

**KITTY HAWK WOODS RESERVE
MANAGEMENT PLAN**

TOWN OF KITTY HAWK

&

**NORTH CAROLINA DIVISION OF COASTAL MANAGEMENT
COASTAL RESERVE PROGRAM**

NOVEMBER 28, 1998

**North Carolina Department of Environment and Natural Resources
Division of Coastal Management**



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ACKNOWLEDGMENTS:

This original document was prepared by Ira Berger, a student intern from Duke university in 1995. Since that time various revisions have been made by the Town of Kitty Hawk staff and the Kitty Hawk Woods Conservation Area Working Group. The following is Ira Berger's acknowledgement to all the people who helped him write the first draft:

"It is a pleasure to acknowledge and thank the many people and organizations who provided valuable assistance in completing this draft plan. Without their support, this draft would not have been possible. First, I want to thank all the residents that attended the first kitty hawk woods reserve meeting hosted by the planning board on July 27, 1995. Also, several individuals provided written inputs. The funding for this project was provided by the Division of Coastal Management, Coastal Reserve Program from a grant from the N.C. Natural Heritage Trust Fund. This plan is based on previous plans written by Dr. John Taggart, Director of the Coastal Reserve Program. A special thanks to George Wood for helping me get this project going in the right direction. Thank you Bill Draper for the background information and allowing me to park at your house. The Town of Kitty Hawk provided administrative and technical support. Thank you - Bob, Richard, Tim, Lynn, John, Chet, Betty and Doris. Valuable background information and materials were provided free of charge from Starkey Sharp, Quible & Associates (Dick Quible and Joe Lassiter), Northstar Mapping Services (Nancy Herman Thompson), and Quentin Bell. Much of the biological information contained in this plan comes from previous work by John Fussell, Mike Lopazanski, Rich Shaw and the N.C. Natural Heritage Program. Wilson Angley wrote the section on the history of Kitty Hawk Woods. I also had the fortunate opportunity to speak with David Stick about this project. Thank you to Steve Jarvis of the wildlife resources commission and Kitty Hawk Sports for guiding me around the woods. Charles Hardy of the Wheels of Dare provided information on biking in the woods, and Lynn Diggs of the Kitty Hawk Horse Owners Association contributed information concerning horse back riding in the woods. Finally, thank you to all the members of the Kitty Hawk Woods Conservation Area Working Group. You all now have the challenge of guiding this plan to completion. Good luck!"

I. EXECUTIVE SUMMARY

Kitty Hawk Woods is an exceptionally beautiful and special natural area. It is very valuable in an ecological sense due to the presence of rare species, extensive forested wetlands and a high diversity of flora and fauna. The Maritime Deciduous and Maritime Swamp Forest communities found in Kitty Hawk Woods are known to exist in fewer than five locations worldwide. The woods also mean a lot to the local residents who see the area as a part of their heritage. Others enjoy the woods through hiking, hunting, biking and horse back riding. This plan strives to balance the research, education and recreational uses of the woods always keeping in mind that we are striving to preserve the natural, cultural, scientific and aesthetic values of the woods.

Management and ownership of the Kitty Hawk Woods Reserve is a joint effort among the North Carolina Division of Coastal Management/Coastal Reserve Program, Town of Kitty Hawk, and local residents. This plan was developed through the efforts of all these groups. This plan outlines the roles that specific organizations and individuals will play in managing the Reserve; includes regulations to protect the area; and recommends several long and short term management actions. It is important to keep in mind that this is a fluid document and will change as needed to meet to the conservation goals of the Kitty Hawk Woods Reserve.

II. INTRODUCTION

A. Purpose and Scope of Plan

This management plan serves two main purposes. One, it informs interested parties about the Kitty Hawk Woods Reserve and activities that will be conducted both on- and off-site. Two, it serves as a road map to ensure responsible management of this valuable public resource. While the plan focuses on the long-term goals discussed below, it does address short term issues. Thus, in order to stay current, the plan will be reviewed annually by the Local Advisory Committee, Town and State.

This plan covers the management of approximately 1,000 acres of maritime forest in separate parcels located within the Town of Kitty Hawk. These tracts are owned by the state, town or held privately with conservation easements. Additional parcels are in various stages of acquisition and should be considered part of the overall management plan. Although small in overall size, Kitty Hawk Woods is comprised of several different environments. Therefore, each parcel was considered separately.

B. Management Goals

The management goals of the Kitty Hawk Woods Reserve are:

1. *To preserve maritime forest habitats found in this portion of North Carolina Outer Banks and to 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.*

While conservation is a primary goal of the Kitty Hawk Woods Reserve, conservation means different things to different people. In terms of Kitty Hawk Woods, conservation refers to preserving the natural, scientific, educational, research and aesthetic values of the property.

C. Coastal Reserve Program

Ownership and management responsibility for the Kitty Hawk Woods Reserve are shared by the Town of Kitty Hawk and the North Carolina Coastal Reserve Program. Kitty Hawk Woods is part of the Coastal Reserve Program. Existing conservation easements in Kitty Hawk Woods are based on Coastal Reserve Program regulations and policies. This plan is modeled on other Coastal Reserve Program management plans. The Coastal Reserve Program is part of the State Division of Coastal Management (DCM), an agency within the Department of Environment and Natural Resources (DENR). The Reserve includes over 12,000 acres of lands and waters situated along the 320 miles of the state's ocean shoreline and is comprised of eight sites or components (see Figure 1): 1. Currituck Banks (Currituck County); 2. Kitty Hawk Woods (Dare County); 3. Buxton Woods (Dare County); 4. Rachel Carson (Carteret County); 5. Permuda Island (Onslow County); 6. Masonboro Island (New Hanover County); 7. Zeke's Island (Brunswick/New Hanover counties); and 8. Bald Head Woods (Brunswick County). Four components (Currituck Banks, Rachel Carson, Masonboro Island and Zeke's Island) also constitute the North Carolina National Estuarine Research Reserve, a federal-state program that manages the sites for research, education and compatible traditional uses. Though Kitty Hawk Woods, Buxton Woods, Permuda Island and Bald Head Island are not components of the Estuarine Reserve, they are managed for the same purposes. The Reserve staff consists of the Program Coordinator and Research Specialist at the University of North Carolina at Wilmington/Center for Marine Science Research (UNCW/CMSR), Education Specialist in Beaufort and Site Manager in Kitty Hawk.

D. Plan Development Process

It is important to recognize that this management plan is the product of a process that has relied heavily upon inputs from the public, Town and State. There are several opportunities for individuals and groups to offer their opinions and recommendations on proposed management actions and policies. Integral to developing the plan is the Kitty Hawk Woods Conservation Area Working Group who is taking lead responsibility to guide the plan through the public participation process. Working Group members include:

MEMBER	ORGANIZATION
Clifton Perry	Mayor of Kitty Hawk
Paul Pruitt	Mayor Pro Temp of Kitty Hawk
Glenn "Port" Beacham	Kitty Hawk Planning Board
Ervin Bateman	Kitty Hawk Planning Board
Rich Shaw	Assistant Director, Division of Coastal Management
Dr. John Taggart	Director of Coastal Reserve Program
John Gaw	Kitty Hawk Town Attorney
Sean Anderson	Kitty Hawk Town Manager
Richard Reid	Kitty Hawk Town Planner
Tim Owens	Kitty Hawk Assist. Town Manager / Planner
George Wood	Environmental Professionals
David Wojnowski	Site Manager - Coastal Reserve Program

The management plan development process is as follows:

STEP	ACTION	ECD
1:	Working Group hosts public meeting at a Planning Board meeting to collect input. Written comments are also solicited.	Complete
2:	Write draft plan.	Complete
3:	Working Group reviews draft plan.	Complete
4:	Reviewed draft plan is available at town hall for public review.	Complete
5:	Working Group hosts public meeting at a Planning Board meeting so public can comment on draft plan. Written comments are also solicited.	Complete
6:	Write draft final plan.	Complete
7:	Working Group reviews draft final plan.	Complete
8:	Town Council hosts a public hearing to make a recommendation (adopt/revise) on draft final plan. Written comments are also solicited.	Complete
9:	DCM makes a recommendation (adopt/revise) on draft final plan.	Complete
10:	Implement plan.	Complete
11:	Appointments of Local Advisory Committee are made	Complete
12:	First annual review.	Jan. 1999

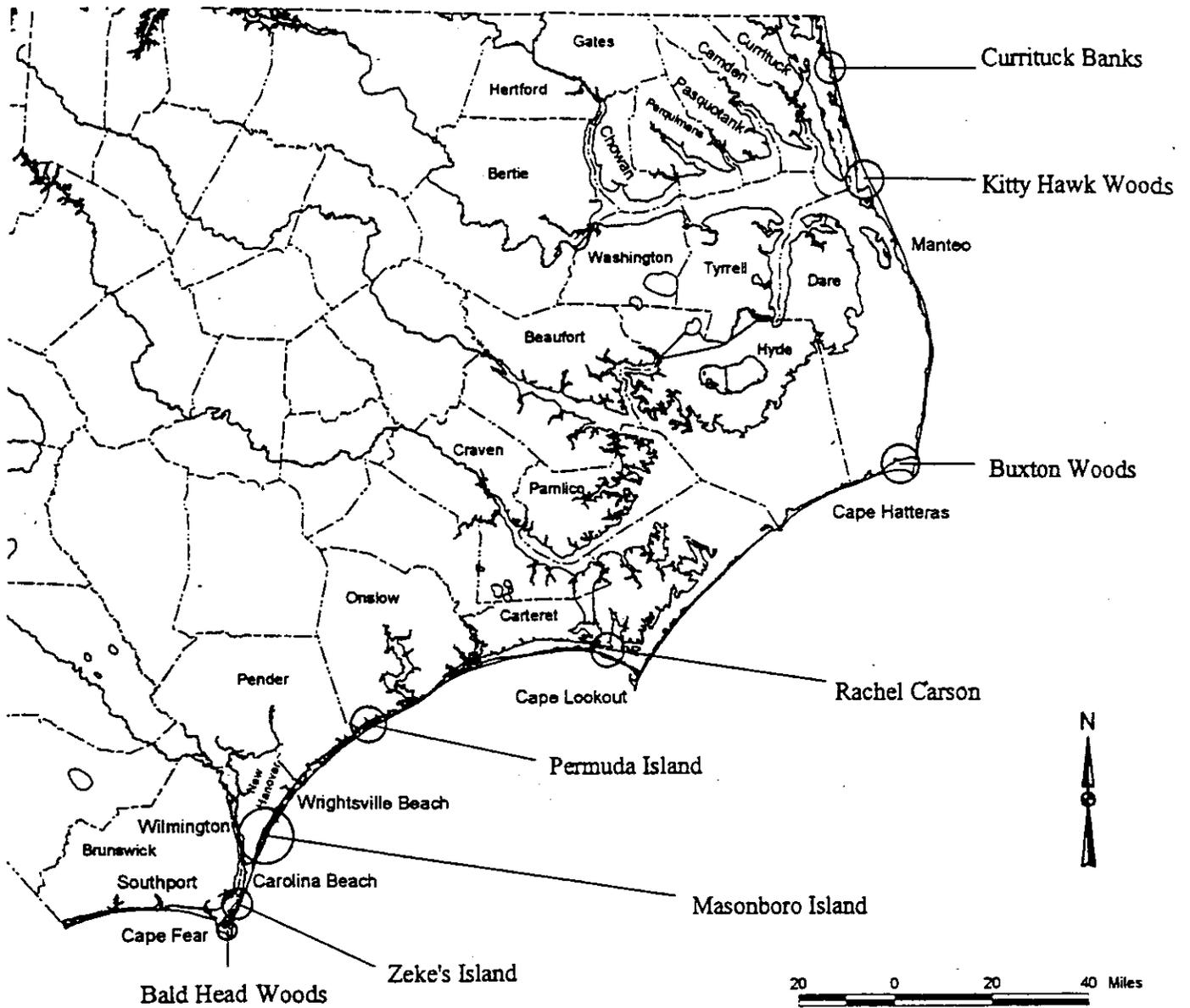


Figure 1. Components of the North Carolina Coastal Reserve

III. SITE DESCRIPTION

A. Reserve Creation and Acquisition

Land acquisition for conservation is an ongoing activity in Kitty Hawk Woods, one of the largest (approximately 1,900 acres) maritime forests on the Outer Banks. The State recognized the importance of Kitty Hawk Woods after completing its assessment of maritime forest sites (Lopazanski et al., 1988). In 1989 the N.C. Coastal Resources Commission (CRC) formed a Maritime Forest Working Group to study various options to protect the remaining tracts of maritime forests and prioritize the most important areas to be protected. Kitty Hawk Woods was nominated for Area of Environmental Concern (AEC) status in 1990, but the CRC Maritime Forest Working Group concluded the area was sufficiently protected by local ordinances and recommended that land in Kitty Hawk Woods be acquired and managed for conservation purposes. This recommendation was based on the area size, presence of rare species and ecological uniqueness.

While all this was occurring, the Kitty Hawk Woods Partnership, which owned 1,400 acres of land in Kitty Hawk Woods, was creating comprehensive plans for residential and commercial development of the woods. As early as 1986, the partnership had tried to offer a portion of their land for sale or donation to the State or a private conservation group in exchange for a U.S. Army Corps of Engineers permit to fill wetlands. This proposed exchange of a conservation easement to the state for permission to fill wetlands generated controversy (both for and against the proposal) at both state and national levels. Nevertheless, the permit was approved and the donation of the conservation easement completed in 1992.

In addition, the Kitty Hawk Town Council led by Mayor Clifton Perry instructed Town Planner, David Monroe, and Town Attorney John Gaw to negotiate an agreement to acquire the title to the 461.5-acre tract of Kitty Hawk Woods as well as conservation easements on other separate wetland areas in the Kitty Hawk Woods. The Town Council understood the importance of the tract to the people of Kitty Hawk. Thus, the Council wanted to acquire title to the tract in order to assure that future generations of Kitty Hawk citizens would be able to continue traditional uses of Kitty Hawk Woods and preserve it for generations to enjoy and study. Negotiations between the Town of Kitty Hawk, the Kitty Hawk Woods Partnership and the Resolution Trust Corporation (RTC) continued for several years before the Town reached the final agreement which resulted in the conveyance of the tract to the Town of Kitty Hawk subject to the conservation easement given to the State of North Carolina. As a result of the acquisition, the Town Council of Kitty Hawk was able to preserve for the citizens of Kitty Hawk the right to participate in decisions concerning the use and management of the woods. The acquisition made cooperation between the State of North Carolina and the Town of Kitty Hawk essential to accomplish the respective goals of each governmental body.

This agreement resulted in three separate parcels of land being protected for conservation purposes. The Town of Kitty Hawk holds fee simple title to 461.5 acres of land and the DCM holds a conservation easement on this property. This area was dedicated a state nature preserve in September 1992. In addition, the partnership gave the town conservation easements on three other tracts of land consisting primarily of undevelopable wetlands. These three tracts are separate from and not contiguous with each other or the 461.5 acre parcel. These lands and future acquisitions will be managed in accordance with Coastal Reserve Regulations (Appendix A).

Subsequently, in part due to the Savings and Loans failures of the 1980's and the bankruptcy of the Kitty Hawk Woods Partnership, the RTC was a significant landowner in Kitty Hawk Woods. The state along with the help of TNC has continued its acquisition efforts in Kitty Hawk Woods such that presently, a total of 370.69 acres of the woods are in state ownership; 494.23 acres have a conservation easement to the state while 498 acres of marsh in the adjacent sound waters are also owned by the state. DCM has received grants from the North Carolina Natural Heritage Trust Fund and the U.S. Fish and Wildlife Service National Coastal Wetlands Conservation Program. One of the main goals of future acquisitions will be to link these various tracts in order to create a wildlife corridor. The Kitty Hawk Woods component is currently comprised of the following tracts:

PARCEL	SIZE (ACRES)	STATUS
Nature Preserve	461.50	Town owns fee and state holds conservation easement
Bender Tract	124.00	State-owned
Nations Bank Tract	110.20	State-owned
Town Conservation Easements:		
- Wal-Mart	10.73	Town conservation easement
- Eckner Street	22.00	Town conservation easement
Other Tracts:		
- High Bridge Creek	30.00	State-owned
- Oyster Bay	33.25	State-owned
- Capital Recovery (Lot 14)	10.00	State-owned
- Forbes	7.80	State-owned
- Lancaster	10.10	State-owned
- Daniels	10.10	State-owned
- Haskitt	10.10	State-owned
- Damwet Lands	25.12	State-owned
- Kitty Hawk Islands (marsh area in the sound)	498.00	State-owned

See Figure 2 for a map of these different parcels. The parcel names in the chart above will be referenced throughout this document. Please take note that **High Bridge Creek** is also known as **Jean Guite Creek**.

B. Site Location

The Kitty Hawk Woods Maritime Forest, a total of 1,900 acres, is located in Kitty Hawk Village. It is bordered by US 158 and associated development to the east, Kitty Hawk Road (SR 1208) to the south, Currituck Sound to the west, and US 158 to the north. The forest is bisected in the east-west direction by Woods Road (SR 1206). See Figure 3 for a vicinity map. Access into the woods is limited. A 461.5-acre portion of Kitty Hawk Woods was formally dedicated as a State Nature Preserve (hereinafter referred to as "the preserve") by the Council of State in 1992. The area is more specifically described as follows:

Nature Preserve: This area is bordered by a N.C. Power right-of-way cut to the east, Treasure Street in the Kitty Hawk Estates subdivision to the north, Woods Road and adjacent houses to the west, Kitty Hawk Road and surrounding houses to the south, and (the former) Outer Banks Contractors site to the southwest. Public access is limited to an entrance to the power line cut off Eckner Street. While other entrances into this tract exist, these are through private property. Much of the area consists of swamp forest.

Kitty Hawk Woods Reserve

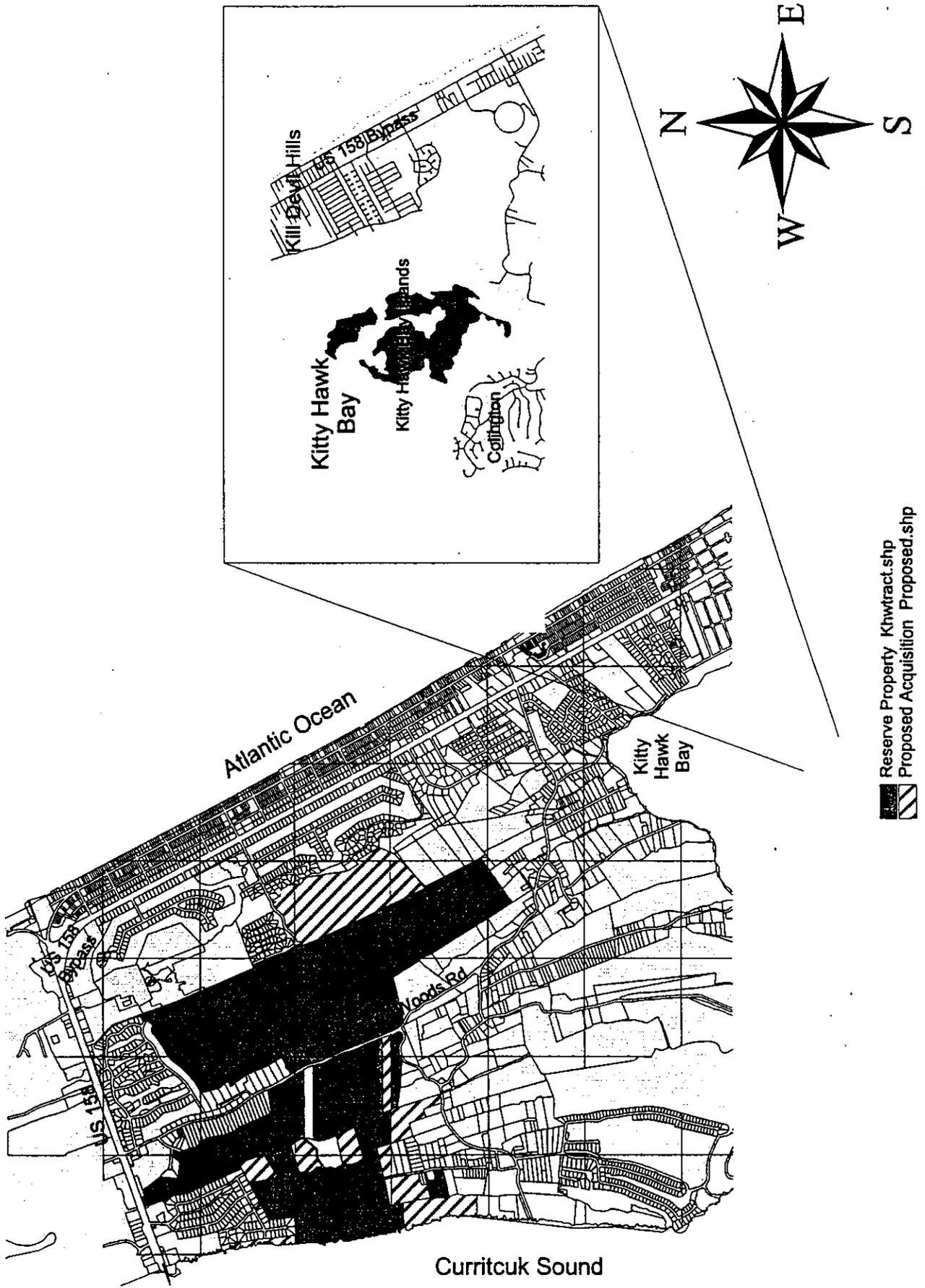


Figure 2. Kitty Hawk Woods Reserve Parcel Map

Kitty Hawk Woods Management Plan

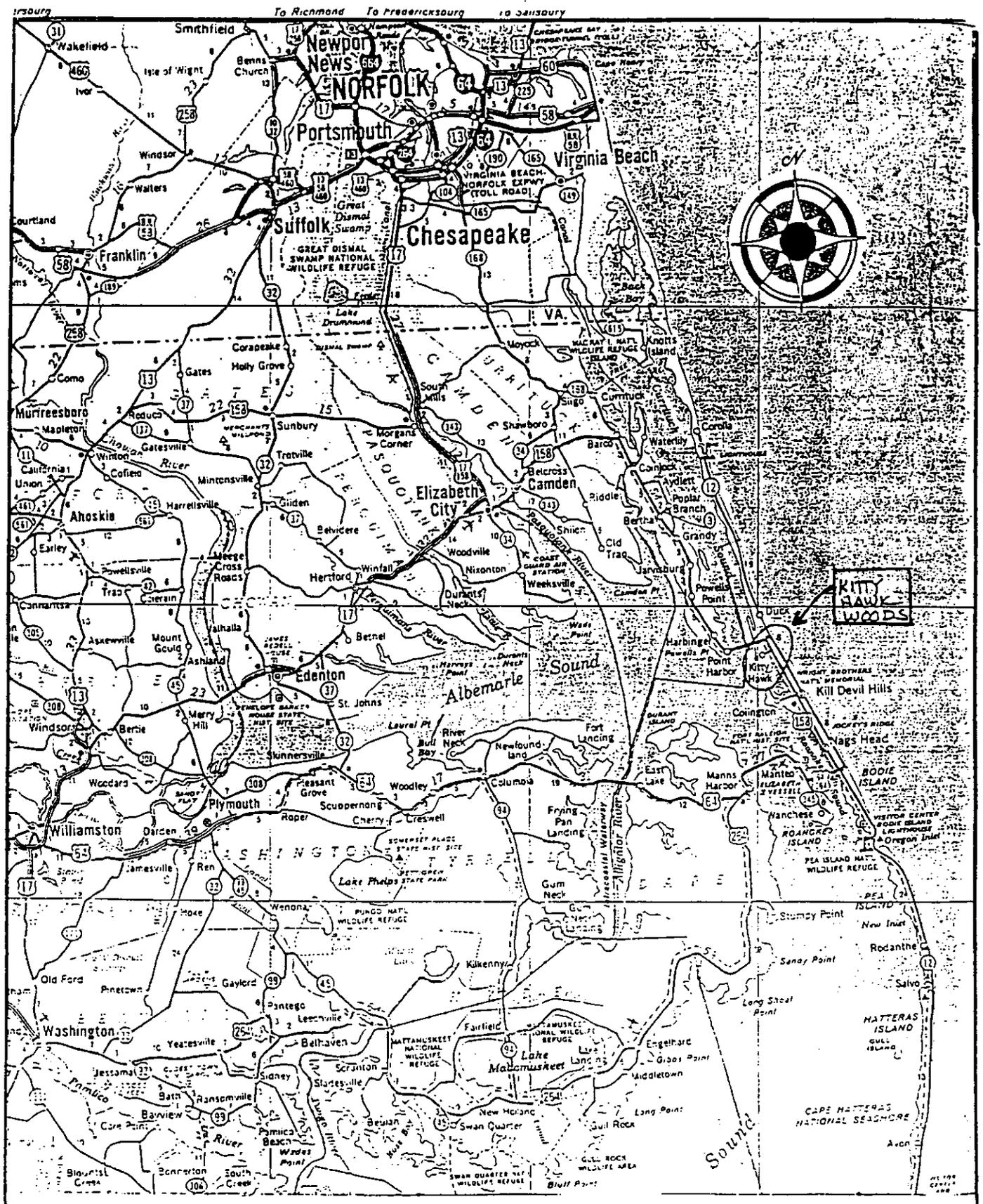


Figure 3. Kitty Hawk Woods Vicinity Map

C. Regional Perspective

Kitty Hawk Woods is located in the center of the village of Kitty Hawk. Kitty Hawk and the surrounding towns (Nags Head, Kill Devil Hills, Southern Shores and Duck) have economies based primarily on resort tourism and service-related support businesses such as real estate, lodging, restaurants, sports fishing, professional services, retail stores and construction. Some Kitty Hawk residents run small-scale, independent commercial fishing and crabbing operations. Tens of thousands of visitors, seasonal residents and retirees come to the Outer Banks each year to enjoy the beach, beautiful scenery and various water sports.

Kitty Hawk is divided into two areas with their own distinct character. Kitty Hawk beach, like much of the Outer Banks, is where most tourists and retirees stay. Land uses are typical of coastal resort towns. In contrast, Kitty Hawk village is more of a year-round, residential community. Part of its contrast to the beach area comes from the high concentration of local residents -- families that have lived in the area for several generations. As one travels through the village, the sight of large live oak trees, Spanish Moss and horses makes it easy to forget that the Atlantic Ocean is only two miles away. Most visitors to the Outer Banks do not know about Kitty Hawk Woods. However, local villagers have a strong attachment to the lands that their ancestors fished, hunted, timbered and used for livestock. Most view the woods as a piece of their heritage that should be preserved.

Individual perspectives on the woods depend on their use of the area. Hunting, fishing and trapping are uses that have existed since the Native Americans occupied this area. Presently, there is limited deer, squirrel and wood duck hunting. Trapping is scarce to non-existent in the woods today. Fishing is limited to a few deep ponds, High Bridge Creek, the sound and its tributaries. Some people escape to the woods to enjoy the natural beauty of the area and the wildlife. More recent uses include biking, horse back riding, and kayaking in High Bridge Creek. The limited access to the area has helped maintain the forest in a rather pristine condition. For the most part, only avid sportsmen and hikers enter the forest. However, in locations where access is easier, there have been some detrimental activities occurring such as dumping, camp fires, timber cutting, target shooting, vandalism and littering.

D. Resource Inventory

1. Geology

(Fussell, 1989; Lopazanski et al., 1988; Root, 1977; Army Corps of Engineers, 1990)

Kitty Hawk Woods is located on Currituck Banks, also called North Bank, a peninsula extending approximately 70 miles from Cape Henry, Virginia to Oregon Inlet. Historically, several inlets created by storms cut across Currituck Banks allowing tidal exchange of salty ocean and fresh sound waters. Around 1828 Caffey's Inlet, also known as New Currituck Inlet, closed. This resulted in a lowering of salinity in the Currituck Sound from salty/

brackish to brackish/fresh waters. Currently, the closest inlet to Kitty Hawk Woods is Oregon Inlet, 23 miles to the south. Because of the distance from Oregon Inlet, sound waters around Kitty Hawk Woods are influenced by wind rather than lunar tides causing the surrounding marshes to flood irregularly.

Kitty Hawk Woods is located on the widest section of Currituck Banks. What remains of the woods are remnants of a larger maritime forest that included Kitty Hawk village and Southern Shores. The eastern edge of the forest is located a quarter mile from the ocean where a dune system that runs parallel to the coast ranges in elevation from 24 to 30 feet, protecting the area from wind shear and salt spray. The forest itself consists of a series of parallel ridges and swales that run in a north-south orientation. The low, gently rolling ridges are actually relict dunes of Pleistocene age. Each ridge represents a past shoreline of the Atlantic. The ridges average 125 feet in width and have an elevation of about two to three meters. Swales average 300 feet in width. Many are saturated with water throughout the year (to two feet in depth during the rainy season) and are hydrologically connected to Kitty Hawk Bay. In some areas of the eastern portion of the preserve portion, there are "ridge islands" about 50 feet wide in the swales. As one moves westward towards the Bender and Nations Bank tracts near the sound, the ridge swale topography becomes less distinct and instead of "ridge islands" there are low-lying wet patches in upland areas.

Where High Bridge Creek opens into Kitty Hawk Bay is considered an estuarine Area of Environmental Concern (AEC) according to the Coastal Area Management Act. Further to the north, the creek is classified as inland waters by the Wildlife Resources Commission. The N.C. Division of Marine Fisheries has designated High Bridge Creek as a Primary Nursery Area. Marshes along the Currituck Sound are classified as a Coastal Wetland AEC.

2. Soils

(Tant, 1992)

Soil composition in Kitty Hawk Woods varies with topography. The relict dune ridges throughout the woods are composed of Fripp fine sand. The Fripp series consists of excessively drained sands comprising slopes from 2 to 30 percent. In a few locations where the dunes are lower and gently sloping, Ousley fine sand is present. The Ousley series is moderately well drained and makes up slopes from 0 to 5 percent. The low lying swales, many of which are ponded with water seasonally or year round, are composed of Conaby muck. The Conaby series comprises slopes from 0 to 2 percent, is very poorly drained, and rarely floods. Between High Bridge Creek and the Currituck Sound, the soil in the depressions are predominantly Osier fine sand. The Osier series comprises 0 to 2 percent slopes, is poorly drained, and rarely floods. Marsh areas along the boarder of High Bridge Creek and the sound are composed of Currituck mucky peat. The Currituck series occurs on 0 to 1 percent slopes, is poorly drained, and floods frequently.

3. Vegetation

(Fussell, 1989; NC Natural Heritage Program, 1988; Tant, 1992; Root, 1977)

There are at least three plant communities in Kitty Hawk Woods: maritime deciduous forest, maritime swamp forest, and marshes -- both freshwater and brackish.

Maritime Swamp Forest: This community is found in low-lying swales. The canopy is dominated by red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*) and blackgum (*Nyssa biflora*). Full stands of baldcypress (*Taxodium distichum*) are found in the eastern and central sections of the Nature Preserve in the deeper and broader swales and in the Wal-Mart easement. Other species that can be found in the canopy include loblolly pine (*Pinus taeda*) and ironwood (*Carpinus caroliniana*). Common species in the understory are sweetbay (*Magnolia virginiana*), red bay (*Persea borbonia*) and willow (*Salix spp.*). Groundcover is dominated by switchcane (*Arundinaria gigantea*), briar (*Smilax spp.*) and several ferns such as the netted chain fern (*Woodwardia areolata*). Other noteworthy groundcover includes ebony spleenwort (*Asplenium platyneuron*) and, in wet areas, lizard's tail (*Saururus cernuus*).

Maritime Deciduous Forest: This community is located on the dune ridges. The canopy is dominated by loblolly pine, American beech (*Fagus grandifolia*) and several varieties of oak (e.g., *Quercus hemisphaerica*, *Q. virginiana*). Other common canopy trees include sweetgum and pignut hickory (*Carya glabra*). Dominants in the subcanopy are flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), red bay, American beech, sweetgum, ironwood, hop hornbeam (*Ostrya virginiana*) and Sassafras (*Sassafras albidum*). The most prevalent shrubs and herbs are highbush blueberry (*Vaccinium corymbosum*), switchcane, partridge berry (*Mitchella repens*) and briars (*Smilax spp.*). Other groundcover plants include beech-drops (*Epifagus virginiana*), squaw-root (*Conopholis americana*), beauty-berry (*Callicarpa americana*), rattan-vine (*Berchemia scandens*), Virginia creeper (*Parthenocissus quinquefolia*), redbay and oak seedlings.

Marsh: This community is found in two main locations. Brackish marsh exists along the coast of the Currituck Sound while brackish and freshwater marshes are found along the banks of High Bridge Creek. Salinity of the water is influenced by the distance from the opening with the sound and the prevailing winds that move the water. There is no tidal influence on High Bridge Creek. Brackish areas are dominated by black needlerush (*Juncus roemerianus*) and giant cordgrass (*Spartina cynosuroides*) while freshwater sections are characterized by giant cordgrass, cat-tails (*Typha sp.*), water willow (*Decodon verticillatus*), wax myrtle (*Myrica cerifera*), and duck potato (*Sagittaria falcata*).

In addition to the diversity of plant communities, Kitty Hawk Woods contains several rare and unusual species:

- Kitty Hawk Woods is the only maritime forest in the state where baldcypress is a dominant canopy species.
- Hop hornbeam is rare on the Outer Banks, only found in Kitty Hawk and Nags Head Woods.
- Southern twayblade (*Listera australis*) and woolly beach heather (*Hudsonia tomentosa*) are considered imperiled in North Carolina. Southern twayblade is located at the ridge swale ecotone. Woolly beach heather has been found along the power line cut.
- Kitty Hawk Woods is the northern most location where dwarf palmetto (*Sabal minor*) has been found.
- Squaw-root is scarce to absent across much of eastern North Carolina.

4. Fauna

(Fussell, 1989; Braswell 1988)

The aforementioned habitats of Kitty Hawk Woods host numerous resident and seasonal avian species including warblers, woodpeckers, hawks, wrens and other various songbirds are found throughout the woods. The deeper swales and isolated portions of High Bridge Creek are home to wood ducks. Within the marsh area there are herons, egrets, geese, ducks, swans, gulls and rails. The swales and ponds support a high density and variety of amphibians and reptiles. Some common species include the green treefrog (*Hyla cinerea*), southern leopard frog (*Rana utricularia*), eastern mud turtle (*Kinosternon s. subrubrum*), diamondback terrapin (*Malaclemys terrapin*), snapping turtle (*Chelydra s. serpentina*), cottonmouth (*Agkistrodon piscivorous*), northern water snake (*Nerodia sipedon*) and brown water snake (*Nerodia taxispilota*). In the upland areas common reptiles are Black Racer (*Coluber constrictor*), eastern kingsnake (*Lampropeltis getulus*) and rough green snake (*Opheodrys aestivus*). Several mammals are also found throughout the woods. Upland areas support opossums (*Didelphis virginiana*), raccoons (*Procyon lotor*), rabbits (*Sylvilagus floridanus*, *S. palustris*), gray foxes (*Urocyon cinereoargenteus*), eastern gray squirrels (*Sciurus carolinensis*) and white-tailed deer (*Odocoileus virginianus*). Marsh areas are inhabited by nutrias (*Myocastor coypus*), river otters (*Lutra canadensis*) and muskrats (*Ondatra zibethicus*).

No formal fauna surveys have been done of the woods, but several rare species have been observed in the area:

- Ospreys (*Pandion haliaetus*) nest in the vicinity.
- Peregrine falcons (*Falco peregrinus*) and Sharp-Shinned hawks (*Accipiter striatus*) migrate through the area.
- Although not yet observed in Kitty Hawk Woods, Bald Eagles (*Haliaeetus leucocapillus*) are known to nest in similar habitat on Colington Island three miles to the south.

5. Archeological

A review by the North Carolina Department of Cultural Resources, Division of Archives and History, found no known areas of archaeological value within the Kitty Hawk Woods component. However, no comprehensive surveys have been performed in this area. Based on the topography and hydrology of the area, it appears likely that the Reserve may contain both historic and prehistoric sites (Brooks, 1995).

E. Site Significance

The woods are of extreme ecological importance and have been designated a Nationally Significant Natural Area by the North Carolina Natural Heritage Program. The Maritime Deciduous Forest and Maritime Swamp Forest communities are extremely rare at the global level. They are known to exist in fewer than five locations worldwide. Kitty Hawk Woods and Nags Head Woods are the only extensive examples of Maritime Deciduous Forests in North Carolina, and Kitty Hawk Woods is the most extensive and diverse example of the two communities occurring together. A large part of the woods' ecological significance lies in its size, lack of disturbance and extensive forested wetlands.

Also, the geologic structure of the woods is unique among North Carolina's maritime forests. The gently sloping ridges and extensive forested wetlands create a network of ecotones where the wetlands and uplands meet. This mosaic of habitats accounts for the diversity of species found there. In addition, Kitty Hawk Woods is located at a latitude where ranges of several northern and southern species overlap. For example, the presence of American beech in the canopy is reminiscent of forests to the north while wax myrtle and dwarf palmetto are southern species.

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. Areas like Kitty Hawk Woods also serve as natural outdoor laboratories for education -- to enhance awareness of coastal processes -- and research -- to improve our knowledge and, hence, management of the coast. Furthermore, many Kitty Hawk residents view the woods as a piece of their heritage that merits protection for future generations.

F. History

(Excerpts from Anglely, 1995)

Long before the arrival of European explorers and colonists, Kitty Hawk Woods was home to Native Americans of the Algonquian stock or language group. Archaeological evidence of Native American presence in the general vicinity of the Kitty Hawk has been found near the west end of the Wright Memorial Bridge, in Southern Shores, on Colington Island, and at

Shellbank Point -- a short distance southwest of Kitty Hawk Woods. No evidence of Native American occupation or activity in the woods themselves has been found, but it seems highly likely that these habitats would have been used intermittently for hunting or the gathering of useful and edible plants.

In July of 1584, captains Philip Armadas and Arthur Barlowe found an entry through the North Banks during the first Roanoke voyage for Sir Walter Raleigh. While scholars debate the precise location of this historic entry, considerable evidence favors Trinity Harbor, an inlet that existed just north of Kitty Hawk near the mouth of Jean Guite Creek. During the three years following the Armadas and Barlowe voyage, no fewer than forty English vessels would visit the North Banks and attempt to settle Roanoke Island. Following the ultimate failure of those efforts, the woods reverted to its Native American inhabitants for nearly a century. It was not until the mid-18th century that European settlement began in Kitty Hawk.

During the years just following the American Revolution, many of the deeds and land grants recorded for the North Banks area were for properties surrounding Kitty Hawk Bay and the area just north, Jean Guite Creek. Already, many of the ridges and marshes extending from the bay toward Kitty Hawk Woods had taken on names such as Bull Ridge Marsh and Duck Pond. Numbered prominently among the early settlers of the area were members of the Perry, Best, Luark, Wright and Gallop families.

Willis Gallop (1767-1848) acquired extensive holdings in Kitty Hawk Woods and adjacent areas. His holdings were further extended by his son Hodges Gallop (1807-1877). A manuscript map from 1851 indicated that Kitty Hawk Woods was not suitable for residential use. The entire area east of Woods Road was described as consisting of "...small sand hills with laurel, pine, and holly interspersed with impassable swamps of briers, gum, bay and small cypress trees."

In 1874 the original Kitty Hawk Lifesaving station was erected on the beach just east of Kitty Hawk village. During the next year, the federal government located a weather station nearby. In 1878 the first Kitty Hawk post office was established near the head of Kitty Hawk Bay. That same year a lifesaving station was built four miles south in Kill Devil Hills. This sudden growth in government facilities promised to increase communications with the outside world and more varied means of livelihood for area residents.

In September of 1900 Wilbur Wright arrived in Kitty Hawk to begin preparations for his experiments with powered flight. Soon he was joined by his brother Orville. Their first glider was constructed in the home of William J. Tate, scarcely a mile southeast from the preserve area. The Kitty Hawk that existed in the fall of 1900, when the Wright brothers first arrived, was a community of roughly sixty families. Still due to extensive wetlands, no residences appear to have existed in the preserve area.

Aside from the increase in federal employment, the occupations and ways of life in Kitty Hawk remained little changed from a century earlier. Residents still subsisted very largely

from fishing, gardening, and tending livestock. Hunting in Kitty Hawk Woods provided an additional source of food and income.

Only a few years before the Wright brothers arrival, the heirs of Hodges Gallop sold his extensive holdings in Kitty Hawk Woods to three sisters from New Jersey. In 1910 the land was sold to the Currituck Lumber Company of Norfolk. This firm contracted with the Tunis Lumber Company of Elizabeth City to harvest timber and transport it to Elizabeth City for milling. As early as 1856, Edmund Ruffin, a celebrated agricultural reformer, noted that all the mature live oaks in Kitty Hawk Woods had been removed for use in shipbuilding. Tunis timbered the woods from 1911 to 1916. To assist in this effort, they constructed a rail line through the upper portion of the preserve westward to a wharf on Currituck Sound. In 1916 logging operations were taken over by the Dan Williams firm out of South Mills, North Carolina. Timbering continued for two to three more years. Approximately 40 years after Williams, another lumbering operation occurred in the woods.

Portions of the tracks laid down for lumbering prior to World War I remained in place until at least the early 1930's. The vast majority of Kitty Hawk Woods, however, seems to have been spared further intrusion for several decades. A Coast and Geodetic Survey map of 1932 described the entire area east of Woods Road as "impassable swamps and sand dunes." Despite tremendous growth on the Outer Banks, much of Kitty Hawk Woods remains impassable swamps and sand dunes.

G. Adjacent Land Use

Primary land uses surrounding the Reserve are single family housing and unimproved, vacant land. However, residential and commercial development have been increasing in the woods and on the rest of the Outer Banks. Surrounding commercial development includes Barrier Island Station (timeshares), Shoreside Shopping Center, The Promenade (family entertainment), and (former) Outer Banks Contractors (industrial site). Plans for asphalt plant within the industrial site were approved by the Town in 1998.

IV. PLAN ADMINISTRATION

A. Introduction

Management and ownership of the Reserve are shared by the Town of Kitty Hawk and the DCM/Coastal Reserve Program. In addition, volunteers and a Local Advisory Committee will have a crucial management role. The State has primary responsibility for on-site management functions, with the assistance from Town staff. This includes activities such as enforcement and maintenance. The Town Manager and Site Manager will coordinate these activities. The Coastal Reserve Program has lead responsibility for the research and education aspects of Reserve management. In addition, Coastal Reserve staff will serve as the liaison between federal, state and local agencies. The Town and Coastal Reserve Program will jointly oversee on-site educational functions. In carrying out their management responsibilities, the Town and Coastal Reserve Program will be able to utilize the Local Advisory Committee and volunteers as resources. In addition to performing existing functions, volunteers and the Local Advisory Committee can develop and implement new management initiatives.

B. Division of Coastal Management (Coastal Reserve Program Staff)

1. Reserve Coordinator

The Reserve Coordinator coordinates administrative functions. The coordinator also acts as a liaison with the National Oceanic and Atmospheric Administration (NOAA). The office for this staff person is housed within the University of North Carolina Center for Marine Science Research (UNCW/CMSR) in Wilmington. Job priorities of the Coordinator are to meet the general Coastal Reserve goals and objectives, as well as the specific goals and objectives as defined in this management plan.

2. Research Specialist

The Research Specialist is the primary person in charge of research and monitoring within the Coastal Reserve program. This office is also located within the UNCW/CMSR (at the Myrtle Grove property). The primary goal of this position is to facilitate and participate in research and monitoring within the Reserve components so that the results may be utilized to improve coastal management decision making. Job duties include: compilation and maintenance of a computer database of previous reserve research, coordination of proposal review, development and coordination of Reserve monitoring regimes and assisting the Reserve Coordinator with management of the components.

3. Education Specialist

This position functions as the education coordinator for the Coastal Reserve Program. The Reserve educational office is located in Beaufort. The education and interpretation functions

of the program are invaluable for increasing the awareness and understanding of coastal processes. Teaching school groups and the general public about the importance of coastal ecosystems and augmenting that knowledge with results from Reserve research and monitoring projects will ultimately improve coastal management. The Educational Specialist will coordinate with the site manager on the following:

- Providing verbal and written information (maps and pamphlets) about the Coastal Reserve to the public;
- Conducting field trips to Reserve components;
- Organizing and giving presentations (e.g., slide shows, lectures, workshops) concerning the Coastal Reserve; and
- Developing and implementing educational outreach programs to local schools and universities.

Site Manager

This employee is located on the Outer Banks to oversee stewardship, education and monitoring/ research activities at the Buxton Woods, Currituck Banks and Kitty Hawk Woods components. The position involves working closely with other Reserve staff, county/town officials, local advisory committees and volunteers. Typical duties will include: providing written and verbal information about the Coastal Reserve to the public, coordinating and conducting field trips in the Reserve, organizing and giving presentations concerning the Reserve, developing and implementing educational outreach programs to local schools and universities, monitoring physical/biological resources, developing interpretive trails, organizing and coordinating with Town staff and volunteer activities, and site maintenance. Primary guidance will come from the Reserve Coordinator as well as policies and guidelines from pertinent Reserve management plans and program regulations. The Site Manager will work with the Town Planner and Manager to develop and implement funding strategies for Reserve operations and programs. The site manager shall coordinate activities with the Reserve Coordinator, the Research Specialist, and the Educational Specialist.

C. Town of Kitty Hawk

1. Town Council / Planning Board

Town Council and Planning Board will serve an oversight role. Policy changes, funding requests, and budgets will be reviewed and approved by the Town Council. These entities play a crucial role in integrating town issues and initiatives relative to Reserve management. During the course of performing their normal duties, issues may arise that impact the Reserve. Conversely, Reserve specific issues may have town-wide implications. The Council and Board via the Town Manager need to keep the Coastal Reserve staff and Local Advisory Committee informed of applicable local issues.

2. Kitty Hawk Woods Conservation Area Working Group

This working group was formed for the express purpose of developing the initial management plan for the Kitty Hawk Woods Reserve. The Working Group chairperson coordinated the activities of this group with the Town Council, Planning Board, Town Staff and Coastal Reserve Staff. The working group recommended persons to serve on the Local Advisory Committee. Once the management plan was finalized, this group was disbanded. To maintain continuity and corporate knowledge, some members of the working group will serve on the Local Advisory Committee.

3. Town Staff

Town Staff includes the manager, assistant manager, planner, attorney, public works and police and fire departments. The staff will collectively have an on-site management function. The Town Manager has designated the Town Planner as liaison with the Site Manager, Planning Board, Town Council, Coastal Reserve Program, Local Advisory Committee, volunteer groups and public. Public works will help with Reserve maintenance while the police department will assist in patrolling the Reserve area. The Town Manager will coordinate the public works and police department assistance in maintenance and patrolling. The Manager, Assistant Manager and Town Planner will work with the Site Manager to develop and implement funding strategies for Reserve operations and programs.

D. Local Advisory Committee

An advisory committee will be created to assist with implementation and review of management at Kitty Hawk Woods. Individuals representing the local community, state and local government, education, research, wildlife resources and other interests will serve on this committee.

The committee will meet at least annually. Coastal Reserve staff, Town staff and volunteer groups will maintain contact with committee members and make available to them appropriate reports and data pertaining to research programs, educational programs and the management of Reserve resources. Additional meetings of the committee may be called when the Reserve Coordinator, Town or committee members feel that a management problem has arisen that merits discussion and action.

E. Volunteer Program

Volunteer groups are typically composed of local citizens representing different user groups or nearby residents. Exactly how volunteers are utilized is up to the Town, Coastal Reserve Program and Local Advisory Committee. It is up to these groups to pursue and foster productive relationships with volunteers. Examples of activities volunteers could perform include trail maintenance, litter removal, on-site education programs, surveillance and enforcement. The Kitty Hawk Horse Owners Association and the Wheels of Dare bike club

have already expressed an interest in providing their help.

F. Coordination

Management of the Kitty Hawk Woods Reserve is a collaborative effort among several different groups and individuals. For this to be successful, there must be an efficient flow of information and coordination. The key points of contact who are responsible for coordinating reserve activities:

Organization	Key Contact
Town of Kitty Hawk	Town Planner (Richard Reid)
Coastal Reserve Program	Site Manager
Local Advisory Committee	Chairperson (unfilled)
Volunteer Group	President or designated representative

G. Plan Review and Modification

The management plan will be reviewed annually by the Local Advisory Committee, Town Council and Coastal Reserve staff. Updates will be made as needed, but at least every five years. The review will include: an on-site evaluation of the condition of the site, an assessment of research, education and traditional use programs and public input.

V. EXISTING REGULATIONS/JURISDICTIONS

A. State

1. North Carolina Coastal Area Management Act

The North Carolina Coastal Area Management Act or CAMA (G.S. 113A-100 et seq.; NCAC - DEH&NR/DCM - T15: 07) was passed in 1974 and established an agency (DCM) and governor-appointed commission (Coastal Resources Commission or CRC) to regulate development and certify locally-adopted land use plans in 20 coastal counties of North Carolina. Thus, any development (e.g., boardwalks or interpretive facilities) done within the Reserve will be carefully coordinated with the planning and permit review staff of DCM so as to conform to CAMA. The activities described in this plan are consistent with the goals and objectives of the North Carolina Coastal Management Program.

2. North Carolina Coastal Reserve Regulations (see Appendix A)

These departmental rules (NCAC - DEH&NR/DCM - T15: 70) were established in 1988 to define the purpose, responsibilities, functions, components and use requirements of the Coastal Reserve Program. The Coastal Reserve Program includes four Estuarine Reserve components (i.e., Currituck Banks, Rachel Carson, Masonboro Island and Zeke's Island) plus four other sites (i.e., Permuda Island, Buxton Woods, Kitty Hawk Woods and Bald Head Woods). The Reserve Use Requirements (T15: 070.0200) specify general management standards within the component boundaries. Kitty Hawk Woods will be managed in accordance with Coastal Reserve regulations.

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

The Coastal Reserve Act (G.S. 113A-129.1 - 129.3) was passed in 1989 and formally established a state program to preserve certain coastal areas for research, education and other consistent public uses.

4. Nature Preserves 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 DEH&NR) as nature preserves. Articles of dedication specify acceptable and unacceptable uses, management purposes and custodial responsibilities. A 461-acre portion of Kitty Hawk Woods was formally dedicated as a State Nature Preserve by the Council State in September 1992.

5. Division of Marine Fisheries

This agency has the primary charge of regulating commercial and recreational taking of fish

and shellfish within the state's marine waters. Marine Fisheries enforcement officers patrol the marine and estuarine portions of Reserve components as part of their jurisdictions and may assist the Reserve with enforcement matters. Though the majority of the Kitty Hawk Woods Reserve component is terrestrial, the site also includes portions adjacent to the Currituck Sound shoreline and Jean Guite Creek. For regulatory purposes, High Bridge Creek is called Jean Guite Creek.

6. Wildlife Resources Commission

The Wildlife Resources Commission has enforcement responsibility concerning the taking of game animals and enforcement of boating regulations. The Non-game and Endangered Species Program has jurisdiction over listed animal species. North Carolina House Bill 1633, Chapter 585 prohibits the running of deer by dogs in the town of Kitty Hawk.

7. 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 T07: 04R .0700) and portions of the Archives and History Act dealing with responsibilities of the N.C. Historical Commission (G.S. 121-12 [a]; NCAC T07: 04R 0.0200) and protection of underwater archaeological sites (G.S. 121, Article 3; NCAC T07 04R .1000). Any proposed development or collection of artifacts within the Reserve will involve consultation with this department.

B. Town of Kitty Hawk

1. Animals at Large

(Ordinance # 82-2A, § 3-1): Dogs off the owners' premises and in the town must be tagged and under control. From June 1 to September 1 between the hours of 10:00 a.m. and 6:00 p.m., all dogs and other animals on sound beaches must be physically restrained with a leash not exceeding six feet in length.

2. Sand Dune Protection

(Ordinance # 86-12, § 7-16 to 7-22): It is unlawful for any person to damage, destroy or remove any sand dune or part thereof, or to kill, destroy or remove any trees, shrubbery or other vegetation growing on sand dunes. Exceptions are found in § 7-21 (a) (1 - 5) and § 7-21 (b) (1 - 2).

3. Miscellaneous Provisions and Offenses

(§ 10): This includes prohibitions against damaging public property (Ordinance # 83-8, § 10-1), producing unreasonably loud noise (Ordinance # 82-5, § 10-2), public urination

(Ordinance #84-2, § 10-3), and glass containers on town owned or operated property
(Ordinance #85-7, .§ 10-4)

4. Firearms

(Ordinance # 91-6, § 10-6): Center fire hunting rifles may be discharged in certain areas of the town when hunting for game during the season established by the state for the hunting of the game for which the rifle is being used; provided further that the rifle must be discharged from a stand or position eight or more feet above the ground level as measured directly below the shooter's position. Reserve policies have restricted the locations where center fire hunting rifles can be used beyond the scope of this ordinance.

5. Nuisances

(§ 12): The following conditions are applicable to Kitty Hawk Woods and are considered nuisances and threats to public health: the accumulation of rubbish, trash, or junk that poses a fire hazard; the accumulation of animal or vegetable matter that is offensive by virtue of odor; and the open storage of any abandoned icebox, refrigerator, stove, glass, building material, building rubbish, similar items, or wrecked or junked motor vehicles or parts thereof.

6. Solid Waste

(Ordinance # 82-7, § 17-1): Littering is prohibited upon any public property in the town.

7. Zoning

(§ 20-126): Reserve property is currently zoned KHW (Kitty Hawk Woods district). This is the most restrictive zoning district in the town. This zoning ordinance prescribes restrictions on allowable uses such as lot size, tree/vegetation removal, wetland alteration, building height and road widths.

VI. MANAGEMENT OBJECTIVES AND POLICIES

A. Research and Monitoring

1. Objectives

Unlike the Estuarine Reserve sites within the Coastal Reserve Program, there is no annual research or monitoring funding available from the program. However, whenever scientists or other prospective researchers wish to use the area for research or monitoring, the goals of the North Carolina Coastal 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 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:

- establish priorities and operational procedures for the different types of research and monitoring to be carried out in the Reserve;
- evaluate prospective research projects according to a permitting and technical review process;
- disseminate results to coastal decision makers and the public; and
- market Kitty Hawk Woods to potential researchers.

To properly manage coastal resources, a better understanding of the complex interrelationships and functions of the ecosystems is necessary. To achieve this goal, research at Kitty Hawk Woods will focus on the natural functions and influences of the coastal ecosystem as well as the effects of human use and abuse on this natural system. A thorough understanding of coastal ecosystems will allow more ecologically-sound management decisions to be made. This in turn assures the long-term availability of the Reserve for future research, education and recreation.

2. Policies

Policy: The long-term integrity of Kitty Hawk Woods as an undisturbed research site will be maintained. This requirement is of primary importance and will be

the basis of all decision making in the Reserve. Any improvements to facilitate access, research, education or traditional uses will be allowed only if, following review by the Local Advisory Committee, Coastal Reserve staff, Planning Board, Town Council, Town Staff and other interested parties, it is determined that construction and operation will cause negligible impacts to 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.

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

- (a) Baseline measurements of maritime forest 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 or to a condition that facilitates natural recovery of the affected habitat(s).

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 the 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. All relevant permits must be obtained before research can begin.

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 Director of 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 (DEH&NR) concerning rare plant species and communities.

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

A written proposal must be submitted to and approved by the Research Specialist who will consult with selected technical and scientific experts. 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 Reserve Research Specialist, but will not require a proposal. However, the agency must notify the Research Specialist and Town Planner 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 Reserve Coordinator and Town Planner.

Field work may not begin until the principal investigator receives a signed research permit from the Research Specialist. Major changes in the original research objectives, materials or methods must be submitted in writing to the Research Specialist who may consult the peer reviewers. Variations from the original research proposal will only be allowed following written notification from the Research Specialist. The Research Specialist will provide a copy of the permit to the Town Planner.

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

Research that deviates from the objectives and policies of the Management Plan or the original proposal will not be allowed or, if progress, will be terminated.

Policy: The principal investigator for each project is responsible for maintaining and removing any human-made objects (field equipment, trash, etc.) that they bring into 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. The Research Specialist will forward copies of this information to the Town Planner.

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

Policy: The DCM 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 Coastal Reserve staff to disseminate information on the Reserve's research accomplishments and educational programs. Local schools, towns (i.e., Kitty Hawk, Kill Devil Hills, Nags Head) and museums (i.e., N.C. Aquarium at Roanoke Island, Outer Banks History Center) will be primary outlets for this information.

B. Education

1. Objectives

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 systems function 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.

2. Policies

Policy: Off-site educational programs will be provided in conjunction with the DCM, North Carolina Aquariums, museums, the Sea Grant Program, public schools, community colleges, universities 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 educational activities with existing off-site programs (e.g., N.C. Aquariums, Outer Banks History Center, 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. Nearby colleges to consider are the College of the Albemarle and East Carolina University.

The DCM may sponsor specific meetings and workshops that are announced statewide. The events will be directed at the interested public and will utilize staff, scientists and volunteer experts. The DCM will also respond to, and encourage, speaking engagements by the Coastal 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. While the Coastal Reserve staff has primary responsibility for educational programs, the Town will assist with local contacts.

Policy: On-site programs at Kitty Hawk Woods will be arranged for supervised groups.

Field trips lead by the Reserve Site Manager, other Coastal Reserve staff, Town staff or a qualified volunteer may be performed on request. Research site tours for college students and other groups are encouraged. It would be appropriate 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 Site Manager, Research Specialist 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.

Policy: Education based literature, visual aids and related materials will be developed, distributed and routinely updated by the Site Manager, and Education Specialist.

Maps, brochures and related information will be developed to guide visitors through the Reserve. A checklist of plant and animal species will be developed on the basis of research

and observations. Pertinent rules and regulations will be published so that visitors will be familiar with the Reserve's management policies

Policy: The Site Manager, Education Specialist and Reserve Coordinator will oversee the educational program and will coordinate activities between participating institutions.

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

C. Traditional Uses

1. Objectives

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

- To accommodate traditional recreational activities and other uses of the Kitty Hawk Woods Reserve as long as:
 1. they do not disturb the natural integrity of the site and safety of other users of the Reserve environment or adjacent areas; 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.

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

2. Policies

a) General

Policy: No user shall disturb research projects or research equipment in place at the Reserve.

Policy: Users of the Reserve shall not disturb or remove any live animals (except for fish, shellfish, game animals, furbearers and waterfowl in accordance with applicable regulations), vegetation or artifacts from the site unless it is part of an approved research or educational project. Fallen timber or other vegetative materials may be removed from established roads, paths, or along boundaries if the wood or brush blocks pose a safety/fire hazard. However, naturally occurring litter and wood will not be removed from the interior of the property. All users must pack up their own trash and carry it out of the reserve.

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 cause them to leave the site, and thus diminish the Reserve's diversity of species.

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 can not 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 in the woods is essential for research and educational use of Kitty Hawk Woods. When appropriate, the Coastal Reserve staff shall review and comment on plans for development and other activities in the Reserve 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 and draining, and deposition of waste materials.

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

Policy: Hikers, bicycles and horses may only travel on roads or trails designated for such type of activity. Power vehicles are not permitted on the Reserve. This does not apply to law enforcement and emergency personnel, Town and Reserve staff, and researchers who have received permission for vehicular access.

Corridors may be gated or abandoned to protect natural features.

Unrestricted road access to sections of Kitty Hawk Woods has resulted in damage to portions of the natural communities by dumping, erosion and compaction. Visitors will be encouraged to follow walking trails routed through the area.

Policy: Any feces dropped by horses in the Reserve boundaries shall be removed by the rider and disposed of away from the Reserve in an environmentally safe and appropriate manner.

Policy: Camping is only allowed by permit on areas designated in the Reserve for research activities requiring an overnight stay. Fires are not allowed within the Reserve, except for management or research purposes.

Restricting camping protects the Reserve's delicate habitats from disturbance and destruction. Only wilderness camping (i.e., pack in/pack out) for researchers will be allowed by written permission from the Reserve Coordinator. Wildfire within the woods can do considerable damage to the plants and animals of this ecosystem. Thus, the use of fire is allowed by permit only from the Reserve Coordinator.

Policy: Littering and dumping of trash is prohibited within the Kitty Hawk Woods Reserve.

Littering and dumping is prohibited and is a violation of state laws (G.S. 14-399 & 14-399.1), the Coastal Reserve Program regulations (Appendix A), dedication of the site as a State Nature Preserve, and local ordinances (Nuisances Ordinance § 12 and Solid Waste Ordinance # 82-7, § 17-1).

Policy: Target shooting is prohibited within the boundaries of the Reserve. This includes the use of paint ball guns.

Policy: Picnicking, and the consumption of alcoholic beverages are prohibited in the Reserve.

Policy: The Reserve is closed to the public after sunset. This does not apply to researchers or others who have permission to use the Reserve after dark.

b) Hunting

Policy: Fishing, hunting and trapping may occur within the limits of local and state laws.

These activities are allowed according to the applicable guidelines set forth by the Wildlife Resources Commission, Dare County and Town of Kitty Hawk.

Policy: No permanent deer stands are permitted in Kitty Hawk Woods. Portable, removable climbing tree stands are permitted.

The common method of nailing fixed structures to trees is not consistent with Reserve conservation goals. Existing deer stands will be removed.

Policy: Sections of Kitty Hawk Woods where hunting is permitted will be registered with the North Carolina Wildlife Resources Commission. **This means that hunters will be required to obtain written permission from the Town to hunt in Kitty Hawk Woods.**

Registering this land with Wildlife Resources will make enforcement of hunting regulations easier.

Policy: Hunting is restricted as follows: in the Nature Preserve bow, shotgun, musket, and center fire rifle hunting are permitted; in the High Bridge Creek Easement bow and shotgun hunting are permitted, in the Wal-Mart Easement no hunting is permitted; in the Eckner Street Easement bow and shotgun hunting are permitted; in the Bender Tract bow and shotgun hunting are permitted; and in the Nations Bank Tract bow and shotgun hunting are permitted.

c) Surveillance, Enforcement, and Maintenance

Policy: The DCM, local law enforcement agencies, the Division of Marine Fisheries, and the Wildlife Resources Commission will cooperate in enforcing Reserve policies and all state and local laws applying to the Reserve.

Policy: The Coastal Reserve staff, Town staff and enforcement personnel from other state and local agencies shall visit the site to identify and investigate possible violations of Reserve policies. The Reserve will rely heavily, but not solely, on researchers, educators, volunteers and other users of the site to report any violations and to cooperate in any investigations.

Current time and budget limitations keep the DCM and state/local enforcement agencies from maintaining a continuous presence at Kitty Hawk Woods. 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 and Town staff and state and local enforcement personnel. The Kitty Hawk Police will continue to make regular patrols of the woods.

Policy: At the present time, the North Carolina Coastal Reserve shall rely on volunteer efforts and Town public works to maintain the quality of the Reserve. The Coastal Reserve and Town 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.

Because the Reserve site has traditionally been heavily used by local residents, volunteer assistance will be necessary. If necessary, specific memoranda of understanding between the DCM and other agencies can be developed to provide additional site protection.

VII. MANAGEMENT ISSUES AND ACTIONS

A. Introduction

This section explains the current management issues facing the Reserve. It also provides specific actions to address these current needs and to implement the general policies and rules put forth in sections VI and VII. These actions are both short and long term in nature. The information in this section overlaps with sections V and VII.

B. Baseline Data

In order to manage any natural area, one must have a comprehensive understanding of the resources that are present. To date, very little work has been done in the Kitty Hawk Woods area to identify, inventory and map the natural and man-made resources of the area. What few studies exist are qualitative in nature or, as is the case with the Town's wetlands mapping, are at too large a scale to be used. Although this plan includes policies that restrict certain activities to designated areas, this has not been done in conjunction with a study that identifies particularly sensitive areas (i.e., wetlands or rare plants). Once such a study is completed, some policies may need to be changed. The identification and mapping of the Reserves biological, cultural and archaeological resources is a top priority project.

1. Geographical Information System (GIS)

The GIS that the town will soon have access to will provide a powerful new management tool. Several opportunities are available.

- Utilizing existing wetlands data as part of an initial resource inventory and map.
- A hand held global positioning system (GPS) can be used to add existing roads, trails, dump sites, deer stands, target ranges, nearby houses and other such sites to the GIS. DCM has access to a GPS and may be able to get someone to do this work or loan the GPS to the town to do this work. Once computerized these data can be used to generate trail and hunting maps.

2. Resource Inventory and Mapping

This is a top management priority and should be completed as soon as possible. Aerial photos, soils maps and field work will be required. Options for completing this work include:

- Contracting with a private consulting firm or a university. Duke University has performed vegetation studies and community mapping at other Coastal Reserve sites.
- Utilizing existing state agencies such as the Natural Heritage Program (vegetation),

Department of Cultural Resources (historic and archaeological), Wildlife Resources, Marine Fisheries and North Carolina Aquarium on Roanoke Island. Based on informal conversations with the local Marine Fisheries office, their staff may be able to sample the fishes of High Bridge Creek.

- Obtain a college or graduate school intern to perform this study.

3. Invasive Species

Any resource mapping that is done should inventory and map invasive, non-native plants and animals. If appropriate, a removal strategy and prevention plan should be developed.

C. Relationships

Both the Town and DCM have limited resources (financial and manpower). To fulfill the objectives, goals and policies of this management plan, both the Town and DCM will have to pursue and strengthen relationships with a broad base of individuals and organizations. Specific groups that should be targeted include:

- **Volunteers:** Building a broad base of user groups will be critical to the success of the Kitty Hawk Woods Reserve. Reserve users such as bikers, hikers, hunters, kayakers, nearby residents, and horse back riders should be drawn upon to help with management planning, enforcement, surveillance, maintenance and education. Input from the first public meeting shows that the Kitty Hawk Horse Owners Association and the Wheels of Dare bike club are willing to help. Two other groups to consider are a bike club called the Outspoken Riders and Kitty Hawk Sports who runs kayak tours on High Bridge Creek. The potential pay back of building a strong volunteer network are enormous.
- **The Nature Conservancy (TNC):** The Southeast Regional office is already involved in helping the state acquire more land in Kitty Hawk Woods. In addition, TNC has a field office that actively manages Nags Head Woods seven miles south of Kitty Hawk Woods. The local staff have a lot of experience managing a maritime forest.
- **Government Agencies:** Wildlife Resources, Marine Fisheries and the North Carolina Aquarium have biologists, enforcement officers and education specialists that may help with Reserve management. Memorandums of understanding should be pursued with these agencies.

This is not intended to be a restrictive or comprehensive list of groups with which to foster relationships. The key is to be creative in forming these partnerships.

D. Public Access

While policies exist to allow public use and access, access must be restricted to achieve the conservation goals of the Reserve.

1. Designated Access Points and Trails

Existing trails will be utilized for public access. This will limit human activities to areas where it is already taking place and help keep interior areas of the woods pristine. Furthermore, the act of constructing new trails will only harm the woods by segmenting the forest and destroying rare and limited habitat. Figure 4 contains a map of recommended public trails and access points in Kitty Hawk Woods. It is important to emphasize that this map is not based on a resource inventory. Once a resource inventory and map are completed, this map needs to be reviewed and possibly revised to protect sensitive areas.

- **Nature Preserve:** Public pedestrian access is available at the Eckner Street access point. The power line cut is open to foot and horse traffic. It is possible to walk on the interior ridges and they are accessible from the power line easement by crossing swales. Some of these ridges have trails created by hunters and horse back riders. Existing trail will be identified and marked for foot and horse traffic only. Mountain bikes shall be prohibited.
- **High Bridge Creek Easement:** There are no existing trails or parking for this area. Kayaks, canoes, and other small boats can access the west side of the easement from High Bridge Creek. The tract is open to foot traffic only. High Bridge Creek shall be a "No wake zone."
- **Wal-Mart Easement:** There are no existing trails or public parking for this area. The tract is open to foot traffic only.
- **Eckner Street Easement:** There are no existing trails for this area. It can be accessed from Eckner Street. The tract is open to foot traffic only.
- **Bender Tract:** Public access is from Woods Road, but no public parking exists. Covered Bridge Road is a paved road on the northern side of the tract. One trail exists which leads to a private residence. This trail is closed to all public access. Covered Bridge Road will be open to foot, horse and bike traffic.
 - **Covered Bridge Road connects the Bender and Nations Bank tracts. However, it does run through private property. Before allowing public access at this point consent must be given by the property owners association or Site Manager**
- **Nations Bank Tract:** Access is from Covered Bridge Road, Ridge Road, Radcliff Court Road (all of which are through private property),. No public parking is

available, but several roads and trails exist. Most roads and trails are open to foot, horse and bike traffic.

2. Vehicles and Dumping

Motorized vehicles and dumping are not allowed in the Reserve. Unfortunately, dumping of white goods, construction waste and land clearing debris has been going on for several years. By restricting vehicle traffic, this should significantly reduce illegal dumping.

- Gates should be installed at vehicle access points. They should be set up so horses are not blocked from the trail. Keys to the gates need to be provided to emergency, enforcement and maintenance personnel. Specific installation locations are:
 - Nature Preserve: Two gates are needed to prevent access from Eckner Street and one gate is needed on the south end of the power line cut. Barrier Island Station has already gated their portion of the power line cut. The gate on the power line cut must not block access to the residence adjacent to the southeast corner of the preserve. Before gates can be installed, it is probably necessary to get approval from North Carolina Power.
 - Nations Bank Tract: A pair of gates are needed for both Ridge Road and Radcliff Court. Covered Bridge Road has chains that block off some of the road to vehicles. However, if all other access is cut off, people may seek out this weaker entrance. If this is the case, gates may need to be installed where chains exist. Whatever actions are taken in this area, they need to be done with the approval of the Covered Bridge Road property owners association.
- Existing trash piles should be removed.

3. Boundaries

All Reserve properties need to be surveyed and signs posted on the boundary line indicating it is a Nature Reserve. To date the Nature Preserve parcel has been surveyed, but not posted. No other tracts have been surveyed or posted.

4. Information

Reserve users need to be aware of the rules of the Reserve. In order to convey this information three things should be done.

- Information signs with Reserve rules should be posted where there is public access.
- Trail maps with Reserve rules should be available at all trail heads. A trail map could be generated from the GIS.

- An educational pamphlet containing Reserve rules and information about the natural and cultural features of the woods should be available at all trail heads. This could be combined with the trail map.

5. Long Term Initiatives

In the short term a lot of things need to take place. However, looking into the future, initiatives that should be considered are:

- Long term monitoring - It is necessary to monitor the impacts of public access, presence and use over time and reassess Reserve policies to ensure reserve goals are being met.
- Parking lot(s) - Presently, parking is very limited. If the popularity of the Reserve grows, parking might be necessary to accommodate visitors. A potential location for a parking lot is in the Bender tract along Woods Road.
- Interpretive trail/Visitor Center - Depending on funding and public interest, interpretive trails and/or a visitor center would facilitate education-based recreation. The Site Manager's office on Kitty Hawk Road could be utilized as a meeting place and/or starting point for interpretive programs.

E. Horses and Bicycles

Horseback riding and mountain biking are two relatively new, but increasingly popular uses of the Reserve area. The Reserve can accommodate a certain amount of these activities, but it must be recognized that they do impact the natural system. Specifically, erosion, compaction and vegetation damage are three major side effects.

1. Designated Trails

Existing trails may be utilized for horse back and bike riding. Trails where these activities are not allowed should be posted accordingly. Figure 5 contains a map of recommended horse and bicycle trails. It is important to emphasize that this map is not based on a resource inventory. Once a resource inventory and map are completed, this map needs to be reviewed and possibly revised to protect sensitive areas. This issue is also discussed in the public access section (VIII. D. 1.).

2. Long Term Issues

Considering the potential impact of these activities on the Reserve, a program should be put in place to monitor the numbers of bikers and horse back riders and their effect on the

Reserve. Most bikers and horse back riders will likely cooperate because they also want to preserve the area and continue their activities. It may become necessary in the future to restrict this activity by permit and/or impose user fees. Also, if several user groups begin to conflict (i.e. bikers, horse riders, hunters), then it may be necessary to impose time restrictions on various activities. A representative of the Kitty Hawk Horse Owners Association estimates that they have roughly twenty members (not all from Kitty Hawk) and that there are ten to fifteen horse owners in the village. No information is known about the number of bikers in Kitty Hawk Woods.

F. Hunting

Hunting in Kitty Hawk Woods has for the most part been unregulated. However, as adjacent development increases and more people use the area for other types of recreation, there is pressure to restrict and even ban hunting. It is important to recognize that Kitty Hawk Woods is a very diverse place. For example, the Nations Bank Tract and Nature Preserve Tract have different carrying capacities for hunting due to size, topography and surrounding development.

1. Wildlife Resources Registration

The Town and State need to register their land with the Wildlife Resources Commission. This would mean that anyone hunting on the land needs the owners written permission to hunt there. Logistically, it makes sense for the Town to handle this function. There are several benefits to registering the land. One, it gives Wildlife Resources officers more enforcement authority. Two, Wildlife Resources would help with management decisions. Three, the town would have a way to track the number of hunters and what they hunt. Registering the land requires that it be posted in accordance with Wildlife Resources regulations.

2. Restrictions

In addition to state and local regulations, certain areas of the reserve need more regulation. The following rules apply to the Reserve:

- Nature Preserve: Bow, shotgun, musket, and center fire rifle hunting are permitted.
- High Bridge Creek Easement: Bow and shotgun hunting are permitted.
- Wal-Mart Easement: No hunting is permitted.
- Eckner Street Easement: Bow and shotgun hunting are permitted.
- Bender Tract: Bow and shotgun hunting are permitted.
- Nations Bank Tract: Bow and shotgun hunting are permitted.

3. Information

After hunters register with the town, they should be given a pamphlet which contains the

reserve hunting rules and a map of surrounding houses and trails where people might be walking, biking or riding horses. This information could be generated from the GIS.

4. Long Term Issues

A great benefit of the registration program is it allows the town to track hunting. It is possible that in the future permits would have to be limited and or user fees introduced. Another initiative to consider is a study on the deer population. Wildlife Resources recently did this in Nags Head Woods and found the deer were underweight and had a high parasite count.

G. Maintenance

Maintenance of the Reserve should be relatively minor. If the area is gated, trash dumps should be removed. This should be a one time cleanup. Also, if vehicles are kept out of the Reserve, the roads may need to be occasionally cleared of fallen debris and undergrowth. This will ensure the roads are accessible for emergency and government vehicles. Periodic litter pickup should be performed by the Town and or volunteers.

H. Fire Management

Fire is a concern that has been expressed by area residents and Reserve users. Debris dump sites contain large piles of dried wood that pose a fire risk. In addition, people who smoke or have camp fires in the woods serve as a potential source of ignition for a fire. Because this is a larger issue than just the Reserve area, the Kitty Hawk Woods Conservation Area Working Group will develop a fire management plan separate from this management plan.

I. Funding

Because the Reserve is jointly owned and operated by DCM and the Town, funding will be also be a shared responsibility. The degree of funding required depends upon what initiatives are undertaken - especially in the area of education. However, the Reserve is not intended to be a "high dollar" project. A large portion of the work that needs to be done can and should be performed by the Coastal Reserve, Town staffs and volunteers.

1. Requirements

Future Acquisitions: (Funding Required) DCM and TNC have pursued grants to fund current and future acquisitions. Cost will vary depending upon acquisition targets and market conditions.

Enforcement / Surveillance: (No Funding Required) This can be achieved through MOUs with state and federal law enforcement agencies and by utilizing Town staff, local police

and volunteers.

Cleanup Dump Sites: (Funding Required) If gates are installed, this should be undertaken. This is more or less a one time project and can be completed using the Town's public works function and disposing of the waste at the County landfill, or the project can be contracted out.

Information: (Funding Required) Trail maps, hunting maps and information pamphlets can be compiled in house by the Education Specialist.

Trail Maintenance: (No Funding Required) Periodic maintenance can be performed by the town public works function and or volunteers.

GIS Mapping: (No Funding Required) Town or DCM staff can use a GPS to map the existing roads, houses, dumps and other features of the area.

Resource Inventory / Mapping: (Funding Required) This project could possibly be completed by a state agency or contracted out. Duke University performed similar studies in other Reserves for \$10,000 to \$12,000. An intern would cost \$5,000.

Install Gates: (Funding Required) At a minimum seven gates are needed.

Survey Boundaries: (Funding Required) The Nature Preserve tract is the only portion that has been surveyed. This cost \$4,600 for 461 acres. Other tracks in public ownership need to surveyed, and as parcels are acquired they should be surveyed.

Post Signs: (Funding Required) Funds are needed to purchase the needed signs, but they can be posted by Town and Coastal Reserve staffs and volunteers. A sand blast sign costs \$1,000 to \$2,000. Information signs (3' x 3') cost \$60 to \$70 each. Boundary signs cost \$10 to \$5 a piece.

Future Projects: (Funding Required) Projects to consider for the long term are parking lots, interpretive trails and a visitor center. The cost will depend upon the scope of these projects.

2. Funding Sources

The Coastal Reserve Program has limited funds available for Reserve management which may be able to cover gates, signs and surveying. The Town should also share in the funding of these and future initiatives. Other sources of funding include various grants through state and federal agencies such as the N.C. Natural Heritage Trust Program, N.C. Department of Cultural Resources, NOAA and U.S. Fish and Wildlife. The agency that is targeted will depend on what projects or initiatives are undertaken. Another option to consider is imposing user fees for activities such as hunting. Such fees should not be prohibitively expensive..

J. Acquisitions

It is important for DCM and TNC to continue their acquisition efforts in Kitty Hawk Woods. While these accomplishments are extremely noteworthy and commendable, the forest is still threatened by fragmentation. The next step is to connect these large tracts by acquiring the land between them, perhaps with conservation easements. Protection of these areas will reduce fragmentation of the woods and provide a more uniform habitat for protection of the flora and fauna of the woods.

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IX. APPENDICES

APPENDIX A. Coastal Reserve Regulations

SUBCHAPTER 70 - NORTH CAROLINA COASTAL RESERVE

SECTION .0100 - GENERAL PROVISIONS

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

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

.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 decisionmakers.

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

.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 Natural Resources and Community Development.

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

.0105 RESERVE COMPONENTS

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

The North Carolina National Estuarine Research Reserve includes components (1)-(4). Detailed boundary maps for each component are maintained and available for inspection at the Division of Coastal Management, 512 North Salisbury Street, Raleigh, North Carolina.

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

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

.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 Natural Resources and Community Development 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: Statutory Authority G.S. 113-3; 113-8; 143-341; 143-342; 143B-10;
Eff. July 1, 1986;
Amended Eff. April 1, 1988.*

.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 regulations;
 - (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 without the written permission of 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 state hunting and fishing regulations 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: Statutory Authority G.S. 143B-10;
Eff. July 1, 1986;
Amended Eff. April 1, 1988.*

APPENDIX B. Coastal Reserve Statutes

CASE NOTES

Trial Court without Jurisdiction. — The trial court was without jurisdiction in a declaratory judgment action to pass upon the question of whether subsection (d)(1) of this section authorizes warrantless searches in violation of the Fourth Amendment where the plaintiffs

did not allege that they had been subject to actual searches or that they had been fined for refusing access to investigators. *Adams v. North Carolina Dep't of Natural & Economic Resources*, 295 N.C. 683, 249 S.E.2d 407 (1978).

§ 113A-127. Coordination with the federal government.

All State agencies shall keep informed of federal and interstate agency plans, activities, and procedures within their area of expertise that affect the coastal area. Where federal or interstate agency plans, activities or procedures conflict with State policies, all reasonable steps shall be taken by the State to preserve the integrity of its policies. (1973, c. 1284, s. 1; 1975, c. 452, s. 5; 1981, c. 932, s. 2.1.)

§ 113A-128. Protection of landowners' rights.

Nothing in this Article authorizes any governmental agency to adopt a rule or issue any order that constitutes a taking of property in violation of the Constitution of this State or of the United States. (1973, c. 1284, s. 1; 1975, c. 452, s. 5; 1981, c. 932, s. 2.1; 1987, c. 827, s. 144.)

§ 113A-129: Reserved for future codification purposes.

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.)

Editor's Note. — Session Laws 1989, upon ratification. The act was ratified c. 344, s. 3, makes this Part effective June 19, 1989.

§ 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, Health, 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.

(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).)

Effect of Amendments. — The 1989 Natural Resources" for "Natural Resources and Community Development" amendment, effective July 1, 1989, substituted "Environment, Health, and in subsection (b).

§ 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.)

Effect of Amendments. — The 1989 substituted "G.S. 113A-164.11" for "G.S. amendment, effective August 12, 1989, 164.11" in subsection (b).

§§ 113A-130 to 113A-134: Reserved for future codification purposes.

APPENDIX C. Nature Preserve Dedication



North Carolina Department of Administration

James B. Hunt Jr., Governor

Katie G. Dorsett, Secretary

January 6, 1997

The Honorable Jonathan B. Howes, Secretary
North Carolina Department of Environment,
Health and Natural Resources
512 North Salisbury Street
Raleigh, North Carolina 27604

Re: Allocation of Property to the Department of Environment, Health and Natural Resources,
Dedication of Areas Within Kitty Hawk Woods, Dare County

Dear Secretary Howes:

Pursuant to Article 9A, Chapter 113A of the North Carolina General Statutes, and pursuant to the authority vested in me by the Administrative 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, Health and Natural Resources subject to the conditions described herein:

Those State-owned properties on the Outer Banks of Dare County managed by the Division of Coastal Management as the Kitty Hawk Woods Coastal Reserve, briefly described below and more specifically described in Exhibit A, and any additional properties subsequently purchased as additions to the Reserve.

Site Name

Approximate Acreage

Kitty Hawk Woods

234

THIS ALLOCATION IS MADE SUBJECT TO THE FOLLOWING CONDITIONS:

1. **Definitions:** As used in this 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 Kitty Hawk Woods Coastal Reserve (hereinafter the "Reserve" or "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, Health and Natural Resources, Division of Coastal Management, which will be responsible for managing the Nature Preserve in accordance with this Letter of Allocation ("Dedication") and the regulations set forth in 15 NCAC 12H.0301-0403.
4. **Primary Classification:** The primary classification and purpose of the Preserve shall be to preserve the maritime forest community 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 activities in the Preserve shall be research, educational programs, walking 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 will be allowed along designated corridors. Camping will be allowed only with the written permission of the Department of Environment, Health and Natural Resources.

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, commercial development, commercial silviculture, except salvage timber harvest and other techniques to improve the forest stand, agriculture and grazing, gathering of plant products for purposes other than approved research, the removal, disturbance, molestation, or defacement of minerals, archaeological and natural resources or natural features, dumping or changes in topography except by existing easements.

Hunting dogs, pets on leashes and riding horses (on designated corridors only) will be allowed, but 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 Department of Environment, Health and Natural Resources, and there shall be no littering.



North Carolina Department of Administration

James B. Hunt Jr., Governor

Katie G. Dorsett, Secretary

January 6, 1997

The Honorable Jonathan B. Howes, Secretary
North Carolina Department of Environment,
Health and Natural Resources
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There will be no fires, except as specifically permitted by the Department of Environment, Health and Natural Resources, and there shall be no littering.

- B. Visitors and Visitor Facilities: The Custodian reserves the right to orient and guide visitors for educational programs, scientific research and Preserve management. Exhibits, programs and printed materials may be provided by the Custodian. The Custodian may create and maintain nature trails, wildlife viewing areas, overlooks, boardwalks and primitive campsites adequate to promote the permitted use of the Preserve.
- The Custodian may construct and maintain service roads for patrol, fire control, right-of-way maintenance and other management activities. The Custodian may maintain roads presently existing within the Preserve. Otherwise, the construction of roads will be prohibited.
- C. Hunting: Hunting shall be permitted in the Preserve subject to regulation and management by the Wildlife Resources Commission and the local ordinances of the Town of Kitty Hawk. Such regulation and management is to be consistent with the protection of the natural diversity and primitive character of the Preserve.
- D. Water Level Control: The purpose of water level control shall be to maintain the Preserve's natural water regimes. Water levels that have been altered by human activities may be changed by the Custodian, if necessary, to restore the Preserve to its natural condition.
- 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 easement/permits between the State and public utility companies and other governmental agencies, or as is necessary for public safety.
- F. Visitor Protection: Guardrails, fences, steps and bridges may be provided by the Custodian when essential to the safety of a reasonably alert and cautious visitor. The Custodian shall have the right to erect such structures as may be necessary to protect the Preserve from unwanted or excessive visitor traffic to sensitive environmental resources.
- G. Control of Vegetational Succession: Control of vegetational succession may be undertaken if necessary to maintain or restore a particular ecosystem or the preservation of threatened, rare, endangered or unusual species.

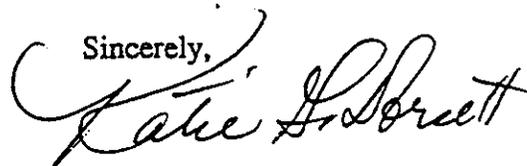
- H. Research and Collecting Permits: Any person wishing to engage in scientific research or collecting shall first secure written permission from the Department of Environment, Health and Natural Resources.
- I. Fences: Fences and barriers may be installed as necessary to further the purposes of the Preserve.
- J. Trails: The Custodian shall locate, build and maintain trails which shall be adequate to provide for permitted use 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 primary Custodian of the Preserve shall be required to prepare and submit for approval to the Secretary of the Department of Environment, Health 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 70.0202 and other such regulations as may be established from time to time by the Secretary of Environment, Health 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 taken precedence.
- M. Vehicles: There will be no horseback riding or bicycling except on trails designated for these purposes and no use of any motorized vehicles. The Custodian may use vehicles as necessary for the management of the Preserve.
- 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.
- O. Bringing in Flora and Fauna: No exotic flora and no animals, except leashed dogs and cats, horses on trails designated for horseback riding or animals being reintroduced, shall be brought into the Preserve. Any reintroduction will be of species native to the natural community and shall be done according to an approved resource management plan.

- P. Fire: Use of prescribed burning is permitted as necessary for the biological management of the Preserve. Any prescribed burning must be done according to an approved fire management plan.
- Q. 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 plan, apply biological controls, herbicides and 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 Council of State. The lands dedicated to the Kitty Hawk Woods Coastal Reserve 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 Kitty Hawk Woods 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 November 12, 1996.

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

Sincerely,



Katie G. Dorsett

CONSENTED AND AGREED TO:



Jonathan B. Howes, Secretary
Department of Environment, Health
and Natural Resources

KGD/jf

EXHIBIT A

KITTY HAWK WOODS COASTAL RESERVE

DESCRIPTION

COUNTY: Dare

TOPO QUAD: Kitty Hawk 7.5'

PHYSIOGRAPHIC PROVINCE: Coastal Plain

SIZE OF AREA: 234 acres

OWNER/ADMINISTRATOR: Division of Coastal Management
Department of Environment, Health and Natural Resources
State of North Carolina

LOCATION: On the Outer Banks, north of the old portion of the town of Kitty Hawk, lying south and west of US 158. A previously dedicated portion of Kitty Hawk Woods lies to the east of the Woods Road, which bisects Kitty Hawk Woods. This proposed dedicated area lies to the west of The Woods Road and consists of two primary sections, both labeled as Phase I and shaded in green on the attached map. The eastern of these two sections actually consists of three tracts (see map), as two narrow tracts have bisected this large section into three portions.

DESCRIPTION: Whereas much of Kitty Hawk Woods lying east of The Woods Road (and previously dedicated) consists of wetlands, the majority of the area to the west of this road is forested uplands. Small streams and pools dot this area, but most of the western half of Kitty Hawk Woods consists of the Maritime Deciduous Forest natural community. This is a rare natural community in North Carolina and is restricted primarily to this portion of the Outer Banks, with nearly all that is remaining found within Nags Head Woods and Kitty Hawk Woods.

The Maritime Deciduous Forest is in excellent condition, with the exception of scattered homes that have recently been built along The Woods Road. The proposed dedicated area contains no homes or other disturbances, other than a few trails that bisect the tracts. The uplands are dominated variously by American beech (*Fagus grandifolia*), loblolly pine (*Pinus taeda*), pignut hickory (*Carya glabra*), sweetgum (*Liquidambar styraciflua*), and water oak (*Quercus nigra*). The well-developed understory is also diverse; common trees include red maple (*Acer rubrum*), flowering dogwood (*Cornus florida*), American hornbeam (*Carpinus caroliniana*), and redbay (*Persea borbonia*). Hop-hornbeam (*Ostrya virginiana*) and redbud (*Cercis canadensis*), rather rare near the coast, are frequent in parts of the area. The shrub layer is also considerable, with cane (*Arundinaria gigantea*) being quite common. The herb layer is of moderate diversity, with a scattering of ferns and partridge-berry (*Mitchella repens*) being characteristic. Spanish-moss (*Tillandsia usneoides*) hangs from many trees in the forest.

Scattered among the uplands are pools and small streams. However, the vegetation along the wetlands is poorly developed, with many of the plants there also occurring in uplands as well. For

example, wax-myrtle (*Myrica cerifera*) is common along the waterways, as is cane, sweetgum, and red maple. The herbs in these wetlands, however, are distinct from those in the uplands, with arrowhead (*Sagittaria falcata*), knotweed (*Polygonum punctatum*), and alligator-weed (*Alternanthera philoxeroides*) being most common. For the most part, these wetlands are not extensive enough to be called swamps, and bald-cypress (*Taxodium distichum*) appears to be absent or very rare in this part of Kitty Hawk Woods.

Few rare species are known from Kitty Hawk Woods: The woolly beach heather (*Hudsonia tomentosa*), typically found on dunes and other bare sandy soil, has been reported from the natural area, but its habitat is clearly scarce at this site. The giant swallowtail (*Papilio cresphontes*) has been found east of The Woods Road and certainly must occur in the proposed dedicated section. Both of these species are found in other nearby sites, but the plant is restricted in the state to the northern coast and the butterfly is found almost exclusively in maritime forests.

Despite the few rare species, Kitty Hawk Woods is an outstanding example of Deciduous maritime Forest and is one of the largest remaining blocks of maritime forest along the North Carolina coast. It is considered to be of National Significance by the North Carolina Natural Heritage Program.

BOUNDARY JUSTIFICATION: All of the lands currently administered by the Division of Coastal Management lying to the west of The Woods Road are proposed for dedication. No secondary (buffer) areas are being proposed. All of these lands are mature deciduous maritime forests, with no man-made structures other than trails present on them.

MANAGEMENT AND USE: The land is to be known as the Kitty Hawk Woods Coastal Reserve. The primary purpose of the reserve will be to preserve the maritime forest community for research, education, and other compatible and traditional uses.

MAP: attached

August 1996, NC NHP

