer breathe and dies of suffocation, and then they eat it."

23. Red rat snake: "They're very brightly colored, have a very distinctive pattern which goes down their back which is unfortunately often mistaken for a diamondback or a copperhead. Many rat snakes have been killed by panicky people who were sure they'd killed a copperhead or rattlesnake in their garage or yard."

24. Eastern black racer: "Probably the fastest snake we have in this area, and one of the most common, is the black racer. There are several black-colored snakes which live in the scrub habitat, but you can distinguish the black racer by its white chin. Bottom jaw is white. They are very fast, but if they're cornered, they will strike out to protect themselves, so if you corner a black racer or try to catch it, it'll probably try to bite you."

25: Coachwhip: "This is one of the largest snakes that live out in the scrub. Notice, he does have a round pupil. This is the coachwhip snake. Do you know why snakes flick their tongues in and out? They're tasting the air. They can pick up tiny little particles that are floating around in the air. There's a special organ in the roof of their mouth called the Jacobson's organ which analyses stuff that's on the tongue to alert the snake to what's in the immediate environment, in case it doesn't see it."

26. Coachwhip: "The coachwhip can get over six feet in length. The first part of the snake looks like a blacksnake, but then as you follow the snake's color down, it turns a brown, almost a tan color, and the very bottom part looks like a woven buggy-whip, and that's where they got their name, Coachwhip. You can see the shed skin of this snake that it crawled out of. As the snakes eat, they grow, and, depending on how well they ate, they might shed from one to five or six times in one year. When their skin gets too tight, it begins to split around the head, and they just crawl out of it, turning it inside out like you might peel off a sock. The shed skin is always longer than the snake, because the skin in between the scales gets stretched out and dries that way.

"There are some pretty wierd old tales about coachwhips. I heard one old cracker say that they'll chase you through the woods and whip you with that tail. Another called them 'hoop snakes,' and said they take their tails in their mouths and roll like a hoop, chasing you, then would whip you to death. Those tales come from the name, coachwhip. Snakes chase you only in your dreams. They'll get away from you if they can. If you come on them too fast, they might strike in alarm, but they don't chase people."

27. Indigo snake: "This is the Eastern indigo snake, also called a gopher snake, because it likes to live down in the gopher tunnels, where it's cool. It's one of the few snakes protected by law because it's threatened with extinction. The largest snake in North America, it can grow to over nine feet long. It's a very gentle snake, not anxious to strike, also very beautiful, so it has been over-collected by hunters for the pet trade. Much of its habitat has been destroyed, and it's becoming increasingly rare. To capture or keep an indigo snake now you need a special permit from the Florida Game and Freshwater Fish Commission. Unfortunately, because it's such a big, relatively slow-moving snake, some people who see one crossing the road can't resist running over it."

28. Female indigo's head: "Females' heads are all black, or rather, indigo. Indigo is a midnight blue color, and in the sunlight, these scales are irridescent blue-black. The belly scales are lighter blue to creamy white."

29. Male indigo's head: "Males usually have a reddish or orange blush around the head and throat. He's tasting the air here."

30. Female indigo: Is this a male or a female?

31. Hog-nose: "This odd litle snake is called the hog-nosed snake. It gets its name from that little turned-up nose it has. It uses that little nose sort of like a shovel, to dig out its favorite prey, the Florida toad. These toads often bury themselves in loose sand, and the hog-nose has a perfect way to get them out, using that shovel nose."

32. Hog-nose: "It's a curious little snake. A lot of people, after seeing a hog-nose snake going through its bluff, think that we have wild cobras in Florida. There are no cobras native to Florida. Cobras are found in Africa and Asia, but our little hog-nosed snake does have the capability of flaring out the skin around the neck, like the hood of a cobra, and it scares people when it does this. They only get about 3 1/2 to 4 feet long. They hiss loudly when they're upset, flare that skin out to try to scare you off, and if that doesn't work, they'll flip over on their back and play dead. If you flip them over on their belly, they'll flip back over to convince you that they're really dead. They don't bite. They go through this bluff routine; they even fake strike, with their mouth closed, but don't seem to bite.

33. Florida toad: "This is the favorite food of the hog-nose -- the Florida toad."

34. Rattlesnake skull: "This skull of an Eastern diamondback rattlesnake shows how the fangs of a pit viper look when extended for striking. The fangs fold back against the top jaw when the snake's mouth is closed."

35. Pygmy rattlesnake: "This pygmy rattlesnake is the smallest rattlesnake we have in Florida. It rarely gets over two feet long. It's also called the dusky pygmy, or the ground rattler. It has tiny rattles which you may not hear, if you're not paying very close attention, so you need to watch for them very carefully, if you're out in the scrub or any Florida woods. They're very small and well camouflaged, but they have a nasty temper, and will strike if you step close to them.

36. Pygmy rattler's head: "This is a closeup of a pygmy rattler's head. Notice the shape of the pupil of the eye. They have elliptical pupils, like cats' eyes. The nostrils are right at the tip of its head, and that little white area below and between the eye and the nostril is the heat-sensing pit. The pygmy is typical of all pit vipers, in that it has heat-sensing pits in its cheeks.

"They can detect minute amounts of body heat. They hunt warm-blooded prey. Just as having two ears helps you to locate where sound is coming from, so that you can face the sound source, so having two heat-sensing pits in its cheeks helps a pit viper to turn its head toward the heat source, whether it's a mouse or a person. They are amazingly accurate, when they strike. Then they use the pits to follow the trail of the prey after they've bitten it, while they wait for the venom to take effect."

37. Eastern diamondback: "The Eastern diamondback rattlesnake is the largest venomous snake in North America, and the most dangerous. They can grow over seven feet in length, and are anxious to strike if cornered or threatened. Notice that long set of rattles on its tail. Each time the smake sheds its skin, it gets a new button, where the rattle is attached. People tell you you can tell how old the snake is by counting the buttons in the rattle, but that's not true. If the snake eats well that year, it might shed four or five times, and that means four or five new buttons are added to the rattle that year. The rattles are made out of the same kind of material that our fingernails are made of, and they will break off, so there's no way to age a rattlesnake by counting the buttons on its rattle.

"It's not true that rattlesnakes will always rattle, and warn you. Usually they'll rattle, and if you ever hear the buzz of an angry diamondback, it's a distinctive sound you'll never forget, but they don't always have time to rattle before striking. Also, all snakes can swim; rattlesnakes are very good swimmers, and if those rattles get soaking wet, they don't make much noise at all, so you can't depend on your ears to detect these snakes out in their habitat. You've got to look for them, and they blend in very well; you've got to be very careful."

38. Striking pose: "This diamondback is poised to strike. They can accurately strike two-thirds of their body length. A six-foot-long rattler can accurately strike four feet, straight up or straight out.

39. Rattlesnake head: This is a close-up of its head. See the eye in the broad, black 'swoop' mark, the nostril at the tip of the nose, and the heat-sensing pit, a little black area right behind and below the nostril. Central Florida has three pit vipers. two, the pygmy rattlesnake and the Eastern diamondback rattlesnake, live in the scrub. The third, the water moccasin or Cottonmouth, lives in wet places. Scrub is too dry for it, since rainwater drains

through the sandy soil immediately. The copperhead is a pit viper, too, but it is found only in North Florida, and only rarely there."

40. Coiled rattlesnake: "This is a head-on shot of a coiled diamondback. They do have a very fat, thick head, typical of pit vipers, but as you remember, many non-venomous snakes can make themselves look like pit vipers by spreading out their jaw or neck muscles."

41. Albino diamondback: "This is a very rare snake, not out in the wild, but in a cage. It's an albino diamondback. Albinos of any species don't survive long in the wild. They can't hide very well, and their eyes lack the pigment which protects them from strong sunlight, so that they go blind. Albino people wear dark glasses outside and even inside, to protect their eyes. This picture is included because the pit shows up so well through the albino rattlesnake's clear skin. See how deeply it extends back into the side of the head."

42. Coral Snake: "This is the exception to the rule on venomous snakes in Central Florida. This little Eastern coral snake does not have an elliptical pupil. If you look closely, you'll see that the pupil is round. However, drop for drop, its venom is probably the most potent venom we have around here. It's a neurotoxic venom: it attacks the nervous system. Rattlesnakes carry a hemotoxic venom, which kills red muscle. Most people who die from a coral snake bite die from paralysis of the diaphragm, that big muscle under your lungs that you need to breathe.

"This little Eastern coral snake gets about three feet long. Because of its less aggressive nature, it is not the most dangerous snake here -- that honor goes to the Eastern diamondback rattlesnake. It has fangs, but they're very short. It doesn't coil up and strike out viciously like the ratlesnake, you almost have to step on this snake or pick it up to be bitten by it. Of course, if you're trying to hit it or kill it, it will try to defend itself.

They are very brightly colored, and there two harmless snakes that mimic this venomous snake very closely, the harmless scarlet snake and the scarlet king snake, which have a different order to their colored bands. There are several rhymes to help you remember this color pattern, like "Red touch yellow, kill a fellow; Red touch black, venom lack," but when people see these brightly colored snakes, they often forget the rhyme. You may have learned that the coral snake has a black nose, but you can't always see the nose."

Perhaps the easiest way to remember how to tell the difference is to remember a traffic light. Yellow means caution; red means stop. If red touches yellow, STOP. That's the venomous coral snake. That's the snake you'd better stay away from, because they are very dangerous, even though they are very pretty, and you might be tempted to pick one up. Don't."

43. Scarlet king snake: "This is the Scarlet king snake, one of the harmless mimics of the coral snake. Scarlet king snakes can climb well. None of the venomous snakes in this country can climb, so if you see what you think is a coral snake in a tree or a bush or up on your roof or a fence your windowsill, it's a harmless snake. Venomous snakes don't have those constrictor muscles for squeezing their prey because they poison their prey,

and it's the constrictor muscles that snakes need to climb with."

44. Shannon and scarlet king snake: "This is Jim Angy's daughter Shannon holding a scarlet king snake. The scarlet king snake gets about 3 1/2 to 4 feet long, and it's a good snake to have around. Like other king snakes, it can kill and eat other snakes, including venomous snakes. That's why it's called a king snake. The venom of the other snakes, including the coral snake's, doesn't seem to affect the scarlet king snake. Notice the color pattern on this snake, and think of the traffic light. Yellow: caution; red: stop. Does this snake have that pattern? No, narrow black bands separate the red and yellow bands. Red does not touch yellow. Red touches black. Venom lack. But NEVER try to capture one of these snakes unless you're ABSOLUTELY sure of what you're doing. A mistake could cost you your life."

45. Scarlet king snake in a tree: "Quick test: which snake is this one? How do you know? Quickest clue is that it's in a tree. Did you think of a stoplight? Yellow: caution; red: stop. Does red touch yellow? It's a __?__ what?" (Scarlet king snake.)

46. Coral snake: "Which is this one? Right. A coral snake."

47. Eastern box turtle: "This is the Eastern box turtle. It's a small turtle, sometimes found in scrub habitat that has some low-lying areas. It seems to prefer wetter or woodsier areas.

48. Eastern box turtle: "It eats a lot of toadstools, insects, earthworms. It's called a box turtle because of its ability to close itself up like a box.

49. Young Eastern box turtle: "The turtle can pull itself completely inside the shell for protection. When the turtle is very young, the hinge on the plastron or bottom shell is not fully formed, so they can't close up as well as an adult, but after about three years,

50. Young Eastern box turtle: "...the hinge forms, and as you can see, this turtle is completely closed up inside that shell. You can just barely see some toenails sticking out at the top there, and the hinge is across the plastron almost in the center. That's the little Eastern box turtle."

51. Gopher tortoise: "This is the largest land turtle we have in Florida, the gopher tortoise or gopher turtle. It's quite common in scrub habitat. It prefers loose sandy dry soil to dig its tunnels or burrows in. The tunnels can be anywhere up to 30 or 40 feet long, but usually not too deep because if they dig too deep they'll get water in them, and they don't like to live in water. The long burrows usually have a chamber at the end so they can turn around in them to come back out frontwards. See the big front flippers used for digging. Unfortunately, some people see this big turtle with these big flippers and think it's a water turtle. If you throw a gopher turtle in water over its head, it will usually sink to the bottom and drown. They don't swim very well at all."

52. Baby gophers: "The babies look just like the adults, except for their color. They are a sort of orangish-yellow in color, though there are individual variations even among nestmates. Some may be brownish black, even at hatching. They are about the size of a silver dollar, and their shells are are rounded for a little while from being in a spherical shell. You'll notice that the hind foot looks sort of like an elephant's foot. It's a strong weight-bearing foot. All five toes can spread out a little to carry a heavy body in loose sand."

53. Three hatchling gophers: "As soon as the baby gophers hatch out of the nest in the sand, they're on their own. The adults don't take care of them at all. They go and dig their own burrows and take care of themselves."

54. Adolescent gopher tortoise: "This gopher looks about three or four years old -- still has a little yellow in its shell. It will eventually take on the dusky gray-brown shell of the adult."

55. Gopher head: "They have a huge, dangerous-looking head, but they're truly herbivores. They eat grasses, leaves, flowers and fruits, such as the gopher apple and the prickly pear. If you put your hand in front of their faces, they will usually pull their heads back behind their front flippers. You'll hear a hissing noise, as they have to let air out of their lungs to make room for their neck and head to pull back. It's very hard to make them bite anything, like a stick, unlike a snapping turtle. You'd never want to stick your hand in front of a snapping turtle!

Sometimes, people do confuse this turtle with a snapping turtle, because the head is so big and dangerous-looking."

56. Gopher heading for burrow: "This is a typical entrance to a gopher tortoise burrow. Usually the tunnel is the same diameter as the shell. It's a real tight fit when they crawl in there, and you can usually tell how big the turtle is that lives in there just by seeing the entrance hole. Several animals share the gopher turtle's tunnel with the gopher turtle -- the indigo snake, often called the gopher snake; the Eastern diamondback rattlesnake will live down there with them; so will the pygmy rattlesnake. Different species of mammals will seek out these tunnels for shelter from predators ar from fire. The Eastern cottontail rabbit will run down a gopher hole; 'possums, raccoons and foxes; several species of insects live in these tunnels, and a rare species of frog, the gopher frog, that lives nowhere else.

"The Gopher tortoise is the 'Innkeeper of the Scrub.' Biologists have estimated that the gopher shelters about 360 other species of animals, mostly insects, in their burrows. That's one of the reasons they are called the KEYSTONE SPECIES of the scrub. Also because they disperse seeds of scrub plants in their droppings. Both plants and animals of the scrub depend upon the gopher. That's what it means to be a keystone species."

57. Gopher heading out: "This gopher is exiting his tunnel. Here's a good look at his big, powerful digging flippers. Just in the last five years, a mysterious, potentially fatal upper-respiratory bacterial infection has been killing many of our gophers, and researchers are alarmed. It's very infectious, and so far, they haven't learned how to treat it or stop its spread. The gopher was already classified as a Florida 'species of special concern,' so it's urgent that this disease be stopped before this keystone species becomes endangered or even extinct."

58. Gopher beside blooming cactus: "This gopher is beside one of its major food sources. It eats those pretty yellow flowers, the ruby-red fruit, the pear, which has tiny but sharp prickles on it and the stems. Those wide, flat stems of the prickly pear cactus, which look like leaves, are high in water content, which is important to thirsty animals in the desert-like scrub habitat. The true leaves have been modified into those long, sharp thorns."

59. Gopher and car wheel: "One of the main causes of death of gopher tortoises is automobiles, when they try to cross a road. It's not that these turtles are so fast that they can leap out in front of a car. If you're a driver who's paying attention to what you're doing, you should be able to slow down and avoid hitting these large, slow-moving animals. Anyone who hits one on purpose would have to be pretty sick."

60. Gopher on asphalt: "If you ever have the opportunity to help a turtle while it's crossing the road, always put it across in the direction it's heading. They have a strong sense of direction, and if you put it back where it came from, it will just turn around and try to cross the road again. They're very determined, especially if it's in the spring, mating season. They can apparently smell each other from rather far distances, and if they're heading for a prospective mate, they won't let a road stop them -- unless, of course, they get hit on it. So always put them in the direction they were heading, if you pick them up to get them off the road."

61. Armadillo: "This little nine-banded armadillo is a baby. Armadillos are unique in that whenever the female gives birth, she always gives birth to four indentical young. They'll either be four females or four males, with identical genes. That makes them an excellent research animal. Scientists love that, because they can perform tests on half of a set of identical quadruplets and keep half as controls, so that they'll know exactly what changes are due to the tests. They don't have to worry about genetic differences confusing the issue.

62. Armadillo: "This is an adult. Armadillos always seem to have their noses in the dirt. They're hunting for insect larvae, grubs, little snails, etc. They love to eat earthworms. "They have real poor eyesight. If you happen to walk up on an armadillo that's foraging in the grasses, they might not even see you. If you hold real still, they'll sometimes walk right up to you and bump into you without even realizing you're there. Maybe they think you're a tree, where they might find grubs around the roots, because they do seem to come right to your feet.

[I've had that happen to me. -- MRB]

"Armadillos get about the size of a large housecat. They're fairly fast runners, and that tough armor enables them to plow through vegetation that you and I could never get through. The armadillo can just go right through it like a tank."

63. Spotted skunk: "This is a little spotted skunk, commonly found in scrub habitat. It gets only about as big as a gray squirrel, when it's fully grown. It's also called a civet cat.

64. Spotted skunk: The spotted skunk carries the same spray that its big cousin, the striped skunk, carries, and they're accurate with that spray within about twelve feet. They'll often do a handstand when they're upset, and that's a warning to stay back. If you get any closer, they'll spray, and the spray is very noxious. If it gets you, it will make you nauseated. It's very powerful stuff, and can really hurt your eyes."

65. Gray fox: "The little gray fox is rarely seen because it is nocturnal. It often lives in gopher holes, and is unusual in that, unlike the larger red fox, it climbs trees. It's one of the four native Florida species that are especially vulnerable to rabies. Skunks, raccoons, bats and foxes often have outbreaks of rabies (hydrophobia), so we have to be specially careful of them."

66. Bobcat: "The bobcat is the largest carnivore native to scrub. Although the panther may pass through scrub, it is more of a pine flatwoods animal. The bobcat is also nocturnal and rarely seen. This wild cat is large enough to take a half-grown deer."

67. Baby raccoon: "This, as I'm sure everybody knows, is a baby raccoon. Raccoons have adapted very well to the encroachment of humans onto their habitat. Many of them have been able to live in close proximity to man. If you've ever had your garbage can raided at night, one of these was probably the culprit."

68. Two raccoons: "They're cute and look cuddly, but they're often carriers of that very dangerous virus, rabies, and if you're scratched or bitten by a rabid raccoon, it could cost you your life. So even though they look like cute little teddy bears, it's not a good idea to approach a wild raccoon, or try to capture one and make it into a pet."

69. Angry raccoon: "This is what they look like when they're upset. If you ever see a raccoon in this posture, just get out of its way. This guy's ready to fight."

70. Possum showing teeth: "This is our answer to the Australian kangaroo. This is the Virginia possum, found throughout Florida. The possum, or opossum, is the only marsupial native to North America. A marsupial is a mammal that carries its young in a pouch, like a kangaroo does."

71. Possum at bird nest: "They are opportunistic feeders. They'l take the easiest meal that comes along. They'll eat everything you or I eat, and they'll eat a lot of things we wouldn't consider eating. Often you'll see possums dead on the road, and it's usually by another carcass because they were out there making use of this easy meal when they themselves got run over."

72. Possum hanging by tail: "They have a prehensile tail. It's used as a sort of fifth hand when climbing. A possum is an excellent climber, and spends most if its time in trees, where it can hang on with its tail."

73. Possum in faint: "You've probably heard the term, 'playing possum.' It means faking that you're dead. Sometimes possums will go into this pose for protection. It's sort of like a faint they may go into when they're terribly frightened. It may work, if whatever scared them thinks they're dead and will leave them alone. They don't often do this. Most of possums would rather fight than faint, so don't count on them to do this. They'll try to run away or hiss at you and use their teeth and claws to escape."

74. Possum babies in pouch: "This is what baby possums look like when they're first born. They're born prematurely, by non-marsupial standards, as 14-day-old embryos, really, and look like pink jellybeans with tiny hands. They crawl from the birth canal to the mother's pouch on her belly, and attach themselves to the milk glands where they just stay and grow. That's unique among North American mammals, as it's the only marsupial we have.".

75. Closeup of baby in pouch: "These little guys are about a month old. They're starting to look a little bit more like possums, but still are terribly premature."

76. Older baby on mother's back: "After about three or four months in the pouch, they begin to climb out onto the mother's back and hang onto her fur. If danger approaches, they all try to pile back into the pouch, but when they're this size, only a few of them will fit inside the pouch."

77. Ditto on stick: "Eventually they will fall off, and by that time, they're normally able to fend for themselves. They'll try to stick with their mother for a while, but she begins to lose interest in them when they learn to eat other foods besides milk."

78. Young cottontail rabbit: "This is a young Eastern cottontail rabbit, commonly found throughout Florida, including the scrub. It will fall prey to almost all the predators that live out there that are bigger than they are. It is the favorite food of the Eastern diamondback rattlesnake."

79. Two cottontails: "These cute little baby cottontails grow up to reproductive age very fast. Since there's a lot of food available for them in Florida year-round, there are always a lot of baby rabbits to take their place in the middle of the food chain."

80. Adult cottontail: "This is an adult cottontail rabbit. If you look closely at the back end of this rabbit, you can see the little cottonny tail, where they get their name."

81. Great horned owl: "This is a great horned owl, one of the predators of cottontails and other small mammals, reptiles and birds. This is the largest owl we have in Florida, one of the only predators that will attack and eat a skunk. They don't seem to mind the smell that goes along with that meal."

82. Great horned owl: "Notice that little white throat patch on

the owl's neck. When they're getting ready to make their call, the throat inflates with air, and ..."

83. Same owl hooting: "...you can see how big it gets when he's actually making that hooting call. That's the great horned owl."

84. Screech owl: "This a tiny little owl found throughout Florida, often found in scrub, called a screech owl. The most common sound they make is not a screech, but a soft warble you may hear at night. They are nocturnal; they come out at night and hunt for small lizards and insects, sometimes small birds."

85. Ditto in cabbage palm hole: "They love to nest in old woodpecker excavations. They're cavity nesters, and may be nesting in your neighborhood, though you may never see them. I hope you can see this one. It's a female in her nest hole entrance. She's trying to hide the hole, so predators and others won't realize that it's there, and is doing a good job of it. If you're just walking by, not paying attention, you'd probably never know there was an owl looking at you."

86. Three color phases: "For some reason, screech owls hatch out either red, gray or brown in color. They just have these three color morphs, or color phases, and Jim Angy's exceptional ability as a wildlife photographer really shows in this picture. It looks like he posed these three screech owls, but it's just that he's incredibly patient, he spends a lot of time in the wild and knows how and where to find wildlife. He found these three color morphs in one tree, and was able to get this amazing picture."

87. Baby screech owl: "This little fellow is just learning to fly."

88. Baby screech owl: "And so is this one. Both are screech owls."

89. Mourning dove: "This is a common bird found throughout scrub habitat. This is a mourning dove, spelled m-o-u-r-n-i-n-g, because of the mournful sound that it makes. A lot of people hear that call of the mourning dove and think they're hearing an owl. It's a very common seed-eating bird, and if you have a bird feeder, you've probably sen plenty of mourning doves. They're also found on power lines. When they fly, you'll hear a whistling sound made by their wing feathers."

90. Mockingbird: "This is a very common bird, in scrub and everywhere else in the United States, except for the Northwest. Almost everybody knows and loves the Northern mockingbird."

91. Three baby mockingbirds: "These are baby mockingbirds, asking to be fed."

92. Blue jay: "Here's a young blue jay. Like mockingbirds, blue jays manage to get along in suburban neighborhoods, particularly where there are big trees. They're not found in scrub, unless the scrub is overgrown, because they can't compete there with the scrub jay, which is better adapted for that special environment. We show it here for comparison, as people mix the two species up."

93. Blue jays: "These young blue jays are colored just like their parents. As they grow older, their tail feathers get longer, but not as long as the scrub jays' tails, which is the main reason that blue jays are about a half inch shorter in overall length. Because they are noisy and aggressive, most people think blue jays are larger than scrub jays, but it's the other way around."

94. Scrub jay: "This is the bird that made scrub habitat in this part of Florida famous. This is the Florida scrub jay, found only in Florida scrub habitat. It's still a matter of debate whether the Florida scrub jay is a separate species from the Western scrub jay, or just a separate sub-species. The closest population of the Western scrub jay is about 1000 miles from Florida, they've been separated for millions of years, and their habits are so different that they probably wouldn't interbreed, even if they found each other now, so they probably are different species.

"The Western scrub jay has a blue forehead, where the Florida scrub jay has a white one, and the Western jays are much more wary of people." ["I'm still trying to get some that live in my daughter's yard in Colorado to come to my hand." -- MRB]

"Western scrub is different, too, and the Florida jay has adapted exclusively to Florida scrub. It needs our sandy soil, the soil of ancient beaches, to bury the acorns of Florida's scrub oaks. The adults may bury up to 8,000 acorns in the fall, and when insects are difficult to find during winter months, they dig up their acorns, many of which have insect grubs living inside them by then, giving the jays more protein than they would have had if they had eaten the acorns fresh. They can usually find about half of the acorns they buried, and the rest help grow new scrub oaks, so they help propagate their own habitat, like the gopher tortoise does when it spreads seeds in its droppings."

95. Scrub jay: "This scrub jay has nesting material. Scrub jays have a unique family system in that the nesting pair often have helpers, usually their sons from years past, staying at home, helping tend the young, helping watch out for predators and helping defend the territory from other scrub jays. For these reasons, pairs with helpers are more successful at raising babies that pairs without helpers, and the oldest helpers inherit the territory when their parents die. The daughters usually disperse, or fly away, when they are a year old, to try to find mates. The helpers will often stay with the parents for up to six years before breeding themselves. Sometimes, if the territory is large enough, a helper will 'bud off' a territory of his own, perhaps taking over part of a neighbor's territory, to nest with a female who has flown in."

96. Scrub jay at nest: "This bird, you may notice, has colorful bands on its leg. Researchers use these bands to identify the birds in the field. The band at the bottom has a number on it. They can trace how far these birds fly from where they were banded, keep track of their geneology, how long they live, etc. The color patterns help us to know which bird we're looking at without having to capture it to read the number."

97. Scrub jay with cricket: "This is a female getting ready to feed her young one of its favorite meals, a cricket. They feed their young mostly insects when they're in the nest. Protein is necessary for the babies to grow, so where the habitat has been

turned into lawns or golf courses which are sprayed to kill insects, there's usually not enough food to raise babies, even if there are bushes suitable for nesting. Palmetto berries are an attraction for insects and lizards right at the time that baby scrub jays need protein, so palmettos are very important. Small snakes and even, occasionally, mice, are other sources of protein."

98. Two and nest: "This is a female getting ready to relieve a male that is on the nest. Males and females look just alike, but there is a distinctive call that only the female makes, called a 'hiccup' call, though it sounds more like a clicking noisemaker than a hiccup to me. Females do spend more time on the nest than males, though, and males are usually a little bolder. This shows the white forehead of the Florida scrub jay, one of the differences between our scrub jay and the Western scrub jay."

99. Scrub jay on hand: "You can attract scrub jays to come and eat out of your hand. They're a very bold, trusting bird. It's rare that a wild bird will actually land on your hand. The scrub jay is trusting enough to do this. Raw, unshelled peanuts are the best food to give them, as they will keep better than salted ones when they bury them in the sand. They'll also take sunflower seeds, and even bread or other human foods like these Cheerios."

100. Fledgling scrub jay: "This is a young scrub jay just learning to fly, about 6 - 8 weeks old. Usually at this age, they have several adults looking after them. Parents that have helpers are more successful at raising young than those without helpers. If it's just a pair, their nesting mortality is higher than if there are helpers. Not only do the helpers help feed the young, but they also help spot predators and alert the other birds to protect them."

101. Adult: "This is what that little guy will look like when he becomes an adult Florida scrub jay.

102. Zebra swallowtail: "This zebra swallowtail is one of the common scrub butterflies."

103. Gulf fritillary: "The Gulf fritillary is another one."

104. Cloudless sulphur: "This is a yellow cloudless sulphur butterfly."

105. Io moth: "This is an Io moth, one of several moths which have so-called 'eye-spots' on their secondary wings."

106. Io flashing: "If a bird or a lizard is about to catch an Io moth, at the last instant, it will flash these eyes at them, startling the predator and usually scaring it off.

107. Bulldozer: "This is one of the biggest problems scrub habitat faces today along the barrier island, the Atlantic Coastal Ridge, where US1 and the railroad are, other ancient coastal ridges like "Ten Mile Ridge" around Valkaria, and throughout Florida -- the clearing of all the natural vegetation that these animals that you've seen live in, find food in, nest in -- and when that vegetation is gone, the animals will eventually die."

108. Canova Scrub: "This is called the Canova Scrub, one of the few parcels of native scrub, called "Coastal Strand," that's left on the South Beaches Barrier Island. More than 100 acres of this property is scrub, stretching from A-1-A to North Riverside Drive, the largest piece remaining between Canaveral and Sebastian Inlets.

"The barrier islands used to be mostly coastal strand, but now that scrub is badly fragmented -- replaced with houses, golf courses, shopping centers, streets and parking lots -- which threatens the scrub jay and all the other animals we have seen pictured here, as well as the sea turtles, with extirpation. That development also lowers our quality of life, by adding traffic, noise, pollution and runoff of dirty water into the river and ocean, instead of letting the sand in the scrub filter it and replenish the shallow-water acquifer. We people have made a mess!

"There's a limited carrying capacity of how many birds can nest here. There are seven active nesting pairs in this piece, including some property just out of the picture to the left that belongs to Holy Name of Jesus Catholic Church, in the foreground. But when the young grow up and are ready to take a mate, they have a hard time dispersing, because the natural vegetation that they would fly to and take cover in has been removed, mostly bulldozed by developers. It is still possible for them to get up and down the island, but it's dangerous, and we don't know how many are lost. We're trying to get the young banded so we can track them."

109. Baby scrub jay: "This little scrub jay seems to be screaming, 'Stop the bulldozers!'"

Certificate of Adoption

It is recognized that by the planting of trees and shrubs, our Town can acquire:

- Buffers from noise, dust, pollution, and lights
- Urban habitats for a variety of wildlife, including endangered species
- Improved air quality
- Improved climate and energy savings, as trees provide shade, block glare and release moisture to ease heat build-up

This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Whitlow Family

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

2208 Rosewood Drive

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor

W. E. Washburn
City Manager

Curtis Byrd
Chairman, EAB

Certificate of Adoption

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This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

Marjorie McArthur

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

213 Fir Avenue

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor | City Manager | Chairman, EAB

Certificate of Adoption

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This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Greene Family

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

211 Fir Avenue

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor

City Manager

Chairman, EAB

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This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Helmintoller Family

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

209 Fir Avenue

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor

City Manager

Chairman, EAB

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This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Thomas Family

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

207 Fir Avenue

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor

City Manager

Chairman, EAB

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This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Jaffe Family

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

205 Fir Avenue

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor

City Manager

Chairman, EAB

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This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Miller Family

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

203 Fir Avenue

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

James M. Kelly
Mayor

W. E. Washburn
City Manager

Curtis Byrd
Chairman, EAB

Certificate of Adoption

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- Improved climate and energy savings, as trees provide shade, block glare and release moisture to ease heat build-up

This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Congregation at St. Sebastian-By-The-Sea Episcopal Church

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

Oak Street

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

Mayor

City Manager

Chairman, EAB

Certificate of Adoption

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- Buffers from noise, dust, pollution, and lights
- Urban habitats for a variety of wildlife, including endangered species
- Improved air quality
- Improved climate and energy savings, as trees provide shade, block glare and release moisture to ease heat build-up

This certificate of adoption for the care and protection of greenways and habitats in Melbourne Beach is awarded to:

The Mehta Family

for establishing and caring for the plants in the Scrub Habitat Restoration Project at

201 Fir Avenue

Planned, developed, and initiated by
The Environmental Advisory Board
and Town Commission

James M Kelly
Mayor

W. E. Workman
City Manager

Curtis Byrd
Chairman, EAB

TOWN OF MELBOURNE BEACH

August 10, 1994

The Family at
207 Fir Avenue
Melbourne Beach, FL 32951

Dear Residents:

The Town of Melbourne Beach is the recipient of a state grant to do an area neighborhood revegetation project. This project consists of planting trees and understory shrubs on residential properties, thereby restoring native habitat for butterflies, scrub jays and other birds, while providing a buffer between the park and the homeowner's property.

The neighbors on Fir Avenue and adjacent lots are being asked for their participation in this project. Oak trees as well as some understory plants will planted in each neighbor's backyard. There is no cost to you - the grant provides for the plants, volunteers will provide the labor, and the town will provide the mulch. We do ask two things of the participants - that they provide a specific location for us to plant and that they will provide watering once or twice a week for the plants until they become established. A watering schedule will be provided to each resident.

We ask for your participation in this project - what better way to beautify your yard with free plants while helping to restore some of Melbourne Beach's natural habitat.

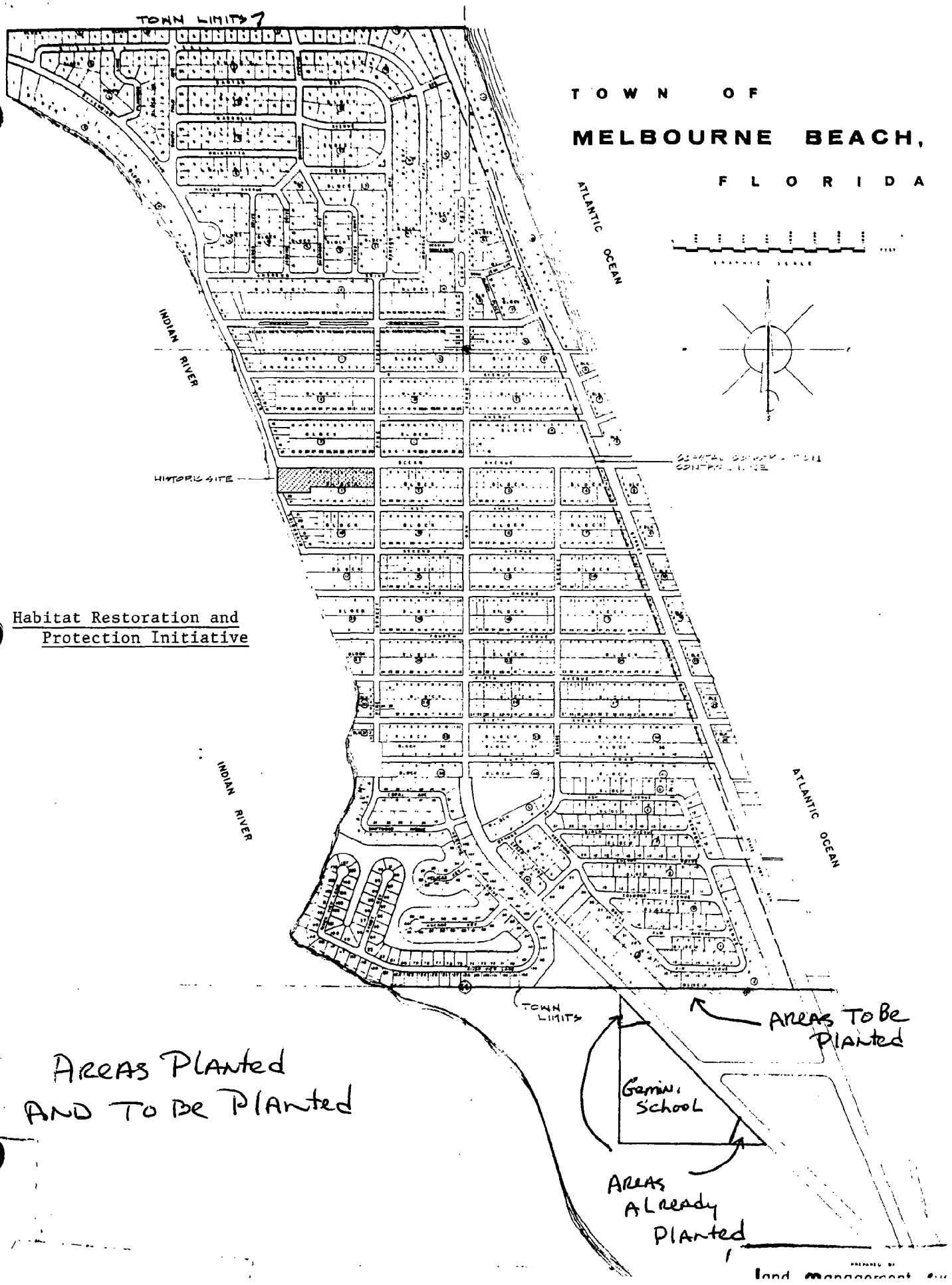
We will be contacting people shortly to obtain their permission to plant in their yards. As you are not currently listed in the directory, we would appreciate you contacting Ed Washburn, Town Manager at 724-5860, or Janet Merkt at 952-0102. Either person will be able to answer any questions you may have. We look forward to your cooperation!

Sincerely,

James M. Kelley

Mayor

507 OCEAN AVENUE, MELBOURNE BEACH, FL 32951-2523 • (407) 724-5860 FAX: (407) 984-8994



Habitat Restoration and Protection Initiative

AREAS PLANTED AND TO BE PLANTED

ENVIRONMENTAL ADVISORY BOARD
SCRIPT / OUTLINE

I. What can a town do to bring nature back into our lives.

A. Developement has taken place but we still want to live in the real Florida.

B. Pockets of wild habitat remain in many communities.

C. People can make a difference in their yards, neighborhoods, schools, and open spaces.

II. Melbourne Beach, Florida has undertaken a project to re-establish wildlife habitats for the endangered scrub jay, sea turtle, and wildlife corridors and on scrub lands and shorelines.

A. School yard replanting, Gemini School.

B. Revegetation of park buffer at Flutie and read basement.

C. Children's education program.

D. Founder's Day - public awareness display.

III. Melbourne Beach, basis for a model wildlife habitat protection and restoration ordinance.

A. Protect natural vegetation in plant communities.

B. Encourage backyard wildlife.

C. Tree protection.

D. Buffer zones and shoreline erosion control.

E. Removal of pest plant.

F. Land scape design.

G. Water conservation.

H. Data base for use by other cities.

IV. What happened?

A. Planting at Gemini.

B. Survey of lots.

C. Butterfly gardens.

D. Backyard revegetation of wildlife habitat.

E. Founder's day.

F. Environmental Advisory Board activities.

G. Environmental Atlas / Calender.

H. Video.

I. Workshop on barrier island habitat.

J. Demonstration and talks to school neighborhoods and organizations.

V. Everyone makes a difference. Nature is part of your neighborhood. Keep it ALIVE.

Certificate of [ ]

BE IT KNOWN THAT...

(NAME of RESIDENT)_____ and the Town of Melbourne Beach believe that habitat restoration is the key to the future of endangered species and to the re-establishment of native ecosystems.

Habitat restoration can:

Improve the quality of life in our Town.

Provide first hand opportunities, within working and living environments, for interaction between people, plants, animals, and other natural resources.

Provide urban habitats for a variety of wildlife.

Foster the survival of endangered species.

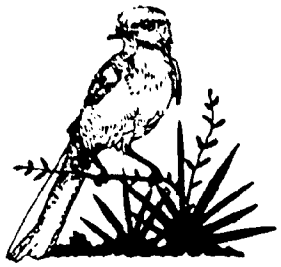
Make our Town a more desirable place not only for us but for future generations as well.

Therefore, we (I) undertake the task of nurturing the newly planted vegetation along the Oak Street right-of-way by scheduled watering until such time that the seedlings are established.

Signed this _____ day of _____, 1994.

(Resident signs)_____

MAYOR OR
(Town Manager signs)_____



FRIENDS OF THE SCRUB

a not-for-profit organization

May 30, 1994

RECEIVED

JUN 0 1 1994

TOWN OF MELBOURNE BEACH

BY

Mr. Ed Washburn, Town Manager
Melbourne Beach Town Hall
507 Ocean Avenue
Melbourne Beach, FL 32951

Dear Mr. Washburn:

Just so you'll know what it is you've requested, here's a working copy of the script to accompany Jim Angy's 109-slide show. I'll have to suspend working on it until sometime in July, as I'll be out of town, then out of state, in June. I need input from him to continue, as he added a number of slides since I saw and recorded him. However, he did show this expanded set to Gemini kids earlier this year, so it's officially part of the FRIENDS OF THE SCRUB education of Melbourne Beach citizens.

Sincerely,

Margaret Broussard

Margaret Broussard

3660 N. RIVERSIDE DRIVE • INDIALANTIC, FLORIDA 32903 • (407) 777-0839

JIM ANGY'S SLIDE SHOW

1. Logo: "Friends of the Scrub"

2. MRB: "Presents"

3. JA: "Wildlife Photographer (and Respiratory Therapist) Jim Angy"

4. Scrub: "and the Creatures of Brevard County's Barrier Island Scrub Habitat: a selection from twenty years' worth of slides."

5. Dune Sunflowers: "This is typical scrub habitat, plants that you'll find out in the scrub near the ocean."

6. Cactus: "You probably know this as Prickly Pear Cactus. A lot of the animals in the scrub make use of this plant. The gopher tortoise will eat both the flowers and the red fruit, and even the fleshy stems, which look like leaves. Some animals will take shelter among the thorns, to escape predators."

7. Sand live oak: "This sand live oak is typical of scrub all over the state, and was common on the barrier island. It's important for shelter and food for many birds and other animals."

8. Anole: "This is the American Green Anole, a-n-o-l-e. Many people call it a chameleon, but it's not a true chameleon. It does have the ability to go from a real bright green color to a dark, almost black, brown color, for camouflage. Its closest cousin is the iguana. It gets only about six inches long, from the tip of the nose to the tip of the tail, and loves to eat insects."

9. Fence Lizard: "This is a fence lizard. Some people call it a pine lizard. It's the only lizard I know of around here which has rough scales like the horned toad lizard, in the deserts out west. It lives in certain types of scrub habitat."

10. Fence Lizard from front: "... and the males have a real bright blue chin and belly patch. They eat a lot of insects."

11. Fence lizard on tree: "See if you can find this camouflaged fence lizard. It's usually found on the ground, but it can climb. It gets about 6-8 inches in length."

12. Six-lined racerunner: "This is the fastest lizard we have out in the scrub: the six-lined racerunner. It can get about 8 to 9 inches long. These males also have a lot of blue, or turquoise, along the belly and under the chin. Females have a white belly."

13. Blue-tailed skink: "This is a young fine-lined skink. When they're young, they have this bright blue tail. The tail will turn brown when they get older. They live in leaf litter, and if a bird gets hold of the tail, it'll break off and the lizard will grow another one. Some old-timers call this a 'blue-tailed scorpion,' and think they can sting with their tail! There are no venomous lizards that live in Florida, but if you were to chew on this one, it'd make you pretty sick. Warn your cat. Cats often get sick from eating lizards. (I wish they'd get sick from eating birds!)"

14. Brown skink: "This is the little brown skink. Only gets about three inches in total length. Very tiny lizard, barely has legs. Has what we call vestigial legs, especially in the front. You can hardly see that little leg hanging down off the lizard. But there is a lizard here in Florida which has no legs at all..."

15. Glass "snake": "Most people call it the glass snake, but it's not a snake at all; it's a true lizard. It gets about 2 feet long. It has the capability of blinking its eye, like a true lizard. A snake has an optical scale that goes across its eye which will not allow it to blink. This harmless lizard can blink."

16. Glass snake head: "The glass snake has an exterior ear hole, right between the yellow spot and the stripe there; no snake has an exterior ear, as a true lizard does. It's called glass because its tail breaks off so easily, like other lizards. It will grow back, though it will look a little different. It does have tiny bones left over from when its ancestors had legs, and the tail begins right after those bones, which are where a pelvis was. If you see one, maybe on a sidewalk, you will notice that it can't wiggle away as fast as real snakes can. That's because it has smooth lizard scales on its belly instead of snake scales, and lizard muscles instead of snake muscles. It does fine in the grass, and is sometimes called a grass snake."

17. Rough green snake: "This is a rough green snake. There's also a species called the smooth green snake, but it's not found in Central Florida. The rough green snake gets about 3, 3 1/2 feet long. It's a very good climber. You often see them in shrubbery, even around your house. They blend in quite well, almost like an anole."

18. Green snake head: "If you look closely at this snake's eye, you'll see that the pupil is round, like your eye, and my eye. This is typical of MOST harmless snakes. We'll look at the venomous snakes' eyes in a few minutes."

19. Eastern garter snake: "Do you think this snake is venomous, or harmless?" "a lot of people think this is a venomous snake. This is the Eastern garter snake. It has no venom (that would hospitalize you). It does have teeth; all snakes have teeth, and all snakes will bite to defend themselves. Many of the harmless snakes in this area can flare their jaw muscles out and make themselves look venomous. It's a bluff, to try to scare you away. Unfortunately, when they do this, people kill them, and say that they've killed a poisonous snake, because of the shape of that head. This is simply a harmless garter snake in a defense posture. He's just trying to make himself look dangerous. so you'll leave him alone. Instead, people kill him, thinking he's a pygmy rattler or a water moccasin or something, and all they've killed is a harmless garter snake."

20. Ribbon snake: "This is a ribbon snake, a thin version of the garter. It's arboreal, which means it's more likely to be found in trees. If you see any snake in a tree, you can be sure it's not venomous. Venomous snakes are not climbers. Climbers have to have constrictor muscles, to climb, and venomous snakes don't need constrictor muscles to kill their prey, because they use poison."

21. Ribbon snake: "See how long and thin this ribbon snake is?"

22. Red rat snake: "This snake, commonly called a corn snake, also a red rat snake, is a very good climber. Corn snakes get over five feet long, and were given the name rat snake because of their ability to kill and eat rodents. They love to eat rats and mice, and farmers like to have rat snakes living in and around their barns. They are constrictors; they throw coils around their prey and squeeze until the prey can no longer breathe and dies of suffocation, and then they eat it."

23. Red rat snake: "They're very brightly colored, have a very distinctive pattern which goes down their back which is unfortunately often mistaken for a diamondback or a copperhead. Many rat snakes have been killed by panicky people who were sure they'd killed a copperhead or rattlesnake in their garage or yard."

24. Eastern black racer: "Probably the fastest snake we have in this area, and one of the most common, is the black racer. There are several black-colored snakes which live in the scrub habitat, but you can distinguish the black racer by its white chin. Bottom jaw is white. They are very fast, but if they're cornered, they will strike out to protect themselves, so if you corner a black racer or try to catch it, it'll probably try to bite you."

25: Coachwhip: "This is one of the largest snakes that live out in the scrub. Notice, he does have a round pupil. This is the coachwhip snake. Do you know why snakes flick their tongues in and out? They're tasting the air. They can pick up tiny little particles that are floating around in the air. There's a special organ in the roof of their mouth called the Jacobson's organ which analyses stuff that's on the tongue to alert the snake to what's in the immediate environment, in case it doesn't see it."

26. :Coachwhip: "The coachwhip can get over six feet in length. The first part of the snake looks like a blacksnake, but then as you follow the snake's color down, it turns a brown, almost a tan color, and the very bottom part looks like a woven buggy-whip, and that's where they got their name, Coachwhip. You can see the shed skin of this snake that it crawled out of. As the snakes eat, they grow, and, depending on how well they ate, they might shed from one to five or six times in one year. When their skin gets too tight, it begins to split around the head, and they just crawl out of it, turning it inside out like you might peel off a sock. The shed skin is always longer than the snake, because the skin in between the scales gets stretched out and dries that way.

"There are some pretty wierd old tales about coachwhips. I heard one old cracker say that they'll chase you through the woods and whip you with that tail. Another called them 'hoop snakes,' and said they take their tails in their mouths and roll like a hoop, chasing you, then would whip you to death. Those tales come from the name, coachwhip. Snakes chase you only in your dreams. They'll get away from you if they can. If you come on them too fast, they might strike in alarm, but they don't chase people."

27. Indigo snake: "This is the Eastern indigo snake, also called a gopher snake, because it likes to live down in the gopher tunnels, where it's cool. It's one of the few snakes protected by law because it's threatened with extinction. The largest snake in North America, it can grow to over nine feet long. It's a very gentle snake, not anxious to strike, also very beautiful, so it has been over-collected by hunters for the pet trade. Much of its habitat has been destroyed, and it's becoming increasingly rare. To capture or keep an indigo snake now you need a special permit from the Florida Game and Freshwater Fish Commission. Unfortunately, because it's such a big, relatively slow-moving snake, some people who see one crossing the road can't resist running over it."

28. Female indigo's head: "Females' heads are all black, or rather, indigo. Indigo is a midnight blue color, and in the sunlight, these scales are irridescent blue-black. The belly scales are lighter blue to creamy white."

29. Male indigo's head: "Males usually have a reddish or orange blush around the head and throat. He's tasting the air here."

30. Female indigo: Is this a male or a female?

31. Hog-nose: "This odd litle snake is called the hog-nosed snake. It gets its name from that little turned-up nose it has. It uses that little nose sort of like a shovel, to dig out its favorite prey, the Florida toad. These toads often bury themselves in loose sand, and the hog-nose has a perfect way to get them out, using that shovel nose."

32. Hog-nose: "It's a curious little snake. A lot of people, after seeing a hog-nose snake going through its bluff, that we have wild cobras in Florida. There are no cobras native to Florida. Cobras are found in Africa and Asia, but our little hog-nosed snake does have the capability of flaring out the skin around the neck, like the hood of a cobra, and it scares people when it does this. They only get about 3 1/2 to 4 feet long. They hiss loudly when they're upset, flare that skin out to try to scare you off, and if that doesn't work, they'll flip over on their back and play dead. If you flip them over on their belly, they'll flip back over to convince you that they're really dead. They don't bite. They go through this bluff routine; they even fake strike, with their mouth closed, but don't seem to bite.

33. Florida toad: "This is the favorite food of the hog-nose -- the Florida toad."

34. Rattlesnake skull: "This skull of an Eastern diamondback rattlesnake shows how the fangs of a pit viper look when extended for striking. The fangs fold back against the top jaw when the snake's mouth is closed."

35. Pygmy rattlesnake: "This pygmy rattlesnake is the smallest rattlesnake we have in Florida. It rarely gets over two feet long. It's also called the dusky pygmy, or the ground rattler. It has tiny rattles which you may not hear, if you're not paying very close attention, so you need to watch for them very carefully, if you're out in the scrub or any Florida woods. They're very small and well camouflaged, but they have a nasty temper, and will strike if you step close to them.

36. Pygmy rattler's head: "This is a closeup of a pygmy rattler's head. Notice the shape of the pupil of the eye. They have elliptical pupils, like cats' eyes. The nostrils are right at the tip of its head, and that little white area below and between the eye and the nostril is the heat-sensing pit. The pygmy is typical of all pit vipers, in that it has heat-sensing pits in its cheeks.

"They can detect minute amounts of body heat. They hunt warm-blooded prey. Just as having two ears helps you to locate where sound is coming from, so that you can face the sound source, so having two heat-sensing pits in its cheeks helps a pit viper to turn its head toward the heat source, whether it's a mouse or a person. They are amazingly accurate, when they strike. Then they use the pits to follow the prey after they've bitten it, while they wait for the venom to take effect."

37. Eastern diamondback: "The Eastern diamondback rattlesnake is the largest venomous snake in North America, and the most dangerous. They can grow over seven feet in length, and are anxious to strike if cornered or threatened. Notice that long set of rattles on its tail. Each time the smake sheds its skin, it gets a new button, where the rattle is attached. People tell you youcan tell how old the snake is by counting the buttons in the rattle, but that's not true. If the snake eats well that year, it might shed four or five times, and that means four or five new buttons are added to the rattle that year. The rattles are made out of the same kind of material that our fingernails are made of, and they will break off, so there's no way to age a rattlesnake by counting the buttons on its rattle.

"It's not true that rattlesnakes will always rattle, and warn you. Usually they'll rattle, and if you ever hear the buzz of an angry diamondback, it's a distinctive sound you'll never forget, but they don't always have time to rattle before striking. Also, all snakes can swim; rattlesnakes are very good swimmers, and if those rattles get soaking wet, they don't make much noise at all, so you can't depend on your ears to detect these snakes out in their habitat. You've got to look for them, and they blend in very well; you've got to be very careful."

38. Striking pose: "This diamondback is poised to strike. They can accurately strike two-thirds of their body length. A six-foot-long rattler can accurately strike four feet, straight up or straight out.

39. Rattlesnake head: This is a close-up of its head. See the eye in the broad, black 'swoop' mark, the nostril at the tip of the nose, and the heat-sensing pit, a little black area right behind and below the nostril. Central Florida has three pit vipers. two, the pygmy rattlesnake and the Eastern diamondback rattlesnake, live in the scrub. The third, the water moccasin or Cottonmouth, lives in wet places. Scrub is too dry for it, since rainwater drains

through the sandy soil immediately. The copperhead is a pit viper, too, but it is found only in North Florida, and only rarely there."

40. Coiled rattlesnake: "This is a head-on shot of a coiled diamondback. They do have a very fat, thick head, typical of pit vipers, but as you remember, many non-venomous snakes can make themselves look like pit vipers by spreading out their jaw or neck muscles."

41. Albino diamondback: "This is a very rare snake, not out in the wild, but in a cage. It's an albino diamondback. Albinos of any species don't survive long in the wild. They can't hide very well, and their eyes lack the pigment which protects them from strong sunlight, so that they go blind. Albino people wear dark glasses outside and even inside, to protect their eyes. This picture is included because the pit shows up so well through the albino rattlesnake's clear skin. See how deeply it extends back into the side of the head."

42. Coral Snake: "This is the exception to the rule on venomous snakes in Central Florida. This little Eastern coral snake does not have an elliptical pupil. If you look closely, you'll see that the pupil is round. However, drop for drop, its venom is probably the most potent venom we have around here. It's a neurotoxic venom: it attacks the nervous system. Rattlesnakes carry a hemotoxic venom, which kills red muscle. Most people who die from a coral snake bite die from paralysis of the diaphragm, that big muscle under your lungs that you need to breathe.

"This little Eastern coral snake gets about three feet long. Because of its less aggressive nature, it is not the most dangerous snake here -- that honor goes to the Eastern diamondback rattlesnake. It has fangs, but they're very short. It doesn't coil up and strike out viciously like the ratlesnake, you almost have to step on this snake or pick it up to be bitten by it. Of course, if you're trying to hit it or kill it, it will try to defend itself.

They are very brightly colored, and there two harmless snakes that mimic this venomous snake very closely, the harmless scarlet snake and the scarlet king snake, which have a different order to their colored bands. There are several rhymes to help you remember this color pattern, like "Red touch yellow, kill a fellow; Red touch black, venom lack," but when people see these brightly colored snakes, they often forget the rhyme. You may have learned that the coral snake has a black nose, but you can't always see the nose."

Perhaps the easiest way to remember how to tell the difference is to remember a traffic light. Yellow means caution; red means stop. If red touches yellow, STOP. That's the venomous coral snake. That's the snake you'd better stay away from, because they are very dangerous, even though they are very pretty, and you might be tempted to pick one up. Don't."

43. Scarlet king snake: "This is the Scarlet king snake, one of the harmless mimics of the coral snake. Scarlet king snakes can climb well. None of the venomous snakes in this country can climb, so if you see what you think is a coral snake in a tree or a bush or up on your roof or a fence your windowsill, it's a harmless snake. Venomous snakes don't have those constrictor muscles for squeezing their prey because they poison their prey,

and it's the constrictor muscles that snakes need to climb with."

44. Shannon and scarlet king snake: "This is Jim Angy's daughter Shannon holding a scarlet king snake. The scarlet king snake gets about 3 1/2 to 4 feet long, and it's a good snake to have around. Like other king snakes, it can kill and eat other snakes, including venomous snakes. That's why it's called a king snake. The venom of the other snakes, including the coral snake's, doesn't seem to affect the scarlet king snake. Notice the color pattern on this snake, and think of the traffic light. Yellow: caution; red: stop. Does this snake have that pattern? No, narrow black bands separate the red and yellow bands. Red does not touch yellow. Red touches black. Venom lack. But NEVER try to capture one of these snakes unless you're ABSOLUTELY sure of what you're doing. A mistake could cost you your life."

45. Scarlet king snake in a tree: "Quick test: which snake is this one? How do you know? Quickest clue is that it's in a tree. Did you think of a stoplight? Yellow: caution; red: stop. Does red touch yellow? It's a __?__ what?" (Scarlet king snake.)

46. Coral snake: "Which is this one? Right. A coral snake."

47. Eastern box turtle: "This is the Eastern box turtle. It's a small turtle, sometimes found in scrub habitat that has some low-lying areas. It seems to prefer wetter or woodsier areas.

48. Eastern box turtle: "It eats a lot of toadstools, insects, earthworms. It's called a box turtle because of its ability to close itself up like a box.

49. Young Eastern box turtle: "The turtle can pull itself completely inside the shell for protection. When the turtle is very young, the hinge on the plastron or bottom shell is not fully formed, so they can't close up as well as an adult, but after about three years,

50. Young Eastern box turtle: "...the hinge forms, and as you can see, this turtle is completely closed up inside that shell. You can just barely see some toenails sticking out at the top there, and the hinge is across the plastron almost in the center. That's the little Eastern box turtle."

51. Gopher tortoise: "This is the largest land turtle we have in Florida, the gopher tortoise or gopher turtle. It's quite common in scrub habitat. It prefers loose sandy dry soil to dig its tunnels or burrows in. The tunnels can be anywhere up to 30 or 40 feet long, but usually not too deep because they if they dig too deep they'll get water in them, and they don't like to live in water. The long burrows usually have a chamber at the end so they can turn around in them to come back out frontwards. See the big front flippers used for digging. Unfortunately, some people see this big turtle with these big flippers and think it's a water turtle. If you throw a gopher turtle in water over its head, it will usually sink to the bottom and drown. They don't swim very well at all."

52. Baby gopher: "The babies look just like the adults, except for their color. They are a sort of orangish-yellow in color, though theire are individual variations even among nestmates. Some may be brownish balck, even at hatching. They are about the size of a silver dollar, and their shells are are rounded for a little while from being in a spherical shell. You'll notice that the hind foot looks sort of like an elephant's foot. It's a strong weight-bearing foot. All five toes can spread out a little to carry a heavy body in loose sand."

53. Three hatchling gophers: "As soon as the baby gophers hatch out of the nest in the sand, they're on their own. The adults don't take care of them at all. They go and dig their own burrows and take care of themselves."

54. Adolescent gopher tortoise: "This gopher looks about three or four years old -- still has a little yellow in its shell. It will eventually take on the dusky gray-brown shell of the adult."

55. Gopher head: "They have a huge, dangerous-looking head, but they're truly herbivores. They eat grasses, leaves, flowers and fruits, such as the gopher apple and the prickly pear. If you put your hand in front of their faces, they will usually pull their heads back behind their front flippers. You'll hear a hissing noise, as they have to let air out of their lungs to make room for their neck and head to pull back. It's very hard to make them bite anything, like a stick, unlike a snapping turtle. You'd never want to stick your hand in front of a snapping turtle!

Sometimes, people do confuse this turtle with a snapping turtle, because the head is so big and dangerous-looking."

56. Gopher heading for burrow: "This is a typical entrance to a gopher tortoise burrow. Usually the tunnel is the same diameter as the shell. It's a real tight fit when they crawl in there, and you can usually tell how big the turtle is that lives in there just by seeing the entrance hole. Several animals share the gopher turtle's tunnel with the gopher turtle -- the indigo snake, often called the gopher snake, the Eastern diamondback rattlesnake will live down there with them, so will the pygmy rattlesnake. Different species of mammals will seek out these tunnels for shelter from predators ar from fire. The Eastern cottontail rabbit will run down a gopher hole, 'possums, raccoons and foxes, several species of insects live in these tunnels, and a rare species of frog, the gopher frog, that lives nowhere else.

"The Gopher tortoise is the 'Innkeeper of the Scrub.' Biologists have estimated that the gopher shelters about 360 other species of animals, mostly insects, in their burrows. That's one of the reasons they are called the keystone species of the scrub. Also because they disperse seeds of scrub plants in their droppings. Both plants and animals of the scrub depend upon the gopher. That's what it means to be a keystone species."

57. Gopher heading out: "This gopher is exiting his tunnel. Here's a good look at his big, powerful digging flippers. Just in the last five years, a mysterious, potentially fatal upper-respiratory bacterial infection has been killing many of our gophers, and researchers are alarmed. It's very infectious, and so far, they haven't learned how to treat it or stop its spread. The gopher was already classified as a Florida 'species of special concern,' so it's urgent that this disease be stopped before this keystone species becomes endangered or even extinct."

58. Gopher beside blooming cactus: "This gopher is beside one of its major food sources. It eats those pretty yellow flowers, the ruby-red fruit, the pear, which has tiny but sharp prickles on it and the stems. Those wide, flat stems of the prickly pear cactus, which look like leaves, are high in water content, which is important to thirsty animals in the desert-like scrub habitat. The true leaves have been modified into those long, sharp thorns."

59. Gopher and car wheel: "One of the main causes of death of gopher tortoises is automobiles, when they try to cross a road. It's not that these turtles are so fast that they can leap out in front of a car. If you're a driver who's paying attention to what you're doing, you should be able to slow down and avoid hitting these large, slow-moving animals. Anyone who hits one on purpose would have to be pretty sick."

60. Gopher on asphalt: "If you ever have the opportunity to help a turtle while it's crossing the road, always put it across in the direction it's heading. They have a strong sense of direction, and if you put it back where it came from, it will just turn around and try to cross the road again. They're very determined, especially if it's in the spring, mating season. They can apparently smell each other from rather far distances, and if they're heading for a prospective mate, they won't let a road stop them -- unless, of course, they get hit on it. So always put them in the direction they were heading, if you pick them up to get them off the road."

61. Armadillo: "This little nine-banded armadillo is a baby. Armadillos are unique in that whenever the female gives birth, she always gives birth to four indentical young. They'll either be four females or four males, with identical genes. That makes them an excellent research animal. Scientists love that, because they can perform tests on half of a set of identical quadruplets and keep half as controls, so that they'll know exactly what changes are due to the tests. They don't have to worry about genetic differences confusing the issue.

62. Armadillo: "This is an adult. Armadillos always seem to have their noses in the dirt. They're hunting for insect larvae, grubs, little snails, etc. They love to eat earthworms. "They have real poor eyesight. If you happen to walk up on an armadillo that's foraging in the grasses, they might not even see you. If you hold real still, they'll sometimes walk right up to you and bump into you without even realizing you're there. Maybe they think you're a tree, where they might find grubs around the roots, because they do seem to come right to your feet.

[I've had that happen to me. -- MRB]

"Armadillos get about the size of a large housecat. They're fairly fast runners, and that tough armor enables them to plow through vegetation that you and I could never get through. The armadillo can just go right through it like a tank."

63. Spotted skunk: "This is a little spotted skunk, commonly found in scrub habitat. It gets only about as big as a gray squirrel, when it's fully grown. It's also called a civet cat.

64. Spotted skunk: The spotted skunk carries the same spray that its big cousin, the striped skunk, carries, and they're accurate with that spray within about twelve feet. They'll often do a handstand when they're upset, and that's a warning to stay back. If you get any closer, they'll spray, and the spray is very noxious. If it gets you, it will make you nauseated. It's very powerful stuff, and can really hurt your eyes."

65. Gray fox:

66. Bobcat:

67. Baby raccoon:

68. Two raccoons:

69. Angry raccoon:

70. Possum showing teeth:

71. Possum at _____ nest:

72. Possum hanging by tail:

73. Possum in faint:

74. Possum babies in pouch:

75. Closeup of baby in pouch:

76. Older baby on mother's back:

77. Ditto on stick:

78. Young cottontail rabbit:

79. Two cottontails:

80. Adult cottontail:

81. Great horned owl:

82. Great horned owl:

83. Same owl hooting:

84. Screech owl:

85. Ditto in cabbage palm hole:

86. Three color phases:

87. Baby _____ owl:

88. Baby _____ owl:

89. Mourning dove:

90. Mocking bird: ?

91. Three baby _____ birds:

92. Blue jay:

93. Blue jays:

94. Scrub jay:

95. Scrub jay:

96. Scrub jay at nest:

97. Scrub jay with cricket:

98. Two and nest:

99. Scrub jay on hand:

100. Fledgling scrub jay:

101. Adult:

102. Zebra swallowtail: ???

103. Gulf fritillary:

104. _____ sulphur:

105. Io moth: ???

106. Io flashing: ?

107. Canova Scrub:

109. Baby scrub jay:

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