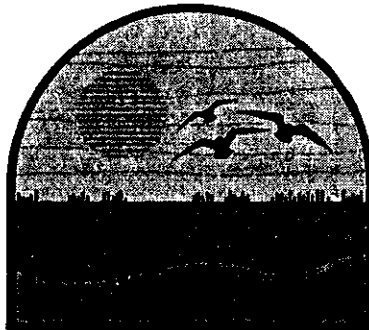


MANAGEMENT PLAN
for the
BIRD ISLAND COMPONENT
of the
NORTH CAROLINA COASTAL RESERVE



**North Carolina Department of Environment
and Natural Resources
Division of Coastal Management
Coastal Reserve Program
5600 Marvin Moss Lane
Wilmington, N.C. 28409**

(910) 962-2470



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I. EXECUTIVE SUMMARY

The North Carolina Coastal Reserve includes over 40,000 acres of lands and waters associated with barrier islands and wetlands along the 320 miles of North Carolina ocean shoreline. The Reserve (Figure 1) includes ten sites or components: 1. Currituck Banks (Currituck County), 2. Kitty Hawk Woods (Dare County), 3. Buxton Woods (Dare County), 4. Emily and Richardson Preyer Buckridge (Tyrrell County), 5. Rachel Carson (Carteret County), 6. Permuda Island (Onslow County), 7. Masonboro Island (New Hanover County), 8. Zeke's Island (Brunswick/New Hanover counties), 9. Bald Head Woods (Brunswick County) and 10. Bird Island (Brunswick County). Four components (Currituck Banks, Rachel Carson, Masonboro Island and Zeke's Island) also represent the North Carolina National Estuarine Research Reserve (NCNERR), part of federal-state program that manages a nation-wide system of sites for estuarine research, education and compatible traditional uses. Although the other six sites are not included in the NCNERR, they are managed for similar purposes by the state Division of Coastal Management.

The concept of governmental protection of coastal natural areas for research and education was created in Section 315 of the federal Coastal Zone Management Act of 1972. This section of the Act created the National Estuarine Research Reserve System, a program within the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA) that includes sites in 23 other coastal states and Puerto Rico. North Carolina began to participate in this program in 1982 and the four sites were acquired during the ensuing years. Following creation of the NCNERR, the N.C. Division of Coastal Management felt that other state-owned coastal tracts not included in the Estuarine Reserve should be protected in a similar manner. Thus, the Coastal Reserve was formally established in 1989 to encompass the NCNERR and other significant coastal natural areas.

As coastal development continues to convert large portions of natural ecosystems to alternative land uses, the public needs to have access to areas that maintain our natural heritage and allow traditional uses. Beyond natural area protection, Reserve sites serve as natural outdoor laboratories for research to improve our knowledge of the coast and for education to convey information that will improve coastal management awareness and decision making for present and future generations. Additional sites may be added to the Reserve as funding and protection needs are evaluated by the state.

Bird Island is an entire, undeveloped barrier located at the southwestern edge of the North Carolina coast, situated between the Town of Sunset Beach and the Little River Inlet in South Carolina. The North Carolina portion of the island is approximately 1.3 miles in length along the ocean beach by 1.45 miles in width extending to the Atlantic Intracoastal Waterway. The Reserve site encompasses approximately 1,200 acres (Figures 2 and 3) consisting of 136 upland acres and over 1,060 acres of marsh, intertidal flats and subtidal area. The property was acquired in two phases -- 69 upland acres plus all wetlands were purchased in 2001 while the remaining 67 upland acres were added in 2002. The combined \$ 4.2 million purchase price was funded by awards from the state

Clean Water Management Trust Fund (\$2.75 million), Natural Heritage Trust Fund (\$750,000) and the N.C. Department of Transportation (\$700,000). All of the land was acquired by the State of North Carolina in fee simple title.

The Reserve site represents excellent examples of barrier communities with several occurrences of rare species. The following barrier island biotic communities are present: upper beach, dune grass, maritime dry grassland, maritime wet grassland, maritime shrub thicket, maritime shrub swamp, brackish marsh, salt shrub, salt flat and salt marsh. The most notable species of the island are nesting loggerhead sea turtles (Caretta caretta) and seabeach amaranth (Amaranthus pumilus), a plant of foredune areas. Both species are listed as "threatened" by the federal and state governments.

The Coastal Reserve staff consists of the Program Coordinator, Reserve Management Specialist and Research Coordinator located at the UNCW Center for Marine Science in Wilmington, the Education Coordinator at Beaufort, the Northern Sites Manager at Kitty Hawk and the Buckridge Site Manager at Columbia. The Program Coordinator oversees administrative functions, personnel, budgets and interacts with public and private agencies/individuals concerning management of all sites. The Reserve Management Specialist is responsible for stewardship activities pertaining to Bird Island as well as the other Coastal Reserve sites in the southern portion of the state plus planning for the Buckridge site. The Research and Education coordinators manage their respective activities with support staff and various organizations (e.g., governmental agencies, state/private universities, marine science programs, public schools) plus any interested individuals. The Northern Sites Manager oversees Reserve operations at the Currituck Banks, Kitty Hawk Woods and Buxton Woods sites, while the Buckridge Site Manager is responsible specifically for stewardship of the Emily and Richardson Preyer Buckridge property.

Bird Island will be managed for use as a natural outdoor laboratory for research, education and traditional uses. Preservation of natural resources shall be priority. A coordinated management approach will be used, involving Reserve staff, a local advisory committee and a network of state, county and local agencies and individuals. Reserve statutes and component use requirements (Appendices A and B) shall be enforced to protect the natural integrity of the island. Current and future management issues are also included. In particular, the Bird Island Preservation Society will be an important partner in the management process (see Appendix C).

This plan is in accordance with all relevant federal, state and local regulations. In particular, it is consistent with the Brunswick County Land Use Plan and the North Carolina Coastal Area Management Act (NCGS 113A-100 et seq.).

II. INTRODUCTION

A. Creation of the Coastal Reserve

The Coastal Reserve was created to manage certain state properties as coastal natural areas. Some of these sites are also designated as the North Carolina National Estuarine Research Reserve, a state-federal program to protect selected estuarine sites for research, education and compatible traditional uses. The federal Estuarine Reserve Program was created by Section 315 of the federal Coastal Zone Management Act of 1972. This section of the Act allows states to apply for matching federal funds to acquire and manage selected areas. North Carolina received federal grants to begin Estuarine Reserve land acquisition in 1982. Federal criteria, funding and subsequent evaluations allowed North Carolina to have a total of four components (Zeke's Island, Masonboro Island, Rachel Carson and Currituck Banks) in the Estuarine Reserve. However, federal Estuarine Reserve acquisition, operations, research, development and education funding is limited to these four sites.

Permuda Island was acquired and placed in the Coastal Reserve by the State in 1987 to stop development that might negatively impact the water quality of Stump Sound -- an important local fishery. Though the 83-acre island has little natural significance because of past farming, it does contain a shell midden of national archaeological significance.

In 1988 the State began to purchase tracts in Buxton Woods to protect this maritime forest from development. This was the first effort to specifically protect maritime forest by inclusion in the Coastal Reserve. Subsequently, the Coastal Resources Commission studied the status of maritime forests guided, in part, by a study -- Lopazanski et al. (1988). From this review, it was determined that the maritime forest ecosystem should be given high priority relative to coastal preservation efforts. The State then pursued acquisitions at Bald Head Island and Kitty Hawk Woods when funding was available and the owners expressed interest in selling. Buxton Woods now includes approximately 850 acres while over 1,000 acres of maritime forest and adjacent marsh islands are protected at Kitty Hawk Woods. Approximately 186 acres of maritime forest have been protected at Bald Head Woods since 1993. Buckridge, an 18,000-acre complex of swamp forest and low-salinity estuarine communities was acquired as the ninth site during 1999 with an additional 8,000 acres added by conservation easement in 2002.

B. Bird Island Acquisition

The original initiative to preserve Bird Island started in 1992 when Ms. Janie Pace Price of Greensboro, the former owner, proposed construction of a bridge/causeway from Sunset Beach to allow access for development. State Representative David Redwine (Brunswick County) had state funding directed toward a conservation feasibility study (DEH&NR 1993). Mr. William Ducker and other Sunset Beach residents approached the N.C. Coastal Federation for

assistance and later formed the Bird Island Preservation Society (BIPS) to protect the island. A 1994 proposal by BIPS to have the island designated as an Area of Environmental Concern (i.e., complex coastal natural area) was ultimately rejected by the Coastal Resources Commission (CRC). However, attempts by the owner to secure a permit for construction of the proposed bridge were turned down by the CRC in 1996. The owner then sought to sell the island. During 1997-2001, representative Redwine, the State Property Office, the Department of Environment and Natural Resources (DENR), the N.C. Coastal Land Trust, the Coastal Federation and BIPS collaborated to determine how the site could be acquired and managed as a natural area. In 2001 DENR decided that Bird Island would be added to the Coastal Reserve Program.

Following surveys, appraisals and negotiations, the Price family and the State agreed upon a price of \$4.2 million for approximately 1,200-acres of the island. In 2001 the Division of Coastal Management applied for and received a grant of \$ 2,750,000 from the Clean Water Management Trust Fund to acquire the island. The state Natural Heritage Trust Fund awarded the DCM \$750,000 for the same purpose. Later, the N.C. Department of Transportation used \$700,000 in highway mitigation funds to make up the difference. The 135.78 acres of uplands and associated intertidal/subtidal areas were acquired in two phases: 68.78 upland acres (plus all wetlands) in 2001 and the remaining 67 acres in 2002. Some of the upland area (28.88 acres plus a 0.72-acre easement along the ocean beach) on the North Carolina side of the island is owned by the U.S. Army Corps of Engineers.

C. Values of Preservation

One obvious question that needs to be addressed is why this site is being protected. One answer, discussed later, is the natural significance of the Bird Island in terms of rare plant and animal species found within an undisturbed barrier island. However, there also needs to be a brief overview of the practical and societal benefits of acquisition and management of the property.

Bennett (1995) characterized wilderness areas in terms of ecological and psychological values. The most tangible reason for natural area protection is preservation of evolutionary processes and genetic diversity which gives us an opportunity to learn more about our world, especially relative to prediction of the consequences of human impacts on our environment. Undisturbed barrier island communities can serve as a scientific "controls" for comparison to developed areas. Issues such as water quality, barrier island hydrology, storm damage and exotic species invasion can be compared and contrasted between the Reserve and adjacent developed islands. Thus, the site serves as an irreplaceable laboratory for education and management-oriented research.

The psychological benefit of the property will vary from individual to individual. Each person's concept of wilderness or natural conditions is founded upon previous life experiences and expectations. Relative to Bird Island, the 1,200-acre tract offers different levels of use from the popular ocean beach area to remote interior shrub thickets and salt marshes. Finally, the visitor may also gain a greater understanding of just how the world is changing by visually contrasting the development elsewhere on the coast to

this undisturbed barrier island. This contrast can be expected to be more profound over time, given the increasing population and the strong demand for coastal real estate.

III. PURPOSE AND GOALS OF MANAGEMENT

A. Purpose and Scope of Plan

The State of North Carolina established the North Carolina Coastal Reserve to manage representative natural areas for long-term research, monitoring, education and compatible traditional uses. The ultimate goal of the Reserve is to provide useful information to coastal decision makers and the public.

The purpose of this management plan is to inform interested parties about the Bird Island component and the activities that will be conducted there. Though it is long-term in scope, the plan will be reviewed annually by the Local Advisory Committee and revised by the State annually.

The management goals of the North Carolina Coastal Reserve are:

1. *To preserve coastal ecosystems representative of the biogeographic regions and typologies in North Carolina and to make them available for continuous future study of processes, functions and influences which shape and sustain the coastal area;*
2. *To provide new information on coastal ecosystem processes to decision makers as a basis for the promotion of sound management of coastal resources;*
3. *To provide a focal point for educational activities that increase the public awareness and understanding of coastal ecosystems; effects of man on them; and their importance to the state and the nation; and*
4. *To accommodate traditional recreational activities and other uses of the Reserve as long as they do not disturb the Reserve environment and are compatible with the research and educational activities taking place there.*

General policies for protection and use of the Reserve's resources are summarized as follows:

B. Research/Monitoring Activities (page 24)

The management plan establishes procedures by which research will be permitted on the Reserve site. Though a very wide range of research may take place, priorities are given for projects depending upon the amount of previous work done within a given component. Briefly, priority research topics include:

1. *Baseline measurements of archaeological, chemical, physical, biological and ecological characteristics;*
2. *Monitoring changes in these characteristics over various time frames; and*
3. *Research to help improve coastal decision making.*

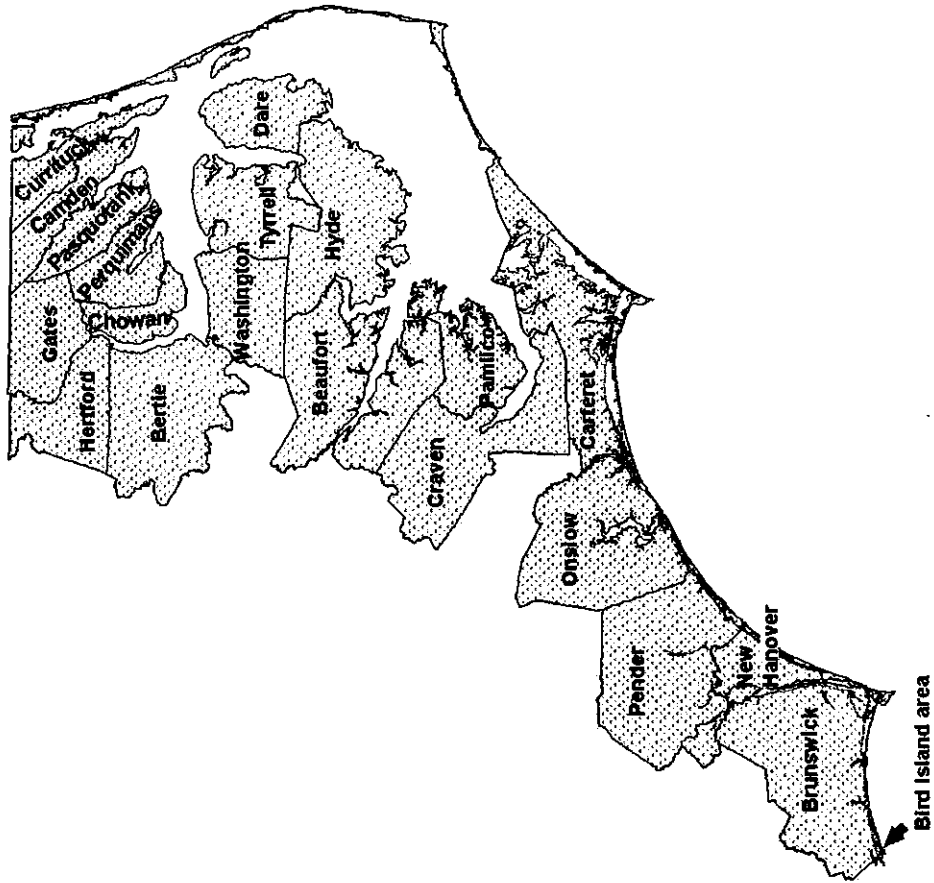
This sequence of research priorities ("3" being the highest) is in the best interest of the Reserve--protecting it from adverse impacts and guaranteeing its long-term value and suitability for research, education and other compatible human activities. The ultimate goal of the research program is the third priority--to provide information to improve coastal decision making.

The management plan also provides procedures for permitting, monitoring/research activities and procedures for disseminating research results to educate scientists, resource managers and the general public. Research in the Reserve will enhance awareness and understanding of natural processes in the coastal region and of human effects on the associated ecosystems.

C. **Educational Activities** (page 27)

Publications, lectures, slide shows, field trips and other related programs will actively draw on and be coordinated with the activities of The Bird Island Preservation Society, The Coastal Land Trust, public schools, the North Carolina Aquariums, colleges and universities, and other educational organizations. Policies related to on-site interpretive programs for students and other groups have been developed. On-site educational programs will not disturb research activities. Off-site educational programs will be coordinated with various marine science programs, such as the University of North Carolina at Wilmington (UNCW), Sea Grant and the North Carolina Aquariums.

Figure 2. Vicinity Map
The Twenty Coastal Counties of North Carolina



D. Other Activities (page 29)

Policies addressing traditional uses of the Reserve have been presented to maintain a balance between these activities and research/educational activities. Standards for recreational activities and vehicular access have been developed. The policies are designed to ensure minimal disruption to research projects and to the Reserve's biotic and abiotic features.

E. Enforcement and Surveillance (page 32)

Protection of the site will be achieved through various cooperative arrangements with federal, state and local agencies and individuals, especially the Bird Island Preservation Society. This undisturbed barrier island is a valuable natural resource that must be preserved for use and enjoyment by future generations.

IV. SITE DESCRIPTION

A. Regional Perspective and Access

The Bird Island Coastal Reserve is located in southwestern Brunswick County, between Sunset Beach and the South Carolina state line (see Figures 2 and 3). Although the island is visited seasonally by thousands of tourists, the permanent population in the immediate area consists of several hundred residents. Most of the local businesses on the adjacent barrier islands and mainland are related to the tourist/resort economy given the number of seasonal visitors and retirees that are attracted to the area for its beauty and mild climate. The broad, gently-sloping, natural beach of Sunset Beach-Bird Island is particularly appealing to visitors, making it an important part of the local economy.

Public access is primarily via the ocean beach on the Sunset Beach side, while boats may land on the beach associated with Little River Inlet on the South Carolina side. With the closure of Mad Inlet in 1999 following Hurricane Bonnie, the public may walk the length of the island at all times. The upland property begins at the boundary with Sunset Beach and continues about 0.9 mile until it meets the Corps of Engineers property approximately 0.4 mile from the state line. The sound and marsh areas of the Reserve may be reached by boat, depending upon vessel draft and tide levels. Several tidal creeks (e.g., Bonaparte Creek, Clayton Creek, East River) are found within the site.

B. Resource Inventory

1. Physiography and Geology

The Bird Island Coastal Reserve is located on the Outer Coastal Plain and is the terminus a series of barrier islands known locally as “the Brunswick County beaches.” The reserve site is bounded by the Atlantic Intracoastal Waterway to the north, the Atlantic Ocean to the south, the Town of Sunset Beach to the east, and the South Carolina state line/US Army Corps of Engineers property to the west.

Geologically, Bird Island primarily consists of marine-deposited Holocene sands overlying limestone and clay strata. The origin of barrier islands is controversial and complex, involving such factors as drowned beach ridges, changes in sea level and site-specific dynamics of sediment transport (Horton and Zullo 1991).

2. Soils

The Reserve property was mapped by Barnhill (1986) as a sequence of soils ranging from fine sands in the uplands to silty clay loams in the wetlands. The excessively drained fine sands of the Newhan series are found throughout the beach and dune areas, including a variant consisting of dredged materials deposited along the waterway and within the former bridge corridor. A limited area of the Corolla series is found within a nearly level flat located near the State of North Carolina/Corps of Engineers boundary just behind ocean beach. This soil consists of fine sands that range from poorly to moderately well drained. The very poorly drained, silty clay loams of the Bohicket series underlie the extensive tidal marshes and mud/sand flats found between the waterway and the beach/dune areas.

3. Hydrology

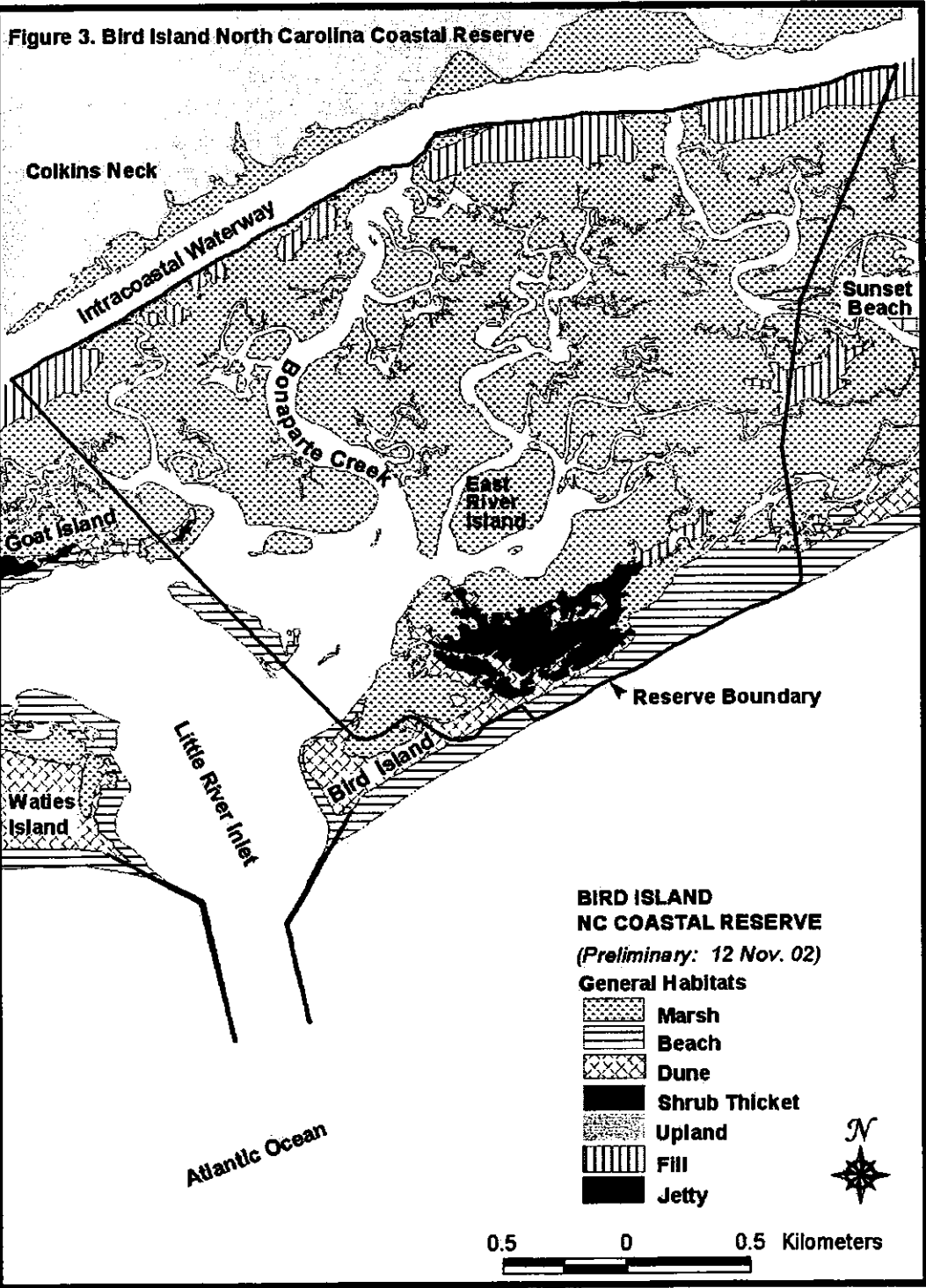
(Art et al. 1974, Bellis 1995)

Though no specific reference is available for the site, general characteristics are likely those described for barrier islands in general. The freshwater resource of Bird Island is a combination of surficial and subsurface aquifer types. The fresh water at or near the soil surface is found in association with unconsolidated sediments above a confining layer of finer sediments, usually clay. Below this aquiclude is found a mixture of saline and fresh ground waters within layers of clay and limestone. Island fresh water is recharged exclusively by precipitation. The lens of freshwater is perched above denser saline waters that seep in from the surrounding ocean and sound.

4. Climate

(Mayes, 1984; NOAA/NCDC, 1996-2001)

The local climate on Bird Island is somewhat milder and more vulnerable to immediate oceanic influences than the neighboring mainland. Nearest Brunswick County weather stations are located near Southport (Sunny Point Military Ocean Terminal) and



Longwood, both considerably inland of Bird Island. Thus, data from these sources must be viewed accordingly when relating them to the Reserve site. Average annual precipitation totals during 1996-2001 were 67.7" and 58.73", respectively, while mean annual temperatures were 62.6⁰F and 62.2⁰F. The average number of frost-free days for the two stations was 225 and 216.

Wind direction on southeast North Carolina barrier islands varies seasonally, with spring and summer winds primarily from the southwest. Fall winds are often from the northeast while winter winds usually come from the north and northwest. Hurricanes, tropical storms and extra-tropical storms (i.e., "nor'easters") have occasionally hit Bird Island, though not as frequently as more exposed Outer Banks areas such as Cape Hatteras. The most powerful storm to strike the area in the recent past was Hurricane Hazel (1954) that drove storm tides over most of the island. More recent hurricanes/tropical storms that directly effected Bird Island included Diana (1985), Hugo (1989), Bertha (1996), Fran (1996), Bonnie (1998), Dennis (1999) and Floyd (1999). Some of these storms accounted for higher than normal rainfalls, including 89.9" measured at the Southport station during 1999.

While hurricanes generally occur during the summer and fall months, extra-tropical storms may affect the island during the fall and winter. Beginning as continental low pressure systems that slowly move offshore, these storms often develop strong, sustained northeast winds that may blow for days, causing as much cumulative damage to coastal areas as the short-lived, but more infrequent, hurricanes.

5. *Vegetation*

(Weakley 1989, Schafale and Weakley 1990, Moul and Baldwin 1992, DEH&NR 1993, Taggart 1994; also Appendix D)

Bird Island, North Carolina contains ocean to sound community zonation characteristic of an undisturbed southeastern barrier island: upper beach, dune grass, maritime dry grassland, maritime wet grassland, maritime shrub swamp, maritime shrub, brackish marsh, salt shrub, salt flat, salt marsh and subtidal. However, changes in island topography, usually the result of storms, can temporarily or permanently alter this sequence.

The highly dynamic **upper beach** habitat is home to a limited number of species, typically succulents, tolerant of harsh conditions that include shifting sands, strong winds, salt spray and infrequent storm tides. Annuals such as sea rocket (*Cakile edentula*), seabeach amaranth (*Amaranthus pumilus*), orach (*Atriplex arenaria*) and dune spurge (*Chamaesyce* spp.) occur as the first plants encountered above the high tide line. In addition, sporadic perennials such as sea oats (*Uniola paniculata*), beach panic grass (*Panicum amarum*), pennywort (*Hydrocotyle bonariensis*) or sea elder (*Iva imbricata*) occasionally become established in the "drift line" of debris and help to form embryonic dunes.

The **dune grass** community is exemplified by prominent frontal and secondary dunes, some in excess of twenty feet in height. Sea oats is the dominant species throughout, forming extensive rhizomatous colonies that bind the shifting sands. Less

frequent species include beach panic grass, sea elder, pennywort, saltmeadow cordgrass (*Spartina patens*), seaside goldenrod (*Solidago sempervirens*) and yucca (*Yucca filamentosa*).

Behind the dunes are irregularly-shaped, herbaceous-dominated flats that contain species less tolerant of salt spray and oceanfront dynamics. **Maritime dry grasslands** of the island have excessively to well drained (with occasional ocean flooding) sandy soils that contain variable patches of sea oats (closest to the dunes), saltmeadow cordgrass, broomsedge (*Andropogon* spp.), or sedges (*Carex* spp.) mixed with a number of forbs: camphor weed (*Heterotheca subaxillaris*), prickly pear cactus (*Opuntia compressa*), pepper grass (*Lepidium virginicum*), blanket flower (*Gaillardia pulchella*) and goldenrods (*Euthamia minor*, *Solidago sempervirens*). Adjacent flats of **maritime wet grassland** (also found within the maritime shrub) are slightly lower in landscape position and experience seasonal to permanent saturation. Colonies of graminoids such as saltmeadow cordgrass, broomsedge, marsh fimbry (*Fimbristylis* spp.), plume grass (*Erianthus* spp.) or sedges are most common.

The **maritime shrub** community is found on portions of the property that experience the least amount of ocean or sound flooding. Soil moisture can be variable, ranging from excessively drained to poorly drained at transitions to adjacent wetlands. Prevalent shrubs to small trees include yaupon (*Ilex vomitoria*), silverling (*Baccharis halimifolia*), red cedar (*Juniperus silicicola*), red bay (*Persea borbonia*), wax myrtle (*Myrica cerifera*), black cherry (*Prunus serotina*), stunted live oak (*Quercus virginiana*) plus scattered Hercules' club (*Zanthoxylum clava-herculis*) and beauty berry (*Callicarpa americana*). Although the dense canopy limits sunlight for growth of forbs or graminoids, a number of vines are present: poison ivy (*Toxicodendron radicans*), catbrier (*Smilax* spp.), climbing hempweed (*Mikania scandens*), peppervine (*Ampelopsis arborea*), Muscadine grape (*Vitis rotundifolia*), Virginia creeper (*Parthenocissus quinquefolia*) and cucumber vine (*Melothria pendula*).

Maritime shrub swamp is dominated by wax myrtle, red bay or silverling associated with seasonally flooded to intermittently exposed swales. Vines include poison ivy, catbrier, climbing hempweed and Virginia creeper, while openings may be populated by non-woody species such as cinnamon fern (*Osmunda cinnamomea*), lizard's tail (*Saururus cernuus*), water pennywort (*Hydrocotyle umbellata*) and peat moss (*Sphagnum* sp.).

Isolated pockets of **brackish marsh** occur in remnants of borrow areas used as sediment sources for construction of the former causeway. Here salt water from sporadic flooding events mixes with groundwater and precipitation to provide a low salinity environment for such species as cat-tails (*Typha* spp.) and giant foxtail (*Setaria magna*).

An irregular zone of **salt shrub** forms a transition from the shrub communities to sound-side marshes. Intermittent flooding by storm or spring tides creates a habitat where only salt tolerant woody species can persist. Marsh Elder (*Iva frutescens*), sea ox-eye (*Borrchia frutescens*), silverling and wax myrtle grow in clusters or as isolated individuals.

The majority of Bird Island is dominated by open flats of mostly herbaceous communities that receive varying degrees of exposure to estuarine (and occasionally, oceanic) waters. Local depressions or **salt flats** (typically >100 sq. ft.) within the supratidal area, where saltwater slowly evaporates between sporadic inundations, contain species tolerant of the highest salinities (> 40 ppt). Glassworts (Salicornia spp.) are dominant with lesser amounts of salt grass (Distichlis spicata) and sea lavender (Limonium nashii). The extensive **salt marsh** (ca. 1,000 acres) area of Bird Island is comprised of two generalized zones. Supratidal marsh is found where spring or storm tides waters reach and contains stands of saltmeadow cordgrass or blackneedle rush (Juncus roemerianus) in combination with scattered sea ox-eye, salt grass, seaside aster (Aster tenuifolius) or sea pink (Sabatia stellaris). Intertidal marsh is flooded twice daily and almost exclusively covered by dense, rhizomatous colonies of saltmarsh cordgrass (Spartina alterniflora), a vital part of the estuarine food web.

Portions of sand and mud **subtidal flats** are populated seasonally by algae that grow where hard substrates (e.g., shells) are available for attachment. Sea lettuce (Ulva lactuca) and green fleece (Codium isthocladum) are common green algae while dictyota (Dictyota dichotoma) and false agardhiella (Gracilaria verrucosa) are examples of local brown and red species, respectively.

6. Fauna

A comprehensive animal survey of the Reserve area has yet to be performed. Previous unpublished reports and letters (Moul and Baldwin 1992, DEH&NR 1993, Gant 1994, Taggart 1994 and Appendix D represent the only available descriptions of local fauna.

Common mammals include, red foxes (Vulpes vulpes), raccoons (Procyon lotor), opossums (Didelphis virginiana), marsh rabbits (Sylvilagus palustris) and cotton mice (Peromyscus gossypinus). White-tailed deer (Odocoileus virginianus) access the island more easily since the closure of Mad Inlet.

Bird Island has a typical complement of barrier island birds. Brown pelicans (Pelecanus occidentalis), laughing gulls (Larus articilla), herring gulls (Larus argentatus) and ring-billed gulls (Larus delawarensis) are commonly observed along the oceanfront. The intertidal beach is frequented by sandpipers (Calidris spp.), while beach areas and frontal dunes serve as feeding, resting or nesting sites for American oystercatchers (Haematopus palliatus), common terns (Sterna hirundo), sandwich terns (Sterna sandvicensis), least terns (Sterna albifrons), black skimmers (Rhynchops niger) and willets (Catoptrophorus semipalmatus). Other species observed include: piping plovers (Charadrius melodus), Wilson's plovers (C. wilsonia), semi-palmated plovers (C. semipalmatus), whimbrels (Numenius phaeopus), short-billed dowitchers (Limnodromus griseus), white ibises (Eudocimus albus), glossy ibises (Plegadis falcinellus), great blue herons (Ardea herodias), little blue herons (Florida caerulea), tricolored herons (Hydranassa tricolor), great egrets (Casmerodius albus), reddish egrets (Dichromanassa refuscens), snowy egrets (Egretta thula) and wood storks (Mycteria americana), though no nesting has been documented. Painted buntings (Passerina ciris) have been observed seasonally in the shrub thickets where migrating birds also find refuge.

Reptile, amphibian and fish information is limited. Nesting by loggerhead sea turtles (Caretta caretta) has been documented. Lizards are infrequent, but represented by Southeastern five-lined skinks (Eumeces inexpectatus). Small pools within the forest area are home to amphibian species such as the southern toad (Bufo terrestris), but no salamanders have been reported. The marked goby (Gobionellus stigmaticus), a species of fish considered “significantly rare” by the Natural Heritage Program, has been recorded from the waters in the vicinity of the reserve.

Invertebrates have been virtually unstudied except for a butterfly record from the North Carolina Natural Heritage Program (see Appendix C) and mollusk occurrence in the vicinity. Giant swallowtails (Papilio cresphontes) are found on the property where their larval food plant, Hercules’ club grows in the maritime shrub community. The knobbed whelk (Busycon carica), a species with “significantly rare” state status, has been found in the waters around the site.

In response to a request by the National Marine Fisheries Service a description of the Essential Fish Habitat (EFH) program and a statement of no effect has been added in Appendix G.

C. Site Significance

The Bird Island Coastal Reserve is given a “C” rating for site significance (i.e., fair/small size) by the North Carolina Natural Heritage Program (see Appendix C). Primary element occurrences include seabeach amaranth plants and loggerhead sea turtles, both listed as “threatened” by federal and state governments. Other occurrences of state significance include: dune community; maritime shrub community; eastern painted bunting; and giant swallowtail. The island was formerly a site for colonial nesting waterbirds—black skimmers, least terns and gulls, but has been inactive since 1983.

D. Archaeological Resources

According to the North Carolina Department of Cultural Resource (Brook 2002) there are no known archaeological sites within the boundaries of the Reserve site.

E. History (Daniels, 2002)

Bird Island, which derives the name from its avian inhabitants, is located in Brunswick County southwest of Sunset Beach with its tip extending into South Carolina. The Atlantic Ocean, Little River, Mad Inlet, salt marshes, and waterways with names such as Dead Backwater, Bonaparte Creek, Clayton Creek, and East River surround the island. Over time man and nature have had an impact on the island, but it has remained undeveloped serving as a habitat for wildlife.

In 1735 what is now Bird Island was evidently the starting point on the boundary survey that established part of the border between North Carolina and South Carolina, the legal division that came about in 1712. Commissioners from both colonies began the survey on May 1, 1735. The landform now known as Bird Island appears on a 1764 map and an important 1776 document. The map entitled “A Plan of the Temporary

Boundary Line Between the Provinces of North and South Carolina” was prepared in connection with a 1764 survey and featured an unnamed island below Goat Island as the place where the division of the colonies began. It was evidently present-day Bird Island. Twelve years later, on December 23, 1776, newly independent North Carolina formally declared in its Bill of Rights that the southern boundary of the state began “on the sea side at a cedar stake, at or near the mouth of the Little River”

Prior to the formation of Brunswick County, Bird Island was situated in New Hanover County (known originally as New Hanover Precinct), formed in 1729. In 1741 the area “on the West side of the Cape Fear River, in New Hanover” that included the island was designated part of St. Philip’s Parish for the purpose of establishing an Anglican Church. (The ruins of St. Philips Church still stand at Brunswick Town State Historic Site.) In 1764 Brunswick County was carved from part of Bladen County and the portion of New Hanover that included St. Philips Parish. On November 22, 1771, the North Carolina Secretary of State issued six land grants totaling 2,620 acres to Joseph Allston (or Alston) along the Little River. Allston received one tract for 640 acres that was referred as Corkins [Colkins] Neck, which is directly above Bird Island. Another grant indicated that he likely acquired what is now Bird Island. A close reading of the survey document shows that the land was bounded by Little River Inlet, Mad Inlet, and the ocean. In 1773 Joseph Allston conveyed to Josias Allston of South Carolina his Colkins Neck tract. Josias Allston in 1774 in turn sold Colkins Neck to his son Francis Allston also of South Carolina. Francis Allston’s deed stated that Colkins Neck consisted 385 acres instead of 640 acres as mentioned in Joseph Allston’s land grant. A decade later, Josias Allston provided Francis with a clear title to the land.

The story of Bird Island in the eighteenth century is rather obscure due to the scant number of references in resources. At this point, the chain of ownership is not clear. Decades later, in 1823, Samuel Frink would receive a land grant for what in now Bird Island. It remains an open question as to how the land passed from Joseph Allston to Frink. During the American Revolution, the area was not the scene of major military actions. The British and the Americans placed only limited strategic value on the inlets around the island. The nineteenth century would bring new owners and during the Civil War, military action in the vicinity of Bird Island. In the nineteenth century, Bird Island was under the ownership of two families, the Frinks and Thomases. The Frink family as stated above obtained the island as a land grant in 1823 and held possession of it for six decades. The Thomas family purchased the island in 1882. Throughout the remainder of the nineteenth century, Bird Island remained in the hands of the Thomas family. By the late nineteenth century, Bird Island was clearly labeled on coastal charts. In 1873 a map of the Little River and its vicinity, created by the federal government, was one of the first documents to refer to the landmass as Bird Island.

Albert P. Thomas of Brunswick County had sole possession of Bird Island by 1903. On January 1, 1912, Thomas sold 3,208 acres that included Bird Island to Dr. George M. Bell for \$10,000. Dr. Bell was a physician who practiced medicine in the Wakefield area of Wake County. On the first day of 1918, Dr. George M. Bell sold two tracts of land to W. M. Heffner of Augusta, Georgia, who was originally from New York, for fourteen thousand dollars. One parcel consisted of only twenty acres while the other contained 2,760 acres. Bird Island was part of the larger tract. For the first time, the

word "Bird" was referred to in a deed. In the document, "Bird Shoal beach" was mentioned once. In February 1926 W. A. Freeman, S. P. Hawes, and R. L. Bell of Horry County took out an option on Heffner's land, still referred to as the "Calvin Thomas place," which now consisted of five thousand acres. On June 20, 1927, W. A. Freeman, S. P. Hawes, and R. L. Bell leased "the Calvin Thomas place" with its now 3,525 acres to Jesse Metcalf of New York City for one thousand dollars. On January 16, 1947, Donald V. Richardson Jr. of Georgetown, South Carolina, purchased Bird Island from Metcalf's estate. On February 8 1953, Ralph C. Price of Greensboro purchased Bird Island from Richardson for \$65,000.

On October 28, 1964, Price acquired property from Sunset Beach and Twin Lakes, Inc., providing him with a perpetual easement on land located in Sunset Beach "to be used for a street or roadway." By December of that year, Price had submitted an application to the Corps of Engineers to erect a causeway in the salt marsh for the proposed connection. Price continued to move forward with his plans for the roadway. In March of 1965, he purchased two additional tracts in Sunset Beach from Sunset Beach and Twin Lakes, Inc. The Corps issued a permit in April of 1965 to construct the causeway that involved the dredging of a forty-eight-foot-wide, twelve-hundred-foot-long, and twelve-foot-deep (mean low water) channel from Salt Boiler Creek extending down to Mad Inlet. The resulting dredge material was to be used to construct the causeway in the salt marsh wetlands. By 1966 a route that included a 4,000-foot-long causeway and a 440-foot long bridge had been constructed. Price began to transform Bird Island into a haven for his family. A 1966 aerial photograph indicates that he had built two roads that spurred from the main route on the island. One of the roads went to a small harbor with a pier that Price had constructed on the back of the island. Price ran power lines and underground telephone lines, installed a septic tank, and dug a well that proved to be salty. He even had a cul-de-sac created. Pilings were brought to the island for the construction of a beach house. Price never erected a dwelling. Around 1970 vandals destroyed the bridge leading to Bird Island by setting fire to it. (An aerial photograph shows the bridge still standing in 1969; the bridge was gone by 1972.) To make matters worse, the culprits put tacks in the road to slow the responding fire trucks. The incident frightened the Prices, so they made the decision not to build on the island. Electrical poles, pier remnants, a partial causeway, and blackened bridge pilings are still visible signs of Price's effort to make Bird Island a family haven. On August 2, 1984, Ralph C. Price transferred Bird Island and its associated Sunset Beach property to his wife.

In February 1992 Mrs. Price, now a widow, filed an initial permit application with the N.C. Division of Coastal Management seeking to rebuild the bridge and causeway, to subdivide the island into fifteen lots, and to construct a pier. Mrs. Price also expressed a desire to erect homes for herself and her grandchildren and others in a small compound. An amended application to erect a bridge and causeway replacement was received by the Division of Coastal Management in April 1992. The project called for the construction of three bridges and rebuilding sections of the causeway to create three separate causeways. Two of the bridges were to replace parts of the old causeway that had eroded away. The application also noted that the fifteen parcels were to be four to six acres apiece. Each lot was to have its own septic tank; water was to be supplied by Sunset Beach. The development was described as "very low density single family lots." All

utilities were to be underground on the island and were to be run via the bridges. The pier was to have slip for four boats with floating docks to rise and lower with the tides. To provide public access to the beach, the project called for the erection of two walkways over the dunes and some parking.

The ensuing reaction to the pending application noted above initiated the ultimate acquisition of Bird Island. A Brunswick County legislator brought the issue of preserving Bird Island before the General Assembly. Rep. E. David Redwine wanted the island to remain in its natural condition and thought the state should buy it if Mrs. Price would sell. Through his efforts, Representative Redwine got a provision inserted in a capital appropriations bill, ratified on July 25, 1992, that called for the N.C. Department of Environment, Health, and Natural Resources to "study the feasibility and appropriateness of the State acquiring Bird Island in Brunswick County for the purpose of conservation." A grassroots effort with help from the NCCF, Audubon Society, and North Carolina Coastal Land led to the formation of the Bird Island Preservation Society (BIPS). The group was officially formed on September 2, 1992.

In June 1993, the Division of Parks and Recreations of the N.C. Department of Environment, Health and Natural Resources issued a report on Bird Island as requested by the legislature. According to the study, the tax value of the 1,200 acres (mostly marsh) that comprise the island was \$539,000. The study acknowledged that the acquisition of Bird Island by North Carolina was appropriate because it "possesses biological, educational, and recreational values of statewide significance."

Rep. E. David Redwine in September 1993 sought to have one million dollars reserved from the 1994 state budget for Bird Island. However, he wanted the Price family to know that it was only a starting place and not an offering price. Rep. Dewey Hill and Sen. R. C. Soles, both of Columbus County, endorsed the idea. Representative Redwine's million dollar initiative finally cleared a House subcommittee in May 1994. Yet, a new hurdle to buying the island arose because its tax value had increased. A Brunswick County property assessment raised Bird Island's tax value from \$539,000 to \$1.63 million.

In March 1995 the Coastal Resources Commission voted that the Prices could not build their 120,000 square-foot-bridge across Mad Inlet. Its decision was based on two rules: one that prohibited structures over 5,000 square feet in an "inlet hazard area" and another that forbade development in the first line of stable vegetation in an "inlet hazard area." The vote on each rule was seven to five. During May, the situation was to change in the Prices's favor. Early in the month, they filed a lawsuit against the Coastal Resources Commission. Ironically, the body in late May backed away from its earlier verdict. A member of the Commission (Tim Thornton) introduced new rules that would allow a bridge to be erected over an inlet if one had been over the inlet previously. Thornton made clear that he had Bird Island in mind when he proposed the new regulations. Two public hearings were called so people could comment on the projected rules. In January 1996 following two hearings and over eight hundred comments, the Coastal Resources Commission voted unanimously to forbid the construction of the bridge of over Mad Inlet. The commission also enacted a resolution calling on the state to purchase the island.

The state in 1995 initiated negotiations with the Price family for the purchase of Bird Island. In that year, the Department of Environment and Natural Resources decided that the site was worth buying because it was "a regionally significant natural area." The Department obtained a \$500,000 grant from the N.C. Natural Heritage Trust Fund (NHTF) in March 1996 to go toward the purchase. However, the grant required that the money to be returned if some action toward acquiring the island had not occurred within twelve months.

As the 1990s were coming to a close, Bird Island remained in limbo, but the state and the Price family were talking. In early 1997 the island was appraised for \$3.5 million. The state offered that amount to the Price family, which they refused. The Prices held out for no less than \$8.5 million. Owing to the lack of an agreement, the state had to return the \$500,000 grant to the N.C. Natural Heritage Trust Fund. Two years later, a reassessment placed the value of Bird Island at five million dollars. In 2001 the state made an offer of \$4.2 million for the island. The Prices agreed to the price with the understanding that the state would come up with nearly half the money before the end of the year. By selling Bird Island for \$4.2 million, the Price family would be allowed to claim an \$800,000 charitable donation. In August 2001 the real estate option was signed by the Prices with the state agreeing to pay two million dollars for a parcel of sixty-nine upland acres during that year and \$2.2 million for a tract of sixty-seven upland acres in the next year.

For government officials, the next major obstacle was obtaining the money. To fund the purchase, the Division of Coastal Management applied for a \$1.5 million dollar grant from the N.C. Clean Water Management Trust Fund (CWMTF). In September Coastal Management also planned to apply for \$750,000 from the NHTF and two million dollars from the federal government's Land and Water Conservation Fund. In the autumn of 2001, grants were received to go toward acquiring the island. The NHTF gave \$750,000 to Coastal Management during its fall grant awards. In November 2001 the CWMTF awarded \$2.75 million to the state agency. As 2002 opened, the Division of Coastal Management still was looking to secure the second parcel of Bird Island. In January Coastal Management had \$1.3 million left from the CWMTF grant, but it still need to come up with \$700,000. The division looked to the N.C. Department of Transportation (DOT) as a possible source of funding. The Department of Transportation responded by directing the amount of \$700,000 toward the purchase. The money was combined with the remaining CWMTF grant. On April 26, 2002, the second parcel that contained sixty-seven upland acres was acquired by the state. The newly purchased land was combined with tidal marsh and wetlands held in public trust to create a twelve-hundred acre coastal reserve.

F. Local Activities That May Affect the Component.

No current activities appear to pose a threat to the site. Visitor uses will be monitored to ensure that certain fragile resources (e.g., foredunes) are not negatively impacted.

V. PLAN ADMINISTRATION

A. RESERVE STAFF

The Secretary of DENR has assigned lead management responsibility for the North Carolina Coastal Reserve to the DCM. Since management and use of the Bird Island Coastal Reserve will likely involve other agencies and municipalities, the DCM will carefully and cooperatively work with all involved parties. The DCM staff serves as liaison between federal, state and local agencies and assists all participants in the program to carry out responsibilities through the following personnel:

1. *Reserve Coordinator*

The Reserve Coordinator oversees administrative functions of the program and serves as a liaison between the state and NOAA. The office for this staff person is located within the UNCW/Center for Marine Science (CMS) in Wilmington near Masonboro Island. A top priority of the Coordinator is to meet the general Coastal Reserve goals and objectives by implementation of site management plans.

2. *Reserve Management Specialist*

The Reserve Management Specialist is based at the CMS and deals with stewardship and operations issues related to the southern Reserve components -- Bird Island, Bald Head Woods, Zeke's Island, Masonboro Island and Permuda Island. This position is also involved with planning related to the Buckridge site and other departmental conservation initiatives such as the DENR/Department of Transportation Ecosystem Enhancement Program and the DENR Land and Water Conservation Program.

3. *Research Coordinator*

Also located at the CMS, the Research Coordinator is in charge of research and monitoring activities for the Coastal Reserve. The primary goal of this position is to facilitate these activities such that the results can be used to improve coastal management decision making. Major job duties include: compilation and maintenance of information concerning previous Reserve research, coordination of Reserve research/monitoring activities and assistance with management of the southern components.

4. *Education Coordinator*

This position coordinates educational and interpretive functions for the program and is located in the Beaufort office. The main goal is to increase public awareness and understanding of coastal issues by: 1. instructing school groups, the public and coastal decision makers about the importance of and interrelationships with coastal ecosystems and 2. translation and dissemination of the knowledge obtained through Reserve research and monitoring projects.

The Education Coordinator has the following job duties:

- To provide verbal and written information (e.g., maps and pamphlets) about the Coastal Reserve to the public;
- To conduct field trips to Reserve components;
- To organize and perform public presentations (e.g., lectures, workshops);
- To develop and implement educational outreach programs to target audiences.

5. *Northern Sites Manager*

This employee is located at Kitty Hawk to oversee stewardship of the Currituck Banks, Kitty Hawk Woods and Buxton Woods sites. Facilitation of research/monitoring and presentation of various educational activities is accomplished by coordination with the other Reserve staff. The Site Manager works closely with local governmental officials to implement management strategies and to enforce existing use policies. An important part of the job is to provide information about the program to site users and to develop working partnerships with local residents and groups (e.g., Outer Banks Bird Club).

6. *Buckridge Site Manager*

The Buckridge position, located in Columbia with a field office at Gum Neck, is responsible for the Emily and Richardson Preyer Buckridge site (26,000+ acres) located in southeastern Tyrrell County. A major thrust at this Reserve site will be restoration of hydrology to protect natural wetlands, especially those dominated by Atlantic white cedar. Facilitation of research/monitoring and presentation of various educational activities is accomplished by coordination with the other Reserve staff and governmental officials (e.g., U.S. Fish and Wildlife Service, Div. of Forest Resources, Tyrrell County). An important part of the job is to provide information about the program to site users and to develop working partnerships with local residents and groups (e.g., Partnership for the Sounds, Palmetto-Peartree Preserve).

B. Local Advisory Committee

An advisory committee will be created to assist the Division of Coastal Management with implementation and review of management at the Bird Island component. The committee provides a unique familiarity with the Reserve's individual sites -- the resources present there and local concerns. Individuals representing state and local government, education, research, traditional uses and other interests will be asked to participate by letter of invitation from the Secretary of DENR. Committee members will be appointed to serve until they choose to resign. The committee shall meet at least annually. Reserve staff will maintain contact with committee members and make available to them appropriate reports and data pertaining to research programs, educational programs and management of Reserve resources. Additional meetings of the committee may be called when the Reserve Coordinator or committee members feel that a management problem has arisen that merits discussion and action.

C. Research Proposal Review

Proposals received by the Reserve Research Coordinator will be screened by Reserve staff and selected technical experts. Each project will be evaluated on the basis of feasibility, scientific and technical merit, and whether or not it meets component objectives and policies as defined in the management plan. Only research that complies with the management plan and established research priorities will be permitted. The Reserve staff may also submit research grant applications to funding agencies.

D. Plan Review and Modification

This management plan will be reviewed annually and revised every five years by the Division of Coastal Management staff in consultation with the Local Advisory Committee. The review will include an on-site evaluation of the condition of the site, an assessment of research/educational programs and an assessment of other uses within the component

VI EXISTING STATE AND LOCAL REGULATIONS/JURISDICTIONS

A. North Carolina Coastal Area Management Act (CAMA)

CAMA (G.S. 113A-100 et seq.) was passed in 1974 and established an agency(DCM) and governor-appointed commission Coastal Resources Commission (CRC) to regulate development and to certify local land use plans in 20 coastal counties of North Carolina. Any development (e.g., boardwalks, interpretive facilities) within a Reserve site will be carefully coordinated with planning and permit staff of the DCM to conform with CAMA. The activities described in this plan are consistent with the goals and objectives of the North Carolina Coastal Management Program.

B. North Carolina Coastal Reserve Act (see Appendix A)

The Coastal Reserve Act (G.S. 113A-129.1-3) was passed in 1989 to formally establish a state program that will preserve designated coastal natural areas for research, education and other consistent public uses.

C. North Carolina Coastal Reserve Regulations (see Appendix B)

These departmental rules (15A NCAC 70) were established in 1986 to define the purpose, responsibilities, functions, components and use requirements of the Coastal Reserve. The Reserve is comprised of ten sites: Currituck Banks, Kitty Hawk Woods, Buxton Woods, Emily and Richardson Preyer Buckridge, Rachel Carson, Permuda Island, Masonboro Island, Zeke's Island, Bald Head Woods and Bird Island. Reserve use requirements (15A NCAC 70 .0200) specify general management standards within each of the component boundaries.

D Nature Preserve Act

This act was passed in 1985 (**Article 9A of NCGS chapter 113A**) and, in conjunction with associated administrative rules (**15 NCAC 12H .0300**), gives the State authority to dedicate outstanding state natural areas (deemed so by the Secretary of DENR) as nature preserves. Articles of dedication specify acceptable and unacceptable uses, management purposes and custodial responsibilities (see **Appendix E**). Bird Island was formally dedicated by the Council of State in 2002.

E. Cultural Resources

All archaeological historic property located on or recovered from state-controlled lands is state property. Applicable statutes and regulations include: the Archaeological Resources Protection Act (**G.S., Article 2; NCAC &07: 04R 0.0700**) and portions of the Archives and History Act dealing with responsibilities of the N.C. Historical Commission(**G.S. 121-2 [a]; NCAC T07: 04R 0.0200**) and protection of underwater archaeological sites (**G.S. 121, Article 3; NCAC T07 04R 0.1000**). Any proposed development or collection of artifacts within the Reserve will involve consultation with the Department of Cultural Resources/ Division of Archives and History.

F. Land Use and Zoning

Bird Island has been designated as wildlife habitat in the Brunswick County Land Use Plan. Use standards are derived from the Conservation Class.

VII. MANAGEMENT OBJECTIVES AND POLICIES

A. Research/Monitoring Objectives and Policies

The Bird Island Coastal Reserve is available for research, but funding is limited. Whenever university faculty or other prospective researchers wish to use the area for research or monitoring, the goals of the Reserve shall be:

- ❖ to preserve coastal ecosystems representative of the biogeographic regions and typologies in North Carolina and to make them available for continuous future study of processes, functions and influences which shape and sustain the ecosystems; and
- ❖ to encourage and perform, when possible, research and monitoring activities that will provide information on coastal processes as a basis for the promotion of thoughtful management of coastal resources

To meet these goals, the management plan contains the following research and monitoring objectives:

- ❖ evaluate research/monitoring proposals according to a permitting and technical review process;
- ❖ disseminate results to coastal decision makers and the public; and
- ❖ encourage use of Bird Island by researchers.

The following policies have been developed from the Coastal Reserve statutes and regulations (Appendices A and B) and will be implemented by the Reserve staff to ensure proper protection and management of the component:

Policy: *The long-term integrity of the Bird Island component as an undisturbed research site will be maintained. This requirement is of primary importance and will be the basis of all decision making establishing the use of the Reserve.*

The goal to protect the Reserve in its present state is extremely important. To support long-term research, the site must retain its integrity as a valid representative of natural North Carolina coastal ecosystems. Any improvements to facilitate access, research or education will be allowed only if, following review by the Local Advisory Committee, Reserve staff and other interested parties, construction and operation will cause negligible impacts to the component.

Policy: *Research and monitoring will be encouraged when it addresses a needed research priority. The order of general research priorities ("c" being the highest) are as follows:*

- (a) Baseline measurements of archaeological, chemical, physical, biological and ecological characteristics;
- (b) Monitoring changes in basic parameters over various time frames; and
- (c) Research to improve coastal management decision-making.

All types of research are encouraged at the North Carolina Coastal Reserve -- it has been preserved to foster scientific study. However, for the long-term good of the Reserve and coastal resource management in general, research applicable to resource management will be favored over other research if conflicts arise in the allocation of study sites.

Policy: *Research involving manipulation of the Reserve environment will be permitted on a limited basis for specified periods, provided that upon completion of research tasks, the study site can be restored to its original condition.*

Manipulative studies are defined as activities that involve creating physical, biological, geological or chemical changes in the environment and observing their

effects. Such studies have the capacity to alter natural processes of the Reserve and undermine its ability to serve as a subject for baseline studies or as a control for comparative studies. Manipulative research will be allowed if it benefits management of the Reserve and coastal resources. Proposals for manipulative research will be strictly evaluated on a case-by-case basis as to the types, extent and reversibility of environmental changes; the duration of the project; its impact on the long-term stability of the Reserve environment; and its potential for improving coastal resource management strategies.

Policy: *No research involving collection of out-of-season species or studies of protected species will be approved until all necessary research permits are obtained.*

For wildlife and inland fish species, including endangered or threatened species, a researcher must obtain a scientific collection permit from the Wildlife Resources Commission, Non-Game Program. The U.S. Fish and Wildlife Service requires a scientific collecting permit for taking, transporting or possessing migratory birds, their parts, nests or eggs for scientific research or educational purposes. Researchers are also expected to consult with the Plant Protection Program (N.C. Dept. of Agriculture) and the N.C. Natural Heritage Program (NCDNER) concerning rare plant species and communities. The Division of Marine Fisheries may also have to be consulted if taking of marine organisms is anticipated.

Policy: *A research permit must be issued by the Reserve Research Coordinator before initiation of any proposed research.*

A written proposal must be submitted to and approved by the Research Coordinator. Routine wildlife management activities, such as bird banding, fish sampling and water quality sampling conducted by state and federal agencies will be coordinated through the Research Coordinator, but will not require a proposal. However, the agency must notify the Research Coordinator either by telephone or in writing prior to initiation of field work. A copy of final results from any such study shall be submitted to the Research Coordinator.

Proposals received by the Research Coordinator will be screened by the Reserve staff and, if necessary, peer-reviewed by selected technical experts. Proposals will be evaluated on the basis of feasibility; scientific and technical merit; whether or not they meet component objectives and policies as defined in the management plan; and relevance to component research priorities. Proposed research will be reviewed with an eye toward its effects on other ongoing or proposed research projects being conducted within the Reserve.

Field work may not begin until the principal investigator receives a signed research permit from the Research Coordinator. Major changes in the original research objectives, materials or methods must be submitted in writing to the Research Coordinator who may consult the peer reviewers. Variations from the original research

proposal will only be allowed following written notification from the Research Coordinator.

Policy: *Research activities must comply with the Reserve objectives, policies and the approved research proposal.*

Research that deviates from the objectives and policies of the Management Plan or the original proposal will not be allowed to continue.

Policy: *The principal investigator for each project is responsible for maintaining and removing any human-made objects (field equipment, trash, etc.) that they bring onto the Reserve.*

Just as researchers bear sole responsibility for maintaining their field equipment, they also bear sole responsibility for removing it when ending the project.

Policy: *The principal investigator for each project is responsible for the timely submission of reports, project progress reports and other information to the Research Specialist for the program files.*

Copies of the project reports (e.g., progress reports, final reports) or other publications will be kept with the Reserve Program files and made available to interested parties with the understanding that proper credit shall be given to the original researcher(s).

Policy: *The Division of Coastal Management will actively encourage the dissemination of scientific information from the Reserve to the public.*

In addition to the avenues available to the scientific community for presenting new information (e.g., journals), media coverage, public presentations and newsletters will be used by the staff to disseminate information on the Reserve's research accomplishments and educational programs. Local officials and other interested residents of Sunset Beach will be a primary target of this information. Materials may also be distributed to county officials in Bolivia.

B. Educational Objectives and Policies

The educational goals of the North Carolina Coastal Reserve are:

- ❖ To manage Reserve components for educational and interpretive activities to enhance awareness of coastal processes; and

- ❖ To provide various opportunities and avenues for the public and decision makers to be better informed about coastal ecosystems and processes, particularly results derived from Reserve research and monitoring

To accomplish these goals, the management plan contains the following educational objectives:

- ❖ Establish procedures for developing and supporting on- and off-site educational programs;
- ❖ Coordinate educational activities among participating groups and agencies; and
- ❖ Translate scientific information generated from the Reserve research program and other research efforts into non-technical terms for transfer to the public and selected groups.

The establishment of the North Carolina Coastal Reserve focuses special attention on the need for long-term protection, wise use and proper management of coastal areas. Through effective interpretive programs, the Reserve environment is made more meaningful to the public. Learning more about coastal ecosystems from Reserve research will improve public understanding of how the system functions and will expand the resource base from which to develop interpretive programs. The program will also assist and support local conservation and land trust efforts.

Publications, lectures, slide shows, organized activities and other educational programs will actively draw on and be coordinated with the activities of public schools, North Carolina Aquariums, N. C. Sea Grant Program, colleges and universities, museums and other educational organizations.

Policy: *Off-site educational programs will be provided in conjunction with the DCM, UNCW, North Carolina Aquariums, public schools, community colleges and other educational institutions in order to make the public aware of the Reserve and its importance at state and national levels.*

The Reserve staff will coordinate activities with existing off-site programs (e.g., UNCW, N.C. Aquariums and Sea Grant) and will help develop instructional materials, slide shows and permanent displays. Cooperative educational programs will be developed to incorporate the information generated by Reserve research into existing school programs. Specialized workshops will be provided for people such as youth group leaders and science teachers to relay this information and other topics related to the Reserve's resources. Information on Coastal Area Management Act regulations and land use planning will also be presented through DCM speakers and literature.

The Division of Coastal Management may sponsor specific meetings and workshops that are announced statewide. The events will be directed at the interested public, especially coastal decision makers, and will utilize staff, scientists and volunteer experts. The DCM will also respond to, and encourage, speaking engagements by its

Reserve staff. Audiences may include service organizations, youth groups, schools and conservation clubs. The staff will also participate in activities such as serving on various boards, advisory groups and public programs.

Policy: *On-site programs at Bird Island will be arranged for supervised groups.*

As staff time allows, field trips led by the Reserve Educational Coordinator, other Reserve staff or a qualified volunteer (e.g., from the Bird Island Preservation Society) will be performed on request. Research site tours for college students and other groups are encouraged. If possible, it would be desirable to have one or more of the researchers present during the tour in order to provide the participants with an explanation of research purpose, methods and data collection. The Research Coordinator or Reserve Coordinator will coordinate such activities with participating research institutions.

Policy: *On-site activities shall stay within the areas of the site designated for public access and shall not in any way interfere with research projects or other sensitive areas.*

While most visitors remain within the beach/dune area, portions of the site may be delimited (e.g. sea turtle nest sites) for resource protection or research purposes.

Policy: *Literature, visual aids and related materials will be developed, distributed and routinely updated in order to convey to the general public and specialized groups the goals, objectives and accomplishments of the North Carolina Coastal Reserve.*

Maps, brochures, and related information will be developed to guide visitors through the site. A checklist of plant and animal species will be developed on the basis of research and observations. Pertinent rules and regulations will be posted so visitors will be familiar with the Reserve's management policies. Signs indicating that the area is a state-owned Coastal Reserve and a dedicated State Nature Preserve will be placed at access points.

Policy: *The Education Coordinator and support staff will oversee the educational program and will coordinate activities between participating institutions.*

The Education Coordinator will address the special needs of the program on a case-by-case basis. These needs may include: securing media coverage, providing staff support, funding and scheduling events or meetings. Lines of communication will be established through informal conversations, annual meetings and newsletters.

C. Objectives and Policies for Other Activities

Research and educational programs at the North Carolina Coastal Reserve will take place within the context of traditional uses of the Bird Island component. The management plan recognizes the value of public use and strives to maintain a harmonious balance between compatible activities, research and education.

The Coastal Reserve can accommodate only passive recreational activities. However, in order for them to occur in concert with the primary research and educational uses of the Reserve, a series of clear management policies tailored to each Reserve component are needed. Only through reasonable and consistent management can compatible traditional activities continue within the Reserve and contribute to its value as a place for learning and enjoyment.

The compatible use goal of the North Carolina Coastal Reserve is:

- ❖ To accommodate traditional recreational activities and other uses of the Reserve as long as:
 1. they do not disturb the natural integrity of the site and safety of other users of the Reserve environment and
 2. are compatible with research and educational activities taking place there

The management plan employs the following objectives to refine this goal and to set a context for managing special concerns of the Reserve:

- ❖ protect the natural and historical features of the area; and
- ❖ establish guidelines for various activities within the Reserve.

1. General Use

Policy: *Littering and dumping of trash is prohibited within the Bird Island Reserve component*

Littering and dumping are in violation of: state laws (G.S.14-399 & 14-399.1), the Reserve regulations (Appendix B) and dedication of the site as a State Nature Preserve (Appendix E).

Policy: *Visitors to the Reserve site shall be subject to state laws concerning public decency.*

Bird Island has a history of nude sunbathing. This will not be allowed according to state Statute (G.S. 14-190.9).

Policy: *Target shooting is prohibited within the boundaries of the Reserve*

This activity can result in debris and dangerous situations for visitors and is, thus, not allowed by Reserve use standards.

Policy: *No user shall disturb research projects or research equipment in place at a Reserve component.*

Research is a priority use and must receive protection. Disrupting research would adversely impact the long-term management of the Reserve and other coastal resources that would benefit from the results. Also, damaged or stolen equipment could cost considerable amounts of money.

Policy: *Users of the Reserve shall not disturb or remove any live animals, vegetation, or artifacts from the site unless it is part of an approved research or educational project. All pets must remain under the total control of their owner by the use of leads, leashes or other restraining devices. All users must remove their own trash.*

Removing and destroying vegetation can lead to serious long-term damage to the habitats found in the Reserve by promoting erosion and sedimentation as well as alteration of established plant and animal communities. Disturbing nesting birds and other animals can interfere with their natural habits, possibly causing them to leave the site and diminish the Reserve's diversity of species. Any interpretive trails established within the Reserve will be compatible with this policy of respecting the integrity of the site.

Policy: *Public camping is not allowed. Camping is only allowed by permit on areas designated in the Reserve for approved research activities requiring an overnight stay. Fires are not allowed within the component.*

Restricting camping protects the Reserve's delicate habitats from disturbance and destruction. Wilderness camping (i.e., pack in/pack out) **for researchers only** will be allowed by written permission from the Reserve Coordinator. Wildfire within certain areas (e.g., maritime shrub) can do considerable damage to the plants and animals of this ecosystem.

Policy: *Personal property not authorized by the Reserve Program shall not be placed within the boundaries of the Reserve for more than two consecutive days.*

Storing of unauthorized property will not be allowed. Violators will be asked to remove any such materials or a fine may be imposed under G.S. 14-399 -399.1. If the owner cannot be found, the materials will be removed.

Policy: *No activity shall be allowed which might pollute any stream or body of water in the Reserve. Acts of pollution shall include:*

- 1 .deposition of solid materials not indigenous to the local ecosystems and*
- 2 discharge of liquids other than uncontaminated water.*

Protection of surface waters (e.g., isolated ponds/wetlands) is essential for research and educational use at the Bird Island site. When appropriate, the Reserve program shall review and comment on plans for development and other activities in the component vicinity.

Policy: *No other acts or uses which are detrimental to the maintenance of the property in its natural condition shall be allowed including, but not limited to, disturbance of the soil, mining, commercial or industrial uses, timber harvesting, ditching, draining or deposition of waste materials.*

Like the other Coastal Reserve components, the Bird Island site was acquired to protect its natural integrity. Such special areas require strong safeguards to ensure their perpetual stewardship.

2. Vehicular Access

Policy: *Only land vehicles allowed by the town of Sunset Beach will be allowed on the Reserve and shall be restricted to the ocean beach. Boats using the sound side of the property shall observe all pertinent state and federal regulations*

Unrestricted vehicular access through the component would result in damage to portions of the natural communities by erosion and compaction.

3. Hunting

Policy: *Hunting is allowed according to state and local regulations.*

Hunters (primarily during the fall in the marsh area) shall abide by Wildlife Resources Commission regulations unless superseded by town or county ordinances.

D. Surveillance, Enforcement, and Maintenance

Maintenance and protection of the resources of the North Carolina Coastal Reserve is essential to its long-term survival and its value for education and scientific research. Policies stated in previous sections of the management plan and the Reserve

regulations (see **Appendix B**) control manipulation of habitats by researchers and control other disruptions (habitat disturbance, littering, species removal, etc.) by all users of the Reserve. This section of the plan presents policies for the overall maintenance of the Reserve, for reporting violations of the management plan's policies and for the enforcement of these policies.

Policy: *The Reserve staff shall visit the site periodically to identify and to investigate possible violations of Reserve policies. The Reserve will rely heavily, but not solely, on researchers, educators and other users of the site to report any violations and to cooperate in any investigations.*

Current time and budget limitations keep the Division of Coastal Management and state/local enforcement agencies from maintaining a continuous presence at Bird Island. Therefore, all users of the Reserve must exercise responsibility for obeying the management policies stated in this plan, for reporting any violations of the management policies and for cooperating with the Reserve staff and state and local enforcement personnel.

Policy: *The Division of Coastal Management will work with, local law enforcement agencies to enforce Reserve policies and all state and local laws applying to the Reserve.*

Cooperation of state and local agencies has been and will continue to be a prime ingredient in the management of the Reserve sites. Assistance from law enforcement agencies (e.g., local police or county sheriff) will be on a request basis from the Reserve staff.

Policy: *At the present time, the North Carolina Coastal Reserve shall rely on volunteer efforts to maintain the quality of the Reserve. The Reserve staff will coordinate periodic litter collections using local volunteers. All users of the Reserve shall respect the litter control and habitat protection policies of the state regulations (Appendix B).*

The Bird Island Preservation Society will function as the primary volunteer group assisting the State with Management of the component.

VIII. MANAGEMENT ISSUES AND ACTIONS

A. Introduction

This section will discuss current and anticipated issues facing the site related to sections VI and VII. The Reserve staff and Local Advisory Committee will update this information as necessary.

B. Baseline Data

To manage any natural area, there must be a comprehensive understanding of the resources present. Information from future research or monitoring will be used to support or, if necessary, modify management policies. Identification and mapping of physical, biological and archeological resource shall be a priority.

1. *Geographic Information System (GIS)*

The Reserve Research Coordinator has initiated a project to have all boundaries of Reserve components and associated data layers on a GIS. However, the current amount of data on Bird Island is minimal. For example, Reserve boundaries will have to be determined by the use of a global positioning system and then entered into the system. Once computerized, these data can then used to generate various maps depending upon the other layers of information available.

2. *Resource Inventory and Mapping*

Though some general information concerning Bird Island has been obtained from previously cited sources (e.g., Brunswick County soil survey, Natural Heritage Program records) there is a need for comprehensive, site-specific information on most basic resources such as vegetation and fauna. Available scientists, students and volunteers will be needed to help fill these gaps.

C. Partnerships

Since the DCM has limited resources, both financial and manpower, to fulfill the goals and objectives of this management plan, the Coastal Reserve Program will have to pursue and strengthen relationships with a broad base of individuals and organizations. Specific groups will include:

- Bird Island Preservation Society: A proposed memorandum of understanding is given in Appendix C. The Society will be a valuable source of volunteers for various activities related to the site.

- The Town of Sunset Beach: The town is an incorporated municipality that will be an important partner concerning the local community and related management issues.
- U.S. Army Corps of Engineers: The Corps owns approximately 29 acres of uplands in Brunswick County plus all of the South Carolina portion of the island. A memorandum of understanding will be developed (**Appendix F**) to ensure coordinated management.
- Other Governmental Agencies: Consultation with the State Property Office has been necessary for acquisition of the site. Other county, state or federal agencies may be of assistance, involving additional memoranda of understanding.

This is not intended to be a comprehensive list of groups. The key is to be creative in forming these partnerships.

D. Public Access

While previously stated policies exist to allow public use and access, decisions concerning access must be made carefully to protect the natural integrity of Reserve.

1. Access Points

Currently, the primary access to the Reserve is via the ocean beach from Sunset Beach. However, boaters may enter the sound side of the property by following several tidal creeks (e.g., Bull Creek, Bonaparte Creek, Clayton Creek) from the waterway. Access from the South Carolina side is via Little River Inlet where boaters may go ashore and walk east to the Reserve property.

2. Information

Signs will be posted along the ocean beach. They will inform visitors as to the name of the site and its managing agency. Additional signs will be posted concerning how/why Bird Island was acquired and will indicate allowable uses.

The Coastal Reserve Program will develop a general brochure describing the Coastal Reserve program and another specific to the island. Sunset Beach Town Hall shall be a distribution point for these materials near the island while copies will also be available from the Reserve offices and from all Division of Coastal Management offices.

3. Boundaries

The Reserve boundaries have been surveyed in the past, but still need to be determine by Global Positioning Systems. Boundary signs similar to those posted at other Reserve sites will be posted to clearly mark the limits of the Reserve.

4. Long Term Initiatives

A dedicated interpretive trail may be developed for use by groups or the general public. Planning would be carefully coordinated with the town, N.C. Natural Heritage

Program, Division of Coastal Management, Local Advisory Committee and other pertinent agencies.

E. Maintenance

Periodic maintenance and monitoring of use will be performed by Reserve staff and by volunteers. Any litter will be picked up either by staff or volunteers during designated events (i.e., Big Sweep).

F. Fire Management

Camping and fires are not allowed the property. Though fire has not been an issue of concern in the past, the Reserve program will work with the town fire department if any actions are needed to either prevent or extinguish fires on the property.

G. Funding

The Coastal Reserve program receives state appropriations to manage the program. Approximately \$ 30,000 is allocated as operational funding for all of the Reserve sites. Additional money is available for trails and public access from the DCM public access program.

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APPENDIX A
Coastal Reserve Statutes

Part 5. Coastal Reserves.

§ 113A-129.1. Legislative Findings and Purposes.

(a) Findings. -- It is hereby determined and declared as a matter of legislative finding that the coastal area of North Carolina contains a number of important undeveloped natural areas. These areas are vital to continued fishery and wildlife protection, water quality maintenance and improvement, preservation of unique and important coastal natural areas, aesthetic enjoyment, and public trust rights such as hunting, fishing, navigation, and recreation. Such land and water areas are necessary for the preservation of estuarine areas of the State, constitute important research facilities, and provide public access to waters of the State.

(b) Purposes. -- Important public purposes will be served by the preservation of certain of these areas in an undeveloped state. Such areas would thereafter be available for research, education, and other consistent public uses. These areas would also continue to contribute perpetually to the natural productivity and biological, economic, and aesthetic values of North Carolina's coastal area. (1989, c. 344, s. 1.)

§ 113A-129.2. Coastal Reserve Program.

(a) There is hereby created a North Carolina Coastal Reserve System for the purpose of acquiring, improving, and maintaining undeveloped coastal land and water areas in a natural state.

(b) This system shall be established and administered by the Department of Environment and Natural Resources. In so doing the Department shall consult with and seek the ongoing advice of the Coastal Resources Commission. The Department may by rule define the areas to be included in this system and set standards for its use.

(c) This system shall be established within the coastal area as defined by G.S. 113A-103(2).

(d) All acquisitions or dispositions of property for lands within this system shall be in accordance with the provisions of Chapter 146 of the General Statutes.

Part 5. Coastal Reserves. (cont.)

(e) All lands and waters within the system shall be used primarily for research and education. Other public uses, such as hunting, fishing, navigation, and recreation, shall be allowed to the extent consistent with these primary uses. Improvements and alterations to the lands shall be limited to those consistent with these uses. (1989, c. 344, s. 1; c. 727, s. 218(58); 1997- 443, s. 11A.119(a).)

§ 113A-129.3. Coordination.

(a) To the extent feasible, this system shall be carried out in coordination with the National Estuarine Reserve Research System established by 16 U.S.C. § 1461.

(b) To the extent feasible, lands and waters within this system shall be dedicated as components of the "State Nature and Historic Preserve" as provided in Article XIV, Section 5, of the Constitution and as nature reserves pursuant to G.S. 113A-164.1 to G.S. 113A-164.11. (1989, c. 344, s. 1, c. 770, s. 47.)

APPENDIX B

Coastal Reserve Regulations

SUBCHAPTER 70 - NORTH CAROLINA COASTAL RESERVE

SECTION .0100 - GENERAL PROVISIONS

15A NCAC 70 .0101 STATEMENT OF PURPOSE

The principal purposes of the North Carolina Coastal Reserve and supporting programs are to:

- (1) preserve coastal ecosystems representative of the various biogeographic regions and typologies in North Carolina and to make them available for continuous future study of the processes, functions, and influences which shape and sustain the coastal ecosystems;
- (2) provide new information on coastal ecosystem processes to decision makers as a basis for the promotion of sound management of coastal resources;
- (3) provide a focal point for educational activities that increase the public awareness and understanding of coastal ecosystems, effects of man on them, and the importance of the coastal systems to the state and the Nation;
- (4) accommodate traditional recreational activities, commercial fishing, and other uses of the Reserve as long as they do not disturb the Reserve environment and are compatible with the research and educational activities taking place there.

History Note: Authority G.S. 113-3; 113-8; 143B-10;
Eff. July 1, 1986;
Amended Eff. April 1, 1988.

15A NCAC 70 .0102 DEFINITIONS AS USED IN THIS SUBCHAPTER

Definitions as used in this Subchapter are:

- (1) "Coastal Reserve" means those coastal land and water areas set aside to be maintained in their natural state for research, education and compatible recreation and enjoyment of natural and scenic beauty.
- (2) "Estuary" means that part of a river or stream or body of water having unimpaired connection with the open sea, where sea water is measurably diluted with fresh water derived from land drainage.
- (3) "Research Reserve" means a group of areas or components, each of which may include all or the key land and water portion of an estuary and adjacent transitional areas and uplands, constituting to the extent feasible a natural unit, set aside as a natural field laboratory to provide long-term opportunities for research, education, and interpretation of the ecological relationships within the area. The Coastal Reserve includes the Estuarine Research Reserve.
- (4) "Reserve" means any area designated pursuant to this Subchapter.

History Note: Authority G.S. 113-3; 113-8; 143B-10;
Eff. July 1, 1986;
Amended Eff. April 1, 1988.

15A NCAC 70 .0103 RESPONSIBILITIES: DUTIES OF THE COASTAL RESERVE PROGRAM

The Coastal Reserve Program of the Division of Coastal Management shall be responsible for managing and protecting the North Carolina Coastal Reserve; for promoting and coordinating research and educational programs at the components while allowing for compatible traditional uses; for maintaining a management plan for the Reserve; for maintaining cooperative agreements with scientific, educational, and resource management agencies and private citizens that will assist in the management of the Reserve; and for providing new information on coastal processes to coastal management decision makers.

History Note: Authority G.S. 113-3; 113-8; 143B-10;
Eff. July 1, 1986;
Amended Eff. April 1, 1988.

15A NCAC 70 .0104 STATE AND LOCAL COASTAL RESERVE ADVISORY COMMITTEES
Advisory committees shall be established for each individual Reserve component. The committees shall advise the Reserve coordinator. Members of the committees shall include researchers, educators, managers, and citizens that use or are affected by the Reserve. The committees shall be appointed by the Secretary of the Department of Environment, Health, and Natural Resources History Note: Authority G.S. 113-3; 113-8; 143B-10; Eff. July 1, 1986; Amended Eff. May 1, 1990; April 1, 1988.

15A NCAC 70 .0105 RESERVE COMPONENTS

(a) The North Carolina Coastal Reserve includes the following components:**

- (1) Zeke's Island;
- (2) Rachel Carson;
- (3) Currituck Banks;
- (4) Masonboro Island;
- (5) Permuda Island;
- (6) Buxton Woods;
- (7) Bald Head Woods; and
- (8) Kitty Hawk Woods.

The North Carolina National Estuarine Research Reserve includes components in Subparagraphs (1) - (4) of this Rule.

(b) Detailed boundary maps for each component are maintained and available for inspection at the Division of Coastal Management, PO Box 27687, Raleigh, North Carolina 27611-7687.

*History Note: Authority G.S. 113-3; 113-8; 143B-10;
Eff. July 1, 1986;
Amended Eff. April 1, 1999; August 1, 1991; April 1, 1988.*

** Emily and Richardson Preyer Buckridge Reserve and Bird Island are recent additions and have not been codified.

SECTION .0200 - MANAGEMENT: USE AND PROTECTION OF THE NORTH CAROLINA COASTAL RESERVE

15A NCAC 70 .0201 MANAGEMENT PLAN

The Division of Coastal Management shall prepare a management plan for the Reserve. The management plan shall contain specific policies for research, education, and traditional uses at each component. The Secretary of the Department of Environment, Health, and Natural Resources shall approve the management plan and its revisions. The Division of Coastal Management shall monitor and manage the components and report to the secretary violations of the approved plan and any other situations that may be harmful to the natural resources of the Reserve.

*History Note: Authority G.S. 113-3; 113-8; 143-341; 143-342; 143B-10;
Eff. July 1, 1986;
Amended Eff. May 1, 1990; April 1, 1988.*

15A NCAC 70 .0202 RESERVE USE REQUIREMENTS

The following use requirements shall apply to all of the components of the Reserve:

- (1) The essential natural character of the Reserve shall be maintained.
- (2) Traditional recreational uses within each component shall be allowed to continue as long as the activities do not disrupt the natural integrity of the Reserve or any research or educational projects. Incompatible traditional uses shall include:
 - (a) fishing, hunting, or trapping activities not allowed by state rules;
 - (b) target shooting;
 - (c) hydraulic clam dredging within Reserve boundaries;
 - (d) use of vehicles off designated corridors at components where vehicles are allowed for upland transportation according to the management plan; and

- (e) production of noise disruptive to local wildlife and the aesthetic enjoyment of the Reserve as a natural area.

- (3) No user shall disturb a research project or research equipment in place at the Reserve.
- (4) Camping or any form of habitation, whether on the uplands, wetlands, or waters within Reserve boundaries, shall not be allowed unless written permission is posted by the Division of Coastal Management.
- (5) Personal property not authorized by the management agency may not be placed within the boundaries of the Reserve for more than two consecutive days.
- (6) Users of the Reserve shall not disturb or remove any live animals, except those allowed by local or state hunting and fishing rules as they apply to the Reserve, or vegetation within the Reserve unless such action is part of a research or educational project approved by the management agency.
- (7) Persons wishing to engage in scientific research or collection of natural materials within the Reserve shall first secure written permission from the management agency.
- (8) No activity shall be allowed which might pollute any stream or body of water in the Reserve. Acts of pollution shall include:
 - (a) Deposition of solid materials not indigenous to the local coastal ecosystem; and
 - (b) Discharge of liquids other than uncontaminated estuarine water.
- (9) No other acts or uses which are detrimental to the maintenance of the property in its natural condition shall be allowed including, but not limited to, disturbances of the soil, mining, commercial or industrial uses, timber harvesting, ditching and draining, deposition of waste materials.

*History Note: Authority G.S. 143B-10;
Eff. July 1, 1986;
Amended Eff. April 1, 1999; December 1, 1991; April 1, 1988.*

APPENDIX C

**Draft Memorandum of Understanding between the Bird Island Preservation Society and
the N.C. Department of Environment and Natural Resources**

DRAFT

MEMORANDUM OF UNDERSTANDING

This memorandum serves as an expression of intent between the North Carolina Department of Environment and Natural Resources/Division of Coastal Management and the Bird Island Preserve Society, Inc.

WITNESSETH

WHEREAS, The State of North Carolina has acquired approximately 1,200 acres comprising Bird Island (Exhibit A) that has been designated as a component of the North Carolina Coastal Reserve (the Reserve), and

WHEREAS, the purpose of the Reserve program is to protect and manage this component and other designated coastal natural areas for research, education and compatible recreational uses.

WHEREAS, the Bird Island Preservation Society, Inc. (the Society), a private organization, is involved with stewardship and educational activities concerning Bird Island, and

WHEREAS, a coordinated effort to manage Bird Island will be to the mutual benefit of both parties.

NOW THEREFORE, in consideration of the mutual benefits to be derived, the signatories agree to the following:

1. The Reserve management plan for Bird Island provides a framework for implementing research, education and stewardship at the site. The plan was developed by Reserve staff and reviewed by all interested parties. This plan shall be reviewed, updated annually by the Bird Island Local Advisory Committee and implemented only if approved by the Division of Coastal Management.
2. The Society shall be represented by at least one member on the Bird Island Local Advisory Committee.
3. The Reserve Coordinator and staff shall have primary responsibility for the implementation of the plan. As part of this responsibility, they shall solicit assistance, as needed, from other parties including the Society. Members of the Society may assist the Reserve program with various activities, including, but not limited to:
 - monitoring/protection of natural resources, educational programs, access (e.g., trail development) and public information (e.g., content development and posting of signs).

4. This memorandum shall continue in effect for three (3) years, at which time unless either party wishes to amend or terminate the agreement.

Signed,

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES

Date _____
William G. Ross, Jr., Secretary

BIRD ISLAND PRESERVATION SOCIETY, INC.
Date _____
William Ducker, President

APPENDIX D

**Federal Threatened and Endangered Listing for Brunswick County
And Excerpts from the Bird Island Site Basic Record**

BRUNSWICK COUNTY
Critical Habitat Designation:

Piping Plover, *Charadrius melodus* - Critical Habitat designation in Federal Register 66:36038-36136, for a description of the primary constituent elements essential for the conservation of wintering piping plovers within the designated units. This document also contains a map and a description of each designated unit.

Common Name	Scientific name	Status
Vertebrates		
American alligator	<i>Alligator mississippiensis</i>	T(S/A)
Bachman's sparrow	<i>Aimophila aestivalis</i>	FSC
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened (Proposed for delisting)
Carolina gopher frog	<i>Rana capito capito</i>	FSC
Carolina pygmy sunfish	<i>Elassoma boehlkei</i>	FSC
Eastern cougar	<i>Puma concolor cougar</i>	Endangered
Eastern Henslow's sparrow	<i>Ammodramus henslowii</i>	FSC
Eastern painted bunting	<i>Passerina ciris ciris</i>	FSC*
Green sea turtle	<i>Chelonia mydas</i>	Threatened
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered
Leatherback sea turtle	<i>Dermodochelys coriacea</i>	Endangered
Loggerhead sea turtle	<i>Caretta caretta</i>	Threatened
West Indian Manatee	<i>Trichechus manatus</i>	Endangered
Mimic glass lizard	<i>Ophisaurus mimicus</i>	FSC
Northern pine snake	<i>Pituophis melanoleucus melanoleucus</i>	FSC*
Piping Plover	<i>Charadrius melodus</i>	Threatened
Rafinesque's big-eared bat	<i>Corynorhinus (Plecotus) rafinesquii</i>	FSC*
Red-cockaded woodpecker	<i>Picoides borealis</i>	Endangered
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	Endangered
Southern hognose snake	<i>Heterodon simus</i>	FSC*
Wood stork	<i>Mycteria americana</i>	Endangered
Invertebrates		
Arogos skipper	<i>Atrytone arogos arogos</i>	FSC***
Buchholz's dart moth	<i>Agrotis buchholzi</i>	FSC
Cape Fear three tooth	<i>Triodopsis soelneri</i>	FSC
Carter's noctuid moth	<i>Spartiniphaga carterae</i>	FSC
Greenfield ramshorn	<i>Helisoma eucosmium</i>	FSC
Magnificent ramshorn	<i>Planorbella magnifica</i>	FSC
Rare skipper	<i>Problema bulenta</i>	FSC
Venus flytrap cutworm moth	<i>Hemipachnobia subporphyrea subporphyrea</i>	FSC
Waccamaw spike	<i>Elliptio waccamawensis</i>	FSC

Vascular Plants

A quillwort	<i>Isoetes microvela</i>	FSC
Awned meadow-beauty	<i>Rhexia aristosa</i>	FSC
Carolina asphodel	<i>Tofieldia glabra</i>	FSC
"Carolina" atamasco lily	<i>Zephyranthes</i> sp 1	FSC
"Carolina" bishopweed	<i>Ptilimnium</i> sp. 1	FSC
Carolina bogmint	<i>Macbridea caroliniana</i>	FSC
Carolina goldenrod	<i>Solidago pulchra</i>	FSC
Carolina grass-of-parnassus	<i>Parnassia caroliniana</i>	FSC
Chapman's sedge	<i>Carex chapmanii</i>	FSC
Chapman's three-awn	<i>Aristida simpliciflora</i>	FSC
Coastal beaksedge	<i>Rhynchospora pleiantha</i>	FSC
Coastal goldenrod	<i>Solidago villosicarpa</i>	FSC*
Cooley's meadowrue	<i>Thalictrum cooleyi</i>	Endangered
"Dune bluecurls"	<i>Trichostema</i> sp. 1	FSC
Dwarf burhead	<i>Echinodorus parvulus</i>	FSC
Harper's fimbry	<i>Fimbristylis perpusilla</i>	FSC
Honeycomb head	<i>Balduina atropurpurea</i>	FSC
Long beach seedbox	<i>Ludwigia brevipes</i>	FSC
Loose watermilfoil	<i>Myriophyllum laxum</i>	FSC
Pineland plantain	<i>Plantago sparsiflora</i>	FSC
Pondspice	<i>Litsea aestivalis</i>	FSC
Rough-leaved loosestrife	<i>Lysimachia asperulaefolia</i>	Endangered
Savanna cowbane	<i>Oxypolis ternate</i>	FSC
Savanna indigo-bush	<i>Amorpha georgiana</i> var. <i>confusa</i>	FSC
"Savanna" onion	<i>Allium</i> sp 1	FSC
Seabeach amaranth	<i>Amaranthus pumilus</i>	Threatened
Spring-flowering goldenrod	<i>Solidago verna</i>	FSC
Swamp Forest beaksedge	<i>Rhynchospora decurrens</i>	FSC*
Thorne's beaksedge	<i>Rhynchospora thornei</i>	FSC
Tough bumelia	<i>Sideroxylon tenax</i>	FSC
Venus flytrap	<i>Dionaea muscipula</i>	FSC
Wireleaf dropseed	<i>Sporobolus teretifolius</i> sensus stricto	FSC

Nonvascular Plants

Savanna campylopus	<i>Campylopus carolinae</i>	FSC*
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KEY:

Status

Definitions

Endangered -A taxon "in danger of extinction throughout all or a significant portion of its range."

Threatened -A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."

Proposed -A taxon proposed for official listing as endangered or threatened.

C1 -A taxon under consideration for official listing for which there is sufficient information to support listing.

FSC -A Federal species of concern--a species that may or may not be listed in the future (formerly C2 candidate species or species under consideration for listing for which there is insufficient information to support listing).

T(S/A) - Threatened due to similarity of appearance (e.g., American alligator)--a species that is threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

EXP - A taxon that is listed as experimental (either essential or nonessential). Experimental, nonessential endangered species (e.g., red wolf) are treated as threatened on public land, for consultation purposes, and as species proposed for listing on private land.

Species with 1, 2, 3, or 4 asterisks behind them indicate historic, obscure, or incidental records.

*Historic record - the species was last observed in the county more than 50 years ago.

**Obscure record - the date and/or location of observation is uncertain.

***Incidental/migrant record - the species was observed outside of its normal range or habitat.

****Historic record - obscure and incidental record.

Excerpts from the Bird Island Site Basic Record (NCNHP, 2002)

DIRECTIONS: Southern-most barrier in NC; between Sunset Beach and the South Carolina border.

Site Description/Design:

SITE DESC: Typical barrier island vegetation consists primarily of sea oats and sea elder on the dunes. Central portion of island is a shrub thicket dominated by live oak, wax myrtle, loblolly pine and false willow.

Site Significance:

PRIORITY	C
RATINGCOM:	Small cluster of elements, nesting loggerhead sea turtles and a small population of <i>Amaranthus pumilus</i> .
BIODIVSIG:	B3
BIODIVCOM:	C ranked <u><i>Amaranthus pumilus</i></u> (G2).
OTHEervalues:	V1
OTHEervalucom:	Wildlife habitat
PROturgency:	P4
PROturgcom:	Accessible by land since closure of Mad Inlet in 1999, but probably little threatened.

Element Occurrence Information:

<u>ELCODE:</u>	<u>S NAME</u>	<u>S COM NAME:</u>	<u>GRANK:</u>	<u>SRANK:</u>
ABPBX64061	PASSERINA CIRIS CIRIS	EASTERN PAINTED BUNTING	G5T3T4	S3B,SZ
ARAAA01010	CARETTA CARETTA	LOGGERHEAD SEATURTLE	G3	S3B,S3
CCTER00320		DUNE GRASS	G3G4	S3
CCTER00340		MARITIME SHRUB	G4	S3
PDAMA040Z0	AMARANTHUS PUMILUS	SEABEACH AMARANTH	G2	S2
SH07.02N00		GULL*TERN*SKIMMER COLONY	G5	S3
	PAPILIO CRESPHONTES	COLONIAL WATERBIRDS NESTI		
		GIANT SWALLOWTAIL	G5	S2?

Element Occurrence Records

PASSERINA CIRIS CIRIS 022 05/30/02

SCOMNAME: EASTERN PAINTED BUNTING

DIRECTIONS: BIRD ISLAND; SHRUB THICKETS ON THE ISLAND

EODATA: "YOU CAN HEAR PAINTED BUNTINGS SINGING IN THE SHRUB THICKETS OF THE ISLAND" (FUSSELL, 1994, P. 377).

BESTSOURCE: FUSSELL, J.O., III. 1994. A BIRDER'S GUIDE TO COASTAL NORTH CAROLINA. UNIV. OF NORTH CAROLINA PRESS.

CARETTA CARETTA 039 05/30/02

SCOMNAME: LOGGERHEAD SEATURTLE

DIRECTIONS: BIRD ISLAND

EODATA: 2000 -- 11 NESTS (NC WRC 2001). 1999 -- 5 NESTS (NC WRC 2000) 2 NESTS REPORTED (BOETTCHER 1997). 1996: 5 NESTS REPORTED; 1995: 1 NEST REPORTED. NESTS EITHER NOT REPORTED PRIOR TO 1995, OR TOTALS LUMPED WITH SUNSET BEACH. DATA FROM RUTH BOETTCHER, N.C. WILDLIFE RESOURCES COMMISSION.

BESTSOURCE: NC WRC. 2001. ANNUAL PERFORMANCE REPORT; NONGAME AND ENDANGERED WILDLIFE PROGRAM, VOL. X. NC WRC. 2000. ANNUAL PERFORMANCE REPORT; NONGAME AND ENDANGERED WILDLIFE PROGRAM. BOETTCHER, RUTH. 1997.LOGGERHEAD SEA TURTLE NESTING ACTIVITY IN NORTH CAROLINA,1987-1997; NC WRC. BOETTCHER, RUTH. 1996. LOGGERHEAD NESTING ACTIVITY IN NORTH CAROLINA, 1986-1996; NC WRC. BOETTCHER, RUTH.1995. NC WRC NONGAME REPORT. CONANT, THERESE. 1994. SEA TURTLES: A NORTH CAROLINA NEWSLETTER. ISSUE 7, WINTER 1994. CONANT, THERESE.1993. SEA TURTLES: A NORTH CAROLINA NEWSLETTER. ISSUE 4, WINTER. NC WRC.

DUNE GRASS 016

05/30/02

DIRECTIONS: BIRD ISLAND: ON THE COAST AT THE SOUTH CAROLINA STATE LINE. ACCESS BY FOOT ACROSS A SHALLOW INLET FROM SUNSET BEACH.

EODATA: COMMUNITY LARGELY FREE OF ARTIFICIAL DISTURBANCE.

GENDESC: CONTINUOUS PRIMARY DUNE LINE AND SECONDARY INTERIOR DUNES. VEGETATION DOMINATED BY *UNIOLA PANICULATA*, WITH *PANICUM AMARUM*, *OPUNTIA SP.*, *YUCCA SP.*, AND SOME *IVA IMBRICATA*, *BACCHARIS HALIMIFOLIA*, AND *MYRICA CERIFERA*.

ELEV 5-15

SIZE: 62ACREAGE

COMMENT: ACREAGE ESTIMATED FROM SOIL MAP. INCLUDES 50 ACRES IN NC AND ACRES IN SC.

SOIL: NEWHAN - TYPIC QUARTZIPSAMMENT THERMIC, UNCOATED

BESTSOURCE: E.F. BROOKS, 10 JUNE 1992, DIVISION OF COASTAL MANAGEMENT FIELD INVESTIGATION REPORT. M.P. SCHAFALÉ, 4 JULY 1995 VISIT.

MARITIME SHRUB 020

05/30/02

DIRECTIONS: BIRD ISLAND: ON THE COAST AT THE SOUTH CAROLINA STATE LINE. ACCESS BY FOOT FROM SUNSET BEACH.

EODATA: COMMUNITY LARGELY FREE OF ARTIFICIAL DISTURBANCE. AN OLD ROAD BED WITH FILL IS PRESENT ON THE ISLAND. SMALL PORTIONS GRADE TO MARITIME EVERGREEN FOREST.

GENDESC: INTERIOR PORTIONS OF THE ISLAND, BEHIND PRIMARY AND BETWEEN SECONDARY DUNES. VEGETATION OF *PINUS TAEDA*, *QUERCUS VIRGINIANA*, AND *JUNIPERUS VIRGINIANA*. OTHER PLANTS NOTED ARE *TOXICODENDRON RADICANS*, *SMILAX SP.*, AND *RUBUS SP.* GRADES TO SALT MARSH IN LOWER AREAS.

ELEV: 3'-10'

SIZE: 22 ACRES

COMMENT: ACREAGE ESTIMATED FROM SOIL MAP.

SOIL: COROLLA - AQUIC THERMIC, UNCOATED QUARTZIPSAMMENT

BESTSOURCE: E.F. BROOKS, 10 JUNE 1992, DIVISION OF COASTAL MANAGEMENT FIELD INVESTIGATION REPORT. M.P. SCHAFALÉ, 4 JULY 1995 VISIT.

AMARANTHUS PUMILUS 037

05/30/02

DIRECTIONS: BIRD ISLAND: ACCESS BY BOAT OR FROM SUNSET BEACH AT LOW TIDE. TOE OF DUNE ALONG MOST OF ISLAND AND ACCRETING SOUTH END OF ISLAND.

EORANKCOM: ISLAND IS ACCRETING ON SOUTHWESTERN TIP SO AMARANTH HABITAT IS INCREASING; HOWEVER, STABILIZATION HAS CAUSED INCREASED GROWTH OF PERENNIALS THAT OUT-COMPETE AMARANTHUS (BUCHER & WEAKLEY 1990).

EODATA: 4 PLANTS (2 IN NC) IN 1990; IN FLOWER AND FRUIT; SPARSE OVER 2 HA (WEAKLEY & BUCHER 1992). 135 PLANTS COUNTED IN 1988, 23 OF WHICH WERE IN NC; SPARSELY DISTRIBUTED OVER 2 HA; (BUCHER & WEAKLEY (1990)

BESTSOURCE: A.S.WEAKLEY & M.A.BUCHER, 25 MAY 1992 (PCP STATUS SURVEY REPORT). M.A.BUCHER & A.S.WEAKLEY, 9 JUNE 1990 (STATUS SURVEY FOR NCPCP & USFWS)

CITATION: WEAKLEY, A.S., AND M.A. BUCHER. 1992. STATUS SURVEY OF SEABEACH AMARANTH (*AMARANTHUS PUMILUS*) IN NORTH AND SOUTH CAROLINA (2D EDITION AFTER HURRICANE HUGO). REPORT PREPARED FOR THE PLANT CONSERVATION PROGRAM, DEPT. OF AGRICULTURE, RALEIGH, NC, AND THE ENDANGERED SPECIES FIELD OFFICE, U.S. FISH AND WILDLIFE SERVICE, ASHEVILLE, NC. 25 MAY 1992. NCNHP STAFF, 1990 FIELD SURVEY BUCHER, M.A., AND A.S. WEAKLEY. 1984-1990. FIELD WORK FOR STATUS SURVEY OF SEABEACH AMARANTH (*AMARANTHUS PUMILUS*) IN NORTH AND SOUTH CAROLINA.

GULL*TERN*SKIMMER COLONY 075

05/30/02

DIRECTIONS: BIRD ISLAND: PARNELL SITE 47-08, A BARRIER ISLAND LOCATED WEST OF SUNSET BEACH, JUST EAST OF THE SOUTH CAROLINA STATE LINE.

EODATA: 1993, 1988, AND 1983: SITE INACTIVE. IN 1977, 22 PAIRS OF BLACK SKIMMERS NESTED.

BESTSOURCE: PARNELL ET AL. 1995. 1993 ATLAS OF COLONIAL WATERBIRDS OF NORTH CAROLINA ESTUARIES. NC SEA GRANT, UNC-SG-95-02.

CITATION: PARNELL, J.F., W.W. GOLDBER, AND T.M. HENSON. 1995. 1993 ATLAS OF COLONIAL WATERBIRDS OF NORTH CAROLINA ESTUARIES. NC SEA GRANT PROGRAM PUBLICATION UNC-SG-95-02.

PAPLIO CRESPHONTES

06/11/02

SCOMNAME: GIANT SWALLOWTAIL

DIRECTIONS: BIRD ISLAND; SHRUB THICKET NEAR NORTH END

EODATA: 2002: SEVERAL INDIVIDUALS OBSERVED FLYING AROUND SHRUB THICKET CONTAINING *ZANTHOXYLUM CLAVA-HERCULIS* DURING JUNE 11-13.
BESTSOURCE: TAGGART, J. AND T. WENTWORTH. SITE VISITS OF JUNE 11-13, 2002.

**EXPLANATION OF NC NATURAL HERITAGE PROGRAM DATABASE OUTPUT:
ELEMENT OCCURRENCE RECORD**

Each record (an occurrence) is printed out in a particular format, the structure of which is explained below. The name of the element (scientific name of a plant or animal, or name of the natural community) is given on the second line. The date the record was printed is given on the third line.

EOCODE: Internal coding for the element occurrence (a 10-digit element code plus a 3-digit occurrence number).

GRANK: Nature Conservancy ?global rank?
G1=Critically imperiled globally because of extreme rarity or otherwise very vulnerable to extinction throughout its range.
G2=Imperiled globally because of rarity or otherwise vulnerable to extinction throughout its range.
G3=Either very rare and local throughout its range, or found locally in a restricted area.
G4=Apparently secure globally, though it may be quite rare in parts of its range (especially at the periphery)
G5 = Demonstrably secure globally, though it may be quite rare in parts of its range (especially at the periphery.
GU=Possibly in peril but status uncertain; need more information.
GH=Of historical occurrence only throughout its range, with the expectation that it may be rediscovered.
GX=Believed to be extinct throughout range.
Q=a suffix attached to the Global Rank indicating questionable taxonomic status.
T=an additional status for the subspecies or variety; the G rank then refers only to the entire species.

SRANK: Nature Conservancy state rank. Coding similar to global ranks.
Additional SRANK codes:
SA=Accidental in state
SN=Regularly occurring in migratory or nonbreeding seasons only.
SR=Reported from the state, but without persuasive documentation which would provide a basis for either accepting or rejecting.

PRECISION: The precision with which the location can be mapped from the available information:
S=seconds (up to a 500 foot radius)
M=minutes (up to one mile radius)
G=general (to a place name only, or up to five mile radius).

SCOMNAME: Common name of the element (plant or animal).
SITECODE: Alpha-numeric code used for cross-referencing within the database.
SITENAME: sitename.
SURVEYSITE: Name of a site (not standardized by NHP in a database), generally using local geographic features.

QUADNAME: USGS 7.5 minute quad map name.
QUADCODE: Numeric code associated with the quad.
MARGNUM: Sequential number assigned as elements are added to the quad map.

DOTNUM: Not used by NC NHP.
TENTEN: Not used by NC NHP.
LAT, LONG: Latitude and Longitude coordinates for the center of the occurrence. N, S, E, W are the coordinates of the northern, southern, eastern, and western limits of the occurrence; used for natural communities.
COUNTYNAME: Name of the county(s).
DIRECTIONS: Describes where the element occurrence is located. If the element is within a site, then the sitename is given first, followed by a description of the geographic location.
WATERSHED: Eight-digit hydrologic unit code.
SURVEYDATE: Year, month, and day of the most recent survey.
LASTOBS: Year, month, and day the element was last observed.
FIRSTOBS: Year, month, and day the element was first observed.
EORANK:
A=excellent/very large
B=good/large
C=fair/small
D=poor/not viable
E=present, but no data available for ranking
H=last observed over 20 years ago, but may still be present
X=likely extirpated from the site
EORANKDATE: Date on which the EORANK is based.
EORANKCOM: Any comments to justify the EORANK.
EODATA: Information on number, size, condition, and other relevant information on the element occurrence. Usually includes the name of the observer(s).
EOTYPE: Type of the occurrence, such as a variant of a natural community, or a nesting site or roosting site for an animal.
GENDESC: General description. A word picture of the site, describing the habitat.
ELEV, SIZE: Elevation and size (acreage) of the occurrence.
ACREAGE COMMENT: Gives the method used to calculate the acreage.
MACODE: Alpha-numeric managed area code used in the NC NHP database.
MANAME: Name of the managed area.
DESIG: Special status such as Registered Natural Heritage Area (RHA) or Dedicated Nature Preserve (DNP).
MORELAND: Y=more land is needed to protect the element at this site.
MOREPROT: Y=more protection effort is needed.
MOREMGMT: Y=more or different management is needed to maintain this occurrence.
TNCINVOLVE: Y=The Nature Conservancy is involved or should be involved in protection of this occurrence.
MGMTCOM: Comments on the management of the element.
PROTCOM: Comments on protection efforts for the element.
OWNER: Name of owner of the site (some abbreviations used).
OWNERCOM: Comments on ownership. Usually the existence of additional owners.
OWNERINFO: Y=information on the owner is present in NC NHP files.
COMMENTS: Additional information on the occurrence, the site, or sources of information.
GEOMORPH: Geomorphic region as defined by Harrington (1982); contact NC NHP for more information.
GEOL: Geologic abbreviation from the NC Geologic Survey map (1985).
SURVEY: P=Preliminary, R=Reconnaissance, D=Detailed, I=Intensive.
SOIL: Soil type for county soil survey maps.
EOSPP: Other element occurrences associated with the element.

DATASENS: Y=information about this element is sensitive and should not be released without review or permission of landowner.

BOUNDARIES: Y=boundaries have been drawn of the element occurrence.

PHOTOS: Y=photos available of the element occurrence at NC NHP.

BESTSOURCE: Source(s) of information on the element occurrence (reference citation, etc.).

SPECIMENS: Information about specimens (e.g., herbarium acronym, accession number, collector, etc.).

CITATION: Bibliographic citations of reports related to this occurrence.

TRANSCRIBR: Date this record first added to the NC NHP database, plus initials of the transcriber.

MAPPER: Date this record first mapped in the NC NHP database, plus initials of the mapper.

DATARESP: Agency responsible for maintaining data on the occurrence (USNCHP = NC NHP).

EDITION: Date the record was added or changed substantially in the database.

EDAUTHOR: Surname of the person responsible for the data in the latest edition.

CHANGE.DATE: Date of last change to the record.

APPENDIX E

Nature Preserve Dedication

LETTER OF ALLOCATION - BIRD ISLAND COASTAL RESERVE

Mr. William G. Ross, Jr., Secretary
North Carolina Department of Environment
and Natural Resources
512 North Salisbury Street
Raleigh, North Carolina 27603

Re: Allocation of Property to the Department of Environment and Natural Resources:
Dedication of the Bird Island Coastal Reserve, Brunswick County

Dear Secretary Ross:

Pursuant to Article 9A, Chapter 113A of the North Carolina General Statutes and pursuant to the authority vested in me by the Administration Procedures Code approved by the Governor and Council of State on January 28, 1976, all State-owned lands within the areas hereinafter described are hereby allocated to the Department of Environment and Natural Resources subject to the conditions described herein:

Those State-owned properties within Brunswick County managed by the Division of Coastal Management as the Bird Island Coastal Reserve, briefly described below and more specifically described in Exhibit A and any additional properties subsequently purchased as additions to the Reserve.

<u>Site Name</u>	<u>Approximate Acreage</u>
Bird Island Coastal Reserve	1,200

THIS ALLOCATION IS MADE SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

1. **Definitions:** As used in the Letter of Allocation, the terms "natural area," and "nature preserve" have the same meaning as contained in North Carolina General Statutes 113A-164.3(3), and (4), respectively.
2. **Dedication:** Pursuant to North Carolina General Statutes 113A - 164.8, all state owned lands lying within the above-designated areas as described in this Allocation are hereby dedicated as a nature preserve to be known as the Bird Island Coastal Reserve (herein after the "preserve") for the purposes provided in the North Carolina Nature Preserves Act, as amended, and other applicable law, and said State-owned land shall be held, maintained and used exclusively for said purposes
3. **Primary Custodian:** The primary Custodian of the preserve will be the Department of Environment and Natural Resources, Division of Coastal

Management, Coastal Reserve Program which will be responsible for managing the preserve in accordance with this letter of allocation (dedication), state statutes set forth in G.S. 113A-129.1-.3 et seq. and regulations set forth in 15 NCAC 12H .0301-.0403 and 15 NCAC 70 .0100 .0202.

4. **Primary Classification:** The primary classification and purpose of the preserve shall be to protect the various wetland communities for research, education and such compatible traditional uses as are allowed by law and the terms of this allocation.

5. **Rules for Management:**

A. **Character of Visitor Activity:** The principal visitor activities in the preserve shall be research, educational programs, walking, canoeing/kayaking and observing. These activities shall be regulated to prevent disturbance of the preserve beyond that which it can tolerate without significant environmental degradation. Use of vehicles only designated for law enforcement, research or emergency purposes will be allowed along the ocean beach. Public camping will not be allowed.

Activities and uses unrelated to those listed above are prohibited except as provided in this Dedication or unless necessary to carry out the purposes of the preserve. Prohibited activities include, but are not limited to, construction not related to the preserve, commercial development, commercial silviculture, agriculture and grazing, gathering of plants or plant products for purposes other than approved research or restoration, the removal, disturbance, molestation, or defacement of minerals, archaeological and natural resources or natural features, dumping or changes in topography except by existing easements or for restoration purposes.

No exotic flora or fauna shall be introduced into the preserve. Hunting dogs and pets on leashes will be allowed consistent with Town of Sunset Beach ordinances. Owners must keep the animals under control to protect other visitors and the natural integrity of the preserve.

There will be no fires, except as specifically permitted by the Custodian for approved fire management activities, and there shall be no littering.

If the Town of Sunset Beach formally annexes the preserve, then town ordinances shall be enforced on the property.

B. **Visitors and Visitor Facilities:** The Custodian reserves the right to orient and guide visitors for educational programs, scientific research and preserve management. The Custodian may provide exhibits, programs and printed materials. The Custodian may create and maintain a visitor contact/research station and nature trails, boating access areas, kiosks, overlooks and boardwalks adequate to promote the permitted use of the

preserve. Guardrails, fences, steps, bridges and boardwalks may be provided where appropriate. The Custodian reserves the right to erect structures necessary to protect the preserve from unwanted or excessive visitor traffic or to restrict visitor access to sensitive environmental resources. Camping will not be allowed except by permit for research purposes that specifically require overnight work. Construction of roads will be prohibited.

- C. Hunting. Hunting shall be permitted subject to regulation and management by the Wildlife Resources Commission and the local ordinances of the Town of Sunset Beach, such regulation and management to be consistent with protection of the natural diversity and primitive character of the preserve. The Custodian reserves the right to change hunting policy in the future should it be deemed necessary to ensure long-term protection of the site's wildlife and habitats.
- D. Orientation and Guidance of Visitors. Exhibits, programs and printed materials may be provided by the Custodian in designated areas. Custodian may provide guide service and labeled nature trails within the preserve.
- E. Disturbance of Natural Features: The cutting or removal of trees, dead or alive, or the disturbance of other natural features is prohibited except that which is consistent with the Rules for Management (see #5 above) of this dedication, or is required under the terms of certain right-of-way easements/permits between the State and public utility companies or other governmental agencies. This exception also includes site manipulations necessary for restoration of natural conditions or to ensure public safety.
- F. Visitor Protection. The Custodian when essential to the safety of a reasonably alert and cautious visitor may provide guardrails, fences, steps and bridges. The Custodian shall have the right to erect such structures as may be necessary to protect the preserve from unwanted or excessive visitor traffic.
- G. Control of Vegetational Succession. Control of vegetational succession may be undertaken if necessary to maintain or restore a particular ecosystem or to preserve threatened, rare, endangered or unusual species.
- H. Research and Collecting Permits: Any person wishing to engage in scientific research or collecting shall first secure written permission from the Custodian.
- I. Fences. Fences and barriers may be installed as necessary to further the purposes of the preserve.

- J. Trails. The Custodian shall locate, build and maintain trails that shall be adequate to provide for permitted uses of the preserve, but otherwise such activities shall be kept to a minimum.
- K. Other Structures and Improvements. The Custodian shall have the right to erect structures or facilities within the preserve, insofar as the same are consistent with the purposes of the preserve as stated in this dedication.
- L. Management Plan: The Custodian shall be required to prepare and submit for approval to the Secretary of the Department of Environment and Natural Resources a management plan for the preserve. This plan shall be subject to all the provisions of this dedication and shall additionally be consistent with the management principles set forth in the North Carolina Administrative Code 15 NCAC 12H.403, 15 NCAC 70.0202 and other such regulations as may be established from time to time by the Secretary of Environment and Natural Resources. In any case where contradictions may arise between this instrument of dedication and other management regulations, the terms of this dedication shall take precedence.
- M. Vehicles: Bicycling shall be restricted to the ocean beach. Likewise, use of motorized vehicles specifically for law enforcement, research or emergency only will be allowed only along the ocean beach as specified by the Custodian in the management plan.
- N. Excavation: There will be no mining, drilling, removal of topsoil, sand, gravel, rock, minerals or other material, nor any change in topography or surface hydrology of the preserve other than for purposes of approved restoration.
- O. Bringing in Flora and Fauna: No exotic flora and no animals, except leashed dogs and cats according to Town of Sunset Beach ordinances or animals being reintroduced, shall be brought into the preserve. Horseback riding is not allowed. Any reintroduction will be of species native to the natural community and shall be done according to an approved resource management plan.
- P. Control of Populations (natural and exotic): Any control of animal or plant populations, other than fishing, shall be only to correct situations where populations have been significantly altered from natural conditions. The Custodian may, in accordance with an approved resource management or restoration plan, apply biological controls, herbicides, pesticides and other means deemed necessary or appropriate to control or eradicate exotic or native species of plant or animal that are degrading the natural character of the preserve.
6. Amendment, Modification, and Termination: Any changes to this Dedication must be made in accordance with the provisions of North Carolina

General Statutes 113A-164.8, which require the approval of the Governor and the Council of State. The lands dedicated to the preserve pursuant to this instrument may be removed from dedication upon approval of the Governor and Council of State.

7. **Permanent Plaque:** The Custodian shall display a permanent plaque or other appropriate marker at a prominent location in the preserve.

The Governor and Council of State have approved the dedication of the State-owned lands described by this document as the Bird Island Coastal Reserve, to be held in trust for the uses and purposes expressed in the Nature Preserves Act at a meeting in Raleigh, North Carolina on

_____, 2002.

This allocation is made at no cost or consideration to the Department of Environment and Natural Resources.

Sincerely,

Gwynn T. Swinson, Secretary
Department of Administration

CONSENTED AND AGREED TO:

William G. Ross, Jr., Secretary
Department of Environment
and Natural Resources

EXHIBIT A

THE BIRD ISLAND DEDICATED NATURE PRESERVE

DESCRIPTION

COUNTY: Brunswick County

TOPO QUAD (7.5'): Little River and Calabash (1990)

SIZE OF AREA ca. 1,200 acres total (all primary area)

OWNER/ADMINISTRATOR: State of North Carolina
Division of Coastal Management
Coastal Reserve Program

LOCATION: The preserve is located approximately 1 mile west of Sunset Beach, NC along the Atlantic Ocean. It is bounded to the north by the Atlantic Intracoastal Waterway, to the south by the Atlantic Ocean, to the east by the Town of Sunset Beach and to the west by the South Carolina State Line. Primary access from Sunset Beach is via the ocean beach. The preserve may also be accessed on the sound side from the waterway. A site map (Figure 1) is attached.

DESCRIPTION: Bird Island is an undeveloped barrier island that encompasses pristine ocean to sound communities: upper beach, dune grass, maritime dry grassland, maritime wet grassland, maritime shrub, maritime shrub swamp, salt shrub, salt flat and salt marsh. The island's land surface is a plain representing a former sea floor that has been elevated above sea level in the relatively recent geologic past. The topography of the site is generally flat with the exception of primary and secondary dunes along the oceanfront. Elevation ranges from about 20 feet above mean sea level on the highest dunes to sea level or slightly below in salt marshes and tidal creeks adjacent to the waterway.

The preserve provides habitat for several species listed by federal and state agencies:

Federal Listing

Loggerhead Seaturtle (Threatened)
Seabeach Amaranth (Threatened)
Eastern Painted Bunting (Species of Concern or Species at Risk)
Giant Swallowtail (Significantly Rare)

State Listing

Loggerhead Seaturtle (Threatened)
Seabeach Amaranth (Threatened)

In addition, the island provides seasonal feeding and resting habitat for numerous birds, including two listed species -- piping plovers and wood storks -- although no nesting has been documented. The estuarine waters of Bird Island (except for Blane Creek on the east side) have been designated as primary nursery area by the N.C. Division of Marine Fisheries.

MANAGEMENT AND USE: The dedicated nature preserve is owned by the State. The site will be used for research, education and compatible recreational uses according to State Statutes (**G.S. 113A-129.1-.3 et seq.**) and departmental regulations (**15 NCAC 70.0100-.0202**) for the Coastal Reserve Program within the Division of Coastal Management.

APPENDIX F

**Draft Memorandum of Understanding between the U. S. Army Corps of Engineers,
Charleston District and the N.C. Department of Environment and Natural Resources**

DRAFT

MEMORANDUM OF UNDERSTANDING between the U.S. Army Corps of Engineers, Charleston District and the North Carolina Department of Environment and Natural Resources

This Memorandum of Understanding serves as an expression of intent among two parties of interest: the U.S. Army Corps of Engineers, Charleston District (hereinafter referred to as the "Corps") and the North Carolina Department of Environment and Natural Resources/Division of Coastal Management.

The federal authority to enter into this Memorandum of Understanding consists of 16 U.S.C. 661 (the Fish and Wildlife Coordination Act) and 16 U.S.C. 715k (the Migratory Bird Conservation Act). State authority is found under G.S. 113A – 129.3 (Coastal Reserve Statutes) and NCAC T15: 07O .0103 (Coastal Reserve Rules).

Witnesseth:

WHEREAS, the State of North Carolina has received federal and state grants for acquisition and development of ten sites or components on the North Carolina coast known as the North Carolina Coastal Reserve, and

WHEREAS, the Bird Island (Appendix A) component of the North Carolina Coastal Reserve has been established just west of Sunset Beach, North Carolina, and

WHEREAS, the Bird Island Coastal Reserve Management Plan outlines policies for research, education, compatible traditional uses and management practices permitted on the site, and

WHEREAS, the U.S. Federal Government and the State of North Carolina own adjacent tracts of land and water that comprise the island, and

WHEREAS, a coordinated effort to preserve and protect Bird Island will be to the mutual benefit of both parties.

NOW THEREFORE, in consideration of the mutual benefits to be derived, the Signatories agree to the following:

1. The Signatories will coordinate and cooperate to insure that management activities on their respective areas do not adversely affect the land, its wildlife, natural and scenic values, or each other's management programs.
2. When compatible, the Signatories agree to allow Coastal Reserve research and education programs on all tracts managed by the Signatories after the proper issuance of permits by appropriate parties. The tracts will be technically included in the Reserve from research and education standpoints; however, individual management prerogatives will be maintained by each signatory for their respective property.
3. The Coordinator of the Coastal Reserve Program shall discuss with a designated Corps representative any proposed and ongoing research/educational activities on property managed by the Corps.

4. The Signatories agree to notify each other if any vandalism, misuse or other problems are observed on the other's property.
5. The Corps, if it wishes, will be represented on the Bird Island Local Advisory Committee, an informal group that will give the Coastal Reserve Program input and suggestions concerning management of the Reserve site.

This Memorandum of Understanding will become effective upon execution of all Signatories and remain in effect for three (3) years thereafter. This Memorandum of Understanding can be extended by mutual written agreement by all Signatories. Any Signatory may terminate this agreement by providing sixty (60) days written notice to the other signatories.

Signed,

**U.S. ARMY CORPS OF ENGINEERS
CHARLESTON DISTRICT**

Date: _____

**NORTH CAROLINA DEPARTMENT
OF ENVIRONMENT AND NATURAL
RESOURCES**

Date: _____

William G. Ross, Jr., Secretary

APPENDIX G
Discussion of Essential Fish Habitat as Mandated by the 1996 Amendments
to the Magnuson-Stevens Fishery Conservation and Management Act

ESSENTIAL FISH HABITAT

In 1996, Congress sought to increase the attention that fisheries managers and other coastal zone users pay to fish habitat by amending the Magnuson-Stevens Fishery Conservation and Management Act to include Essential Fish Habitat provisions.

Congress stated that:

One of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. Habitat considerations should receive increased attention for the conservation and management of fishery resources of the U.S.

Essential Fish Habitat is defined as:

“Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” 16 U.S.C. s. 1802(10) (1999).

National Marine Fisheries Service Guidance describes the breadth of the definition:

For the purpose of interpreting the definition of EFH: “waters” includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include areas historically used by fish; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle.

With respect to the EFH program the following species relevant to Bird Island are covered by the fishery management plans and managed species program for the South Atlantic Region:

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

Shrimp Fishery Management Plan

Brown shrimp – *Farfantepenaeus aztecus* [*Penaeus aztecus*]

Pink shrimp – *Farfantepenaeus duorarum* [*Penaeus duorarum*]

White shrimp – *Litopenaeus setiferus* [*Penaeus setiferus*]

Red Drum Fishery Management Plan

Red drum – *Sciaenops ocellatus*

Those species identified under the Mid-Atlantic Council are as follows:

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Summer Flounder... Fishery Management Plan

Summer flounder – *Paralichthys dentatus*

Bluefish Fishery Management Plan

Bluefish – *Pomatomus saltatrix*

The Essential Fish Habitat identified in Fishery Management Plan Amendments of the South Atlantic and Mid-Atlantic Fishery Management Councils relative to Bird Island are as follows:

South Atlantic FMC

Estuarine areas

Estuarine Emergent Wetlands
Oyster reefs & shell banks
Intertidal Flats
Estuarine water columns

Mid-Atlantic FMC

Estuarine areas

Creeks
Mud bottom
Estuarine water column

Within the area covered by the Bird Island Management plan those activities controlled by the policies included in the plan and the anticipated traditional use activities are not expected to have an adverse on the EFH's located within the North Carolina Bird Island Coastal Reserve.



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