

---

---

# VILLAGE OF BALD HEAD ISLAND



## CAMA CORE LAND USE PLAN

Adopted by the Village of Bald Head Island Village Council: April 11, 2008

Certified by the Coastal Resources Commission: May 22, 2008

Prepared by:



Wilmington, North Carolina

The preparation of this document was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

---

---

VILLAGE OF BALD HEAD ISLAND  
CAMA CORE LAND USE PLAN  
**TABLE OF CONTENTS**

	<u>PAGE</u>
PREFACE .....	i
SECTION I. INTRODUCTION .....	1
SECTION II. HISTORY .....	2
SECTION III. REGIONAL SETTING .....	5
SECTION IV. BALD HEAD ISLAND CONCERNS/ASPIRATIONS .....	7
A. KEY ISSUES .....	7
B. VILLAGE OF BALD HEAD ISLAND COMMUNITY VISION .....	8
SECTION V. ANALYSIS OF EXISTING AND EMERGING CONDITIONS .....	9
A. POPULATION, HOUSING, AND ECONOMY .....	9
1. Village of Bald Head Island Permanent Population .....	9
a. Village of Bald Head Island and Brunswick County .....	9
b. Population Profile .....	11
c. Population Summary .....	14
2. Housing .....	15
a. Housing Occupancy and Tenure .....	15
b. Age of Structure .....	16
c. Housing Conditions .....	18
d. Units in Structure .....	19
e. Housing Summary .....	20
3. Employment and Economy .....	21
a. General Economic Indicators .....	21
b. Household Income .....	21
c. Employment by Industry .....	22
d. Employment Commuting Patterns .....	23
e. Industries .....	24
f. Employment and Economy Summary .....	24
4. Population Projections .....	25
B. NATURAL SYSTEMS ANALYSIS .....	25
1. Mapping and Analysis of Natural Features .....	25
a. Topography .....	25

b.	Climate .....	26
c.	Flood Zones/Storm Surge .....	27
d.	Man-made Hazards .....	34
e.	Soils .....	35
f.	Water Supply .....	37
g.	Fragile Areas .....	38
i.	Estuarine Waters and Estuarine Shorelines .....	38
ii.	Public Trust Areas .....	40
iii.	Coastal Wetlands .....	41
iv.	Ocean Beaches and Shorelines & Inlet Hazard Areas .....	45
v.	Protected Land and Significant Natural Heritage Areas .....	49
vi.	Outstanding Resource Waters .....	53
h.	Areas of Resource Potential .....	53
i.	Regionally Significant Parks .....	53
ii.	Marinas and Mooring Fields .....	54
iii.	Floating Homes .....	54
iv.	Channel Maintenance .....	54
v.	Marine Resources (Water Quality) .....	55
2.	Environmental Composite Map .....	58
3.	Environmental Conditions .....	61
a.	Introduction .....	61
b.	Cape Fear River Basin .....	63
c.	Hydrologic Unit 03030005 (Subbasin 03-06-17) .....	63
d.	Summary of Water Quality Subbasin 03-06-17 .....	64
i.	Introduction .....	64
ii.	Registered Animal Operations/Population Density within Cape Fear River Basin .....	67
iii.	Growth Trends .....	68
e.	Wastewater Treatment Facilities .....	69
f.	Natural Hazards .....	69
g.	Natural Resources .....	70
C.	ANALYSIS OF LAND USE AND DEVELOPMENT .....	71
1.	Existing Land Use .....	71
2.	Land Use Conflicts .....	74
3.	Development Trends .....	75
4.	Historical, Cultural, and Scenic Areas .....	76
5.	Land Use in Relation to Environmental Composite Map .....	76
6.	Land Use Demand Forecast .....	77
D.	ANALYSIS OF EXISTING COMMUNITY FACILITIES/SERVICES .....	78
1.	Transportation .....	78
2.	Health Care .....	79
3.	Police Department .....	80
4.	Fire/EMS Services .....	80

5.	Administration	81
6.	Water System	81
7.	Sewer System	82
8.	Solid Waste	84
9.	Schools	84
10.	Recreation	85
11.	Post Office	85
12.	Electric Service	86
13.	Stormwater Management	86
a.	Introduction	86
b.	Existing Drainage Problems	86
c.	Water Quality Problems	87
d.	EPA Regulations	87
e.	Construction Activities	89
f.	North Carolina Shoreline Buffering	89
E	LAND SUITABILITY ANALYSIS (LSA)	90
F.	CURRENT PLANS, POLICIES, AND REGULATIONS	93
1.	Introduction	93
2.	Buildings and Building Regulations (Chapter 6)	93
3.	Environment (Chapter 10)	94
4.	Floods (Chapter 14)	94
5.	Stormwater Management (Chapter 22)	95
6.	Streets, Sidewalks, and Other Public Places (Chapter 24)	95
7.	Subdivisions (Chapter 26)	95
8.	Utilities (Chapter 30)	96
9.	Zoning Ordinance (Chapter 32)	96
10.	Village of Bald Head Island Hazard Mitigation Plan	98
11.	Village of Bald Head Island Stormwater Management Ordinance	99
12.	Village of Bald Head Island - Vision 2010	99
13.	Village of Bald Head Island 2002 Long Range Plan	99
14.	Review of the 1996 Brunswick County CAMA Land Use Plan	100
	SECTION VI. PLAN FOR THE FUTURE	103
A.	FUTURE DEMANDS	103
1.	Introduction	103
2.	Housing Trends	103
3.	Commercial	104
4.	Transportation	104
5.	Public Land Use	105
6.	Recreation	105
7.	Water System	106
8.	Sewer System	106



9.	Administration .....	107
10.	Fire/EMS Services .....	107
11.	Police Department .....	107
12.	Stormwater Management .....	107
B.	LAND USE/DEVELOPMENT GOALS AND IMPLEMENTING ACTIONS .....	108
C.	POLICIES/IMPLEMENTING ACTIONS .....	108
1.	Introduction .....	108
2.	Policies Regarding Land Use and Development in AECs .....	111
D.	LAND USE PLAN MANAGEMENT TOPICS .....	112
1.	Introduction .....	112
2.	Impact of CAMA Land Use Plan Policies on Management Topics .....	112
3.	Public Access .....	113
4.	Land Use Compatibility .....	114
5.	Infrastructure Carrying Capacity .....	119
6.	Transportation .....	121
7.	Natural Hazard Areas .....	123
8.	Water Quality .....	126
9.	Local Areas of Concern .....	131
E.	FUTURE LAND USE PLAN .....	136
1.	Introduction .....	136
2.	Future Land Use Map .....	137
a.	Introduction .....	137
b.	Future Land Use Acreages .....	139
3.	Descriptions of Future Land Use Categories .....	140
4.	Land Use in Relation to Zoning .....	145
5.	Land Demand Forecast (Carrying Capacity & Density/Intensity Analysis) ..	145
6.	Summary of General Principles Used to Develop the Land Use Plan .....	147
	SECTION VII. TOOLS FOR MANAGING DEVELOPMENT .....	148
A.	GUIDE FOR LAND USE DECISION MAKING .....	148
B.	EXISTING DEVELOPMENT PROGRAM .....	148
C.	ADDITIONAL TOOLS .....	148
D.	ACTION PLAN/SCHEDULE .....	148
1.	Citizen Participation .....	148
2.	Action Plan/Schedule .....	149
E.	RESOURCE CONSERVATION MANAGEMENT ACTION PLAN/POSITIVE AND NEGATIVE IMPACTS ON LAND USE PLAN POLICIES .....	151

#### TABLES

Table 1	Village of Bald Head Island and Brunswick County Population Growth by County and Municipality .....	9
Table 2	Village of Bald Head Island Seasonal Population, 2003 .....	11

Table 3	Village of Bald Head Island and Brunswick County Racial Composition . .	12
Table 4	Village of Bald Head Island and Brunswick County Age Composition . . .	13
Table 5	Village of Bald Head Island and Brunswick County Educational Attainment, 2000 . . . . .	14
Table 6	Village of Bald Head Island and Brunswick County Housing Occupancy and Tenure, 1990 and 2000 . . . . .	15
Table 7	Village of Bald Head Island Housing Structure, 2000 . . . . .	16
Table 8	Village of Bald Head Island Building Permit Data . . . . .	17
Table 9	Village of Bald Head Island Improved and Unimproved Properties . . . .	18
Table 10	Village of Bald Head Island, Brunswick County, and North Carolina Housing Conditions . . . . .	19
Table 11	Village of Bald Head Island and Brunswick County Units in Structure and Mobile Home Count . . . . .	19
Table 12	Village of Bald Head Island Year Householder Moved into Unit . . . . .	20
Table 13	Village of Bald Head Island, Brunswick County, and North Carolina Summary of Economic Indicators . . . . .	21
Table 14	Village of Bald Head Island and Brunswick County Household Income . .	22
Table 15	Village of Bald Head Island Employment by Industry, 2000 . . . . .	22
Table 16	Village of Bald Head Island Travel Times to Work . . . . .	23
Table 17	Village of Bald Head Island Permanent and Seasonal Population Projections, 2000-2025 . . . . .	25
Table 18	Village of Bald Head Island Flood Zones in Acres . . . . .	30
Table 19	Village of Bald Head Island Storm Surge Inundation Acreage . . . . .	34
Table 20	Village of Bald Head Island Soil Conditions . . . . .	35
Table 21	Village of Bald Head Island Coastal Wetlands by Type and Aerial Extent	42
Table 22	Village of Bald Head Island Significant Natural Heritage Areas and Protected Lands . . . . .	50
Table 23	NC Division of Water Quality Water Body Classifications . . . . .	55
Table 24	Village of Bald Head Island Listing of Water Bodies . . . . .	56
Table 25	Village of Bald Head Island Environmental Composite Map Layers . . . .	58
Table 26	Village of Bald Head Island Environmental Composite Acreage . . . . .	59
Table 27	Characteristics of Subbasin 03-06-17 . . . . .	64
Table 28	Cape Fear River Basin - Subbasin 03-06-17 Registered Animal Operations . . . . .	67
Table 29	Cape Fear River Basin Population Density . . . . .	67
Table 30	Village of Bald Head Island Developable Land Use Acreage within Flood Hazard Areas . . . . .	70

Table 31	Village of Bald Head Island Existing Land Use .....	72
Table 32	Village of Bald Head Island Zoning Classification of Undeveloped Properties .....	75
Table 33	Village of Bald Head Island Undeveloped Land in Relation to Environmental Composite Analysis (Class I-III) .....	77
Table 34	Village of Bald Head Island Residential Land Use Demand Estimates ....	78
Table 35	Schools Serving the Village's School Age Children .....	84
Table 36	Land Suitability Analysis Criteria Table .....	91
Table 37	Village of Bald Head Island LSA Acreage .....	93
Table 38	Village of Bald Head Island Future Land Use Acreages .....	140
Table 39	Village of Bald Head Island Infrastructure System Demand Based on Residential Land Demand Forecast .....	147
Table 40	Village of Bald Head Island Policy Analysis Matrix .....	152

#### MAPS

Map 1	Village of Bald Head Island Regional Location Map .....	6
Map 2	Village of Bald Head Island Flood Hazard .....	29
Map 3	Village of Bald Head Island SLOSH Model Storm Surge - Fast Moving ...	31
Map 4	Village of Bald Head Island SLOSH Model Storm Surge - Slow Moving ..	32
Map 5	Village of Bald Head Island Soils Classification .....	36
Map 6	Village of Bald Head Island AECs - Wetlands .....	43
Map 7	Village of Bald Head Island Long-Term Average Annual Shoreline Change and Setback Factors .....	47
Map 8	Village of Bald Head Island Protected Lands .....	51
Map 9	Village of Bald Head Island Significant Natural Heritage Areas .....	52
Map 10	Village of Bald Head Island Locations of Water Bodies .....	57
Map 11	Village of Bald Head Island Environmental Composite .....	60
Map 12	Village of Bald Head Island North Carolina River Basins and Subbasins ..	62
Map 13	Village of Bald Head Island Existing Land Use .....	73
Map 14	Village of Bald Head Island Existing Infrastructure .....	83
Map 15	Village of Bald Head Island Areas of Stormwater Concern .....	88
Map 16	Village of Bald Head Island Land Suitability Analysis .....	92
Map 17	Village of Bald Head Island Future Land Use Map .....	138

#### CHARTS

Chart 1	Village of Bald Head Island Age Composition .....	13
Chart 2	Village of Bald Head Island Year Structure Built .....	17

## APPENDICES

Appendix I	Village of Bald Head Island Citizen Participation Plan
Appendix II	Village of Bald Head Island Issues Identification
Appendix III	Village of Bald Head Island Property Owners Survey Results
Appendix IV	Village of Bald Head Island Hazard Mitigation Plan Mitigation Strategies
Appendix V	Policy/Implementing Action Definitions of Common Terms
Appendix VI	Operational (On-Site) Systems Maintained by Utilities Department
Appendix VII	Information Regarding South and West Beach Damages

## MATRIX OF REQUIRED ELEMENTS

CAMA CORE LAND USE ELEMENT	ELEMENT DISCUSSED
(a) Organization of the Plan	page i and I
(b) Community Concerns and Aspirations	
(1) Significant Existing and Emerging Conditions	page 7
(2) Key Issues	page 7
(3) A Community Vision	page 8
(c) Analysis of Existing and Emerging Conditions	
(1) Population, Housing, and Economy	pages 9-15
(A) Population:	
(i) Permanent population growth trends using data from the two most recent decennial Censuses;	page 9
(ii) Current permanent and seasonal population estimates;	page 11
(iii) Key population characteristics;	pages 11-12
(iv) Age; and	page 13
(v) Income	
(B) Housing Stock:	
(i) Estimate of current housing stock, including permanent and seasonal units, tenure, and types of units (single-family, multi-family, and manufactured); and	pages 15-21
(ii) Building permits issued for single-family, multi-family, and manufactured homes since last plan update	page 17
(C) Local Economy	pages 21-24
(D) Projections	page 25

CAMA CORE LAND USE ELEMENT	ELEMENT DISCUSSED
<p>(2) Natural Systems Analysis</p> <p>(A) Mapping and Analysis of Natural Features</p> <ul style="list-style-type: none"> <li>(i) Areas of Environmental Concern (AECs);</li> <li>(ii) Soil characteristics, including limitations for septic tanks, erodibility, and other factors related to development;</li> <li>(iii) Environmental Management Commission water quality classifications and related use support designations, and Division of Environmental Health shellfish growing areas and water quality conditions;</li> <li>(iv) Flood and other natural hazard areas;</li> <li>(v) Storm surge areas;</li> <li>(vi) Non-coastal wetlands including forested wetlands, shrub-scrub wetlands, and freshwater marshes;</li> <li>(vii) Water supply watersheds or wellhead protection areas;</li> <li>(viii) Primary nursery areas, where mapped;</li> <li>(ix) Environmentally fragile areas; and</li> <li>(x) Additional natural features or conditions identified by the local government.</li> </ul>	<p>pages 25-57</p> <p>pages 38-49</p> <p>pages 35-36</p> <p>pages 55-57</p> <p>pages 27-30</p> <p>pages 30-34</p> <p>page 37</p> <p>pages 38</p> <p>pages 49-55</p>
<p>(B) Composite Map of Environmental Conditions:</p> <ul style="list-style-type: none"> <li>(i) Class I</li> <li>(ii) Class II</li> <li>(iii) Class III</li> </ul>	<p>pages 58-60</p>

CAMA CORE LAND USE ELEMENT	ELEMENT DISCUSSED
<p>(C) Environmental Conditions</p> <p>(i) Water Quality:</p> <p>(I) Status and changes of surface water quality, including impaired streams from the most recent NC Division of water Quality Basinwide Water Quality Plans, 303(d) List and other comparable data;</p> <p>(II) Current situation and trends on permanent and temporary closures of shellfishing waters as determined by the Report of Sanitary Survey by the Shellfish Sanitation Section of the NC Division of Environmental Health;</p> <p>(III) Areas experiencing chronic wastewater treatment system malfunctions; and</p> <p>(IV) Areas with water quality or public health problems related to non-point source pollution</p> <p>(ii) Natural Hazards:</p> <p>(I) Areas subject to storm hazards such as recurrent flooding, storm surges, and high winds;</p> <p>(II) Areas experiencing significant shoreline erosion as evidenced by the presence of threatened structures or public facilities; and</p> <p>(III) Where data is available, estimates of public and private damage resulting from floods and wind that has occurred since the last plan update</p> <p>(iii) Natural Resources:</p> <p>(I) Environmentally fragile areas or areas where resource functions may be impacted as a result of development; and</p> <p>(II) Areas containing potentially valuable natural resources</p>	<p>pages 63-68</p> <p>pages 69-70</p> <p>page 70</p>

CAMA CORE LAND USE ELEMENT	ELEMENT DISCUSSED
(3) Analysis of Land Use and Development	
(A) A map of land including the following: residential, commercial, industrial, institutional, public, dedicated open space, agriculture, forestry, confined animal feeding operations, and undeveloped;	page 73
(B) The land use analysis shall including the following: (i) Table that shows estimates of the land area allocated to each land use; (ii) Description of any land use conflicts; (iii) Description of any land use-water quality conflicts; (iv) Description of development trends using indicators; and (v) Location of areas expected to experience development during the five years following plan certification by the CRC and a description of any potential conflicts with Class II or Class III land identified in the natural systems analysis	page 72  page 74  page 75 pages 76-77
(C) Historic, cultural, and scenic areas designated by a state or federal agency or by local government	page 76
(D) Projections of future land needs	pages 77-78
(4) Analysis of Community Facilities	
(A) Public and Private Water Supply and Wastewater Systems	pages 81-83
(B) Transportation Systems	pages 78-79
(C) Stormwater Systems	pages 86-90
(D) Other Facilities	pages 79-86
(5) Land Suitability Analysis (A) Water quality; (B) Land Classes I, II, and III summary environmental analysis; (C) Proximity to existing developed areas and compatibility with existing land uses; (D) Potential impacts of development on areas and sites designated by local historic commission or the NC Department of Cultural Resources as historic, culturally significant, or scenic; (E) Land use and development requirements of local development regulations, CAMA Use Standards and other applicable state regulations, and applicable federal regulations; and (F) Availability of community facilities, including water, sewer, stormwater, and transportation	pages 91-93



CAMA CORE LAND USE ELEMENT	ELEMENT DISCUSSED
(6) Review of Current CAMA Land Use Plan (A) Consistency of existing land use and development ordinances with current CAMA Land Use Plan policies; (B) Adoption of the land use plan's implementation measures by the governing body; and (C) Efficacy of current policies in creating desired land use patterns and protecting natural systems	pages 93-102
(d) Plan for the Future (1) Land Use and Development Goals: (A) Community concerns and aspirations identified at the beginning of the planning process; (B) Needs and opportunities identified in the analysis of existing and emerging conditions	pages 103-147
(2) Policies: (A) Shall be consistent with the goals of the CAMA, shall address the CRC management topics for land use plans, and comply with all state and federal rules; (B) Shall contain a description of the type and extent of analysis completed to determine the impact of CAMA Land Use Plan policies on the management topics, a description of both positive and negative impacts of the land use plan policies on the management topics, and a description of the policies, methods, programs, and processes to mitigate any negative impacts on applicable management topics; (C) Shall contain a clear statement that the governing body either accepts state and federal law regarding land uses and development in AECs or, that the local government's policies exceed the requirements of state and federal agencies.	pages 112-136
(3) Land Use Plan Management Topics.	
(A) Public Access	page 113
(B) Land Use Compatibility	page 114
(C) Infrastructure Carrying Capacity	page 119
(D) Natural Hazard Areas	page 123
(E) Water Quality	page 126
(F) Local Areas of Concern	page 131



## PREFACE

### A. WHY IS A PLAN NEEDED?

This plan is intended to fulfill the Coastal Area Management Act (CAMA) requirements for the preparation of a CAMA Core Land Use Plan. This plan is organized to adhere to the 15A NCAC 7B requirements.

In addition to the CAMA requirements, there are other reasons to plan. The Village of Bald Head Island has a great deal of influence on the way in which the village develops. The buildings, facilities, and improvements provided by the Village of Bald Head Island affect the daily lives of its citizens, give form to the village, and stimulate or retard the development of privately-owned land. In addition, the workings of the real estate market help determine the uses of private land, but these uses are regulated by Bald Head Island. The village has an opportunity to coordinate the overall pattern of physical development.

Once this plan is adopted, the village must realize that the plan is not the end of the process. The Village of Bald Head Island must continuously work at accomplishing plan implementation and establishing an effective planning program. **The village must view the preparation of this document as the first step in a continually evolving process.**

### B. WHAT IS CAMA?

CAMA is the North Carolina Coastal Area Management Act (N.C.G.S. 113A-100, et seq.), which establishes a cooperative program of coastal area management between local and state governments. The Act, originally passed in 1974 and since amended, states that local governments shall have the initiative for planning, while the state government establishes areas of environmental concern. With regard to planning, the state government is directed to act primarily in a supportive, standard-setting, and review capacity, except in situations where local governments do not elect to exercise their initiative.

In addition, the CAMA establishes the Coastal Resource Commission within the Department of Environment and Natural Resources, whose duties include approval of Coastal Habitat Protection Plans and designation of Areas of Environmental Concern (AEC). After designation of these areas, the Commission is responsible for issuing all permits (Source: National Oceanic and Atmospheric Administration, Coastal Services Center).

## **SECTION I. INTRODUCTION**

This Fiscal Year 2004/2006 CAMA Land Use Plan is prepared in accordance with the requirements of the North Carolina Coastal Area Management Act (CAMA). Specifically, this document complies with Subchapter 7B, "CAMA Land Use Planning Requirements," of the North Carolina Administrative Code, as amended, August 1, 2002.

The 7B guidelines provide that each of the twenty coastal counties prepare and adopt a CAMA Land Use Plan that meets the planning requirements adopted by the Coastal Resources Commission (CRC). If a county chooses not to prepare a plan, the guidelines specify that the CRC will prepare and adopt a CAMA Land Use Plan for that county.

In general, 7B requires that a plan include analysis of existing and emerging conditions, a plan for the future including specific land use/development goals/policies, and tools for managing development. The management tools must specify the actions which the Village of Bald Head Island will take to ensure implementation of this plan. Hereinafter, the Village of Bald Head Island will be referred to as the Village.

At the beginning of the preparation of this document, the Village adopted a Citizen Participation Plan which is intended to ensure that all interested citizens have an opportunity to participate in the development of this plan through both oral and written comments. A copy of the Citizen Participation Plan is included as Appendix I.

Following adoption of the plan by the Bald Head Island Village Council, it was submitted to the CRC for certification. Certification of the plan was achieved on May 22, 2008.

## SECTION II. HISTORY

The Village's history is peppered with colorful people and connections. Through the years, the island has been a breeding ground for wild boar, a prime hangout for bootleggers, a supplier of materials for cedar pencils, a Civil War fort, a nesting ground for loggerhead turtles, and a produce farm and fruit orchard. Pirates, lighthouse keepers, Indians, river pilots, ruffians, soldiers, farmers, and entrepreneurs of all types have come and gone, and yet, the Village's essence is unchanged. This can only be because the island itself is a living thing, with its own integrity and spirit, its wild beauty more or less disregarding man's inclination to tinker.

In the 17th and 18th centuries, when pirates ruled the waters off the coast of North Carolina with greed and terror, the Village was a favorite refuge and base for these notorious buccaneers. In all, the waters surrounding Cape Fear were a hideaway for hundreds of pirates, the most famous of which were Edward Teach, better known as Blackbeard, and Stede Bonnet, the gentleman pirate.

Bonnet, the so-called "Gentleman Pirate" from Barbados, was an educated retired military officer who turned to piracy in 1717 as a second career in order to escape what one historian tactfully referred to as "the discomforts he found in a married state." During his short stint as a pirate, Bonnet terrorized the Carolina and Virginia coasts aboard his sailing sloop *Revenge* with 10 guns and 70 men. For a brief time, Bonnet even linked up with Blackbeard, a pirate who never carried the title "gentleman." In 1718 Blackbeard was cornered and killed aboard his sloop, *Adventure*, by two warships sent by the governor of Virginia. Just three weeks later, Bonnet was captured at Bonnet's Creek in Southport by Colonel William Rhett of South Carolina and hanged near Charlestown. Their deaths marked a dramatic end to the Golden Age of Piracy in North Carolina.

Long before pirates ever discovered the Village's nooks and crannies, Native Americans hunted Bald Head Island and fished its surrounding waters in the spring and summer while maintaining permanent settlements on the mainland. The island was, in effect, a seasonal retreat for the Native Americans when supplies of corn or grain began running low.

Early river pilots were responsible for giving the Village its unique and descriptive name. Eager to offer their navigational services to ships approaching the entrance to the Cape Fear River, they took up watch on a high dune headland on the southwest point of the island. According to local lore, the headland was worn bare of vegetation, making it stand out in contrast to the forest

behind it. This “bald” headland served as a reference point for ships entering the river, and the name Bald Head Island has endured.

The year 1817 saw the construction of the island’s most revered landmark and symbol, Old Baldy Lighthouse. Still the island’s only “highrise,” Old Baldy lighthouse was the second of three lighthouses built on Bald Head Island, and is the only one remaining. In 1903, the lighthouse was decommissioned when the Cape Fear Light was erected on the eastern end of the island, but it still serves as a prominent day marker for mariners. Due to restoration efforts by the Old Baldy Foundation and the generosity of hundreds of contributors, visitors to North Carolina’s oldest lighthouse can climb up her 108 steps for a spectacular panoramic view of Bald Head Island.

The foundation of the Cape Fear Light can still be seen at the end of Federal Road across from three lightkeeper’s cottages known as Captain Charlie’s Station, after Captain Charles Norton Swan, a lighthouse keeper who lived with his family on Bald Head Island from 1903 until 1933. Captain Charlie’s Station is listed in the National Register of Historic Places, and still commands a sweeping view of the dunes and sea at the island’s southeastern point.

In addition to lightkeepers, in the late 19th and early 20th centuries the island was home to members of the U.S. Lifesaving Service, the predecessor to the modern day Coast Guard. Several buildings on the southeastern shore of the island overlooking Frying Pan Shoals served as equipment storage and housing for the servicemen. The only remaining Lifesaving Station structure is a boathouse that was moved from the beachfront to back among the dunes where it is now a private residence.

Another symbol of the past presence of lightkeepers and lifesaving servicemen on the island is the Old Boat House on Bald Head Creek, built in 1903 to store supplies and boats. A dramatic change in the shape of the creek channel over the last ninety years makes it appear to have moved several hundred yards.

The most notable feature on the 1864 Blackford map (established by B.L. Blackford) was Fort Holmes, located on the Bald Head promontory at the southwest corner of the island. Most of what we know regarding the fort can be gathered from a detailed sketch of its layout prepared in 1865. In addition, several firsthand accounts prepared by officers at Fort Holmes are extant. The fort had been hurriedly erected in 1863 and 1864 as part of a defense system for the lower Cape Fear. The string of forts from Bald Head to Wilmington kept the river, the “lifeline of the

Confederacy,” open for blockade runners. Given the presence of two navigable entrances, that at Bald Head and a second above Smith Island at New Inlet, the river was ideal for such traffic.

The sketch of Fort Holmes prepared by Federal occupation forces in 1865 indicates that the earthen breastworks extended the width of the island from the lighthouse to the southwest tip at Bald Head. A road to the opposite end of the island ran through the upper part of the fort. The earthen works, it was noted, were reinforced with palmetto and oak logs. Four batteries extended along the east side of the fort. The fifth and largest, Battery Holmes, with bombproof magazines, was at the island’s southwesternmost point. A flagstaff was positioned on the Bald Head promontory. Quarters and storehouses were located in several spots inside the fort.

Despite subtle shifts in sand and sea, Bald Head Island remains much as it was centuries ago. It still serves as a natural sanctuary for educators and students interested in coastal ecology, a home for a special breed of permanent residents that share a kinship of spirit with the hardy, independent lightkeepers and servicemen of days long past, and a refuge for vacationers seeking privacy and rejuvenation in a beautiful, relaxed setting.



### **SECTION III. REGIONAL SETTING**

The Village is the southernmost of North Carolina's cape islands, and is located at the mouth of the Cape Fear River. The island sits off of the North Carolina Coast adjacent to the City of Southport and Oak Island. Reaching the island involves a 20-minute passenger ferry ride which transports you from the ferry terminal at Indigo Plantation and Marina in Southport, N.C., to the harbor at the Village. This trip covers a distance of two nautical miles.

In order to reach the ferry terminal you must travel down NC Highway 211 to Southport. Southport is located 30 miles south of Wilmington, N.C., and 60 miles north of Myrtle Beach, S.C. From points west, Interstate 40 and Highway 74/76 link the region directly with I-95. Entering Southport on Route 211 (Howe Street), turn right onto West 9th Street and continue to the ferry landing. The ferry service to and from the Village runs year round on a consistent basis. Map I provides the regional location and ferry route for the Village.

MAP I - REGIONAL LOCATION

## SECTION IV. BALD HEAD ISLAND CONCERNS/ASPIRATIONS

### A. KEY ISSUES

On January 17, 2005, the Village conducted a publicly advertised meeting with the purpose of identifying key issues and concerns for the Village. The intent of this effort was to identify issues related to the Village that can be addressed in the context of this plan. All permanent Village residents were mailed a letter inviting them to attend the meeting, and advertisements were also run in the local newspaper and on the Bald Head Island Association public cable channel. Approximately 30 people attended the meeting. The following provides the top ten issues (see Appendix II for a complete listing):

Rank	Issue	Score
1	Protect maritime forests	25
2*	Beach erosion	22
2*	Address carrying capacity and future needs of the Island. Build-out?	22
3	Water quality in Bald Head Creek	21
4	Need to address redevelopment of a public restroom/shower facility at East Beach	18
5	Wildlife management	16
6*	Allow for adequate commercial development	13
6*	Preservation of vegetation and dune lines (Live Oaks)	13
6*	Protect conservation areas	13
6*	Coordinate LUP with restrictive covenants	13
7	Stormwater management	11
8*	Maintenance of ferry basin	10
8*	Protection of water table (foreign water affecting aquifer)	10
9*	Restriction of gas powered engines	9
9*	Processing of waste	9
9*	Address utilities	9
	– Size (7)	
	– Disposal of treated reuse quality wastewater of golf courses (2)	
10	Preservation of the dune ridge	8

\*Indicates a tie score.

Additionally, surveys were mailed out to 1,348 absentee property owners. A total of 473 completed questionnaires were received. Results of the responses to the village meeting and absentee property owners were very similar. See Appendix III for a comparison of these results as well as the tabulation of additional questions from the absentee property owners survey.

B. VILLAGE OF BALD HEAD ISLAND COMMUNITY VISION

***Bald Head Island is a residential, family oriented community and major family vacation destination committed to living in harmony with nature while being supportive of activities and services necessary to enhance the quality of life on the Island.***

## SECTION V. ANALYSIS OF EXISTING AND EMERGING CONDITIONS

### A. POPULATION, HOUSING, AND ECONOMY

#### I. Village of Bald Head Island Permanent Population

##### a. *Village of Bald Head Island and Brunswick County including all municipalities*

The permanent population for the Village remains quite low; however, growth has been consistent since the Village's incorporation in 1985. Between 1990 and 2000, the population increased by 121.8%. The 1990 Census was the first year that a population count was prepared for the Village. According to estimates from the North Carolina Office of State Planning, an additional 32 permanent residents moved to the island between 2000 and 2003, boosting the total population to 205 residents. Although the growth in terms of total population has been low, the percentage growth rate experienced in the Village has been rapid. In terms of percentage growth rate, the Village was the fourth fastest growing municipality in Brunswick County between 1990 and 2003. Table I below provides a detailed breakdown of population growth and growth rates for the Village as well as all municipalities within Brunswick County.

**Table I: Village of Bald Head Island and Brunswick County  
Population Growth by County and Municipality**

Municipality	Total Population			% Change		Overall '90-'03
	1990	2000	2003 Estimate	'90-'00	'00-'03	
<b>Bald Head Island</b>	<b>78</b>	<b>173</b>	<b>205</b>	<b>121.8%</b>	<b>18.5%</b>	<b>162.8%</b>
Belville	66	363	407	450.0%	12.1%	516.7%
Boiling Spring Lakes	1,650	2,972	3,427	80.1%	15.3%	107.7%
Bolivia	228	148	151	-35.1%	2.0%	-33.8%
Calabash	179	711	1,334	297.2%	87.6%	645.3%
Carolina Shores	1,031	1,482	2,120	43.7%	43.0%	105.6%
Caswell Beach	175	370	425	111.4%	14.9%	142.9%
Holden Beach	626	787	836	25.7%	6.2%	33.5%
Leland	1,801	1,938	4,703	7.6%	142.7%	161.1%
Long Beach*	3,816	0	0	-100.0%	0.0%	N/A
Navassa	445	479	1,570	7.6%	227.8%	252.8%
Northwest	611	671	727	9.8%	8.3%	19.0%
Oak Island*	0	6,571	7,120	0.0%	8.4%	N/A

**Table 1: Village of Bald Head Island and Brunswick County  
Population Growth by County and Municipality (Continued)**

Municipality	Total Population			% Change		Overall '90-'03
	1990	2000	2003 Estimate	'90-'00	'00-'03	
Ocean Isle Beach	523	426	448	-18.5%	5.2%	<b>-14.3%</b>
Sandy Creek	243	246	262	1.2%	6.5%	<b>7.8%</b>
Shallotte	1,073	1,381	1,662	28.7%	20.3%	<b>54.9%</b>
Southport	2,369	2,351	2,558	-.8%	8.8%	<b>8.0%</b>
St. James**	0	804	1,610	0.0%	100.2%	<b>N/A</b>
Sunset Beach	311	1,824	1,967	486.5%	7.8%	<b>532.5%</b>
Varnamtown	404	481	513	19.1%	6.7%	<b>27.0%</b>
Yaupon Beach*	734	0	0	-100.0%	0.0%	<b>N/A</b>
Total Municipalities	16,363	24,178	32,045	47.3%	33.0%	<b>95.8%</b>
Total Unincorp. Areas	34,622	48,963	49,765	41.6%	1.5%	<b>43.7%</b>
Total County	50,985	73,141	81,810	43.5%	11.9%	<b>60.5%</b>

\*Long Beach and Yaupon Beach merged to form the Town of Oak Island on 7/1/1999.

\*\*This municipality was incorporated between the 1990 and 2000 Census. NOTE: The Town of Saint James paid for a special census to be completed as a result of some annexations that occurred after the 2000 Census was taken. The special census, dated June 10, 2004, reflects a census count of 1,831 persons. Municipalities may challenge a census count within three years of when the census is taken in order to have the population changed. The special census for Saint James was completed after that time period and, therefore, the official decennial census count was not changed. However, the state demographer gave Saint James an updated census count of 1,814. This figure was based on the town's boundaries, including the 2001 annexed areas (This information was obtained from the NC State Data Center). Source: US Census Bureau & NC Office of State Planning.

Table 2 summarizes peak seasonal population in the Village. The Village relies heavily on seasonal visitors. During the summer months, population on the island increases substantially, and resources of the Village are stretched. The information provided in this table is taken from several different sources. The calculations provided for marina boat slips are based on data obtained from the dockmaster operating the Bald Head Island Marina. According to the dockmaster, there are 150 boat slips at the marina. All of these slips have full hookups, meaning that water and electric service is provided to all slips. During peak summer months, it is estimated that 25 of these slips are utilized for overnight visitors. According to the dockmaster, each boat typically houses an average of 4.5 persons. The only other means of getting to Bald Head Island is by the ferry. Based on this, peak seasonal population figures have been based on total available parking at the ferry terminal located at Indigo Plantation. There are currently 1,138 total parking spaces at this facility. During peak summer months, these lots are generally full. In order to establish a peak seasonal population estimate, an average of four persons per car was utilized. By using this methodology,

foot traffic into the Village will be accounted for; however, construction workers and other personnel utilizing the construction ferry terminal have not been included. Additionally, parking spaces utilized by permanent residents and employees were subtracted from this figure. In order to determine how many parking spaces are occupied by permanent residents, an average of 1.5 cars per household was utilized. There are approximately 88 homes within the Village that are occupied by permanent residents. Parking spaces that are occupied by Village employees have also been subtracted. Accounting for these two groups results in 973 parking spaces available for seasonal visitors and residents. Based on these calculations, the total peak seasonal population for 2003 is 4,210.

**Table 2: Village of Bald Head Island  
Seasonal Population, 2003**

Housing Type	Number of Units	Persons Per Unit	Seasonal Population
Parking Spaces	973	4.00	3,892
Marina Boat Slips	25	4.50	113
Total			4,005
Permanent Population	205		
Peak Seasonal Population	4,005		
Total Peak Population	4,210		

\*It should be noted that when parking at Indigo Plantation is not sufficient, additional parking is available at Southport Elementary School, as well as the old Roses Parking Lot. These parking spaces are not accounted for in these figures. Source: Holland Consulting Planners, Inc.

#### *b. Population Profile*

As of 1990 the US Census reported that the population in the Village was one hundred percent Caucasian. The 2000 Census reported that there is some racial diversity now on the island. The permanent population is still predominantly Caucasian, making up 95.4% of the population, but there is a small African American population (3.0%), as well as one American Indian and two individuals of two or more races. The gender breakdown of the permanent population is fairly evenly split with 89 males (51.4%) and 84 females (48.6%). The following table is a comprehensive summary of racial composition in the Village and Brunswick County.

**Table 3: Village of Bald Head Island and Brunswick County  
Racial Composition, 1990-2000**

	Village of Bald Head Island		Brunswick County
	Total	Percentage	Percentage
<b>1990 Population*</b>	78	100.0%	100.0%
White	78	100.0%	81.1%
Black	0	0.0%	18.1%
Asian or Pacific Islander	0	0.0%	0.2%
American Indian, Eskimo, Aleut	0	0.0%	0.5%
Other	0	0.0%	0.2%
<b>2000 Population**</b>	173	100.0%	100.0%
White	165	95.4%	82.3%
Black or African American	5	3.0%	14.4%
Asian or Pacific Islander	0	0.0%	0.3%
American Indian and Alaska Native	1	0.6%	0.7%
Some Other Race	0	0.0%	1.3%
Two or More Races	2	1.2%	1.0%
Male	89	51.4%	49.1%
Female	84	48.6%	50.9%

\*Racial breakdown available for the 1990 Census.

\*\*Racial breakdown available for the 2000 Census.

Source: 2000 US Census.

A majority of the permanent population living within the Village can be considered middle aged according to the 2000 US Census. Approximately 72% of the population is between the ages of thirty-five and sixty-four. The population has aged slightly since 1990, with the fifty-five to sixty-four age brackets increasing by 14%. This increase can also be attributed to in-migration experienced over the same period. The school age population in the Village has increased by six individuals between 1990 and 2000. However, the percentage of total population for this age range remained at approximately 5%. The retired age population decreased slightly during this same period. Table 4 provides a detailed breakdown of age composition for the Village and Brunswick County.

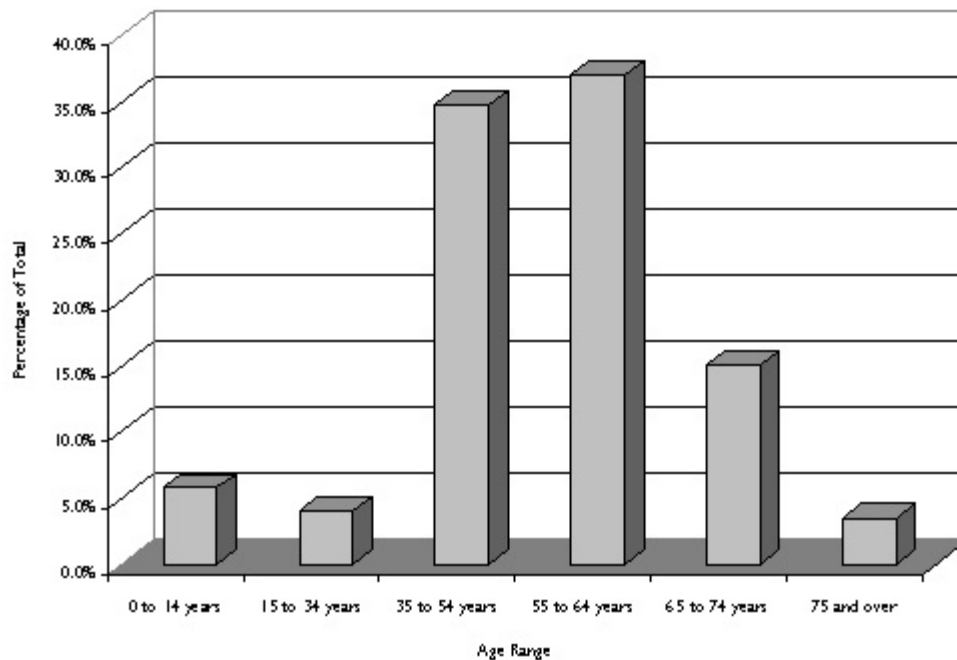


**Table 4: Village of Bald Head Island and Brunswick County  
Age Composition, 1990 and 2000**

	Village of Bald Head Island				Brunswick County	
	1990 Total	1990 % of Total	2000 Total	2000 % of Total	1990 % of Total	2000 % of Total
0 to 14 years	4	5.1%	10	5.8%	19.4%	17.6%
15 to 34 years	7	9.0%	7	4.0%	27.5%	22.2%
35 to 54 years	33	42.3%	60	34.7%	25.9%	28.6%
55 to 64 years	18	23.1%	64	37.0%	12.5%	14.7%
65 to 74 years	15	19.2%	26	15.0%	10.3%	11.1%
75 and over	1	1.3%	6	3.5%	4.4%	5.8%
Total population	78	100.0%	173	100.0%	100.0%	100.0%
Median age	n/a	n/a	56.3	n/a	n/a	42.2
School Age Population (5-18)	4	5.1%	9	5.2%	18.3%	18.0%
Working Age Population (16-64)	58	74.4%	131	75.7%	64.4%	65.5%
Retired Population (65+)	16	20.5%	32	18.5%	14.7%	16.9%

Source: 2000 US Census.

Chart 1: Village of Bald Head Island  
Age Composition



The permanent population within the Village is well educated. According to the 2000 US Census, 69% of residents have completed their Bachelor's Degree or higher. It should be noted that this is based on individuals 25 years of age and over. Out of 150 persons recorded in this count, only 38 did not obtain some form of college degree. The following table summarizes the educational attainment for Village residents.

**Table 5: Village of Bald Head Island  
Educational Attainment, 2000  
Based on Persons 25 Years Old or Older**

	Village of Bald Head Island		Brunswick County	North Carolina
	Total	% of Total	% of Total	% of Total
Less than 9 <sup>th</sup> grade	0	0.0%	6.3%	7.8%
Ninth to twelfth grade, no diploma	0	0.0%	15.4%	14.0%
High school graduate	10	6.7%	33.2%	28.4%
Some college, no degree	28	18.7%	22.5%	20.5%
Associate degree	9	6.0%	6.5%	6.8%
Bachelor's degree	64	42.7%	11.0%	15.3%
Graduate/Professional degree	39	26.0%	5.1%	7.2%
Total population 25 years and over	150	100.0%	100.0%	100.0%
Percent High School Graduate or higher		100.0%	78.3%	78.1%
Percent Bachelor's degree or higher		68.7%	16.1%	22.5%

Source: 2000 US Census.

*c. Population Summary*

The following provides a summary of the population demographic information for the Village:

- ▶ The permanent population in the Village increased by 127 individuals or 162.8% between 1990 and 2003.
- ▶ The total peak seasonal population for the Village is 4,210.
- ▶ The permanent population within the Village is predominantly Caucasian (95.4%); the remaining population is predominantly African American comprising 3% of the total population.

- ▶ A majority of the Village population is between the ages of thirty-five and sixty-four (72%).
- ▶ Approximately 69% of Village residents age 25 and over have received an education equivalent to a Bachelor's Degree or higher.

## 2. Housing

### a. *Housing Occupancy and Tenure*

The Village exists primarily as a second home community and is a well known tourist and/or seasonal destination. Because of this, a majority of the housing stock is comprised of vacant housing units. Based on the 2000 Census, 87.1% of the Village's total housing stock is comprised of vacant housing. Approximately 95.5% of the vacant housing units are considered to be either for rent or are second homes. The following table summarizes housing occupancy and tenure for the Village, as well as Brunswick County.

**Table 6: Village of Bald Head Island and Brunswick County  
Housing Occupancy and Tenure, 1990 and 2000**

	Village of Bald Head Island		Brunswick County
	1990 % of Total	2000 % of Total	2000 % of Total
Total Housing Units	100.0%	100.0%	100.0%
Vacant:	90.1%	87.1%	40.8%
For rent*	1.1%	28.3%	10.2%
For sale only*	3.7%	2.7%	4.7%
Rented or sold, not occupied*	0.0%	1.7%	1.9%
For seasonal, recreational or occasional use*	94.6%	67.2%	74.0%
For migrant workers*	0.0%	0.0%	0.1%
Other vacant*	0.6%	0.0%	9.2%
Occupied:	9.9%	12.9%	59.2%
Owner-Occupied**	94.9%	90.8%	82.2%
Renter-Occupied**	5.1%	9.2%	17.8%

\*Indicates breakdown of vacant household types.

\*\*Indicates breakdown of occupied household types.

Source: US Census Bureau.

*b. Age of Structure*

Table 7 and Chart 2 provide a summary of residential construction activity dating back to the early 1900s. Based on this information, it is very clear that Bald Head was discovered during the seventies. Once the picturesque island was established as not only a destination but a residential development, construction increased substantially. Between the years of 1980 and 1989, approximately 34% of the island's entire housing stock was constructed.

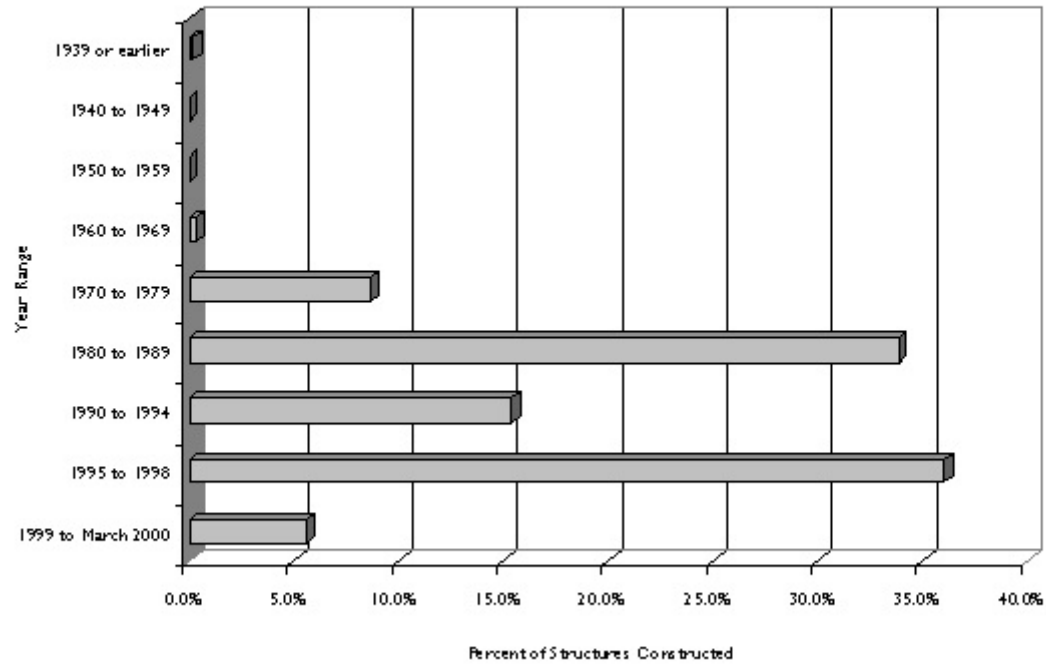
Table 8 is a summary of residential building permit activity dating back to 1992. This information was provided by the Village of Bald Head Planning and Inspections Department. According to this information there have been 775 total building permits issued since 1992. Since the year 2000 43.8% or 340 of these permits have been issued. This clearly shows that residential development continues to increase on the island.

**Table 7: Village of Bald Head Island  
Housing Structure, 2000**

Year	% of Total
1999 to March, 2000	5.6%
1995 to 1998	36.0%
1990 to 1994	15.4%
1980 to 1989	33.8%
1970 to 1979	8.6%
1960 to 1969	0.3%
1950 to 1959	0.0%
1940 to 1949	0.0%
1939 or earlier	0.2%
Total Structures	100.0%
Median Year Structure Built	1992

Source: US Census Bureau.

Chart 2: Village of Bald Head Island  
Year Structure Built



**Table 8: Village of Bald Head Island  
Building Permit Data 1992-November 2004**

Year	# of Residential Building Permits
1992	31
1993	15
1994	61
1995	110
1996	61
1997	52
1998	55
1999	50
2000	62
2001	63
2002	88
2003	71
2004	56
Total	775

Source: Village of Bald Head Island Planning and Inspections Department.

The following table provides a breakdown of improved and unimproved properties throughout the Village. The data is further broken down by land use. This information accounts for all development within each of these stages.

**Table 9: Village of Bald Head Island  
Improved and Unimproved Properties**

Residential	Improved	Unimproved	% Developed
Stage I	700	826	45.9%
Stage II	188	299	38.6%
Middle Island	26	81	24.3%
Total	914	1,206	43.1%

Commercial	Improved	Unimproved	% Developed
Stage I*	19	27	41.3%
Stage II	0	14.62 acres**	0.0%
Middle Island	0	0	0.0%
Total	19	27	55.6%

Acreage Open Space	Unimproved
Stage I	135
Stage II	32
Middle Island	19
Total	186

\*Improved commercial properties in Stage I consist of properties that are located in the Harbor, Maritime Market Way, and Edward Teach Extension.

\*\*Stage II commercial properties are shown in acres due to the fact that none of the commercial properties have been subdivided. The Shoals Club is considered a recreational property, and is not reflected in the commercial figures.  
Source: Village of Bald Head Island.

### c. *Housing Conditions*

The housing stock within the Village is in outstanding condition. Based on the tables above, it is clear that a majority of the residential structures on the island are of fairly new construction. This not only results in more structurally sound homes, but ensures that they have been built under more recent building codes. Building codes have been updated over time to better deal with strong winds and storm surge associated with tropical storm events. Residential units within the Village average 5.4 rooms per unit. Approximately 77% of the residences have three or more

bedrooms. The following table summarizes a few key statistics regarding housing conditions with comparisons to Brunswick County and North Carolina overall.

**Table 10: Village of Bald Head Island, Brunswick County, and North Carolina Housing Conditions**

	Village of Bald Head Island	Brunswick County	North Carolina
Average Rooms Per Unit	5.4	5.3	5.5
Percent with no bedroom	0.3%	0.7%	1.1%
Percent with 3+ bedrooms	76.5%	62.5%	60.8%
Percent lacking complete kitchen facilities	0.0%	0.7%	1.1%
Percent lacking complete plumbing	0.3%	0.9%	1.1%
Percent occupied with telephones	100.0%	96.2%	86.2%

\*The average rooms per unit does not include crofters. Crofters are single units with plumbing for a bathroom situated separate from the primary residence. These are typically located over garages.

Source: US Census Bureau.

#### *d. Units in Structure*

Nearly the entire housing stock within the Village (90%) is comprised of single-family residential construction. Additionally there are a small number of multi-family units located on the island. Table 11 summarizes the units in structure count for housing construction in the Village, as well as Brunswick County.

**Table 11: Village of Bald Head Island and Brunswick County Units in Structure and Mobile Home Count, 2000**

	Village of Bald Head Island	Brunswick County
Units in Structure	% of Total	% of Total
1-unit, detached	87.6%	55.7%
1-unit, attached	2.0%	1.3%
2 units	5.8%	1.2%
3 or 4 units	4.6%	2.1%
5 to 9 units	0.0%	1.9%
10 to 19 units	0.0%	1.1%
20 units or more	0.0%	0.6%
Mobile home	N/A	35.9%
Boat, RV, van, etc.	0.0%	0.2%
Total	100.0%	100.0%

Source: US Census Bureau.

The demographic information presented in Table 12 is an interesting account of when owner occupants moved into their homes. This is not only an additional indicator of population growth but provides the reader with a brief account of when sharp increases in permanent population and owner-occupant housing development occurred. According to this information, 43.4% of owner-occupants moved to the island between 1995 and 1998. A total of 67 residential units became home to year round residents between the years 1990 and 2000.

**Table 12: Village of Bald Head Island  
Year Householder Moved Into Unit**

Year	Total	% of total
Total Occupied Units	90	100.0%
1999 to March 2000	18	19.7%
1995 to 1998	39	43.4%
1990 to 1994	23	25.0%
1980 to 1989	8	9.2%
1970 to 1979	2	2.6%
Before 1970	0	0.0%
Median year householder moved into unit	1996	

Source: US Census Bureau.

e. *Housing Summary*

The following provides a summary of significant points identified through the housing demographics discussion:

- ▶ A majority of the housing units in the Village (87.1%) are vacant; of these 67.2% are considered to be for seasonal, recreational, or occasional use.
- ▶ The median for the year in which residential structures have been built within the Village is 1992.
- ▶ Since the year 2000, 340 residential building permits have been issued by the Village Planning and Inspections department.
- ▶ Residential housing units on average have 5.4 rooms per unit, and 76.5% have three or more bedrooms.



- ▶ Nearly the entire housing stock (89.6%) within the Village is comprised of single-family residential homes.

### 3. Employment and Economy

#### a. General Economic Indicators

Table 13 provides a summary of general economic indicators for the Village, as well as Brunswick County and North Carolina. According to this table, the per capita income for the Village residents is \$45,585. The Village's per capita income is over twice that of the state and Brunswick County. The percent of the population currently in the workforce is approximately 56.7%. This percentage is comparable to that of Brunswick County. It is difficult to determine how accurate these economic indicators are for the Village, due to the methodology used to calculate the census. This information should be viewed as estimates only.

**Table 13: Village of Bald Head Island, Brunswick County and North Carolina  
Summary of Economic Indicators**

	Year	Bald Head Island	Brunswick County	North Carolina
Per Capita Income	2000	\$45,585	\$19,857	\$20,307
Mean Income	2000	\$73,392	\$43,808	\$50,814
Unemployment Rate	2000	3.3%	2.6%	3.4%
% of Population in labor force	2000	56.7%	57.7%	65.7%

\*Per capita income is calculated by totaling all reported annual incomes for permanent Bald Head Island residents and dividing that figure by the total population. This figure may appear low due to the fact that approximately 19% of the Village's total population are of retirement age and are no longer producing an annual income.

Source: NC Department of Commerce & US Census Bureau.

#### b. Household Income

Household income for the Village is much higher than that of Brunswick County. It is clear that the income range for Village residents is fairly high. This is evidenced by property values across the island. Approximately 80.2% of the households on the island report an annual income in excess of \$50,000 per year. The median income of Village residents is \$62,083, compared to \$35,888 for Brunswick County. Table 14 provides a comprehensive breakdown of household income for the Village and Brunswick County.

**Table 14: Village of Bald Head Island and Brunswick County Household Income, 2000**

	Village of Bald Head Island		Brunswick County
	Total	% of Total	% of Total
Less than \$10,000	4	4.9%	10.3%
\$10,000 to \$14,999	2	2.5%	7.7%
\$15,000 to \$24,999	1	1.2%	15.5%
\$25,000 to \$34,999	0	0.0%	15.2%
\$35,000 to \$49,999	9	11.1%	18.0%
\$50,000 to \$74,999	31	38.3%	18.6%
\$75,000 to \$99,999	7	8.6%	7.4%
\$100,000 to \$149,999	15	18.5%	4.6%
\$150,000 to \$199,999	3	3.7%	1.2%
\$200,000 or more	9	11.1%	1.5%
Total Families	81	100.0%	100.0%
Median Income	\$62,083		\$35,888

Source: 2000 US Census.

*c. Employment By Industry*

Table 15 provides a breakdown of employment by industry for Village residents. This table accounts for all permanent residents age sixteen or over. Based on this information the largest employer of Village residents is the finance, insurance, real estate, and rental and leasing industry. This group of businesses account for 30.0% of the jobs for eighty individuals age sixteen or over reported to be in the work force. Other notable industries providing employment of Village residents are: professional, scientific, management, administrative, and waste management services; and retail trade.

**Table 15: Village of Bald Head Island Employment By Industry, 2000**

Industry	# Employed	% Employed
Agriculture, Forestry, Fishing, and Mining	0	0.0%
Construction	5	6.3%
Manufacturing	3	3.8%
Wholesale Trade	3	3.8%
Retail Trade	8	10.0%
Transportation, Warehousing, and Utilities	2	2.5%

**Table 15: Village of Bald Head Island  
Employment By Industry, 2000 (continued)**

Industry	# Employed	% Employed
Information	1	1.3%
Finance, Insurance, Real Estate, and Rental and Leasing	24	30.0%
Professional, Scientific, Management, Administrative, and Waste Management Services	19	23.8%
Education, Health, and Social Services	1	1.3%
Arts, Entertainment, Recreation, Accommodation, and Food Services	2	2.5%
Other Services (except Public Administration)	0	0.0%
Public Administration	12	15.0%
Total Persons Employed 16 Years and Over	80	100.0%

Source: US Census Bureau.

*d. Employment Commuting Patterns*

Table 16 provides a summary of commuting patterns for Village residents. The information provided in this table is slightly inaccurate because it does not factor the ferry transit time into the overall commute. The table represents driving time only. Taking this into account, it is difficult to determine how many of the individuals who reported a commuting time of ten minutes or less are commuting to work on the island. It is known, however, that there are very few businesses and offices operating on the island. One notable statistic in this table is that 43.8% of the 80 individuals reported to be currently working are working out of their home.

**Table 16: Village of Bald Head Island  
Travel Times to Work**

Travel Time	Total	% of Total
Total workers 16 years and over	80	
Did not work at home	45	11.1%
Travel Time:	5	31.1%
Less than five minutes	14	24.4%
5 to 9 minutes	11	22.2%
10 to 14 minutes	10	8.9%
15 to 19 minutes	4	0.0%
20 to 24 minutes	0	0.0%
25 to 29 minutes	0	0.0%
30 to 34 minutes	0	0.0%

**Table 16: Village of Bald Head Island  
Travel Times to Work (Continued)**

Travel Time	Total	% of Total
35 to 39 minutes	0	0.0%
40 to 44 minutes	0	0.0%
45 to 59 minutes	0	0.0%
60 to 89 minutes	0	0.0%
90 minutes or more	1	2.2%
Mean travel time to work	14.1	
Worked at home	35	43.8%

Source: 2000 US Census.

e. *Industries*

There is no industrial activity within the Village corporate limits. There is some commercial activity, but this is primarily limited retail trade including: grocery, hardware, and restaurants. Additionally, golf cart repair and servicing is also available within the Village. Other than retail trade, the only other non residential construction activity involves the marina, country club, multi-family common areas, Bald Head Island Conservancy, office space, and town-owned facilities.

f. *Employment and Economy Summary*

The following is a summary of the economic data that has been discussed in this section:

- ▶ The per capita income for the Village's residents is \$45,585.
- ▶ Out of the total families recorded in the 2000 Census within the Village, approximately 80% reported an annual house hold income of \$50,000 or greater.
- ▶ The largest employer of the Village's working age population is the finance, insurance, real estate, and rental and leasing industries. This figure only takes into account the occupations of permanent residents.
- ▶ Approximately 44% of the Village's working population reported working out of their homes.

#### 4. Population Projections

The following table provides permanent and peak seasonal population estimates for the Village. These estimates are based on population growth trends experienced since the Village incorporated in 1985. The overall population growth in terms of numbers has been modest; however, the population percentage growth rate has been fairly rapid. This trend is expected to continue. If these trends do continue, the permanent population on Bald Head is expected to reach 665 individuals by the year 2025. This would result in an 284.3% increase from the 2000 Census report.

The estimates for peak seasonal population have been compiled based on average population growth dating back to 1990. The peak seasonal population estimates assume that these population growth trends will continue. Additionally, a 2003 estimate of peak seasonal population has been established based on available parking at Indigo Plantation, and estimates of usage at the Village's marina.

**Table 17: Village of Bald Head Island  
Permanent and Seasonal Population Projections, 2000-2025**

	2000	2007	2010	2020	2025	% Change '00-'25
Permanent Population	173	210	319	428	537	210.4%
Peak Seasonal Population	N/A	4,215	5,537	7,284	9,789	132.2%*

\*Percentage change is for 2003-2025.

Source: US Census Bureau, North Carolina Office of State Planning, Village of Bald Head Island.

#### B. NATURAL SYSTEMS ANALYSIS

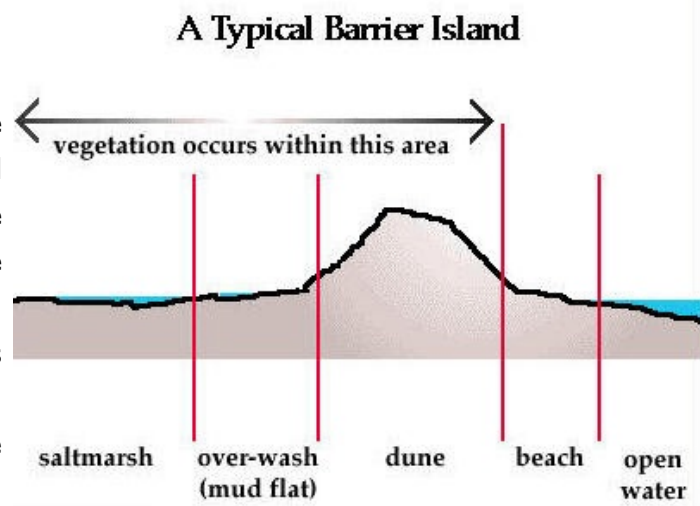
##### I. Mapping and Analysis of Natural Features

###### a. *Topography*

Bald Head Island is a semi-tropical barrier island located off the southern coast of Brunswick County, North Carolina. The Village is unique in that the island is home to many tropical plant species and birds that generally do not thrive in an environment located this far north. Barrier islands are a phenomenon that are still not fully understood by scientists. Barrier islands are fragile, constantly changing ecosystems that are important for coastal geology and ecology. These islands are separated from the mainland by a shallow sound. Barrier islands are

often found in chains along the coastline and are separated from each other by narrow tidal inlets. The Village is separated from the mainland by the Cape Fear River to the east and Corn Cake Inlet, also known as New Inlet, to the north. This inlet has been filled in over the years due to the shifting of the beach, and completely closed in 1999 as a result of Hurricane Floyd. Elevations on the island range from sea level to 38 feet. This determination was made based on a contour map with elevation intervals of two feet. This shows a significant change in elevation across the Village's jurisdiction for a coastal barrier island.

Barrier islands serve two main functions. First, they protect the coastlines from severe storm damage. Second, they harbor several habitats that are refuges for wildlife. In fact, the salt marsh ecosystems of the islands and the coast help to purify runoffs from mainland streams and rivers. Bald Head Island fits this overall description of a barrier island system. The island is home to a wide variety of wildlife including several endangered species.



*b. Climate*

The Village's climate is marked by hot and humid summers, and cool winters with occasional cold spells. During summer months, the area is cooled by offshore breezes. Rain typically falls throughout the year and can be quite heavy at times. The Village is extremely vulnerable to tropical storms and the flooding associated with them because of the unique location of the barrier island. In the event of a cyclonic storm event, the island is situated between the turbulent waters of the Cape Fear River to the west, and the open Atlantic Ocean to the east and south, which exacerbates the problem of erosion along coastal portions of the island.

In winter, the average temperature in the Village is approximately 47°F, and the average daily minimum temperature is 37°F. The coldest recorded temperature on record for the region was 9°F occurring in 1977. During summer months, the average temperature is 78°F. The highest temperature on record for summer months was 103°F. Approximately 60% of all annual precipitation within the Village typically falls between the months of April and September. Thunderstorms typically occur on roughly 45 days annually. Snowfall in the area is rare; however, snow and winter storm events do occasionally occur.

c. *Flood Zones/Storm Surge*

Coastal flooding associated with tropical storm systems and nor'easters is a significant issue for the Village. Coastal flooding is the inundation of land areas along the oceanic coast by sea waters over and above normal tidal action. Such flooding can originate from the ocean front and/or adjacent sounds or riverine areas. Factors that contribute to the severity of coastal flooding include: tidal cycles, persistence and behavior of the storm that is generating the flooding, topography, shoreline orientation, and bathymetry (ocean floor contour) of the area.

The most significant concern for the Village with regards to coastal flooding is the storm surge that is generated by tropical storm events, including tropical storm systems and hurricanes. A storm surge is a dome or bulge of water that is caused by wind and pressure forces. It is a rise above the normal water level along a shore that is caused by strong onshore winds and/or reduced atmospheric pressure. The surge height is the difference of the observed water level minus the predicted tide.

A storm surge is caused by powerful coastal storms that move toward or adjacent to the coastline. It may be worsened by higher than normal astronomical tide levels. Two factors key in the development of a storm surge:

**Low barometric pressure** reduces the weight of the air on the ocean surface causing a slight rising (1 to 2 feet) of the surface of the water. This rising creates a dome and a new balance of forces.

**Wind** sweeps around the dome of water and induces currents that spiral toward the center of the storm. The force of the winds induces high waves that travel away from the storm. Wind is the dominant force at landfall, often bringing violent wave action far inland. The battering of these waves causes damage beyond mere flooding.

There are two different sets of data that will be used in the context of this plan to determine what portions of the Village fall within a flood hazard area: Federal Emergency Management Agency (FEMA) designated flood zones; and National Oceanic and Atmospheric Administration (NOAA) Storm Surge Inundation Model.

The Flood Insurance Rate Maps (FIRMS) for Brunswick County are currently being updated in response to inaccuracies in the data exposed during Hurricane Floyd in 1999. On September 15, 2000, the first anniversary of the Hurricane Floyd disaster, FEMA and the State of North

Carolina announced a historic agreement to develop a model program to maintain accurate flood hazard information for the State. As part of this program, the flood maps for the County are currently under revision. The portion of the County that falls within the Lumber River Basin has already been completed.

The Village, however, falls within the Cape Fear River Basin. The overall flood map updates are adopted on a county-by-county basis. The Cape Fear River Basin flood maps are expected to be complete and ready for review over the next few months. Once these maps are completed and have been through the formal review process, Brunswick County will move to adopt the updated County FIRM's. Once adopted, this plan will be updated to reflect data and Special Flood Hazard Area (SFHA) locations outlined on the new FIRMs.

It should be noted that in order to get secured financing to buy, build, or improve structures in Special Flood Hazard Areas you will be required to purchase flood insurance. Lending institutions that are federally regulated or federally insured must determine if the structure is located in a SFHA and must provide written notice requiring flood insurance.

Table 18 provides a summary of the acreage within the Village that falls within various flood zones outlined on existing FIRMs. Additionally, Map 2 provides the locations of these flood zones. The following provides an explanation of how FEMA defines each of the Special Flood Hazard Areas or flood zones designations that encompass portions of the Village:

**Zone AE:** Zone AE is the flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined in the Flood Insurance Study by detailed or limited detailed methods. In most instances, whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

**Zone VE:** Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

**Shaded X:** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than one foot or with drainage areas less than one square mile; and areas protected by levies.



MAP 2 - FLOOD ZONES

**Table 18: Village of Bald Head Island  
Flood Zones in Acres**

Flood Zone	Acres	% of Total Town Acreage
AE	571.64	22.8%
Shaded X	115.94	4.6%
VE	1,814.50	72.5%
<b>Total Acres in Floodplain</b>	<b>2,502.08</b>	100.0%
<b>Total Village Acres</b>	<b>3,128.00</b>	

Source: Federal Emergency Management Agency.

A majority of the Village's jurisdiction falls within either the velocity (VE) or one hundred year (AE) flood hazard area. There is a significant portion of the island that is designated as falling within the five hundred year (X) flood hazard area. This portion of the Village is generally aligned with an elevated ridge centrally located across the eastern side of the island. This ridge ranges in elevation from 18 to 38 feet above sea level. The Village has submitted a letter of appeal protesting the proposed flood zone change along the shoreline of Bald Head Island Creek from an AE zone to a VE zone.

NOAA National Weather Service forecasters model storm surge using the SLOSH (Sea, Lake and Overland Surges from Hurricanes) model. The SLOSH model is a "diagnostic" model in that the hurricane's track, size, and intensity must be specified before the model is run. When these parameters are put into the model, a model wind field is produced, which in turn gives the surface stresses. The stresses act as the driving forces to move the water. Friction, the surface wind stress, and the pressure gradient cause the water to pile up along the coast.

Generally, shallow areas will experience greater storm surges than areas with a shelf that drops off rapidly. NOAA has run the SLOSH model for coastal areas of the United States assuming average parameters in order to determine the general locations of storm surge impact associated with fast and slow moving hurricanes. Table 19 provides a summary of the impact that varying storm events will have on the Village. Maps 3 and 4 show the location of the storm surge inundation.

MAP 3 - FAST MOVING STORM SURGE INUNDATION

MAP 4 - SLOW MOVING STORM INUNDATION

The data in these models is broken down by storm magnitude. The following provides a summary of hurricane strength according to the Saffir-Simpson Scale:

**Category 1:** Winds of 74 to 95 miles per hour. Damage primarily to shrubbery, trees, foliage, and unanchored mobile homes. No appreciable wind damage to other structures. Some damage to poorly constructed signs. Storm surge possibly 3 to 5 feet above normal. Low-lying roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.

**Category 2:** Winds of 96 to 110 miles per hour. Considerable damage to shrubbery and tree foliage; some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roof materials of buildings; some window and door damage. No major wind damage to buildings. Storm surge possibly 6 to 8 feet above normal. Coastal roads and low-lying escape routes inland cut by rising water 2 to 4 hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying island areas required.

**Category 3:** Winds of 111 to 130 miles per hour. Foliage torn from trees; large trees blown down. Practically all poorly constructed signs blown down. Some damage to roofing materials of buildings; some window and door damage. Some structural damage to small buildings. Mobile homes destroyed. Storm surge possibly 9 to 12 feet above normal. Serious flooding at coast and many smaller structures near coast destroyed; larger structures near coast damage by battering waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives.

**Category 4:** Winds of 131 to 155 miles per hour. Shrubs and trees blown down; all signs down. Extensive damage to roofing materials, windows, and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes. Storm surge possibly 13 to 18 feet above normal. Major damage to lower floors of structures near shore due to flooding and battering by waves and floating debris. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives. Major erosion of beaches.

**Category 5:** Winds greater than 155 miles per hour. Shrubs and trees blown down; considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs on many residences and industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes. Storm surge possibly greater than 18 feet above normal. Major damage to lower floors of all structures less than 15 feet above sea level. Low-lying escape routes inland cut by rising water 3 to 5 hours before hurricane center arrives.

**Table 19: Village of Bald Head Island  
Storm Surge Inundation Acreage (Fast & Slow Moving Hurricanes)**

Hurricane Strength	Fast Moving		Slow Moving	
	Acreage*	% of Total Village Acreage	Acreage*	% of Total Village Acreage
Category 1 - 2	2,450	78.3%	2,434	77.8%
Category 3	2,599	83.1%	2,588	82.7%
Category 4 - 5	2,749	87.9%	2,657	84.9%
<b>Total Village Acres</b>	<b>3,128</b>			

\*It should be noted that all acreage falling within a Category 1 - 2 storm surge area will also fall within the storm surge boundary of a Category 3 storm. The same applies to a Category 5 storm.

Source: National Oceanic and Atmospheric Administration.

The Village adopted a Hazard Mitigation Plan (HMP) in response to federal and state legislation. The plan is designed to enable the Village to be more prepared for natural disasters by establishing goals, policies, and implementing actions, which have been included as Appendix IV. When either the HMP or the Land Use Plan are revised, a review of each document is necessary to ensure consistency.

*d. Man-Made Hazards*

There are no man-made hazards located within the Village. It should be noted, however, that there are two underground storage tanks located at the Bald Head Island Limited Marina Facility. These tanks are documented and inspected by the North Carolina Department of Environment and Natural Resources (NCDENR) Underground Storage Tanks Program. The UST Section enforces UST regulations and manages funds used to perform cleanups of petroleum UST discharges or releases. The program was initiated in 1988 in response to growing reports of USTs leaking petroleum into soil and drinking water supplies. All tank removal and efforts to remove ground and groundwater contamination should be coordinated with the UST Section. According to NCDENR, there have been no reported problems associated with the underground storage tanks at this facility.

Although there are no man-made hazards immediately within the Village, the western side of the island is immediately adjacent to a shipping channel that is utilized by cargo ships accessing the NC State Port Facility in Wilmington. The location of this shipping channel has a minimal impact with regards to development within the Village. One benefit to the Village is that when this channel is periodically dredged, the least cost option for disposal of the spoil is on the south and east facing beaches of the island. The Village currently has a contract with the US Army Corps of Engineers to receive this sand through 2006.

e. Soils

There are four different soil series within the Village's jurisdiction. Observations regarding the soils and soils conditions were taken from the Soil Survey of Brunswick County, North Carolina, which was issued in November 1986. All of the four soil series identified within the Village are considered to have severe conditions for septic tank usage. When making determinations regarding the installation of septic tanks, the County soil survey should not be utilized. The soil survey is intended for use only as a general reference, and not for site specific determinations. Slight elevation and soil condition changes can have a drastic effect on the permeability of soils, and in turn the suitability for septic tank installation. There is not a substantial number of individual septic tank systems installed within the Village. Residential developments on the island are moving toward the use of advanced package treatment facilities.

Of the four soil series identified, two are comprised entirely of hydric soils. The definition of a hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. The concept of hydric soils includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Soils that are sufficiently wet because of artificial measures are included in the concept of hydric soils. Also, soils in which the hydrology has been artificially modified are hydric if the soil, in an unaltered state, was hydric. Some series, designated as hydric, have phases that are not hydric depending on water table, flooding, and ponding characteristics. The presence of hydric soils is significant due to the fact that these soils are typically poorly suited for development. Additionally, these soils may meet the definition of 404 wetland areas if found in combination with certain 404 vegetation and require permitting by the U.S. Army Corps of Engineers' Wilmington office prior to any disturbance. Map 5 shows the location of all soil types within the Village, and the following table provides a summary of the soil conditions.

**Table 20: Village of Bald Head Island  
Soil Conditions**

Soil	Acreage	Septic Tank Conditions	Flooding Frequency
BO - Bohicket	893.7	Severe: flooding, ponding, percs slowly	Frequent
Co - Corolla	583.5	Severe: wetness, poor filter	Rare
Du - Duckston	63.2	Severe: flooding, wetness, poor filter	Occasional
NeE - Newhan	1,051.6	Severe: poor filter, slope	None
Water	536.6	N/A	N/A
Total	3,128.6		

Source: Soil Survey of Brunswick County, North Carolina.

MAP 5 - SOILS MAP



*f. Water Supply*

Water is by far the most abundant natural resource in Brunswick County, as well as Bald Head Island. The water supply for the Village comes from a combination of sources. There is a main trunk line that extends onto Bald Head Island from Caswell Beach to the southeast. This line is operated by the Brunswick County Utilities Department. The water from this system is taken from the Castle Hayne Aquifer. The Village owns and maintains the water line which extends to Caswell Beach. The water line is metered on the mainland, and the Village purchases all utilized water resources from Brunswick County.

The Castle Hayne aquifer, underlying the eastern half of the coastal plain, is the most productive aquifer in the state and the primary water source for the county's water system. It is primarily limestone and sand. The Castle Hayne aquifer is noted for its thickness (more than 300 feet in places) and the ease of water movement within it, both of which contribute to high well yields. It lies fairly close to the surface toward the south and west, deepening rapidly toward the east. Water in the Castle Hayne aquifer ranges from hard to very hard because of its limestone composition. Iron concentrations tend to be high near recharge areas but decrease as the water moves further through the limestone.

Throughout the low lying and coastal areas of Brunswick County, the Castle Hayne aquifer is subject to salt water intrusion. Because of the potential for salt water intrusion, approximately 2,500 square miles of the Castle Hayne aquifer, including portions underlying Brunswick County, have been designated as a capacity use area by the NC Groundwater Section. A capacity use area is defined as an area where the use of water resources threatens to exceed the replenishment ability to the extent that regulation may be required. Therefore, wells are not permitted to pump more than 2.018 million gallons per day.

In addition to the water supplied through the county's system, the Village of Bald Head Island, operates a series of wells across the island that are tapped into the semi-confined aquifer running beneath the Village. These wells average about sixty feet in depth. Operation of these wells is crucial in the event that the county water source is cutoff. The well system on the island is sufficient to support current demand; however, if the county line is shut down, water conservation measures must be considered. The aquifer beneath the Village is also vulnerable to issues associated with salt water intrusion as discussed above pertaining to the Castle Hayne Aquifer.

g. *Fragile Areas*

CAMA establishes “Areas of Environmental Concern” (AECs) as the foundation of the Coastal Resources Commission's permitting program for coastal development. An AEC is an area of natural importance: It may be easily destroyed by erosion or flooding; or it may have environmental, social, economic, or aesthetic values that make it valuable.

The Coastal Resources Commission designates areas as AECs to protect them from uncontrolled development that may cause irreversible damage to property, public health or the environment, thereby diminishing their value to the entire state. Statewide, AECs cover almost all coastal waters and less than 3% of the land in the 20 coastal counties.

Fragile areas are those areas that are not explicitly defined as AECs but that could cause significant environmental damage or other degradation of quality of life if not managed. These include wetlands, natural heritage areas, areas containing endangered species, prime wildlife habitats, or maritime forests. These areas must be evaluated pursuant to State regulations at 15A NCAC 7H for the CAMA Land Use Planning process.

This section will evaluate the following AECs and fragile areas within the Village: estuarine waters and shorelines, public trust areas, coastal wetlands, ocean beaches and shorelines, areas of excessive erosion, natural resource fragile areas, and outstanding resource waters.

i. Estuarine Waters and Estuarine Shorelines (AEC)

Estuaries are transition zones between fresh and salt water, usually where a river or stream flows into the ocean. Estuaries are protected from the full force of ocean waves and wind by barrier islands, mudflats, or sand. The sheltered waters support an abundance and diversity of plant and animal life, including marine mammals, shore birds, fish, crabs, clams and other shellfish, and reptiles. A number of marine organisms, including many of the commercially valuable fish species, depend on the estuaries for spawning, nursing, or feeding.

Besides serving as an important habitat for wildlife, estuaries also serve as a water filtration system by removing sediments, nutrients, and pollutants before they reach the ocean. The filtration process creates cleaner water, which is of benefit to both marine life and people who inhabit the surrounding areas. Estuaries also are important sources of flood control, with porous salt marsh soils and grasses absorbing flood waters and dissipating storm surges. Like barrier islands, they provide natural barriers between the land and the ocean. The Village's entire

jurisdiction falls adjacent to the estuarine waters of Middle Island. Due to the increased development occurring throughout the Village, protection of these waters will be a focus throughout the context of this plan.

Estuarine shorelines are shorelines immediately adjacent to or bordering estuarine waters. The areas are immediately connected to the estuary and are very vulnerable to heavy erosion caused by wind and water. In shoreline areas not contiguous to waters classified as ORW by the Division of Water Quality, all land 75 feet leeward from the normal water level are considered to be estuarine shorelines. The Village is not adjacent to any Outstanding Resource Waters. Development along estuarine shorelines can exacerbate water quality problems within estuarine waters, and expedite the threats of shorefront erosion and flooding.

Under CAMA rules, all estuarine shorelines are subject to CAMA development regulations at 15A NCAC 7H.0205-.0208, as follows:

- ▶ The location, design and construction of the project must give highest priority to conserving the biological, economic and social values of coastal wetlands, estuarine waters and public trust areas, and protect public rights of navigation and recreation in public trust areas.
- ▶ The project should be designed and located to cause the least possible damage to the productivity and integrity of:
  - coastal wetlands;
  - shellfish beds;
  - submerged grass beds;
  - spawning and nursery areas;
  - important nesting and wintering areas for waterfowl and other wildlife; and
  - important natural barriers to erosion, such as marshes, cypress fringes, and clay soils.
- ▶ The project must follow the air and water quality standards set by the N.C. Environmental Management Commission. Generally, development will not be permitted if it lowers water quality for any existing uses of the water (such as shellfishing, swimming, or drinking).

- ▶ The project must not significantly increase siltation or erosion, which can smother important habitats, block sunlight from aquatic plants, and choke fish and shellfish.
- ▶ The project must not create a stagnant body of water, which can affect oxygen levels and accumulate sediments and pollutants that threaten fish and shellfish habitats and public health.
- ▶ Construction of the project must be timed to have the least impact on the life cycles and migration patterns of fish, shellfish, waterfowl and other wildlife. The life cycles of animals that depend on the estuarine system are especially sensitive during certain times of the year.
- ▶ The project must not cause major or irreversible damage to valuable archaeological or historic resources. Archaeological resources, such as the remains of Native and Early American settlements, shipwrecks and Civil or Revolutionary War artifacts, provide valuable information about the history of the coastal region and its people. Information on the location of these sites is available from the N.C. Division of Archives and History in the Department of Cultural Resources.
- ▶ The project must not reduce or prevent the use of, and public access to, estuarine waters and public trust lands and waters.
- ▶ The project must comply with the local land use plan. A land use plan is a "blueprint" developed by local leaders to help guide decisions that affect the growth of the community. CAMA requires each of the 20 coastal counties to prepare a local land use plan and update it according to CRC guidelines. More than 70 cities and towns have adopted their own plans.

ii. Public Trust Areas

The public trust area is comprised of submerged lands waterward of the mean high water line in tidal, coastal, or navigable waters adjacent to the Village. On the ground, the public trust area extends from the water up to a prominent debris line or high water mark. In general, if an area is regularly wet by the tides, it is probably safe to assume that it is in the public trust area. The public trust area is also sometimes referred to as tidelands, and can be generally defined as

"public beach." In almost every case, private property ends and public trust property begins at the mean high water line. The following provides a detailed description of areas that are considered public trust areas:

- ▶ all waters of the Atlantic Ocean and the lands underneath, from the normal high water mark on shore to the state's official boundary three miles offshore;
- ▶ all navigable natural water bodies and the lands underneath, to the normal high watermark on shore (a body of water is considered navigable if you can float a canoe in it). This does not include privately-owned lakes where the public does not have access rights;
- ▶ all water in artificially created water bodies that have significant public fishing resources and are accessible to the public from other waters; and
- ▶ all waters in artificially created water bodies where the public has acquired rights by prescription, custom, usage, dedication, or any other means.

These areas are significant because the public has rights in these areas, including navigation and recreation. The public trust areas also support valuable commercial and sports fisheries, have aesthetic value, and are important resources for economic development. All of the land within the Village that falls immediately adjacent to waters of the Cape Fear River, estuarine areas throughout Middle Island, and the Atlantic Ocean are considered public trust areas. Under CAMA regulations, all lands 30 feet leeward of public trust areas are subject to the restrictions specified above for estuarine shoreline areas.

### iii. Coastal Wetlands

Coastal Resources Commission rules define "Coastal Wetlands" as any marsh in the 20 coastal counties that regularly or occasionally floods by lunar or wind tides, and that includes one or more of the following ten plant species:

- ▶ *Spartina alterniflora*: Salt Marsh (Smooth) Cord Grass
- ▶ *Juncus roemerianus*: Black Needlerush
- ▶ *Salicornia spp.*: Glasswort
- ▶ *Distichlis spicata*: Salt (or Spike) Grass

- ▶ *Limonium spp.*: Sea Lavender
- ▶ *Scirpus spp.*: Bulrush
- ▶ *Cladium jamaicense*: Saw Grass
- ▶ *Typha spp.*: Cattail
- ▶ *Spartina patens*: Salt Meadow Grass
- ▶ *Spartina cynosuroides*: Salt Reed or Giant Cord Grass

Coastal wetlands provide significant environmental and economic benefits to the Village. They protect against flooding, help maintain water quality, provide habitat to wildlife, and serve as part of the estuarine system.

In 2003, DCM classified and mapped coastal wetlands based on an analysis of several existing data sets, including aerial photographs and satellite images of coastal areas in North Carolina, including all portions of Brunswick County. Even though the presence of wetlands must be established by an on-site delineation and investigation of plants, DCM produced an excellent representation of wetlands in the Village, and throughout coastal North Carolina. The location of all wetlands identified within the Village are shown on Map 6.

According to NCDCM's 2003 Coastal Wetlands Inventory, approximately 18.8% of the Village's land area, or 271.6 acres, are coastal wetlands (see Table 21).

**Table 21: Village of Bald Head Island  
Coastal Wetlands by Type and Aerial Extent**

Wetlands	Acres	% of Total Town Acreage
Cleared Depressional Swamp Forest	0.01	0.001%
Cleared Estuarine Shrub/Scrub	0.19	0.020%
Cutover Depressional Swamp Forest	0.01	0.001%
Cutover Estuarine Shrub/Scrub	5.79	0.540%
Depressional Swamp Forest	0.24	0.020%
Estuarine Forest	18.22	1.700%
Estuarine Shrub/Scrub	153.37	14.300%
Managed Pineland	3.93	0.370%
Salt/Brackish Marsh	890.48	83.050%
Total	1,072.24	100.000%

Source: NCDCM Wetlands Inventory, 2003.

MAP 6 - WETLANDS

The following provides the DCM descriptions of the various wetland areas found in the Village. These descriptions are followed by the modifiers cleared and cutover as indicated in the table above:

**Depressional Swamp Forest** - Very poorly drained non-riverine forested or occasionally scrub/shrub communities that are semi-permanently or temporarily flooded. Typical species include cypress, black gum, water tupelo, green ash, and red maple.

**Estuarine Shrub/Scrub** - Any shrub/scrub dominated community subject to occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial watercourses). Typical species include wax myrtle and eastern red cedar.

**Estuarine Forest** - A forested wetland community subject to occasional flooding by tides, including wind tides (whether or not the tide waters reach these areas through natural or artificial watercourses). Examples include pine-dominated communities with rushes in the understory or fringe swamp communities.

**Managed Pineland** - Seasonally saturated, managed pine forests (usually loblolly pine) occurring on hydric soils. This wetland category may also contain non-managed pine forests occurring on hydric soils. Generally these are areas that were not shown on National Wetlands Inventory maps. These areas may or may not be jurisdictional wetlands. Since this category is based primarily on soils data and 30 meter resolution satellite imagery, it is less accurate than the other wetland categories. The primary criteria for mapping these areas are hydric soils and a satellite imagery classification of 'pine forest'.

**Salt/Brackish Marsh** - Any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial watercourses), as long as this flooding does not include hurricane or tropical storm waters. Coastal wetland plant species include: smooth cordgrass, black needlerush, glasswort, salt grass, sea lavender, salt marsh bullrush, saw grass, cattail, salt meadow cordgrass, and big cordgrass.



The following provides the definition of the modifiers used in the wetlands table above:

**Cleared Wetland** - Areas of hydric soils for which satellite imagery indicates a lack of vegetation in both 1988 and 1994. These areas are likely to no longer be wetlands.

**Cutover Wetland** - Areas for which satellite imagery indicates a lack of vegetation in 1994. These areas are likely to still be wetlands; however, they have been recently cut over. The vegetation in cutover areas may be regenerating naturally, or the area may in use for silvicultural activities.

iv. Ocean Beaches and Shorelines & Inlet Hazard Areas (Areas of Excessive Erosion)

Ocean beaches and shorelines are lands consisting of unconsolidated soil materials that extend from the mean low water line landward to a point where either (1) the growth of vegetation occurs, or (2) a distinct change in slope or elevation alters the configuration of the land form, whichever is farther landward. The entire southern length of the Village is an ocean beach. The Village contains approximately 5.5 miles of ocean erodible areas and high hazard flood areas.

This entire area constitutes an Ocean Hazard AEC as defined by CAMA. The Ocean Hazard AEC covers North Carolina's beaches and any other oceanfront lands that are subject to long-term erosion and significant shoreline changes. The seaward boundary of this AEC is the mean low water line.

The landward limit of the AEC is measured from the first line of stable natural vegetation and is determined by adding:

- ▶ a distance equal to 60 times the long-term, average annual erosion rate for that stretch of shoreline to
- ▶ the distance of erosion expected during a major storm.

The average annual erosion rates and the respective setback limits for each boundary is shown on Map 7. The erosion rates, and in turn the setbacks, vary substantially along the shoreline of the Village. On Map 7, there are two different sets of setback requirements. One set applies to lots that were platted under prior setback requirements as set by NCDCM. These

setbacks are referred to as grandfathered setback requirements. The second set indicates the current requirements and applies to newly established lots. When a lot is subdivided, the setback requirements that are in place at that time will apply in perpetuity unless a particular lot is subdivided at a later date when new requirements are in place. The CRC updates these long-term erosion rates about every five years using aerial photographs to examine shoreline changes. General maps of erosion rates are available free from the Division of Coastal Management; detailed erosion rate maps are available for inspection at all Coastal Management field and local permitting offices.

The following requirements apply to all development in the Ocean Hazard AEC (15A NCAC 7H .0306):

- ▶ The development must be located and designed to protect human lives and property from storms and erosion, to prevent permanent structures from encroaching on public beaches and reduce the public costs (such as disaster relief aid) that can result from poorly located development.
- ▶ The development must incorporate all reasonable means and methods to avoid damage to the natural environment or public beach accessways. Reasonable means and methods include: limiting the scale of the project and the damage it causes; restoring a damaged site; or providing substitute resources to compensate for damage.
- ▶ No growth-inducing development paid for (in any part) by public funds will be permitted if it is likely to require more public funds for maintenance and continued use – unless the benefits of the project will outweigh the required public expenditures.
- ▶ The project should be set as far back from the ocean as possible. At minimum, all buildings must be located behind the crest of the primary dune, the landward toe of the frontal dune, or the erosion setback line - whichever is the farthest from the first line of stable natural vegetation.
- ▶ The project must not remove or relocate sands or vegetation from primary or frontal dunes. These dunes help protect structures from erosion, flooding, and storm waves, and they help maintain North Carolina's barrier islands and beaches.

MAP 7 - EROSION RATES

- ▶ Moving a building that is in an ocean hazard area will require a CAMA permit. Buildings relocated entirely with private funds should be relocated as far landward as possible. Buildings relocated with public funds must meet all AEC standards, including the setback requirement.
- ▶ The project must meet all local minimum lot-size and setback requirements. Counties and towns often require a setback from roads, property lines, or dunes.
- ▶ The project must comply with the local CAMA land use plan. A land use plan contains a community's goals, management policies, and a map classifying land according to the types of development allowed.
- ▶ A mobile home must not be placed within the high hazard flood area unless it is in a mobile home park that existed before June 1, 1979. Not only are mobile homes likely to be damaged by coastal storms, they are also likely to damage other buildings during storms.
- ▶ The public's ability to reach, use, and enjoy the resources that belong to all the people of the state must not be interfered with or blocked. These resources include the wet sand beaches and waters. No development is allowed seaward of the vegetation line, because the public has a right to use the sandy beach. Development also may not block established pathways to the beach.
- ▶ The project must not cause major or irreversible damage to valuable archaeological or historic resources. Information on the location of these sites is available from the N.C. Division of Archives and History in the Department of Cultural Resources.
- ▶ The construction of publicly-funded projects, such as sewers, water lines, roads, bridges and erosion control works, will be permitted only if they:
  - greatly benefit the public, nation, or state;
  - do not promote additional development in ocean hazard AECs;
  - will not damage natural buffers to erosion, wave wash, and flooding;

-- will not otherwise increase existing hazards.

- ▶ Meet all setback requirements for all development in the Ocean Hazard AEC.

Inlet hazard areas are portions of land that lie adjacent to turbulent waters associated with inlet navigation channels. Land adjacent to the inlet hazard area is extremely vulnerable to inlet migration, rapid and severe changes in watercourse, flooding and strong tides. The location of the inlet hazard area along the western coast of the island is shown on Map 7. Erosion rates along this portion of beach are extremely high. The US Army Corps of Engineers has just completed a channel maintenance project for this inlet. As part of this project approximately 1.2 million cubic yards of sand was placed on South Beach. This channel is dredged on a periodic basis every three to five years. Restrictions regarding development along the shoreline adjacent to the inlet hazard area follow the same provisions as shorelines within an ocean hazard area, however, the following additional restrictions apply:

- ▶ Permanent structures can be permitted at a density of no more than one commercial or residential per 15,000 square feet of land area.
- ▶ Only residential structures of four units or less or non-residential units of less than 5,000 square feet total floor area will be allowed.

v. Protected Land and Significant Natural Heritage Areas

Natural resource fragile areas are generally recognized to be of educational, scientific, or cultural value because of the natural features of the particular site. Features in these areas serve to distinguish them from the vast majority of the landscape. These areas include complex natural areas, areas that sustain remnant species, pocosins, wooded swamps, prime wildlife habitats, or registered natural landmarks.

Within the Village, the State of North Carolina recognizes three primary sites as protected lands. These include the Bald Head Woods Coastal Reserve, comprising the maritime forest centrally located on the island, and the Bald Head Island Natural Area, which comprises the estuarine waters adjacent to Middle Island, as well as the large parcel at Cape Fear on the island's southeastern point. Additionally, the NC Division of Parks and Recreation has also identified four Significant Natural Heritage Areas that fall within the jurisdiction of the Village. These include

central Bald Head Island, Bluff Island and East Beach, the Lower Cape Fear Aquatic Habitat, and Middle Island. For more information about Middle Island, see Section VI(E)(2)(b) - Future Land Use Acreages. The locations of all these areas are shown on Maps 8 and 9. The maritime forest is a state-defined conservation area, and falls under the state’s jurisdiction. The remaining protected lands either fall under the jurisdiction of the Smith Island Land Trust or are overseen by the Bald Head Island Conservancy.

The Smith Island Land Trust is a non-profit organization that was formed in 1996. The organization’s mission is as follows: “to acquire and preserve historically and ecologically significant lands on Smith Island for the benefit of current and future generations.” The Smith Island Land Trust merged with the Bald Head Island Conservancy in 2002. In conjunction, these two entities work to maintain and conserve the natural and pristine environment that exists throughout the Village. Since 1996, the Smith Island Land Trust has secured two large tracts of land totaling 24 acres, and have received private donations of an additional 25 lots that will remain in their natural state in perpetuity. The intent of these actions is to alleviate development density in an effort to preserve the ecological environment and water quality throughout the Village, as well as Bluff Island. To provide additional protection, the Conservation Trust of North Carolina has placed conservation easements on these properties. The Bald Head Island Conservancy has ongoing efforts to acquire additional properties and conservation easements throughout the Village to further this cause. The acreage figures for these areas are summarized in Table 22.

**Table 22: Village of Bald Head Island  
Significant Natural Heritage Areas and Protected Lands**

Area	Acres	% of Total Town Acres
Bald Head Woods Coastal Reserve	191.1	6.1%
Bald Head Island Natural Area	1,143.3	36.5%
Bald Head Island SNHA	1,753.1	56.0%
Bluff Island and East Beach SNHA	49.1	1.6%
Lower Cape Fear River Aquatic Habitat SNHA	51.7	1.7%
Middle Island SNHA	1,026.3	32.8%

Source: North Carolina Parks and Recreation Department and CGIA.

MAP 8 - PROTECTED LANDS

MAP 9 - SNHA



vi. Outstanding Resource Waters

All surface waters in North Carolina are assigned a primary classification by the NC Division of Water Quality (DWQ). Outstanding Resource Waters (ORW) is a supplemental classification intended to protect unique and special waters having excellent water quality and being of exceptional state or national ecological or recreational significance. To qualify, waters must be rated “Excellent” by DWQ and have one of the following outstanding resource values:

- ▶ Outstanding fish habitat or fisheries,
- ▶ Unusually high level of waterbased recreation,
- ▶ Some special designation such as NC or National Wild/Scenic/Natural/Recreational River, National Wildlife Refuge, etc.,
- ▶ Important component of state or national park or forest, or
- ▶ Special ecological or scientific significance (rare or endangered species habitat, research or educational areas).

No new or expanded wastewater discharges are allowed; although there are no restrictions on the types of discharges to these waters. There are also associated stormwater runoff, building density, best agricultural practices, and landfill siting controls enforced by the Division of Water Quality.

The Village is not adjacent to any waters classified as ORW by the Division of Water Quality.

h. *Areas of Resource Potential*

i. Regionally Significant Parks

There are no public parks of regional or statewide significance within the corporate limits of the Village, aside from the state-defined protected areas discussed above. There are, however, regional beach access sites located throughout the Village’s jurisdiction. Regional beach access sites are defined by the NC Division of Coastal Management as public beach access sites that are generally the largest of the access sites and that have clear signage, ample parking, and often have other facilities such as restrooms, showers and picnic tables.

ii. Marinas and Mooring Fields

Marinas are defined as any publicly- or privately-owned dock, basin, or wet boat storage facility constructed to accommodate more than ten boats and providing any of the following services: permanent or transient docking spaces, dry storage, fueling facilities, haulout facilities, and repair service. Excluded from this definition are boat ramp facilities allowing access only, temporary docking and none of the preceding services. There is one large marina facility located within the Village that is owned by the Bald Head Island Club and leased to BHI Transportation and to the BHI Club. The marina slips have recently undergone expansion, and there are currently 150 yacht club boat slips. Of the 150 boat slips at the marina, approximately 90 are under a year round lease agreement. This leaves 60 slips available for overnight and/or weekly use. All slips provide electric and water services. Several of the slips also have cable service available. This marina accommodates both long term and short term rentals. It is not anticipated that additional marina facilities will be constructed within the Village.

A “freestanding mooring” is any means to attach a ship, boat, vessel, floating structure, or other water craft to a stationary underwater device, mooring buoy, buoyed anchor, or piling (as long as the piling is not associated with an existing or proposed pier, dock, or boathouse). When more than one freestanding mooring is used in the same general vicinity, it is commonly referred to as a mooring field. There are no mooring fields within the Village.

iii. Floating Homes

A floating home or structure is any structure, not a boat, supported by means of flotation, designed to be used without a permanent foundation, which is used or intended for human habitation or commerce. A structure will be considered a floating structure when it is inhabited or used for commercial purposes for more than 30 days in any one location. A boat may be deemed a floating structure when its means of propulsion has been removed or rendered inoperative and it contains at least 200 square feet of living space area. There are currently no floating homes within the Village.

iv. Channel Maintenance

There are navigable channels that run into the Village that are utilized by residents, as well as the island’s ferry system. The BHI Marina Entrance serves as the gateway to the island, and maintenance of this channel is an integral part of day-to-day operations on the island.

Additionally, the US Army Corps of Engineers is responsible for maintenance of the shipping channel located off the western end of the Village. One benefit to the Village is that when this channel is periodically dredged, the least cost option for disposal of the spoil is on the south and east facing beaches of the island. The Village will continue to support this policy unless it is determined that the channel needs deepening. It should be noted that the Village opposes deepening of this channel unless it is shifted west. The Village currently has a contract with the US Army Corps of Engineers to receive this sand through 2006.

v. Marine Resources (Water Quality)

The North Carolina Division of Water Quality (DWQ) monitors approximately one-third of the state's stream miles for water quality. For stream miles not monitored, DWQ uses professional judgement to evaluate whether the streams are supporting their designated uses. The State categorizes miles of stream as Fully Supporting, Support Threatened, Partially Supporting or Not Supporting. Partially Supporting and Not Supporting mean that a stream is supporting only part or none of its designated uses. These streams are considered by the State to be impaired. Support Threatened means that though the stream is currently supporting its full uses, there is reason to believe it may not support them in the future. The following table provides a detailed breakdown of water quality classifications as defined by the North Carolina Division of Water Quality.

**Table 23: NC Division of Water Quality  
Water Body Classifications**

<b>PRIMARY FRESHWATER AND SALTWATER CLASSIFICATIONS*</b>	
<u>CLASS</u>	<u>BEST USES</u>
C and SC	Aquatic life propagation/protection and secondary recreation
B and SB	Primary recreation and Class C uses
SA	Waters classified for commercial shellfish harvesting
WS	<i>Water Supply watershed.</i> There are five WS classes ranging from WS-I through WS-V. WS classifications are assigned to watersheds based on land use characteristics of the area. Each water supply classification has a set of management strategies to protect the surface water supply. WS-I provides the highest level of protection and WS-V provides the least protection. A Critical Area (CA) designation is also listed for watershed areas within a half-mile and draining to the water supply intake or reservoir where an intake is located.
<b>SUPPLEMENTAL CLASSIFICATIONS</b>	
<u>CLASS</u>	<u>BEST USES</u>
Sw	<i>Swamp Waters:</i> Recognizes waters that will naturally be more acidic (have lower pH values) and have lower levels of dissolved oxygen.
Tr	<i>Trout Waters:</i> Provides protection to freshwaters for natural trout propagation and survival of stocked trout.

**Table 23: NC Division of Water Quality  
Water Body Classifications (Continued)**

<u>CLASS</u>	<u>BEST USES</u>
HQW	<i>High Quality Waters:</i> Waters possessing special qualities including excellent water quality, Native or Special Native Trout Waters, Critical habitat areas, or WS-I and WS-II water supplies.
ORW	<i>Outstanding Resource Waters:</i> Unique and special surface waters that are unimpacted by pollution and have some outstanding resource values.
NSW	<i>Nutrient Sensitive Waters:</i> Areas with water quality problems associated with excessive plant growth resulting from nutrient enrichment.

\*Primary classifications beginning with an “S” are assigned to saltwaters.  
Source: NC Division of Water Quality.

There are only 13 different water bodies or segments immediately adjacent to Village. Table 24 provides a listing of all water bodies that are classified by the NC Division of Water Quality. Also included are their stream index number and assigned classification. Map 10 identifies the location of these water bodies.

**Table 24: Village of Bald Head Island  
Listing of Water Bodies**

<u>Name of Stream</u>	<u>Description</u>	<u>Stream Index Number</u>	<u>Class</u>
Cape Fear River	From a line across the river from Snows Point (through Snows Marsh) to Federal Point to Atlantic Ocean	18-(87.5)	SA; HQW
Buzzard Bay	Entire bay	18-88-8-2	SA; HQW
Muddy Slough	Entire slough	18-88-8-2-1	SA; HQW
Still Creek	From Muddy Slough to Buzzard Bay	18-88-8-2-2	SA; HQW
Burris Creek	From Muddy Slough to Buzzard Bay	18-88-8-2-3	SA; HQW
Cedar Creek	From Cape Fear River to Buzzard Bay	18-88-8-2-4	SA; HQW
Cape Creek	From source to Cape Fear River	18-88-8-3	SA; HQW
Bay Creek	From source to Cape Creek	18-88-8-3-1	SA; HQW
Deep Creek	From source to Bay Creek	18-88-8-3-1-1	SA; HQW
Bald Head Creek	From source to Cape Fear River	18-88-8-4	SA; HQW
Fishing Creek	From source to Bald Head Creek	18-88-8-4-1	SA; HQW
Bald Head Island Marina Basin	All waters of the basin and entrance channel	18-88-8-5	SC:#
Atlantic Ocean	The waters of the Atlantic Ocean contiguous to that portion of the Cape Fear River Basin that extends from the edge of the White Oak River Basin to the southwestern end of Smith Island at a point called Bald Head	99-(3)	SB

Source: NC Division of Water Quality.

MAP 10 - WATER BODIES

## 2. Environmental Composite Map

Under the updated CAMA Planning Guidelines, there is a requirement for the preparation of an Environmental Composite Map. The preparation of this map involves an overlay analysis of geographic data layers involving natural features and environmental conditions. The layers are classified into three categories based on their environmental sensitivity. The intent of this analysis is to break the jurisdiction into three separate land classifications in an effort to identify what portions of land are most and least suitable for future development with respect to environmental conditions and sensitive areas. A land suitability analysis will also be performed in the context of this plan that will incorporate community facilities into an analysis similar to the environmental composite map. The following table details the Geographic Information System (GIS) data that was utilized in the preparation of the environmental composite map.

**Table 25: Village of Bald Head Island  
Environmental Composite Map Layers**

Layer	Class I	Class II	Class III
Coastal Wetlands			✓
Exceptional or Substantial Non-Coastal Wetlands			✓
Beneficial Non-Coastal Wetlands		✓	
Estuarine Waters			✓
Soils with Slight or Moderate Septic Limitations	✓		
Flood Zones		✓	
Storm Surge Areas		✓	
HQW/ORW Watersheds		✓	
Water Supply Watersheds		✓	
Significant Natural Heritage Areas		✓	
Protected Lands			✓

In order to make this analysis more useful, a slightly different approach was taken in compiling this map. NC Division of Coastal Management has provided the Village with a model that breaks the Village's jurisdiction into one-acre cells. Breaking the planning jurisdiction into these one-acre cells distorts the outcome of this analysis, mainly because a majority of the lots within the Village are smaller than one-acre in total area. In order to produce an environmental composite map that more accurately depicts the true nature and location of environmentally sensitive areas within the Village, a different approach was taken.

In order to establish accurate data layers for Environmental Composite Classes I-3, all data related to each class was simply merged into a single GIS data layer. The result of this operation was the

creation of three independent datasets that include the boundaries of each GIS layer defined for Classes I, 2, and 3.

Table 25 above lists all of the GIS data that was utilized in the preparation of the environmental composite map. Additionally, this table lists whether each data layer was classified as Class I, II, or III. This classification corresponds to the development potential of a defined area with respect to environmentally sensitive areas located throughout the corporate limits of the Village. The following provides a definition of the three classes:

**Class I** – Land that contains only minimal hazards and limitations that can be addressed by commonly accepted land planning and development practices. Class I land will generally support the more intensive types of land uses and development.

**Class II** – Land that has hazards and limitations for development that can be addressed by restrictions on land uses, special site planning, or the provision of public services, such as water and sewer. Land in this class will generally support only the less intensive uses, such as low density residential, without significant investment in services.

**Class III** – Land that has serious hazards and limitations. Land in this class will generally support very low intensity uses, such as conservation and open space.

Map I I displays the outcome of the environmental composite overlay analysis. This map was compiled by merging all of the GIS data listed under each of the classes above. All data listed under Class III was merged to form the boundaries shown on the environmental composite map. This process was repeated for Classes I and II. Table 26 provides a summary of the land area within the Village that falls within each of the defined classes.

**Table 26: Village of Bald Head Island  
Environmental Composite Acreage**

	Acreage	% of Total
Class I	0.0	0.0%
Class II	1,238.5	50.1%
Class III	1,234.5	49.9%
Total	2,473.0	100.0%

Source: NC Division of Coastal Management, Holland Consulting Planners, Inc., and Brunswick County GIS.

MAP 11 - ENVIRONMENTAL COMPOSITE



### **3. Environmental Conditions**

#### *a. Introduction*

A river "basin," or watershed, is the entire land area drained by a river. All life that resides within the defined boundaries of a particular river basin are linked by this water course. Due to this linkage, any pollution that occurs in a basin, even if it occurs far away from the river itself, can eventually wind up in the river, and in turn affect water quality throughout the basin.

In response to this issue, the NC Department of Environment and Natural Resources launched the Basinwide Water Quality Planning Program. The Village falls completely within the Cape Fear River Basin, and therefore falls under the recommendations and analysis included in the Cape Fear River Basinwide Water Quality Plan. The Cape Fear River Basinwide Water Quality Plan was adopted by the Division of Water Quality in 1996 with updates occurring in 2000 and 2005. The following are the goals of DWQ's basinwide program:

- ▶ Identify water quality problems and restore full use to Impaired waters.
- ▶ Identify and protect high value resource waters.
- ▶ Protect unimpaired waters while allowing for reasonable economic growth.

These goals are accomplished through the following objectives:

- ▶ Collaborate with other agencies to develop appropriate management strategies.
- ▶ Assure equitable distribution of waste assimilative capacity.
- ▶ Better evaluate cumulative effects of pollution.
- ▶ Improve public awareness and involvement.

As existing and future land uses are considered within the Village, these goals should be kept in mind. More detailed water quality information is available for municipal jurisdictions at the subbasin level. Subbasins are geographic areas that represent part of a watershed, made up of a combination of drainage areas and/or distinct hydroponic features, all draining to the primary watershed. Within the Cape Fear River Basin, the Village is located entirely within subbasin 03-06-17. The Cape Fear River Basin and subbasin boundaries are shown on Map 12.

MAP 12 - RIVER BASINS

*b. Cape Fear River Basin*

The Cape Fear River Basin is the largest river basin in the State of North Carolina. The basin encompasses 9,149 square miles and covers a total of 26 different counties. There are 6,386 miles of rivers and streams traversing through the river basin. The Cape Fear River Basin forms at the confluence of the Deep and Haw rivers adjacent to the border of the Chatham/Lee County line.

Within this river basin, there are several large urban centers including: Greensboro, High Point, Burlington, Chapel Hill, Durham, Fayetteville, and Wilmington. The Fort Bragg Military Base is also centrally located within the Cape Fear River Basin. Rapid growth within and adjacent to these urban areas has resulted in significant impacts on water quality throughout the Cape Fear River Basin. According to information provided in the 2005 Cape Fear Basinwide Water Quality Plan, almost 11% of the land within the basin was considered urban and built up by the Natural Resources Inventory. Comparatively, the Natural Resources Inventory reported that 6.3% of land was urban and built up in 1982. Swine operations are also detrimental to water quality within the Cape Fear River Basin. This basin alone is home to approximately 54% of the state's overall swine operations. These operations are scattered throughout the river basin, although a majority of them are located inland away from coastal and estuarine waters.

The Cape Fear River Basin supports a wide variety of aquatic ecosystems, as well as many species of aquatic and recreational fish. These include wetlands, estuaries, blackwater rivers, and rocky streams, all of which support varying aquatic wildlife including 30 endangered species.

*c. Hydrologic Unit 03030005 (Subbasin 03-06-17)*

Most federal government agencies, including the US Geological Survey (USGS) and the US Natural Resources Conservation Service (NRCS), use a system of defining watersheds that is different from that used by the Division of Water Quality (DWQ) and many other state agencies in North Carolina. Under the federal system, the Cape Fear River Basin is made up of six hydrologic areas referred to as hydrologic units. Each hydrologic unit is defined by an 8-digit number. DWQ has a two-tiered system in which the state is subdivided into 17 river basins with each basin further subdivided into subbasins. The Village falls within Hydrologic Unit 03030005 (Lower Cape Fear River), which is broken down into three subbasins by the North Carolina Division of Water Quality. Subbasin 03-06-17 encompasses the extreme southern portion of the Cape Fear River Basin including the Village and the City of Southport.

The Village is not a major contributor to water quality problems within subbasin 03-06-17 of the Cape Fear River Basin. Development within the Village has been steady over the years, but as growth has occurred careful steps have been taken to ensure the long term environmental quality of the island and its surrounding waters. Rapid growth and urban expansion on the mainland portions of Brunswick County have had a much more substantial impact on water quality within the subbasin, as well as the entire Cape Fear River Basin. The following section is an excerpt from the 2005 Cape Fear River Basinwide Plan that summarizes the condition of water quality within subbasin 03-06-17. This excerpt also includes recommendations for improving water quality. Water quality ratings for specific water bodies within and around the Village were discussed earlier in the plan (page 56).

d. *Summary of Water Quality Subbasin 03-06-17*

i. Introduction

Subbasin 03-06-17 is located in the outer coastal plain and in estuarine regions of the basin. The subbasin contains portions of the City of Wilmington, City of Southport, and the Village. Most tributaries in this subbasin are backwater and slow moving or tidal. The primary land uses are forest and agriculture. However, Wilmington and surrounding suburban areas also contribute to nonpoint source pollution. There are currently no defined Outstanding Resource Waters (ORW) within or adjacent to the corporate limits of the Village. The following table provides a summary of population and land cover characteristics for subbasin 03-06-17.

**Table 27: Characteristics of Subbasin 03-06-17**

**Land and Water Area (sq. miles):**

Total Area	547
Land Area	498
Water Area	49

**Land Cover (%):**

Forest/Wetland	74.7%
Surface Water	9.3%
Urban	4.1%
Cultivated Crop	7.6%
Pasture/Managed Herbaceous	4.3%

Source: NC Division of Water Quality 2005 Cape Fear River Basinwide Water Quality Management Plan.

There are 41 individual NPDES wastewater discharge permits in subbasin 03-06-17 with a permitted flow of 99.9 MGD. The largest of them are International Paper (50 MGD), Progress Energy (3.5 MGD), New Hanover County WWTP (4 MGD), Northside WWTP (16 MGD), and Southside WWTP (12 MGD).

Use support ratings were assigned for waters in the subbasin in the aquatic life, recreation, fish consumption, and water supply categories. All waters are Impaired on an evaluated basis in the fish consumption category because of fish consumption advice that applies to the entire basin. In the water supply category, all WS classified waters (1.6 miles) are Supporting on an evaluated basis based on reports from DEH regional water treatment plan consultants. The stressor for Impaired waters in subbasin 03-06-17 is Fecal Coliform Bacteria.

In the aquatic life category, 97.8 stream miles (31.2%), 407 freshwater acres (32.5%), and 20,592 estuarine acres (87.8%) were monitored during this assessment period. There were 6,457 estuarine acres (27.5%) identified as Impaired in this category.

In the recreation category, 21,188.9 estuarine acres (90.4%), 44.1 freshwater miles (14.1%), and 10.3 coastline miles (45.2%) were monitored during the assessment period. There were 96.6 estuarine acres (<1%) and 4.7 coastline miles (20.6%) identified as Impaired in this category.

In the shellfish harvesting category, 8,286.1 estuarine acres (100%) were monitored during the assessment period. There were 2,061.6 estuarine acres (24.8%) identified as Impaired in this category.

The Division of Water Quality has concluded that current coastal stormwater rules have not adequately addressed water quality impacts to public trust waters. Additionally, DWQ's review of scientific studies has resulted in a determination that local governments' simply deferring to state and federal rules to address water quality issues still results in impaired local water quality based on the following conclusions:

- ▶ Areas that have impervious surfaces of 10% or greater can be linked to local stream degradation.
- ▶ Biological diversity has been shown to drop when areas of impervious surface increase beyond 10-15%.

- ▶ Stream stability is affected when impervious surface approaches 10% in an area.
- ▶ Estuaries generally degrade when areas have 10% impervious surface areas.
- ▶ Sensitive fish species loss increases with 12% impervious surface.

#### 2005 Recommendations:

The following recommendations were provided in the Basinwide Water Quality Management Plan for water bodies within Bald Head Island.

**Bald Head Creek.** From source to the Cape Fear River (79.9 acres) is Impaired for shellfish harvesting because this segment is classified by DEH SS as prohibited in growing area B-2. Bald Head Creek will be added to the 303(d) list of Impaired waters.

**Cape Fear River.** The 2000 basinwide plan recommended that a TMDL be developed for dissolved oxygen and that the TMDL be used to guide wasteload allocations for new and expanding discharges. The Cape Fear River from Polly Gully Creek to ICWW (11.3 miles) is Impaired for shellfish harvesting because these segments are classified by DEH SS as prohibited in growing areas B-1 and B-4. Segment 18-(87.5)a is Supporting aquatic life and recreation because no criteria were exceeded at sites BA722 and S-43. Segment 18-(87.5)B is Supporting shellfish harvesting and aquatic life because this area is approved and no criteria were exceeded at site BA734.

DWQ is developing a TMDL to address the low dissolved oxygen in these segments. TMDL targets and allocations will be addressed as part of the process. Modeling efforts will include a watershed model of the Northeast Cape Fear River and hydrodynamic and water quality modeling of the estuary. The TMDL was scheduled to be submitted to EPA in late 2005. Until the TMDL is approved by EPA, new and expanding discharges will be carefully considered on a case-by-case basis. The NPDES compliance process will be used to address the significant permit violations noted above.

**Fishing Creek.** From source to Bald Head Creek (7.9 acres) is Impaired for shellfishing harvesting because this segment is classified by DEH SS as prohibited in growing area B-1. Fishing Creek will be added to the 303(d) list of Impaired waters.

ii. Registered Animal Operations/Population Density within Cape Fear River Basin

The following table provides a summary of registered swine operations within Cape Fear River subbasin 03-06-17. The numbers only reflect those operations required by law to be registered. There are no registered cattle or poultry operations in the subbasin or adjacent to the Village.

**Table 28. Cape Fear River Basin - Subbasin 03-06-17  
Registered Animal Operations**

Subbasin	Swine*		
	No. of Facilities	No. of Animals	Total Steady State Live Weight**
03-06-17	7	40,866	6,381,110

\*There are no other registered animal operations located within subbasin 03-06-17.

\*\*Steady State Live Weight (SSLW) is the result, in pounds, after a conversion factor has been applied to the number (head count) of swine, cattle, or poultry on a farm. The conversion factors, which come from the Natural Resource Conservation Service (NRCS) guidelines, vary depending on the type of animals on the farm and the type of operation (for example, there are five types of hog farms). Since the amount of waste produced varies by the size of the animal, SSLW is the best way to compare the sizes of the farms.

Source: NC Division of Water Quality 2005 Cape Fear River Basinwide Water Quality Plan.

Table 29 provides population density by subbasin for the Cape Fear River Basin. This information is useful in determining what streams are likely to be affected by population growth.

**Table 29. Cape Fear River Basin  
Population Density, 2000**

Subbasin	Population Density (Persons/Sq. Mile)
03-06-01	352
03-06-02	441
03-06-03	508
03-06-04	181
03-06-05	419
03-06-06	315
03-06-07	257
03-06-08	510
03-06-09	180

**Table 29. Cape Fear River Basin  
Population Densities, 2000 (continued)**

Subbasin	Population Density (Persons/Sq. Mile)
03-06-10	101
03-06-11	98
03-06-12	82
03-06-13	162
03-06-14	166
03-06-15	344
03-06-16	85
03-06-17	143
03-06-18	173
03-06-19	63
03-06-20	42
03-06-21	113
03-06-22	66
03-06-23	148
03-06-24	361
Total	197

Source: NC Division of Water Quality 2005 Cape Fear River Basinwide Water Quality Plan.

### iii. Growth Trends

Between 1990 and 2000, the population within the Cape Fear River Basin increased an estimated 19.4%. The Cape Fear River Basinwide Water Quality Plan projects percent growth between 2000 and 2020 for counties in the basin. Since river basin boundaries do not coincide with county boundaries, these numbers are not directly applicable to the Cape Fear River Basin. They are estimates of county-wide population changes.

Population growth trends for the basin between 2000 and 2020 indicate eight counties with growth rates in excess of 30% and ten counties with growth rates of 20% to 30%, with a total population increase in the basin of 28.9%. According to the Water Quality Plan, Brunswick County is expected to experience a 35.2% population increase between 2000 and 2020. Growth rates and demographic information specific to the Village has been discussed earlier in the plan.



e. *Wastewater Treatment Facilities*

Originally the Village relied solely on private septic tank systems for the disposal and treatment of wastewater. As development increased within the Village, it became very apparent that an alternative method would be required due to the rapid increase in development that occurred between 1980 and 1990. In response to concerns related to wastewater treatment, Bald Head Island Utilities installed two 50,000 gpd package treatment plants, and began installing central sewer system lines throughout main thoroughfares of the Village. Bald Head Island Utilities, Inc., was the original owner of the utilities. The Village has acquired the water and sewer utility systems and assumed responsibilities regarding oversight and maintenance of the system.

This system became antiquated over time, so the two plants were replaced by a single batch processing plant that is capable of serving the entire Village. The Village is working toward running the central sewer system to all portions of its corporate limits; however, this process is taking time. Although a majority of the Village is currently served, several private septic systems still exist. Eventually it is anticipated that all properties will be served by the system, except those located at Middle Island. For more information about Middle Island, see Section VI(E)(2)(b) Future Land Use Acreages. Currently, the Village's policy is to extend sewer service to properties as they are developed or when property owners experience problems with their on-site septic systems. It is anticipated that over time this will result in the sewer extension to all portions of Stage I and Stage II, as well as Middle Island. It is anticipated that all properties within the Village will be on central sewer by the year 2027.

According to the Brunswick County Health Department, the private septic tank systems that do still exist within the Village are operating properly and do not pose a threat to water quality conditions within or adjacent to the Village.

f. *Natural Hazards*

The Village is very vulnerable to the effects of natural hazards in the form of hurricanes, coastal flooding, and nor'easters. One of the most significant impacts of these events is the flooding and beach erosion that occurs. The Village has a proactive approach to dealing with the issue of beach erosion; however, there is no straight forward approach to ensuring the safety of personal property when a hurricane and/or flooding event occurs. The locations of both flood zones and storm surge inundation areas have been discussed in detail earlier in the plan (refer to page 27). These two areas aim to define boundaries around portions of land that will potentially flood in storm events of varying magnitude.

In order to further define how significant an impact a major storm event may have on the Village, the following table provides the acreage within the AE and VE flood zones by land use type. These two flood zones are considered to be high hazard areas, where there is a one percent annual chance of a flooding event. The primary distinction between these two zones is that properties within the VE zone are also vulnerable to coastal wave action. All properties within these two zones are required to carry federal flood insurance. Additionally, development within these areas must comply with the Village's Flood Damage Prevention Ordinance, which has provisions for construction and finished floor elevation to increase the safety of a structure if a flooding event occurs. Table 30 provides the Village's acreage that falls within the AE and VE flood zones by land use. According to this table, 693 or 84.5% of the housing units within the Village fall within or are immediately adjacent to a flood hazard area. This includes both single- and multi-family housing units.

**Table 30: Village of Bald Head Island  
Developable Land Use Acreage within Flood Hazard Areas**

Land Use	Acres	% of Total
Association Owned Properties	125.5	6.3%
Commercial	12.7	0.6%
Government	9.0	0.5%
Multi-Family Residential	12.3	0.6%
Office & Institutional	2.2	0.1%
Right-of-Way	104.4	5.3%
Recreation	116.2	5.9%
Single-Family Residential	195.2	9.8%
Utilities	9.9	0.5%
Vacant	1,396.2	70.4%
Total	1,983.6	100.0%

NOTE: There are 654.8 undevelopable acres within the Village. These areas are comprised of wetlands, estuarine areas, and other water bodies.

Source: Holland Consulting Planners, Inc., Brunswick County GIS, and Bald Head Island.

*g. Natural Resources*

The Village is home to many natural resources including significant natural heritage areas, wetlands, public trust areas, and state-defined protected lands. These areas have been discussed in detail earlier in the plan. This discussion begins on page 25 of the plan and includes maps showing the locations of all natural resources and areas of environmental concern within the jurisdiction of the Village.

## C. ANALYSIS OF LAND USE AND DEVELOPMENT

### I. **Existing Land Use**

In order to address future development within the Village, it is necessary to establish a snapshot of what is currently developed within the Village's jurisdiction. Conducting a detailed land use survey allows for a review of existing land use patterns. This survey will assist in identifying land use patterns and trends that exist within the Village's planning jurisdiction. This process will serve two main purposes: identifying key conflicts in land use and addressing the issue of future housing demand. This review will provide a solid foundation for decisions regarding future land use and policy development.

A detailed land use survey was conducted for the entire planning jurisdiction of the Village. This survey was completed through the use of aerial photography, county tax data, and on-site windshield surveys. The existing land use map was then submitted to the Village Planning and Inspections Department for review to address any errors. Land use within the Village was broken into the following land use categories: multi-family residential, commercial, office & institutional, recreational, single-family residential, governmental, utility, right-of-way, and undeveloped.

The following provides a summary of what types of facilities are included in each of the land use categories listed above:

**Multi-Family Residential** - all residential structures with two or more attached dwelling units on a single property.

**Commercial** - This land use category includes private business operations located throughout the Village. These include restaurants, the marina, retail shopping facilities, and any commercially operated overnight accommodations (bed & breakfast operations)

**Office & Institutional** - These properties include all professional office-related uses, as well as any institutional uses. Institutional uses include churches, membership organization meeting facilities.

**Recreational** - Recreational land uses on the land use map correspond to all public/private recreational facilities. In the case of the Bald Head Island Golf Course, the entire complex has been shown as recreational. The clubhouse and pro shop facilities, although a commercial establishment, have been classified as recreational, due to the fact that they are a service facility tied to the golf course.

**Single-Family Residential** - This land use category includes all single-family residential dwellings.

**Governmental** - This includes all structures that support government activities. This includes administration buildings, as well as police and fire department facilities.

**Utility** - This land use category is reserved for all properties that have utility system components or other infrastructure components situated on them.

**Right-of-Way** - This land use category includes all land utilized for the Village's road infrastructure network.

**Undeveloped** - All vacant land falls under this category.

Map 13 provides an overview of existing land use within the Village based on the land use categories listed above. The following table provides a breakdown of land use acreage that corresponds to the existing land use map. All data regarding land use acreage have been provided for the Village's total jurisdiction.

**Table 31: Village of Bald Head Island  
Existing Land Use\***

Land Use	Acreage	% of Total
Association Owned Properties	115.7	4.8%
Commercial	14.2	0.6%
Government	14.0	0.6%
Multi-Family Residential	15.7	0.6%
Office & Institutional	2.4	0.1%
Right-of-Way	149.3	6.2%
Recreation	134.7	5.5%
Single-Family Residential	240.5	9.9%
Utilities	21.0	0.9%
Vacant	1,696.6	69.9%
Water	23.2	1.0%
Total	2,427.2	100.0%

\*The existing land use map is intended to show existing uses. The map does not take into account who owns the property, or whether there is public access to a given property.

Source: Holland Consulting Planners, Inc., Brunswick County GIS, and Village of Bald Head Island.

MAP 13 - EXISTING LAND USE

## 2. Land Use Conflicts

Land use conflicts often exist within a municipality's planning jurisdiction resulting from a variety of circumstances. Issues leading to land use conflicts can result from a lack of proper land use controls, demand for increased development, and situations beyond the municipality's control. The Village has been very conscious of these issues over the past, and has addressed many problems related to land use conflicts through adoption of local ordinances and installation of infrastructure. Although steps have been taken to address potential problems that may be detrimental to environmental conditions, several conflicts still exist within the Village planning jurisdiction. These issues are summarized as follows:

**Residential Development within Flood Hazard Areas.** The Village lies on a barrier island and is extremely vulnerable to coastal flooding associated with tropical storm events. The Village's vulnerability to flood hazards is discussed in detail beginning on page 27. As with other barrier island communities, this fact has not slowed development. The Village aims to ensure the safety of all property within its jurisdiction through proper land use controls. All residential structures are subject to requirements outlined in the Village's Flood Damage Prevention Ordinance, as well as the North Carolina State Building Code.

**Encroachment of residential and urban type uses into forested areas.** The Village is situated in the center of a maritime forest. As discussed in the natural systems analysis portion of the plan, the entire island is considered a protected land by the State of North Carolina. From the Village's origin, there has been a focus on preserving the maritime forest wherever feasible. The large Bald Head Woods Coastal Reserve centrally located on the island will never be developed, along with many other properties that have been established as conservation areas under the Smith Island Land Trust. The Village aims to protect the natural setting throughout the island by preserving the forest where possible, and promoting moderate density development. Additionally, there is a provision in the PUD ordinance that states where the peripheral property line is the boundary between the Planned Unit Development and the State of North Carolina Maritime Preserve, the required minimum setback shall be 20 feet. The issue of preserving the forest in light of continued development pressures will be addressed in the policy statement section of the plan.

### 3. Development Trends

The Village is a very unique municipality in that the entire jurisdiction exists primarily as a planned development. Because of this, development trends throughout the Village's jurisdiction are very predictable. From its origin, the Village has been developed as a residential community intended to support year round residents, as well as second homeowners and seasonal visitors. All nonresidential development within the Village's corporate limits exists solely to support the residents and visitors to the island. This includes governmental structures, retail commercial operations, recreational facilities, and utility facilities.

According to the land use survey conducted as part of the plan, approximately 59% of the Village's total parcels remain vacant. With the exception of several large conservation easements, nearly all of these vacant parcels have been platted for single-family residential development. These parcels are scattered throughout the Village's jurisdiction. It is anticipated that a majority of these vacant parcels will be developed as single-family residential homes, although some multi-unit complexes may be developed in conjunction with planned unit developments.

In order to provide a forecast of how vacant land will be developed throughout the Village's jurisdiction, an overlay analysis was performed based on the existing land use survey and the Village's zoning map. Based on this analysis, the zoning district of each undeveloped parcel has been identified. Table 32 provides a summary of how all vacant parcels will be developed, if this development follows existing zoning patterns.

**Table 32: Village of Bald Head Island  
Zoning Classification of Undeveloped Properties**

Zoning District	Parcels	% of Total Vacant Parcels	Acreage by Land Use	% of Total Vacant Acreage
PD - 1	760	60.0%	406.3	41.5%
PD - 2	323	25.5%	367.4	37.5%
PD - 2C	41	3.2%	39.6	4.1%
PD - 3	51	4.0%	14.2	1.5%
PD - 3C	13	1.0%	5.8	0.6%
PD - 3C - I	6	0.5%	9.8	1.0%
PD - 4	67	5.3%	134.4	13.7%
PD - NC	5	0.4%	1.7	0.2%
Total	1,266	100.0%	979.3	100.0%

Source: Holland Consulting Planners, Inc., and Village of Bald Head Island.

Refer to page 97 for a summary of the zoning districts included in the table above, as well as the intended use of each zoning district as defined in the Village’s zoning ordinance.

According to this information, 1,078 or 86.7% of the Village’s undeveloped land is zoned for moderate density single-family development. It is difficult to judge how rapidly this development will take place. The Village planning and inspections office has issued an average of 68 building permits per year over the last five years. It is anticipated that development of all vacant parcels will continue at this rate across the Village’s jurisdiction. It is not expected that rapid development will occur in specific portions of the Village’s jurisdiction.

In addition to falling under the land use controls established for the zoning districts designated above, approximately 407 acres of vacant property also fall within the Maritime Forest Protection Overlay District. The standards for this overlay district are intended to establish restrictions on development beyond those outlined in a property’s primary zoning district. These restrictions are intended to promote development that is compatible with the environmentally sensitive nature of the Bald Head Island and Middle Island maritime forest. For more information about Middle Island, see Section VI(E)(2)(b) Future Land Use Acreages. The overall purpose of this district is to protect natural features and functions of the area in the interest of health, safety and general welfare of the residents and visitors of the Village.

#### **4. Historical, Cultural, and Scenic Areas**

There are several Protected Lands and state-defined Natural Heritage areas that fall within the planning jurisdiction of the Village. These areas have been thoroughly discussed in the Natural Systems Analysis portion of this plan beginning on page 25. All fragile areas are discussed and maps detailing the locations of these areas are provided.

#### **5. Land Use in Relation to Environmental Composite Map**

The environmental composite map (Map 11) was discussed beginning on page 58 of the plan. This map is intended to break the Village’s jurisdiction into varying classes in accordance with environmentally sensitive areas. For a detailed discussion of how this map was compiled and what the various classes mean, refer to Section B(2). The following table provides a summary of how the undeveloped parcels in the Village relate to the classes established on the environmental composite map. If a parcel was located in more than one class as defined in the environmental composite analysis, the most environmentally sensitive class was assigned to that parcel.



**Table 33: Village of Bald Head Island  
Undeveloped Land in Relation to Environmental Composite Analysis (Class I-III)**

Environmental Composite Map	Acreage by Land Use	% of Total Vacant Acreage
Class I	0.00	0.0%
Class II	571.76	33.0%
Class III	1,161.17	67.0%
Total	1,732.93	100.0%

Source: NC Division of Coastal Management and Holland Consulting Planners, Inc.

## 6. Land Use Demand Forecast

In order to gauge the rate of growth within the Village, it is necessary to establish estimates of how rapidly development is expected to occur. Many times land use demand is established based on the growth rate of a jurisdiction's population. The Village, as well as other barrier island communities, faces a different situation than a typical inland municipality.

One issue is that there is no space to grow. The Village has no means through which to expand. The Village cannot establish an extraterritorial jurisdiction, which would establish land use control over land beyond the Village's primary corporate limits. Another issue is that the Village is growing rapidly and the amount of vacant land available for development is diminishing rapidly. Approximately 59% of the Village's total platted tax parcels remain undeveloped. Of the 1,291 vacant parcels, 1,078 or 87% are zoned for single-family residential development.

The Village does not have a problem supporting the permanent or seasonal population in terms of housing. There is more than adequate housing to support these two populations. As the housing stock increases, so will the peak seasonal population until total build out occurs. Due to the unique nature of development within the Village, residential development estimates have been established based on building permit activity over the last five years. Over the last five years, an average of 68 residential building permits have been issued annually. Table 34 provides a summary of these estimates. The land demand forecast, outlined below, have only been compiled for residential land use throughout the Village's corporate limits. Development of non-residential structures is expected to be minimal through build-out of the Village's developable acreage. Non-residential development, as indicated on the Future Land use Map, will be in the form of mixed use nodes. These mixed use nodes will combine commercial, office & institutional, and residential uses in an effort to minimize the impact of varying land uses.

**Table 34: Village of Bald Head Island  
Residential Land Use Demand Estimates**

	2005**	2010	2015	2020	2025
Residential Acreage (Single- and Multi-Family)*	256.2	358.2	460.2	562.2	664.2
Residential Unit Increase	820	1,160	1,500	1,840	2,180

\*Residential acreage increase is based on the average lot size of all remaining undeveloped land within the Village's jurisdiction. The average lot size is 0.3 acre. Unbuildable land was eliminated prior to calculating the average lot size for vacant properties.

\*\*Figure based on the existing land use survey.

\*\*\*It should be noted that the land demand forecast outlined above have been compiled independently of population forecast noted on page 25. In comparing the two forecasts, it appears that at peak season the average household size will remain at approximately five (5) persons.

Sources: Holland Consulting Planners, Inc., and Village of Bald Head Island Planning Department.

## **D. ANALYSIS OF EXISTING COMMUNITY FACILITIES/SERVICES**

### **I. Transportation**

The Village is a very unique location in that no automobiles are permitted on the island for personal transportation. Travel to and from the Village is provided by a private ferry system that operates year round. The ferry system is operated by the primary developer on the island, Bald Head Island Limited, and provides residents and visitors with round trip service originating from Indigo Plantation located in Southport, NC. The road network present throughout the Village does support passenger vehicles and full size vehicles are allowed in the Village by permit only. These vehicles are generally present on the island to support construction activity. The vehicles are transported to the island by barge. There are several trucks that remain on the island year round to support municipal operations, including emergency management and police operations.

The roads within the Village are not state maintained. A majority of the road network throughout the Village is maintained by the Village. There are several right-of-ways that fall under the jurisdiction of Property Owners Associations; however, over time some of these roads may be dedicated to the Village. Once this transaction is complete, the Village assumes all maintenance responsibility in these areas. For all municipally maintained rights-of-way, the Village receives state street-aid or Powell Bill allocations for the purposes of maintaining, repairing, constructing, reconstructing, or widening of local streets. Powell Bill funds are distributed on both a per capita (based on permanent population) and a total mileage basis. For fiscal year 2004, the per capita distribution was \$23.43, while the per mile distribution was \$1,718.80. Additionally, the speed

limit throughout the Village is eighteen miles per hour. Because the speed limit is below the state minimum for a municipality, speed limit and other traffic related laws are enforced through Village Ordinances.

## **2. Health Care**

There are no medical facilities within the corporate limits of the Village. There are systems in place to emergency evacuate a patient, if necessary. A summary of the fire/EMS operations within the Village will be provided below. The closest hospital, as well as emergency medical facilities, is located in Southport.

J. Arthur Doshier Memorial Hospital in Southport, founded in 1930, provides comprehensive medical care to residents of Southport and the Smithville Township. The hospital is owned by the Smithville Township taxpayers and is managed by an elected seven member Board of Trustees. Doshier Memorial Hospital and the Skilled Nursing Center are both accredited by the Joint Commission on Accreditation of Healthcare Organizations. The laboratory and Cardiopulmonary Service are accredited by the College of American Pathologists. The Diagnostic Imaging Department is accredited by the American College of Radiology in Mammography and the hospital has been certified in Mammography by the Food and Drug Administration. The hospital is licensed for 36 acute care beds and 64 nursing center beds and has a staff of 300.

Last year the hospital served 11,624 patients in the Emergency Room, over 2,000 outpatients in the OR, 500 inpatients in the OR, 83,000 outpatients in Lab Services, 33,000 inpatients in Lab Services, 5,400 outpatients in Cardiopulmonary, 30,000 inpatients in Cardiopulmonary, 26,000 outpatients in Diagnostic Imaging, and 4,000 inpatients in Diagnostic Imaging. Following are services provided at the facility:

- ▶ Acute Nursing Care
- ▶ Cardiopulmonary and Respiratory Therapy
- ▶ Diagnostic Imaging
- ▶ Emergency Services
- ▶ Lab Services
- ▶ Nutritional Counseling
- ▶ Skilled Nursing Center
- ▶ Social Services
- ▶ Therapy Services (Speech, Physical, and Occupational)

- ▶ OR Procedures and Surgeries (General, Gynecology, Ophthalmology, Orthopedic, Otolaryngology, and Urology)
- ▶ Cardiac Rehabilitation - (2005)

There are also a large number of specialists with offices located in Southport. These include dentists, family practice doctors, general practice doctors, and physical therapy. The Village fire/EMS department works in cooperation with Airlink, the emergency response evacuation service run through New Hanover Regional Medical Center. There are several evacuation spots located through the corporate limits of the Village.

### **3. Police Department**

The Village operates a 12 person full-time police department located in a 3,200 square foot facility at 253 Edward Teach Wynd Extension. The department employs 11 sworn officers and one administrative assistant. At least two police officers are on duty at all times, and staffing levels are increased during peak summer months. All emergency response calls to the department are routed through the Brunswick County Emergency 911 call center. The Village police department does not house any jail facilities. All custody arrests are transported to the Brunswick County Detention Center. The following provides a summary of the operations vehicles utilized by the department:

- ▶ 3 gas powered four wheel drive trucks
- ▶ 2 electric powered golf carts
- ▶ 3 bicycles

### **4. Fire/EMS Services**

The Village Fire and Emergency Management operations center is located immediately adjacent to the police department at 251 Edward Teach Wynd Extension. The department employs seven full-time and eight part-time firefighters. All firefighters are also paramedics. The department is also assisted by 41 local volunteers. The Village is under a mutual aid agreement with departments on both Oak Island and the City of Southport. If needed, fire trucks from Oak Island are transported by barge, while fireman are transferred to the island by the US Coast Guard. Fireman from the Southport Fire Department are transferred to the island by ferry if their services are required. The Village Fire Department receives service from Airlink, an air ambulance service that operates out of New Hanover Regional Medical Center. There are several sites located

throughout the island that serve as landing sites for the Airlink helicopters. The following provides a listing of all service equipment utilized by the Village Fire/EMS department:

- ▶ 1,250 GPM Ladder Truck
- ▶ 1,250 GPM Pumper Truck
- ▶ 1,500 GPM Pumper (Fire Truck)
- ▶ 2 Ambulances (housed at the Village Fire Department)
- ▶ 1 Ambulance (located at Indigo Plantation)
- ▶ 1 seven man Zodiac Inflatable Rescue Boat
- ▶ 1 beach rescue truck
- ▶ 1 command vehicle

**5. Administration**

The Village utilizes a mayor-council-manager form of government. The Village currently has 33 full-time employees. The following provides a summary of governmental organizations and employees.

▶ Administration/Building Inspections	9
▶ Fire/EMS	7
▶ Police Department	12
▶ Public Works	5

**6. Water System**

The Village operates a community public water system that serves all but 14 of the Village’s residents. The water system operates off a series of 16 wells throughout the Village that are tapped into a semi-confined aquifer underneath the island. The water from these wells is treated and served to all residential and nonresidential units. A major water line from the Brunswick County Water System also ties into the Village of Bald Head Island Utilities water system from Oak Island. This county water supplies on average 42% of the water currently utilized by Village residents during any given period of time.

In the event that this county water line is damaged or shut down, the Village must rely on the water supplied by the local well system. The water provided by these wells is sufficient to support current demand. In peak summer months, however, water conservation measures may have to

be taken if the county water line is not in operation. Map 14 provides a view of the water system that currently exists on Bald Head Island. It should be noted that the Village Fire Department has a boosting station that will increase fire flow.

## **7. Sewer System**

The Village recently acquired both the water and sewer systems from Bald Head Island Utilities, Inc. The North Carolina Division of Water Quality has jurisdiction over all wastewater treatment facilities located throughout the Village. In the 1970s and early 1980s, a majority of the residential units on the island relied heavily on private septic tank systems or cluster systems. Cluster systems, also known as mound fields, are septic systems where several units are tied to one large septic tank, which utilizes a single drain field.

Prior to the utilities acquisition, Bald Head Island Utilities, Inc., developed two independent wastewater treatment facilities to address concerns regarding the traditional septic systems. These two plants have been shut down and converted to lift stations since the construction of the new Batch Processing Plant in 1996, which now handles a majority of the waste treatment throughout the Village. The most significant portion of the Village not served by Village of Bald Head Island Utilities central sewer system is Middle Island, which still relies on private septic tank systems. For more information on Middle Island, see Section VI(E)(2)(b) Future Land Use Acreages.

The batch processing plant now serving the Village is an innovative system that allows for extreme fluctuations in wastewater flow. Traditional sewage treatment plants require constant wastewater flow in order to keep the system up and running. This new system allows the utilities department to shut down portions of the system during winter months. As peak summer months arrive, the system can be revived at a fairly rapid pace, allowing the Village to deal with the additional wastewater flows generated during summer months. The new system works extremely well, and is currently operating well below maximum capacity. It is estimated that approximately 94% of the Village's residential and nonresidential units are currently being served by the central treatment system. The following summarizes the existing system capacity for the Village's wastewater treatment system: Capacity - 400,000 gpd; Peak Season Capacity Utilized - 152,000 gpd; Off Season Capacity Utilized - 52,000 gpd.

Appendix VI outlines the units that still rely on private septic systems for wastewater treatment.

MAP 14 - EXISTING WATER LINES

## 8. Solid Waste

Solid waste disposal services are provided by Waste Industries. The Village is billed for the service, and in turn recoups the cost through property tax revenues. Trash pickup is provided in the Village once per week during winter months (Labor Day through Memorial Day), and twice per week during summer months. Yard debris is picked up once per month during winter months (first Wednesday) and twice per month during the summer (first and third Wednesday).

## 9. Schools

The Village is served by the Brunswick County School System. Students in grades K-12 must take the public ferry to Indigo Plantation, in order to receive either private or public transportation to their respective school. Brunswick County school bus service is provided to/from the Indigo Plantation Ferry Terminal. Southport Elementary School serves grades K-5. The school is located at 701 West 9<sup>th</sup> Street. Village students in grades 6-8 attend South Brunswick Middle School and students in grades 9-12 attend South Brunswick High School. Both the middle and high schools are in nearby Boiling Spring Lakes. Table 35 provides a summary of the schools that serve the Village's school age children.

**Table 35: Schools Serving the Village's School Age Children**

School	Enrollment	Staff	Recreational Facilities
Southport Elementary School Grades K-5	594	93	Playground, gym
South Brunswick Middle School Grades 6-8	907	99	Gym, soccer field, baseball/softball field, fitness walk
South Brunswick High School Grades 9-12	1,050	90	Gym, auxiliary gym, track, football field, baseball/softball fields, tennis courts

Source: Brunswick County School System.

Higher education is offered in nearby Southport at a Brunswick Community College (BCC) annex facility. The community college offers a variety of continuing education classes including: Art, Southport-Brunswick County History, Computer, Basic Law Enforcement, Calligraphy, and Sign Language. Village residents are also in close proximity to the BCC main campus where one can earn an Associate Degrees in Applied Science or a technical certificate. The University of North Carolina at Wilmington (UNCW) is also within commuting distance to the Village's residents. UNCW is a major four-year university, and is part of the University of North Carolina system.



## **10. Recreation**

The Village does not operate any municipal park facilities. A majority of the recreational facilities provided throughout the Village are operated by one of several property owners' associations that operate within the Village. Additionally, the Bald Head Island Golf Course and Country Club provides golfing, tennis courts, and a swimming pool for members, as well as visitors. The Village does have public beach access points through its corporate limits. These public access points provide easements that the general public may utilize to access the beach. A majority of these municipal accesses provide parking areas for golf carts and bicycles. There is also a public creek access that is maintained and operated by the Village. This creek access provide residents with a place to store small boats and kayaks. Kayaks may also be rented for daily use by visitors to the Village. Provision of a municipal recreational facility is a concern of the Village, and this issue will be addressed in the policy statement section of the plan.

The Shoals Club is a private facility providing recreational opportunities that is available to Village residents. The club offers an oceanfront clubhouse, dining areas, lounge, fitness room, shower and locker facilities, swimming pools, and direct beach access. Membership in the Bald Head Island Club is required prior to establishing membership in the Shoals Club.

## **11. Post Office**

In late 1989 and early 1990, negotiations were being formulated to handle the transport and delivery of the United States Postal Service Mail to Bald Head Island, NC. The growth and rapid development of the Village created this need for its permanent residents. Representative Redwine proposed House Bill 608, which was ratified June 20, 1991, in the General Assembly of North Carolina. This act allowed the Village to operate a United States Post Office facility, under contract with the United States Postal Service. This act applied to the Village of Bald Head Island only. Today, the Village's Contract Postal Unit has grown along with the development of Bald Head Island.

The United States Postal Service places the mail from Southport on the 11 a.m., ferry originating from the Indigo Ferry Landing. The ferry arrives at the Marina Ferry Landing at 11:30 a.m. The Public Works Department unloads the mail and transports it to the Village Post Office as soon as possible.

All Registered mail and packages, Express mail and packages, Priority mail and packages, First Class mail and packages, Wall Street Journals and other daily papers are distributed before 1 p.m. The window hours are from 1 p.m., to 3 p.m., Monday through Friday, except for Federal Holidays.

The Postmaster for the CPU must close the window at 3 p.m., and leave on the 3:30 p.m., ferry arriving at the Indigo Ferry Landing at approximately 4 p.m. The Southport USPS closes at 4:30 p.m. All mail transactions from Bald Head Island must be taken to the loading dock at the back of the Post Office in Southport before 4:15 p.m. Except for Registered Mail, Express Mail, International Express Mail, Global Priority, Customs mail and packages, this must be taken to a Window Clerk for electronic scanning.

## **12. Electric Service**

All residences and businesses within the Village's planning jurisdiction receive electric service from Progress Energy.

## **13. Stormwater Management**

### *a. Introduction*

Stormwater is pure rainwater plus anything the rain carries along with it. In urban areas, rain that falls on the roof of a house, or collects on paved areas like driveways, roads, and footpaths is carried away through a system of pipes that is separate from the sewerage system. Unlike sewage, stormwater is not treated. In some cases it is filtered through traps, usually located at the end of the pipe system, but it still flows directly from streets and gutters into the Cape Fear River and ocean, straight from the street to waterways inhabited by fish and other aquatic animals and plants in these estuarine environments. There are three main types of stormwater pollution: litter, such as cigarette butts, cans, paper, or plastic bags; chemical pollution, such as detergents, oil, or fertilizers; and 'natural' pollution, such as leaves, garden clippings, or animal droppings.

### *b. Existing Drainage Problems*

An issue that the Village is constantly dealing with is stormwater management. There are many areas within the corporate limits that experience localized flooding and ponding of water subsequent to significant rains and storm events. The location of these stormwater problem areas are outlined on Map 15. Problems related to stormwater management are generally situated within the Stage I or western portion of the Village's corporate limits. The Village has taken a proactive approach to dealing with the problems that have been experienced with stormwater drainage. A study and proposed design for a municipal storm sewer system was prepared by Cape Fear Engineering in 2000. This report is intended to deal with stormwater issues within the Stage I

portion of the Village. The report cites general recommendations for collecting and treating stormwater generated within this portion of the Village. For further details regarding this study, refer to the report document entitled Design Report for Stormwater Controls at Bald Head Island, Stage One. This document is available at Village Hall. At this time, the village is preparing to review the existing plan and work with McKim & Creed and Coastal Land Design to move forward with implementation.

*c. Water Quality Problems*

Stormwater runoff is a significant problem with respect to water quality. Water quality within and adjacent to the corporate limits of the Village has been discussed in detail in the Natural Systems Analysis (Page 25) and Environmental Conditions (Page 61) sections of the plan. The Village does not currently have a comprehensive stormwater management system, but as noted will be installing a system to address stormwater runoff throughout large portions of the Village's corporate limits. This system will not only collect stormwater, but will treat the water prior to disposing of it into the adjacent water bodies. Addressing this problem through development of a stormwater management system will help reduce the impact the Village's runoff is having on the waters of the Cape Fear River, as well as the Atlantic Ocean.

*d. EPA Regulations*

The Environmental Protection Agency (EPA) has begun implementation of Phase II of the National Pollutant Discharge Elimination System (NPDES). These policies apply to municipalities with populations greater than 10,000 and with densities of 1,000 per square mile. For municipalities that meet these parameters, submittal of a stormwater management plan is required. Phase II regulations apply to all entities that meet these criteria based on both the 1990 and 2000 census. This will apply only if the entity is operating a Small MS4 (Small Municipal Separate Storm Sewer System). An MS4 is defined as a publicly-owned conveyance or system of conveyances designed or used for collecting and conveying stormwater. MS4's are not combined with sewer and are not part of a publicly-owned treatment facility. At this time, the Village is not required to meet the new EPA Phase II Stormwater Management Program regulations.

The Village may be required to submit a stormwater management permit application under Phase III of the NPDES program. It is more likely, however, that the Village will fall under the jurisdiction of the Brunswick County Comprehensive Stormwater Management Program.

MAP 15 - STORMWATER CONCERNS

e. *Construction Activities*

Stormwater runoff from construction activities can have a significant impact on water quality, contributing sediment and other pollutants exposed at construction sites. The NPDES Stormwater Program requires operators of both large and small construction sites to obtain authorization to discharge stormwater under an NPDES construction stormwater permit. In 1990, the Phase I Stormwater Management Program regulations addressed large construction operations that disturbed five (5) or more acres of land. The NPDES program also addresses small construction activities – those that disturb less than five (5) acres of land – which were included in the Phase II final rule. Construction activities that disturb over one (1) acre of land are required to develop and implement a stormwater pollution prevention plan specifically designed for the construction site. The development implementations of the plan follow the basic phases listed below:

- (1) Site Planning and Design Development Phase
- (2) Assessment Phase
- (3) Control Selection/Design Phase
- (4) Certification/Verification/Approval Phase
- (5) Implementation/Construction Phase
- (6) Final Stabilization/Termination Phase

f. *North Carolina Shoreline Buffering*

In August 2000, the State of North Carolina developed a 30 foot buffering rule for all new development in the 20 coastal counties governed by the Coastal Area Management Act (CAMA). This rule applies to all navigable waters, excluding the ocean, which has previously established setback requirements. The development of this buffer does not restrict the construction of water dependent structures, such as docks and boat ramps. The benefits of the buffering include the following:

- (1) Flood Control – by reducing the velocity and providing a collection area for stormwater runoff and precipitation. Buffers encourage water infiltration into the ground, rather than flooding low-lying areas.
- (2) Groundwater Recharge – buffers are also beneficial to recharging the groundwater supply and promoting groundwater flow.
- (3) Soil Erosion Prevention – vegetated buffers stabilize the soil and reduce sedimentation.

- (4) Conservation of Coastal Riparian Wildlife Habitats – these natural areas provide breeding, nesting, and habitat, and protect wildlife from predation. Vegetated buffers help increase the diversity of wildlife while providing site for foraging and corridors for dispersal.

#### E. LAND SUITABILITY ANALYSIS

A thorough analysis of all impediments to development, as well as existing community facilities, has been completed in the preceding sections. All of these variables factor into suitability for development for a specific piece of property. In order to assess what affect the various man-made and environmental constraints will have on development throughout the Village, an overlay analysis was performed. This overlay analysis is a Geographic Information System (GIS)-based process geared toward evaluating the suitability of land for development. The procedure is very similar to the practice developed by Ian McHarg, in which geospatial data layers are referenced to each other in an effort to determine what portions of a land mass appear to be the most favorable sites for a specific land use.

The overall process utilized Arcview GIS software with the Spatial Analyst extension along with data layers provided by the North Carolina Center for Geographic Information and Analysis (NCGIA). The analysis takes into consideration a number of factors, including natural systems constraints, compatibility with existing land uses and development patterns, existing land use policies, and the availability of community facilities. The end product of this analysis is a land suitability map that shows underutilized land that is suited or not suited for development (see Map 16). This map can be used as a foundation for the discussion and formation of village-wide land use policy and should be compared to the future land use map.

Land suitability analysis involves the application of criteria to the landscape to assess where land is most and least suitable for development of structures and infrastructure. A computer application is not essential for this analysis, but greatly simplifies the process. There are eight key steps to completing the overlay analysis:

- (1) Define criteria for the analysis
- (2) Define data needed
- (3) Determine what GIS analysis operations should be performed
- (4) Prepare the data
- (5) Create a model
- (6) Run the model
- (7) Analyze results
- (8) Refine model as needed

All of these steps have been completed, and as noted above, the end product is displayed on Map 16. There were no additions or adjustments to the default layer sets and weighting factors provided by the Division of Coastal Management to the Village for the existing land suitability analysis map. Prior to producing the map, data was compiled and each data layer in conjunction with criteria was assigned a weight. The Village was then divided into one-acre squares. Each of these one-acre squares of land was given a score based on how that respective piece of property related to each data layer. The score for each data layer was multiplied against that given layer's weight. The scores for each layer were added together to determine a suitability rating for that one-acre square of property. The suitability rating falls into four primary categories: least suitable, low suitability, medium suitability, and high suitability.

The following table summarizes all data layers used, including the criteria and weight assigned to each layer.

**Table 36. Land Suitability Analysis Criteria Table**

Layer Name		Criteria and Rating				Assigned Weight
		Least Suitable	Low Suitability	Medium Suitability	High Suitability	
		0	-2	1	+2	
Coastal Wetlands	Exclusion*	Inside	--	Outside	--	
Exceptional & Substantial Non-Coastal Wetlands	Exclusion*	Inside	--	Outside	--	
Estuarine Waters	Exclusion*	Inside	--	Outside	--	
Protected Lands	Exclusion*	Inside	--	Outside	--	
Storm Surge Areas	Weighted	--	Inside	--	Outside	2
Soils (Septic Limitations)	Weighted	--	Severe	Moderate	Slight	2
Flood Zones	Weighted	--	Inside	--	Outside	2
HQW/ORW Watersheds	Weighted	--	Inside	--	Outside	1
Natural Heritage Areas	Weighted	--	< 500'	--	> 500'	1
Hazardous Substance Disposal Sites	Weighted	--	< 500'	--	> 500'	1
NPDES Sites	Weighted	--	< 500'	--	> 500'	1
Wastewater Treatment Plants	Weighted	--	< 500'	--	> 500'	1
Discharge Points	Weighted	--	< 500'	--	> 500'	1
Land Application Sites	Weighted	--	< 500'	--	> 500'	1
Developed Land	Weighted	--	> 1 mi	.5 - 1 mi	< .5 mi	1
Roads	Weighted	--	> 1 mi	.5 - 1 mi	< .5 mi	2
Water Pipes	Weighted	--	> .5 mi	.25 - .5 mi	< .25 mi	3
Sewer Pipes	Weighted	--	> .5 mi	.25 - .5 mi	< .25 mi	3

\*Data layers that are slated as exclusion have a suitability of 0 or 1, meaning that if a specific one-acre piece of property falls within one of these areas, it is automatically considered least suitable for development.

Source: NCGIA and CAMA.

MAP 16 - LSA



Overall, land in the Village is moderately suitable for development. Table 38 provides a summary of land suitability acreage based on the results of the overlay analysis.

**Table 37. Village of Bald Head Island LSA Acreage**

Suitability	Acreage	% of Total
Least Suitable	1,642	52.5%
Low Suitability	568	18.2%
Medium Suitability	704	22.5%
High Suitability	215	6.9%
Total	3,129	100.0%

Source: Holland Consulting Planners (April, 2003); North Carolina Center for Geographic Information and Analysis.

## **F. CURRENT PLANS, POLICIES, AND REGULATIONS**

### **I. Introduction**

The Village has adopted a comprehensive Municipal Code that addresses a wide range of topics with respect to development, environmental protection, and daily operations. This code serves as the primary tool for construction and future development for the Village's planning and inspections department. The code is enforced by the Village Administration, as well as the Village Council and Planning Board. The Village Code addresses the following topics: Administration; Animals; Buildings and Building Regulations; Civil Emergencies; Environment; Fire Prevention and Protection; Floods; Offenses and Miscellaneous Provisions; Parks and Recreation; Solid Waste Management; Stormwater Management; Streets, Sidewalks, and other Public Places; Subdivisions; Traffic and Vehicles; Utilities; and Zoning. The following provides a summary of all Village Codes that relate to land use and future development/redevelopment.

### **2. Buildings and Building Regulations (Chapter 6)**

Chapter 6 of the Municipal Code includes these regulations. The town has adopted and enforces the North Carolina state building, plumbing, heating, electrical, and residential codes. This chapter also outlines the procedures related to applying for and obtaining a building permit for construction. Additionally, the general duties and powers of the Village's inspections department are outlined in this chapter.

### **3. Environment (Chapter 10)**

Chapter 10 of the Village Code addresses issues related to protection of environmentally sensitive areas. Specifically, this chapter provides provisions for the process of identifying and removing junked vehicles, dune protection, and groin protection. The Village has adopted a dune protection ordinance to ensure the safety of the frontal dune line which runs along oceanfront portions of the Village's corporate limits. According to this ordinance, it is unlawful to disturb or infringe on any frontal dune areas except at marked public access points, which are located throughout the Village. It is also illegal to construct a dune crossing or oceanfront access without the issuance of a building permit and CAMA permit from the Village Building Inspector. The groin protection ordinance is intended to protect the geo-textile tube installed on the east and west facing beaches of the Village. These tubes are installed to stabilize the beach, and are imperative to slowing down the effects of beach erosion.

### **4. Floods (Chapter 14)**

The Village is a standard member of the National Flood Insurance Program (NFIP). The NFIP has recently completed updated floodplain maps, and these maps are in the final review stage prior to adoption. The floodplain maps have been discussed further in the Natural Systems Analysis Constraints section of the plan.

In accordance with regulations under the NFIP, the Village has an updated Flood Damage Prevention Ordinance. The purpose of the new ordinance is as follows:

- (1) Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion, flood heights or velocities;
- (2) Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- (3) Control the alteration of natural floodplains, stream channels, and natural protective barriers which are involved in the accommodation of flood waters;
- (4) Control filling, grading, dredging, and all other development which may increase erosion or flood damage; and

- (5) Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

## **5. Stormwater Management (Chapter 22)**

This ordinance is intended to address the issue of stormwater management throughout the Village's planning jurisdiction. It is important to take a proactive approach to dealing with stormwater for the protection of both surface and ground water within and adjacent to the corporate limits of the Village. This ordinance contains language outlining all standards for development as outlined by NC Department of Environment and Natural Resources and NCDCM. The intent of this ordinance is summarized as follows:

- (1) Regulate existing developments, new development, and construction activities in accordance with state requirements and institute additional mandatory requirements to prevent careless pollution of surface waters, groundwaters, and the creation of additional floodprone areas;
- (2) Establish the authority of the Village to administer and enforce stormwater regulations;
- (3) Create public education programs so that the citizens of the Village will have knowledge of how to reduce and prevent pollution from their homes and businesses.

## **6. Streets, Sidewalks, and Other Public Places (Chapter 24)**

The use and maintenance of streets, sidewalks, and all other public access locations is regulated by Chapter 24 of the Village Code. Damage to streets, bridges, lights, and signs is regulated and prohibited. Additionally, the use of vehicles and the standards related to motorized vehicles are also outlined in this ordinance.

## **7. Subdivisions (Chapter 26)**

Chapter 26 of the Village Code provides the Village's subdivision regulations. The following excerpt from the subdivision ordinance provides the purpose of the subdivision regulations:

“The purpose of this chapter is to regulate and control the subdivision of land within the limits of the Village in order to promote the public health, safety, and general welfare of the community. They are designed to lessen congestion in the streets and roadways; to further the orderly layout and use of land; to ensure proper legal description and proper monumenting of subdivided lands; to secure safety from fire, panic and other dangers; to provide adequate light and air; to prevent the overcrowding of land and avoid undue concentration of population; to facilitate adequate provisions for transportation, water, sewerage, open space, recreational areas, and other public requirements; and to facilitate the further resubdivision of larger tracts into small parcels of land.”

Specifically, the subdivision regulations require that:

- ▶ Town services shall not be provided until a final subdivision plat is approved;
- ▶ No streets or utilities shall be accepted until a final subdivision plat is approved;
- ▶ No construction permits shall be issued until a final subdivision plat is approved.

## **8. Utilities (Chapter 30)**

Chapter 30 of the Village Code establishes regulations regarding the installation of utility lines throughout the Village’s planning jurisdiction. It is unlawful to install or construct above ground utility lines at any location throughout the corporate limits unless a property owner falls under one of the exemptions outlined under Section 30-34 of the Village Municipal Code.

## **9. Zoning Ordinance (Chapter 32)**

The Village zoning ordinance is included in Chapter 32 of the Municipal Code. The purposes of the zoning ordinance, as stated in the Section 32-1 of the ordinance, are as follows:

“(1) Secure safety from fire, panic, and other dangers; (2) Promote health and general welfare; (3) Provide adequate air and light; (4) Prevent the overcrowding of land; (5) Avoid undue concentration of population; (6) Facilitate the adequate provisions of public requirements; (7) Conserve the value of buildings and encourage the most appropriate use of land throughout the Village; and (8) Protect

the areas ecology through full cooperation with the County, State, and Local authorities.”

The zoning ordinance includes the following seven land use districts, and two overlay districts. Each parcel of land in the Village is included in at least one of the following districts:

**PD - 1.** Planned Development 1 District is established as a district in which the principal use of land is for dwellings. It is encouraged that this land be utilized primarily for single-family residential development. Uses in this district shall not include any commercial or trade activity except that associated with a golf course or clubhouse. It is the intent of this district to preserve the natural environment as much as possible.

**PD - 2.** Planned Development 2 District is established as a district in which the principal use of land is for residential dwellings. Uses compatible with those outline in PD - 1 are promoted. It is also the intent of this district to protect the natural environment by limiting maximum lot coverage, providing common areas adjacent to all lots, clustering residential nodes, and preserving a sizeable maritime forest area without intrusions.

**PD - 2C.** Planned Development 2 Commercial District is established as a district in which the principal uses of land are for commercial, municipal, and utility service areas for the entire island.

**PD - 3.** Planned Development 3 District is established as a district in which the principal use of land is residential but with some offices allowed and bed and breakfast without commercial restaurant facilities.

**PD - 3C.** Planned Development 3 Commercial District is established as a district in which the principal use of land is for mixed uses which includes residential uses, commercial services, offices, marina and marina related uses, club facilities, transient inn uses and leisure activities and their attendant uses.

**PD - 4.** Planned Unit Development 4 District is established as a district in which the principal use of land is for single-family residential dwellings on large lots, leisure activities, and the protection of the natural environment.

**NC.** The Neighborhood Commercial District is primarily intended to accommodate very low intensity office, and personal service uses within residential areas. The district is established to provide convenient locations for businesses, which serve the needs of Island residents and visitors without disrupting the character of the neighborhood. The neighborhood commercial district is a transitional land use zoning district in which the principal use of land is residential with some office and service uses allowed to serve the surrounding residential districts and in which traffic and parking congestion can be reduced to a minimum in order to preserve residential values and promote the general welfare of the surrounding residential districts.

**PD-3C-1.** The Lighthouse-Chapel Overlay District is established in order to permit development that is compatible with the pastoral environment of this district.

**MFPO.** The Maritime Forest Protection Overlay District is established in order to permit development that is compatible with the environmentally sensitive nature of the Bald Head Island and Middle Island maritime forests, and to preserve land in a natural state where such land is considered to be a vital link in the local groundwater replenishment cycle and where the destruction of natural vegetation could have a harmful effect on the stability of the soil and its resistance to erosion.

## **10. Village of Bald Head Island Hazard Mitigation Plan**

Developed by the Village Planning Director, the Hazard Mitigation Plan (HMP) identifies potential natural hazards that may affect the Village, identifies the extent of the risk the Village faces from these hazards, and adopted goals, policies and procedures to help minimize these risks over the long term.

This Plan was required by Federal and State laws adopted in the year 2000 that require all local governments to have a hazard mitigation plan in place as a condition of disaster recovery and hazard mitigation assistance after November 2004. The HMP has been approved by the State and is under final review by FEMA as of this writing (April, 2005).

## **11. Village of Bald Head Island Stormwater Management Ordinance**

The central environmental goals of the Village of Bald Head Island are to restore and preserve water quality and the natural ecological functions of the surface and ground waters that are included in its planning area and to reduce the potential for flooding residential areas. In order to meet these important goals, the Village of Bald Head Island Stormwater Ordinance was adopted for the following purposes:

- (1) To regulate existing developments, new developments, and construction activities in accordance with State requirements and to institute additional mandatory requirements to prevent careless pollution of surface waters, ground waters, and the creation of additional flood prone areas.
- (2) To establish the authority of the Village to administer and enforce stormwater regulations.
- (3) To create public education programs so that the citizens of the Village will have knowledge of how to reduce and prevent pollution from their homes and businesses.

## **12. Village of Bald Head Island - Vision 2010**

Vision 2010 was a joint effort between the Village, Bald Head Island Limited, the Bald Head Island Association, the Bald Head Island Conservancy, and other interested parties. Members of each entity served on the steering committee for the process. This was a first attempt at coordination between all interest groups on the island. The visioning plan was broken into four separate segments including: roads and transportation; recreation, environment, tourism, and resource conservation; public facilities, utilities, and services; and community design and land use. Committees worked on establishing visioning statements under each of these categories. The input received through this process will be utilized as a basis for developing a comprehensive plan to address the long range needs of the community.

## **13. Village of Bald Head Island 2002 Long Range Plan**

The long range planning sub-committee for the Village established an update to the Village long range plan in 2002. Priorities established in the Vision 2010 visioning process were utilized in

working through the updated long range plan. This planning document identifies strengths and weaknesses that exist throughout the planning jurisdiction of the Village, and establishes goals for addressing identified weaknesses. As of May 2006, the committee has completed the update of this document. Policies outlined in the long range plan will be addressed in the policy statement section of this plan.

#### **14. Review of the 1996 Brunswick County CAMA Land Use Plan**

In 1997, Brunswick County completed its current CAMA land use plan update. The Village currently falls under the jurisdiction of this plan. Within the context of this plan, policy statements were established specific to the Village. The Coastal Resources Commission certified this document on November 20, 1998. The current plan addresses a variety of issues, with a focus on resource protection policies, resource production and management policies, economic and community development policies, continuing public participation and coordination policies, and storm hazard mitigation & post disaster recovery policies.

The following summarizes the policy statements from the Brunswick County Plan that were established for the Village. All policy statements from the plan have been implemented.

1. The Village of Bald Head Island supports the concept of a family oriented island developed in harmony with nature, promoting responsible development with respect for the environment.
2. Educational programs and other efforts targeted to property owners and visitors will be utilized in order to further Bald Head Island's goal of preserving the beauty of its beaches, creeks, maritime forest, and other natural resources which make it unique.
3. The Village of Bald Head Island supports state and federal laws designed to manage development in Ocean Hazard Areas of Environmental Concern as well as Estuarine Shoreline Areas of Environmental Concern.
4. The Village of Bald Head Island realizes the importance of its shoreline from an aesthetic and economic standpoint. The Village will establish a shoreline management plan to evaluate methods of beach and dune stabilization. The Village supports all State and Federal programs for beach stabilization and encourages the active funding of these programs.



5. The Village of Bald Head Island supports efforts to maintain a high level of water quality in order to enhance fisheries resource and recreational value of its waters.
6. Protection of sea turtle nesting areas will continue to be enforced through recognized ordinances.
7. The Village of Bald Head Island recognizes its natural resources as one of its greatest assets. To help preserve these resources the development of a maritime forest management plan and consistent open space plan have become a point of focus.
8. Bald Head Island restricts the use of vehicles powered by internal combustion engines, because of the fragile nature of its unique habitat, in order to prevent adverse environmental impacts. Bald Head Island will continue to enforce its Internal Combustion Engine Ordinance, which prohibits the use of internal combustion engines on the Island with certain exceptions.
9. Bald Head Island advocates a strong local government that supports effective community planning and appropriate land use controls.
10. Bald Head Island will attempt to facilitate the expansion of public services and facilities to meet the needs of existing and future populations, as resources allow.
11. Bald Head Island supports innovative transportation programs related to improved road and water transportation system improvements, including an enhanced emergency transportation system.
12. Residential and commercial development in accordance with applicable Village ordinances is encouraged.
13. Bald Head Island supports and encourages the restoration and/or appropriate adaptive reuse of significant and architecturally important historic and cultural structures and sites.
14. Bald Head Island supports a completed and well-maintained infrastructure, including the development of a state of the art solid waste collection system.

15. Bald Head Island supports regional intergovernmental planning as it relates to transportation, emergency services, etc. Bald Head Island encourages improved regional cooperation covering all local government units including Brunswick County area municipalities, neighboring counties, and the State.
16. Measures to enhance public safety will be supported, such as regulation of golf cart safety, as well as enhanced emergency medical service programs. Bald Head Island encourages equitable application of county resources to all municipalities, specifically emergency services such as EMT-paramedic and fire protection.
17. The Village of Bald Head Island supports continued public participation in Village government. Every effort will be made to improve channels of communication to property owners and residents to obtain input and ideas at the front-end of the decision making process.
18. The Village of Bald Head Island believes that the core of strong local government is active citizen involvement and open communication between Village representatives and their constituents. The Village will continue to support efforts to further this purpose, such as the establishment of Village committees, including but not limited to: Finance, Beach, Roads and Transportation, Public Safety, and Public Works.
19. The Village of Bald Head Island will continually pursue methods and procedures to minimize the loss of life and property during major storm events. This includes establishment of an Emergency Mitigation Plan to effectively plan for evacuation/security measures, as well as provide an orderly method of post-disaster clean up and recovery.
20. The Village of Bald Head Island shall continue to enforce the North Carolina Building Code, which establishes design/construction standards to meet resistive factors such as high wind velocity. The Village will also continue to comply with CAMA regulations, whose standards dictate setbacks for structures particularly susceptible to storm surge.
21. Bald Head Island, in cooperation with County and State officials, continues to explore the safest, most expedient and efficient evacuation routes for citizens. Continued cooperation with appropriate officials to ensure proper implementation of emergency planning will be pursued.

## **SECTION VI. PLAN FOR THE FUTURE**

### **A. FUTURE DEMANDS**

#### **I. Introduction**

This portion of the plan will focus on the future needs and demands facing the Village over the course of the planning period. The Village faces a unique set of challenges in balancing increased growth with the protection of the island's unique atmosphere and fragile plant and animal habitats. The Village has been established and maintained with this problem at the forefront of discussions regarding future growth. Through the development of goals, policies, and implementing actions in the context of this plan, the Village will establish a specific course of action that will assist the citizens and administration in overcoming these challenges.

In addition to environmental protection, the Village must also address the provision of public services to a growing permanent and seasonal population base. Every year, the number of available housing units throughout the Village increases, which has a drastic effect on the number of individuals visiting the island during peak summer months. Although permanent population increase has been modest over the last 10 to 15 years, the popularity of the Village as a seasonal and vacation destination has substantially increased. This presents the Village administration with the issue of addressing this growth with adequate police protection, infrastructure carrying capacity, fire/EMS protection, recreational opportunities, and transportation facilities.

The goals, policies, and implementing actions section of this plan will address these demands balanced by protection of sensitive areas of environmental concern.

#### **2. Housing Trends**

As evidenced by the existing land survey (page 71) a majority of the developed land (32%) within the corporate limits of the Village is comprised of single-family residential housing. Residential development far exceeds any other use in terms of percentage of total land use. This trend is expected to continue into the future. A majority of the land within the Village has been subdivided to accommodate residential development. Most of the large tracts of land that still remain undeveloped are either tied to the maritime forest, or are protected under the Smith Island Land Trust.

There is still a great deal of vacant land throughout the Village; however, this land has already been subdivided, and a substantial number of these lots have been sold to private investors. Of the remaining 1,725 acres of developable vacant land, approximately 87% is zoned for single-family residential development. It is difficult to predict how rapidly this land will be developed, although in recent years residential construction has been steady. Since 2000, the Village has issued an average of 68 building permits per year. It is expected that residential growth will remain consistent throughout the planning period, and that seasonal population will continue to grow as a result of this development. There are currently no deficiencies in terms of the quality or availability of housing within the Village. Additionally, build out of vacant property is not expected to occur during the planning period (2025).

### **3. Commercial**

Commercial development within the Village is intended to serve the needs of visitors and permanent residents. Until recently, commercial development was very sparse. However, there has been some commercial development in an effort to provide access to additional goods and services without having to traverse to the mainland. Most of the commercial development within the Village is located immediately adjacent to the marina and ferry terminal, or along Edward Teach Wynd.

It is expected that the new commercial development will occur in these areas; however, there may be some low intensity commercial/office space development in the Cape Fear Station Development. There is a small portion of land within the Cape Fear Station Development that has a zoning classification compatible with commercial development. It is not clear at this time whether this will occur; however, there has been some interest in providing retail space within this portion of the Village. Commercial development throughout the Village will be minimal during the planning period. New commercial structures will mainly involve small retail facilities, restaurants, and office space.

### **4. Transportation**

As stated in the community facilities section of the plan, the Village is responsible for maintaining and constructing most of the public right-of-ways within the corporate limits. All roads not maintained by the Village fall under the jurisdiction of a property owners association. Over time, these roads may be dedicated to the Village if the roads meet required standards. There are no major road projects currently planned within the Village. The road network within the corporate

limits of the Village is complete, and any additional right-of-way will come as a result of future private development.

The most notable change in the current transportation system will be moving the Bald Head Island Limited Ferry Terminal from Indigo Plantation to Deep Point in Southport. This transition will provide a more contiguous and user friendly parking and ferry terminal for Village residents and visitors. It is anticipated that the new ferry terminal will be developed as a mixed use development with commercial and office space available. The travel time to and from the island will remain approximately the same.

## **5. Public Land Use**

Public land use is not expected to change substantially during the planning period. No significant construction or land acquisition is anticipated. The Village will continue to maintain and improve its existing public facilities. In particular, the Village will focus on improving the quality of its infrastructure systems and public access sites.

## **6. Recreation**

There are currently no recreational facility plans for the Village of Bald Head Island. Public recreational facilities within the Village consist of walking trails within the maritime forest, public beach access points, and the public boat ramp and creek access. The Village is working to upgrade and maintain all existing public beach access points. The Village is installing rope and pole barriers at several of the beach access points located along South Beach. This effort is intended to protect the dunes and dune vegetation recently erected and planted in conjunction with beach renourishment efforts.

The Village is also in the process of establishing an Island-wide pedestrian trail system. This effort is being headed up by the long-range planning committee. The trail system is intended to utilize existing municipal right-of-ways and easements to create a contiguous trail system throughout the Island.

## **7. Water System**

The Village's municipal water system runs off a series of 16 wells throughout the Village, and is capable of producing 170 GPM of potable water. The Village does not anticipate the need to increase the volume of their reverse osmosis water treatment plant system. The Village is now tied into a county water line that traverses to the island via Oak Island. While operational, this water line, in conjunction with the existing RO system, is capable of providing an adequate water supply even during peak summer months.

The water line that traverses from Oak Island was recently ruptured during dredging efforts off the southwest corner of the Village. In the event that this water line breaks, the Village has established a water shortage supply handbook. This handbook establishes a priority system for water customers during times of water shortages. The Brunswick County water line is now functional again, and it is not anticipated that there will be additional problems in the future.

As outlined on page 81, the Village's maximum water plant capacity is 170 gallons per minute. The water line that the Village installed and tied into the Brunswick County water system is intended to provide the water capacity required through build-out of the Village's corporate limits. Currently, the Village's system operates at capacity and is supplemented by the county line. The county line provides approximately 42% of the Village's water supply at any given time.

## **8. Sewer System**

Currently the Bald Head Island sewer plant has a permitted maximum capacity of 400,000 GPD. It is estimated that during peak summer months the most significant flows reach approximately 200,000 GPD. At this time, it is not anticipated that the plant's capacity will be increased in the near future. According to the plant supervisor, the plan is to increase the plant's capacity to 800,000 GPD in approximately ten years. Planning for this expansion is anticipated to begin around the year 2013.

There are still approximately 50 on-site septic systems in place throughout the Village's corporate limits. All cluster systems, as discussed in the community facilities section of the plan, have been eliminated. It is anticipated that eventually all of these units will also be served by the system. The Village closely monitors these systems, and determines when it will be necessary to tie in these homes and eliminate the remaining septic tank systems. Middle Island is not currently served by the central sewer system, and it is not anticipated that they will tie into the system.

## **9. Administration**

The Village does not anticipate substantial changes to its current administrative structure.

## **10. Fire/EMS Services**

There are no significant changes anticipated within the Village of Bald Head Island Fire and EMS Service Department. The Department relies on pumper trucks and an excellent system of fire hydrants. Water pressure is not an issue for the Village. There is a 450,000 gallon elevated tank that assists with water pressure and the Department has an emergency fire pump available, if it is needed. The water system for the Village has adequate capacity for fire protection. The Department is in the process of purchasing a new 2006 Rescue Pumper with a capacity of 1,000 gallons. The Department is also purchasing a new beach rescue vehicle. The only personnel changes anticipated during the planning period will be the addition of an Administrative Captain.

## **11. Police Department**

As with the Fire and EMS Department, there are no significant changes anticipated within the Village Police Department. The department is anticipating the purchase of two all terrain vehicles to be used for beach patrols, and this will require the hiring of two additional part-time officers. The department has also recently acquired a 26-foot Zodiac Patrol Boat that will be utilized during hurricane events to protect the boat harbor from people entering the Village, as well as patrolling Bald Head Creek. The Police Department also operates on a three year cycle for the purchase of a new truck to replace obsolete models currently in service.

## **12. Stormwater Management**

Stormwater management was discussed in the community facilities section of the plan. At this time, implementation of these improvements has not yet begun. Coastal Land Design is currently in the process of working through data compiled during the initial study, and anticipates moving forward with the project over the next 12 to 24 months. This effort will result in a comprehensive Flood Management Plan.

## B. LAND USE/DEVELOPMENT GOALS AND IMPLEMENTING ACTIONS

This section of the plan is intended to guide the development and use of land within the Village of Bald Head Island. The future land use maps and policies are intended to support the Village's and CAMA's goals. Specifically, this section includes Village goals, land use development policies, and the future land use maps. The future land use maps and the specified development goals are based in part on the Village of Bald Head Island community concerns (identified on page 7 of this plan) and the future needs/demands (identified in Section VI(A) of this plan). The Village is somewhat unique in that the planning jurisdiction has been planned and platted based on the developer's (Bald Head Island Limited) master plan. At this time, the vacant tracts that remain are comprised of single-family residential and commercial tracts. The future land use map will work in conjunction with the intended uses of property throughout the Village. One variation will be the establishment of conservation areas in areas considered hazardous or environmentally sensitive.

## C. POLICIES/IMPLEMENTING ACTIONS

### I. **Introduction**

It is intended that the policies included in this plan are consistent with the goals of CAMA. This plan will address the CRC management topics for land use plans and comply with all state and federal rules and regulations. The following will serve as a guideline to assist in assuring that this land use plan will guide the development and use of land in a manner that is consistent with the management goal(s), planning objective(s), and land use plan requirements of this plan. These policies/implementing actions will be applied throughout the Village's planning jurisdiction. All policies/implementing actions shall be used for consistency review by appropriate state and federal agencies.

Resource conservation and impact analysis issues are addressed throughout the policies and implementing actions included in this plan. However, the following conservation related policies and implementing actions are emphasized:

- ▶ Public Access, page 113.
- ▶ Conservation, page 117.
- ▶ Stormwater Control, page 118.
- ▶ Natural Hazard Areas, page 123
- ▶ Water Quality, page 126.
- ▶ Cultural, Historical, and Scenic Areas, page 132.



Specifically, in implementing this plan, the Village Planning Board and Village Council will continually do the following:

- ▶ Consult the Land Use Plan during the deliberation of all re-zoning requests.
- ▶ Consider the following in deliberation of all zoning petitions:
  - ▶ Consider the policies and implementing actions of this plan and all applicable CAMA regulations in their decisions regarding land use and development (including 15A NCAC 7H).
  - ▶ All uses that are allowed in a zoning district must be considered. A decision to re-zone or not to re-zone a parcel or parcels of property cannot be based on consideration of only one use or a partial list of the uses allowed within a zoning district.
  - ▶ Zoning decisions will not be based on aesthetic considerations.
  - ▶ Requests for zoning changes will not be approved if the requested change will result in spot zoning. Spot zoning is a form of discriminatory zoning whose sole purpose is to serve the private interests of one or more landowners instead of furthering the welfare of the entire community as part of an overall zoning plan. Spot zoning is based on the arbitrary and inappropriate nature of a re-zoning change rather than, as is commonly believed, on the size of the area being re-zoned.
  - ▶ The concept of uniformity should be supported in all zoning deliberations. Uniformity is a basic premise of zoning which holds that all land in similar circumstances should be zoned alike; any different circumstances should be carefully balanced with a demonstrated need for such different treatment.
  - ▶ Zoning regulations should be made in accordance with the Village Land Use Plan and designed to secure safety from fire, panic, and other dangers; to promote health and the general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; and to facilitate the adequate provision of transportation, water, sewerage, open space, and other

public requirements. The regulations shall be made with reasonable consideration, among other things, as to the character of the district and its peculiar suitability for particular uses, and with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout the Village's planning jurisdiction.

- ▶ Specifically, the Planning Board and Village Council should ask the following questions:
  - ▶ Does the Village need more land in the zone class requested?
  - ▶ Is there other property in the Village that might be more appropriate for this use?
  - ▶ Is the request in accordance with the Village land use plan? It should be noted that no CAMA permits (major or minor) shall be issued for any proposal that is inconsistent with any of the policies noted within the Land Use Plan.
  - ▶ Will the request have a serious impact on overall traffic circulation, sewer and water services, and other utilities?
  - ▶ Will the request have an impact on other Village services, including police protection and fire protection?
  - ▶ Is there a good possibility that the request, as proposed, will result in lessening the enjoyment or use of adjacent properties?
  - ▶ Will the request, as proposed, cause serious noise, odors, light, activity, or unusual disturbances?
  - ▶ Does the request raise serious legal questions such as spot zoning, hardship, violation of precedents, or need for this type of use?
  - ▶ Does the request adversely impact any CAMA AEC's or other environmentally sensitive areas including water quality?

It is intended that this plan will serve as the basic tool to guide development/growth in the Village subject to the following:

- ▶ The Village Land Development Ordinances, when applicable, should be revised from time to time to be consistent, as reasonably possible, with the recommendations of this plan and the evolving nature of the Village's growth and development policy.
- ▶ Land development regulations should be designed: to ensure safe and efficient transportation; to secure safety from fire, panic, and other dangers; to promote health and the general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; and to facilitate the adequate provision of transportation, water, sewerage, and other public requirements.
- ▶ The Village will coordinate all development proposals that fall subject to CAMA regulations with appropriate State and/or Federal agencies.

## **2. Policies Regarding Land Use and Development in AEC's**

**The Village accepts state and federal law regarding land uses and development in AEC's.** By reference, all applicable state and federal regulations are incorporated into this document. All policies and implementing actions are to be utilized by the State of North Carolina for consistency review. Note the following:

- ▶ No policy is subordinate to another.
- ▶ All management topics have equal status.
- ▶ The future land use map may show some areas in a developed category which may also include sensitive habitats or natural areas. The intent is that development should be designed/permitted to protect these areas through utilization of concepts such as cluster development. Development/project approval will be based on project design which avoids substantial loss of important habitat areas.

## D. LAND USE PLAN MANAGEMENT TOPICS

### I. **Introduction**

The purposes of the Coastal Resources Commission (CRC) management topics are to ensure that CAMA Land Use Plans support the goals of CAMA, to define the CRC's expectations for the land use planning process, and to give the CRC a substantive basis for review and certification of CAMA Land Use Plans. Each of the following management topics (Public Access, Land Use Compatibility, Infrastructure Carrying Capacity, Transportation, Natural Hazard Areas, Water Quality, and Local Areas of Concern) include three components: a management goal, a statement of the CRC's planning objective, and requirements for the CAMA Land Use Plan. These policies apply to the entire Village. The local concerns which should be addressed in this plan are identified on page 7. These concerns and issues were utilized to develop the goals and objectives which are included in this plan. Additionally, the survey results obtained through the absentee property owner questionnaires will also be taken into account. Most of the implementing actions are continuing activities. In most situations, specific timelines are not applicable. Refer to page 149 for a list of those implementing actions which have a specific schedule. The policies and implementing actions frequently utilize the following words: should, continue, encourage, enhance, identify, implement, maintain, prevent, promote, protect, provide, strengthen, support, work. The intent of these words is defined in Appendix V. Please note: Policies and Implementing Actions are numbered consecutively throughout this document with the letter "P" denoting a policy and the letter "I" denoting an implementing action.

### 2. **Impact of CAMA Land Use Plan Policies on Management Topics**

The development of this land use plan has relied in some part on the CAMA-prescribed existing land suitability analysis which is included in Section V(E) of this document. Reliance on this map is based in large part on the intent that this document is supportive of the CAMA regulations for protection of AEC's (15A NCAC 7H). This analysis was performed to identify pockets of land that are particularly poorly suited for development with respect to environmentally sensitive areas.

This plan is intended to support the Village vision statement which was developed under the Community Vision 2010 long range planning process. No negative impacts are anticipated by the implementation of the goals, objectives, and policies which are included in this plan.

Note: It is intended that all policies are, at a minimum, consistent with applicable State and Federal requirements when State and Federal requirements apply. If a policy goes beyond federal requirements, it shall be interpreted as a policy established by the Village of Bald Head Island.

### **3. Public Access**

#### *a. Management Goal*

The Village will maximize public access to the beaches and the public trust waters bordering its primary corporate limits.

#### *b. Planning Objective*

The Village will develop comprehensive policies that provide beach and public trust water access opportunities for the public along the shoreline and estuarine areas within the planning jurisdiction.

#### *c. Land Use Plan Requirements*

The following are the Village's policies/implementing actions for waterfront access.

#### **Policies:**

- P.1 The Village supports the Brunswick County Economic Development Commission and recreational related developments that protect and preserve the natural environment while promoting the Village as a family vacation destination. It supports the private and public development of public waterfront access through private funds and grant monies.
- P.2 The Village supports providing shoreline access for persons with disabilities.
- P.3 The Village supports the frequency of shoreline access as defined by 15A NCAC 7M, Section .0300, Shorefront Access Policies.
- P.4 The Village supports state/federal funding of piers for crabbing and fishing, as well as other facilities to serve the public at beach and estuarine access sites.

- P.5 The Village supports the development of estuarine access areas to ensure adequate shoreline access within all areas of the Village.

**Implementing Actions:**

- I.1 The Village will prepare a shoreline access and public facilities plan and request Division of Coastal Management funding for the preparation of the plan. **Schedule: Fiscal Years 2007-2009.**
- I.2 The Village will pursue funding under the North Carolina CAMA Shoreline Access funding program (15A NCAC 7M, Section .0300, Shorefront Access Policies). **Schedule: Fiscal Years 2007-2010.**
- I.3 The Village will pursue private sources of funding for the establishment of additional properties to be protected under the Smith Island Land Trust, including donation of land. **Schedule: Continuing Activity.**
- I.4 The Village will cooperate with state and federal agencies as well as private interest to secure estuarine access areas, including Bald Head Creek, to ensure adequate shoreline access within all areas of the Village. **Schedule: Continuing Activity.**

**4. Land Use Compatibility**

*a. Management Goal*

The Village will ensure that development and use of resources or preservation of land minimize direct and secondary environmental impacts, avoid risks to public health, safety, and welfare, and are consistent with the capability of the land based on considerations of interactions of natural and manmade features.

*b. Planning Objectives*

- i. The Village will adopt and apply local development policies that balance protection of natural resources and fragile areas with continued growth and development.

- ii. The Village's policies will provide clear direction to assist local decision making and consistency findings for zoning, divisions of land, and public and private projects.

c. *Land Use Plan Requirements*

The following are the Village's policies/implementing actions for land use compatibility:

**Policies - Residential:**

- P.6 The Village supports discouraging the re-zoning of existing residentially-developed or zoned areas to a non-residential classification in an effort to maintain the overall residential character of the Village. Such re-zoning and amendments in classifications to the future land use map should be carefully balanced with a demonstrated need for such proposed development that will be the best overall land development policy for the Village.
- P.7 The Village supports quality development reflecting the spectrum of housing needs ranging from single-family homes to multi-family and cluster type developments.
- P.8 The Village supports the approval of growth to coincide with the provision of public facilities and services.
- P.9 The Village supports wooded buffers along thoroughfares while allowing for maximum sight line visibility at intersections.
- P.10 The Village supports providing adequate conservation/open space buffers between areas designated for residential development as indicated on the future land use map and any adjacent non-residential land use, including commercial and utility areas.
- P.11 The Village supports the ability of all Property Owners Associations (POA) to establish restrictive covenants throughout its planning jurisdiction. Proposals for development or redevelopment should not only comply with Village land development policies and ordinances, but should also abide by all restrictions established under a given properties respective POA restrictive covenants.

### **Implementing Actions - Residential:**

- I.5 All re-zoning and subdivision approvals will consider the future land use and land suitability maps and analyses which are included in this plan. ***Schedule: Continuing Activity.***
- I.6 The Village will permit residential development to occur in response to market needs provided that the following criteria are met:
- (1) Current codes and ordinances in conjunction with NCDCM oversight will ensure that due respect is offered to all aspects of the environment.
  - (2) If deficient community facilities and services are identified, the Village shall attempt to improve such to the point of adequately meeting demands.
  - (3) Additional residential development shall concurrently involve planning for improvements to community facilities and services if excess capacity does not exist within those facilities and services.
  - (4) Residential development is consistent with other Village policies and the Future Land Use Map as contained in this plan update.

This implementing action will be enforced through the Village zoning and subdivision ordinances. ***Schedule: Continuing Activity.***

- I.7 The Village will consider revisions to the zoning ordinance for non-residential sites to ensure adequate buffering and landscaping to separate residential and incompatible non-residential uses, and adequate regulation of off-site lighting, hours of operation, and vehicular access and parking locations. ***Schedule: Fiscal Years 2007-2009.***
- I.8 The Village will regulate through its zoning and subdivision ordinance the development of conflicting land uses in areas where non-residential development is permitted. The Village will aim to minimize these impacts through promoting mixed use development (see page 142). ***Schedule: Continuing Activity.***



### **Policies - Commercial:**

- P.12 The Village supports commercial development consistent with the Village's future land use map and current zoning ordinance.
- P.13 The Village opposes the establishment of any industrial operations within its planning jurisdiction.
- P.14 The Village opposes additional private or public solid waste collection sites within the Village's planning jurisdiction.

### **Implementing Actions - Commercial:**

- I.9 The Village will enforce its zoning regulations and rely on state permitting agencies to ensure that all commercial development within or adjacent to Areas of Environmental Concern is carried out properly. ***Schedule: Continuing Activity.***
- I.10 The Village will review its zoning and subdivision ordinances to ensure compliance with policies P.13-P.16. ***Schedule: Fiscal Years 2008-2009.***

### **Policies - Conservation:**

- P.15 Except as otherwise permitted in this plan, residential, commercial, and office/institutional development should not be supported in natural heritage areas, conservation areas, or coastal wetlands. Residential and commercial development which meets 15A NCAC 7H use standards will be allowed in estuarine shoreline, estuarine water, and public trust areas. In all other areas, development will be allowed that is consistent with applicable local, state, and federal regulations.
- P.16 The Village will support larger lots in conservation classified areas as designated on the future land use map through enforcement of the Village subdivision and zoning ordinances in zoned areas.
- P.17 The Village aims to maintain its character as an eco-friendly residential community. Commercial development should be permitted only in areas outlined on the future land use map.

- P.18 It is the policy of the Village to encourage the construction of dune walkover platforms at all private beach access points. If individual walkovers are not established, then property owners will be required to utilize municipal dune crossings for beach access.
- P.19 The Village recognizes that major updates and revisions need to be made to the current landscaping ordinance to address tree trimming and removal procedures.

**Implementing Actions - Conservation:**

- I.11 The Village will continue to promote the Smith Island Land Trust program in an effort to preserve additional portions of the Island as conservation/open space.  
***Schedule: Continuing Activity.***
- I.12 The Village will review its zoning and subdivision ordinances to ensure compliance with policies P.17-P.19. ***Schedule: Fiscal Years 2008-2009.***

**Policies - Stormwater Control:**

- P.20 The Village supports reducing soil erosion, runoff, and sedimentation to minimize the adverse effects on surface and subsurface water quality.
- P.21 The Village supports the enforcement of all controls and regulations, specifically design standards, tie-down requirements, construction and installation standards, elevation requirements, flood-proofing, CAMA regulations, and FEMA regulations, and locally adopted Hazard Mitigation Plan, deemed necessary by the Village Council to mitigate the risks to lives and property caused by severe storms and hurricanes.
- P.22 The Village supports the Brunswick County National Pollutant Discharge Elimination System (NPDES) Phase II stormwater management program, due to its role in reducing the impact of stormwater runoff to waterbodies throughout the county.

### **Implementing Actions - Stormwater Control:**

- I.13 The Village will consider adopting and enforcing a soil erosion and sediment control ordinance. ***Schedule: Fiscal Years 2008-2010.***
- I.14 The Village will review its stormwater control ordinance and include updates regarding regulations for water detention and/or retention facilities in new developments as new state and federal policy requires. ***Schedule: Fiscal Years 2007-2008.***
- I.15 The Village supports ongoing planning and capital improvement efforts to address the drainage problem associated with flooding from tropical storm events. ***Schedule: Fiscal Years 2007-2009***
- I.16 The Village will seek grant funding from state and federal agencies for assistance in funding capital improvement projects that will aid the Village in alleviating flooding and storm drainage problems which exist throughout the Village. ***Schedule: Fiscal Years 2007-2009.***

## **5. Infrastructure Carrying Capacity**

### *a. Management Goal*

The Village will ensure that public infrastructure systems are appropriately sized, located, and managed so the quality and productivity of AECs and other fragile areas are protected or restored. It is acknowledged that to achieve the infrastructure carrying capacity goals, policies, and implementing actions, some utility lines may have to extend through some environmentally sensitive areas.

### *b. Planning Objective*

The Village will establish level of service policies and criteria for infrastructure consistent with the projections of future land needs.

c. *Land Use Plan Requirements*

Please refer to Map 14 for delineation of the water and sewer service areas. The following are the Village's policies for infrastructure carrying capacity.

**Policies:**

- P.23 The Village supports providing adequate community services and facilities which meet the needs of the Village's citizens and businesses.
- P.24 The Village supports providing sufficient water and sewer service to promote continued growth and to alleviate public health problems created by the absence of public water and sewer services in the Village. Extensions of central sewer service will be provided as required.
- P.25 The Village supports the extension of water services from existing systems and encourages the use of central systems for new developments whether residential, commercial, or office/institutional in nature. It also supports the continued public provision of solid waste disposal, law enforcement, and educational services to all citizens of the Village.
- P.26 The Village supports the ongoing maintenance and use of properly permitted septic tank systems and the enforcement of District Health Department regulations and local development regulations regarding lot sizes and waste disposal system placement until FY2027, whereby all existing systems must be connected to the Village's Central Sewer System.
- P.27 The Village supports the provision of public recreational facilities and areas and will pursue grant funds and private donations for public open space and recreation facilities.

**Implementing Actions:**

- I.17 The Village will rely on its existing land use and development ordinances to regulate development and may amend or modify regulations to encourage or require the provision of central water service to lots or parcels proposed in new

developments. This change will reflect the current policy of the Village of Bald Head Island Utilities. **Schedule: Fiscal Years 2007-2008.**

- I.18 The Village will consult the future land use map when considering new public facilities and private development. **Schedule: Continuing Activity.**
- I.19 The Village will rely on the NC Division of Water Quality and the Brunswick County Department of Environmental Health to oversee the proper operation, management, and maintenance of all wastewater treatment facilities within portions of the Village where sewer is not available. **Schedule: Continuing Activity.**
- I.20 The Village will consider adopting an operating and capital financing plan for the development of water and sewer system extensions and upgrades in preparation for future demand. **Schedule: Fiscal Years 2006-2008.**
- I.21 The Village will provide sufficient emergency management personnel and facilities to adequately serve the projected peak seasonal population growth. **Schedule: Annually.**
- I.22 The Village will coordinate the development of any Village facility with all applicable property owners' associations in order to maximize the potential quality, access, and use of these facilities. Additionally, the Village will consider taking over jurisdiction and maintenance of POA facilities, if requested, assuming that these facilities comply with Village standards and requirements. **Schedule: Continuing Activity.**

## **6. Transportation**

### *a. Management Goal*

The Village will achieve a safe, efficient, reliable, environmentally-sound, and economically feasible road system within the Village.

b. *Planning Objective*

The Village will provide a safe and efficient road system throughout the Village's planning jurisdiction.

c. *Land Use Plan Requirements*

**Policies:**

- P.28 The Village supports interconnected street systems for residential and non-residential development.
- P.29 The Village supports limited access from development along all roadways to provide safe ingress and egress.
- P.30 The Village supports maintaining an effective signage and addressing system for all right-of-ways including private drives and access streets.
- P.31 The Village supports state and federal funding for maintenance/dredging of the Intracoastal Waterway including the ferry channel which is utilized as the primary transportation route to and from the mainland.
- P.32 The Village will maintain strict enforcement of its regulations against gas powered engines. Gas powered engines should be limited to emergency management/police vehicles, as well as all required contractor traffic including solid waste removal vehicles.
- P.33 The Village supports the developer's careful monitoring of the ferry basin to ensure safe travel into and out of the basin. This will serve to maintain safe, consistent, and efficient travel to and from the mainland.
- P.34 The Village will aim to ensure the safe operation of watercraft within waters immediately adjacent to its jurisdiction. Specifically, the Village will enforce its regulations regarding watercraft in Bald Head Creek. This policy specifies that there shall be no boat with a horsepower rating greater than 25 or greater than 16 feet in length stored or launched from the Village's boat access.

### **Implementing Actions:**

- I.23 The Village will continue to consider the dedication of all street right-of-ways for Village maintenance. Dedication of all existing and proposed streets will be determined on a case-by-case basis, and will be determined based on whether the respective street right-of-way meets the design specifications of the Village. ***Schedule: Continuing Activity.***
- I.24 The Village will periodically review its ordinances regarding the restriction of gas powered engines as growth continues, in an effort to minimize the impacts of noise and water pollution throughout the Village's planning jurisdiction. ***Schedule: Annually.***
- I.25 The Village will establish a no wake zone at the mouth of Bald Head Creek. This will be implemented through the installation of buoys and signage specifying where this zone will begin. This rule will be primarily enforced by NC Marine Fish and Wildlife, as well as the Brunswick County Sheriff's Department. ***Schedule: Fiscal Years 2007-2008.***
- I.26 The Village will consider options for establishing a public Inter-Island Transportation System. This system will focus on alleviating traffic from areas of the Village where traffic flow has historically been a problem. ***Schedule: Ongoing.***

## **7. Natural Hazard Areas**

### ***a. Management Goal***

The Village will conserve and maintain shorelines, floodplains, major dune ridges, and other coastal features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

### ***b. Planning Objective***

The Village will develop policies that minimize threats to life, property, and natural resources resulting from development located in or adjacent to hazard areas, such as those subject to erosion, high winds, storm surge, flooding, or sea level rise.

c. *Land Use Plan Requirements*

The following are the Village's policies/implementing actions for natural hazard areas.

**Policies:**

- P.35 The Village supports the installation of properly engineered and permitted bulkheads.
- P.36 The Village supports the US Army Corps of Engineers' regulations and the applicable guidelines of the Coastal Area Management Act and the use of local land use ordinances to regulate development within or immediately adjacent to freshwater swamps, marshes, and 404 wetlands.
- P.37 The Village supports relocation of structures endangered by erosion, if the relocated structure will be in compliance with all applicable policies and regulations.
- P.38 The Village recognizes the uncertainties associated with sea level rise. The rate of rise is difficult to predict. Thus, it is difficult to establish policies to deal with the effects of sea level rise. The Village supports cooperation with local, state, and federal efforts to inform the public of the anticipated effects of sea level rise.
- P.39 The Village supports the land use densities that are specified on page 140 (Future Land Use) of this plan. Through enforcement of the zoning ordinance, these densities will minimize damage from natural hazards and support the hazard mitigation plan.
- P.40 The Village continues to believe the US Army Corps of Engineers is responsible for the damages to South and West Beach and the Village infrastructure resulting from the sloughing and shoaling of the South Beach Shoreline into the federal navigation channel caused by the deepening of the channel pursuant to the Wilmington Harbor Deepening Project, NC-96 Act ("The Deepening Project"). The Village supports the remediation provided by the Sand Management Plan (see Appendix VII), as interpreted by Colonel James W. DeLony's letter of June 9, 2000 (see Appendix VII), that was incorporated into the Environmental Assessment to obtain a Finding of No Significant Impact for the Deepening Project and a Consistency Determination from the NC Division of Coastal Management (see Appendix VII) for the Deepening Project. The Village also relies upon the Settlement Agreement



entered into between the Village and the US Army Corps of Engineers dated March 24, 2005 (see Appendix VII), and the requirements for communication and cooperation required therein. The Village opposes any further deepening of the federal navigation channel and believes the Corps needs to explore additional measures to protect South and West Beach from the effects of the 2000-2001 Deepening Project.

- P.41 The Village recognizes the significance of protecting the primary dune line along oceanfront portions of the Village, as well as the inter-Island dune ridge system. The Village supports continued efforts to protect these dunes through a proactive dune stabilization and protection program.
- P.42 The Village will continue to enforce its requirement for a landscape permit in an effort to protect all existing dunes, berms, vegetative cover, and tree species. Furthermore, it is imperative that the inner island dune ridge system, which traverses east to west across the island, be preserved.

#### **Implementing Actions:**

- I.27 The Village supports hazard mitigation planning. The Village's Hazard Mitigation Plan may be viewed at the Village Hall during normal office hours. The Land Use Plan and the Hazard Mitigation Plan should be consistent with one another. Should there be conflicting policies, the Land Use Plan takes precedence. ***Schedule: Continuing Activity.***
- I.28 The Village will continue to enforce its Floodplain Ordinance and participate in the National Flood Insurance Program. It will rely on the North Carolina Department of Environment and Natural Resources, Division of Coastal Management to monitor and regulate development in areas up to five feet above mean high water susceptible to sea level rise and wetland loss. Subdivision regulations will be enforced – requiring elevation monuments to be set so that floodplain elevations can be more easily determined. ***Schedule: Reviewed Annually.***
- I.29 The Village will monitor development proposals for compliance with Section 404 of the Clean Water Act and will continue to enforce local land use ordinances to regulate development within or adjacent to freshwater swamps, marshes, and 404 wetlands. ***Schedule: Continuing Activity.***

- I.30 In the event of a natural disaster, the Village permits redevelopment of previously developed areas, provided all applicable policies, regulations, and ordinances are complied with. Redevelopment, including infrastructure, should be designed to withstand natural hazards. **Schedule: Continuing Activity.**
- I.31 The Village will enforce the density controls in the zoning ordinance and subdivision ordinance in potential redevelopment areas to control growth intensity. **Schedule: Continuing Activity.**
- I.32 In response to possible sea level rise, the Village will review all local building and land use related ordinances and consider establishing setback standards, density controls, bulkhead restrictions, buffer vegetation protection requirements, and building designs which will facilitate the movement of structures in the event that sea level rise poses a threat to existing development. **Schedule: Fiscal Years 2009-2010.**
- I.33 The Village will utilize the future land use maps to control development. These maps are coordinated with the land suitability map and existing infrastructure maps. **Schedule: Annually.**
- I.34 The Village will vigorously enforce its rights to protect its beaches and infrastructure under the Sand Management Plan, Colonel DeLony's June 9, 2000 letter, the Consistency Determination of the Division of Coastal Management, and the March 24, 2005 Settlement Agreement. **Schedule: Fiscal Years 2007-2010.**
- I.35 The Village will continue its dune stabilization efforts by continuing to install rope and pole fence enclosures around the primary dune line along oceanfront portions of the Village. This effort will also involve the planting of sea oats and Bitter Panicum to increase the stability of the dune line. **Schedule: Continuing Activity.**

## **8. Water Quality**

### *a. Management Goal*

The Village will maintain, protect, and where possible, enhance water quality in all coastal wetlands, rivers, streams, and estuaries. This should include a means of addressing the complex problems of planning for increased development and economic growth while protecting and/or restoring the quality and intended uses of the basin's surface waters.

*b. Planning Objective*

The Village will adopt policies for surface waters within the Village to help ensure that water quality is maintained if not impaired and improved if impaired.

*c. Land Use Plan Requirements*

The following provides the Village's policies/implementing actions on water quality.

**Policies:**

- P.43 The Village supports the guidelines of the Coastal Area Management Act and the efforts and programs of the North Carolina Department of Environment and Natural Resources, Division of Coastal Management and the Coastal Resources Commission to protect the coastal wetlands, estuarine waters, estuarine shorelines, and public trust waters of the Village.
- P.44 The Village supports conserving its surficial groundwater resources.
- P.45 The Village supports commercial and recreational fishing in its waters and will cooperate with other local governments and state and federal agencies to control pollution of these waters to improve conditions so that commercial and recreational fisheries will not be depleted. It also supports the preservation of nursery and habitat areas.
- P.46 The Village opposes the disposal of any toxic wastes, as defined by the US Environmental Protection Agency's Listing of Hazardous Substances and Priority Pollutants (developed pursuant to the Clean Water Act of 1977), within its planning jurisdiction.
- P.47 The Village recognizes the value of water quality maintenance to the protection of fragile areas and to the provision of clean water for recreational purposes and supports the control of stormwater runoff to aid in the preservation of water quality. The Village will support existing state regulations relating to stormwater runoff resulting from development (Stormwater Disposal Policy 15 NCAC 2H.001-.1003). Additionally, the Village supports all efforts of the Brunswick County NPDES Phase II stormwater management program.

- P.48 The Village supports regulation of underground storage tanks within the marina area for storing fuel in order to protect its groundwater resources. The Village will continue to rely on the NCDENR UST Division to regulate this policy.
- P.49 The Village supports the policy that all State of North Carolina projects should be designed to limit to the extent possible stormwater runoff into coastal waters.
- P.50 The Village supports implementation of the Cape Fear River Basin Water Quality Management Plan.
- P.51 The Village supports protection of those waters known to be of the highest quality or supporting biological communities of special importance.
- P.52 The Village supports management of problem pollutants, particularly biological oxygen demand and nutrients, in order to correct existing water quality problems and to ensure protection of those waters currently supporting their uses. This effort should focus on residential development adjacent to Bald Head Creek.
- P.53 The Village opposes the installation of package treatment plants and septic tanks or discharge of waste in any areas classified as coastal wetlands, freshwater wetlands (404), or natural heritage areas. This policy does not apply to constructed wetlands.
- P.54 The Village supports the following actions by the General Assembly and the Governor:
- Sufficient state funding should be appropriated to initiate a program of incentives grants to address pollution of our rivers from both point sources and nonpoint sources.
  - An ongoing source of state funding should be developed to provide continuous support for an incentives grant program.
  - The decision-making process for the award of incentives grants should involve river basin organizations representing local governments and other interest groups in the review of all applications for state funding.

- The ongoing effort of the Department of Environment and Natural Resources to develop administrative rules implementing the Cape Fear River Basin Management Strategy should continue to involve local government officials in the development, review, and refinement of the proposal.

P.55 The Village does not support the location of floating homes within its jurisdiction.

P.56 The Village supports the following goals of the NC Coastal Habitat Protection Program (CHPP):

- Document the ecological role and function of aquatic habitats for coastal fisheries.
- Provide status and trends information on the quality and quantity of coastal fish habitat.
- Describe and document threats to coastal fish habitat, including threats from both human activities and natural events.
- Describe the current rules concerning each habitat.
- Identify management needs.
- Develop options for management action using the above information.

P.57 The Village supports the efforts of the Bald Head Island Conservancy to monitor, and research methodologies to improve water quality throughout the Village's planning jurisdiction.

P.58 The Village of Bald Head Island will comply with all Phase II Stormwater Requirements, if the Village becomes a named community under the program by the NC Environmental Management Commission.

### **Implementing Actions:**

I.36 The Village will comply with CAMA and NC Division of Water Quality stormwater runoff regulations. This will include implementation of an NPDES Phase II program when the Village becomes a named community. ***Schedule: Fiscal Years 2007-2009.***

- I.37 The Village will enforce its zoning and subdivision regulations to aid in protecting sensitive shoreline areas. It will rely on state and federal agencies to promote and protect the Cape Fear River, as well as other nursery and habitat areas adjacent to the Village. **Schedule: Continuing Activity.**
- I.38 The Village will rely on the technical requirements and state program approval for underground storage tanks (40 CFR, Parts 280 and 281), and any subsequent state regulations concerning underground storage tanks adopted during the planning period. **Schedule: Continuing Activity.**
- I.39 The Village will continuously enforce, through the development and zoning permit process, all current regulations of the NC State Building Code and North Carolina Division of Health Services relating to building construction and septic tank installation/replacement in areas with soils restrictions. **Schedule: Continuing Activity.**
- I.40 The Village will implement the following actions through local ordinances to improve water quality (Note: these actions are especially significant in areas adjacent to Bald Head Creek):
- Use watershed-based land use planning
  - Minimize impervious cover in site design
  - Limit erosion during construction
  - Maintain coastal growth measures
  - Restoration of impaired waters
  - Reduction of nutrients in the Village waters. **Schedule: Review local ordinances annually.**
- I.41 Preservation of wetlands is important to the protection/improvement of water quality in the Village. The following will be implemented:
- Coordinate all development review with the appropriate office of the US Army Corps of Engineers and the Soil Conservation Service. **Schedule: Continuing Activity.**

- Require that wetland areas be surveyed and delineated on all preliminary and final subdivision plats. **Schedule: Fiscal Years 2007-2008.**

I.42 In responding to the requirements of the Phase II program, the Village will outline and implement a five-year stormwater management program aimed at reducing pollutants into receiving waterbodies. This program will focus on improving water quality in order to maintain adjacent waterbodies for the purposes of recreation and shellfishing. Specifically, this program will address the following minimum control measures (MCMs) in relation to stormwater management:

- Public Education and Outreach
- Public Participation
- Illicit Discharge Detection and Elimination
- Construction Site Runoff
- Post Construction Runoff Control
- Municipal Operations

**Schedule: Fiscal Year 2007-2008.**

## **9. Local Areas of Concern**

### *a. Management Goal*

The Village will integrate local concerns with the overall goals of CAMA in the context of land use planning.

### *b. Planning Objective*

The Village will identify and address local concerns and issues, such as cultural and historic areas, scenic areas, economic development, or general health and human services needs.

### *c. Land Use Plan Requirements*

The following provides the Village's policies/implementing actions on local areas of concern. All policies are continuing activities.

### **Policies - Cultural, Historic, and Scenic Areas:**

- P.59 The Village supports local, state, and federal efforts to protect historic properties within its borders and to perpetuate its cultural heritage. This specifically refers to the following recognized historic properties within the Village: Bald Head Creek Boathouse, Bald Head Island Lighthouse, Fort Holmes.

### **Implementing Actions - Cultural, Historic, and Scenic Areas:**

- I.43 The Village will guide development so as to protect historic and potentially historic properties in the Village and to perpetuate the Village's cultural heritage. ***Schedule: Continuing Activity.***
- I.44 The Village will coordinate all Village public works projects with the NC Division of Archives and History, to ensure the identification and preservation of significant archaeological sites. ***Schedule: Continuing Activity.***

### **Policies - Economic Development:**

- P.60 Visitors are important to the Village and will be supported by the Village.
- P.61 The Village will encourage both residential and mixed use (commercial/residential/office & institutional) development while aiming to protect the Village's resources and preserve its environmentally friendly atmosphere. Support for commercial development is limited to those areas specified on the future land use map.
- P.62 The Village will encourage moderate mixed use development in areas with existing infrastructure that does not infringe on existing medium density residential areas.
- P.63 The Village supports the extension of water services from existing systems and encourages the use of central systems for new developments.



### **Implementing Actions - Economic Development:**

- I.45 The Village will continue to support the activities of the Brunswick County Economic Development Commission. ***Schedule: Annual Membership.***
- I.46 The Village will support projects that will increase public access to shoreline areas. ***Schedule: Continuing Activity.***

### **Policies - General Health and Human Services Needs:**

- P.64 The Village supports the continued public provision of solid waste disposal, law enforcement, and educational services to all citizens of the Village.
- P.65 In an effort to improve health conditions, the Village supports the following water and sewer policies:
- The Village supports the extension of central water service into all areas of the Village shown on the land suitability analysis map as suitable for development, including the construction of lines to and through conservation areas to serve development which meets all applicable state and federal regulations.
  - The Village is aware that inappropriate land uses near well fields increase the possibility of well contamination. Land uses near groundwater sources are regulated by the North Carolina Division of Water Quality, Public Water Supply Section through NCAC Subchapter 2L and Subchapter 2C. The Village recognizes the importance of protecting potable water supplies, and therefore supports the enforcement of these regulations.
  - The Village supports all efforts to secure available state and federal funding for the construction and/or expansion of public and private water/sewer systems.
  - The Village supports the construction of water systems with adequate line sizes to ensure adequate water pressure and fire protection.

- The Village will continue to ensure provision of water services to Village residents and will continue the process of studying the role of Village government in providing sewage treatment facilities for rapidly growing areas of the Village, including the construction of lines to and through conservation areas to serve development which meets all applicable state and federal regulations. The Village will secure federal and state grants, when feasible, to help carry out this policy.

### **Implementing Actions - General Health and Human Services Needs:**

I.47 Floodplain regulation is a concern in the Village. To accomplish protection of public health and service needs, The Village will:

- Continue to enforce the flood hazard reduction provisions of the Village Land Development Ordinances. **Schedule: Continuing Activity.**
- Prohibit the installation of underground storage tanks in the 100-year floodplain. **Schedule: Continuing Activity.**
- Zone for open space, recreational, residential (at densities outlined under future land use), or other low-intensity uses within the floodplain. **Schedule: Continuing Activity.**

I.48 To effectively manage the Village's investment in existing and proposed community facilities and services, the Village will develop a specific capital improvements plan (CIP) with emphasis placed on services and facilities which affect growth and development. **Schedule: Fiscal Years 2007-2009.**

I.49 The Village will provide sufficient emergency services to all residents. The Village will implement the following:

- Require that all necessary infrastructure firefighting capability/capacity be provided in new subdivisions and developments. **Schedule: Review Annually.**

- Continue to maintain an effective signage and addressing system for all streets, roads, and highways. **Schedule: Continuing Activity.**
- I.50 The Village will manage the deer population within the Village in consultation with NC Wildlife and Fisheries and the BHI Conservancy. **Schedule: Annually.**

**Implementing Actions - Funding Options:**

- I.51 The Village will continue to support state and federal programs that are deemed necessary, cost-effective, and within the administrative and fiscal capabilities of the Village. **Schedule: Continuing Activity.** These include:
- Community Development Block Grant Program
  - Area Agency on Aging
  - Emergency Medical Services
  - Coastal Area Management Act, including shoreline access funds
  - Small Business Association
  - Economic Development Administration Funds
  - Federal Emergency Management Program
  - MEDICAID
  - Crisis Intervention
- I.52 The Village will selectively support state and federal programs related to the Village. The Village, through its boards and committees, will monitor state and federal programs and regulations. It will use opportunities as they are presented to voice support for or to disagree with programs and regulations that are proposed by state and federal agencies. **Schedule: Continuing Activity.**
- I.53 The Village officials will continue to work with the Army Corps of Engineers and any other state and federal agencies to ensure continued dredging and maintenance of channels and rivers as needed to keep these facilities open to navigation. These efforts shall comply with applicable state and federal regulations. Providing borrow or spoil areas and provision of easements for work will be determined on case-by-case basis. The Village encourages spoil material being placed on those areas where beach renourishment efforts are necessary. Channel maintenance has major economic significance and is worthy of state and federal funding. **Schedule: Program Reviewed Annually.**

## E. FUTURE LAND USE PLAN

### I. **Introduction**

The future land use plan or “map” is an essential tool for implementing land use planning. The map is intended to serve as a guide for the Village Council and Planning Board when they review private development proposals and make decisions on the location of public facilities. The land use plan also provides the framework upon which zoning and subdivision regulations and the capital improvements program should be based.

A land use plan is intended to accomplish three primary objectives. These objectives are as follows:

- ▶ To promote economic efficiency by coordinating the size and location of future publicly-provided future community facilities with the location and intensity of future private residential and commercial development activity.
- ▶ To optimize resources by allocating land for its most suitable use. For example, a village may want to focus high density residential development into areas that will not affect traffic flow, or impede sight lines and views from single-family residential areas.
- ▶ To provide a land use form that reflects the vision of the Village’s residents, is unified, avoids conflicting land uses, optimizes resources, preserves the Village’s character and is pleasing: providing open space, vistas and distinguishable districts.

It is important that the Village understands that merely completing the land use plan, illustrating the Village’s vision for the future, does not ensure that its objectives will be met. It should be noted however, that as discussed earlier in the plan, the Village is unique in that it is a planned community. Due to this fact land uses throughout a majority of the Village’s planning jurisdiction have already been determined. The Future Land Use map (page 138) expresses these development preferences which are in line with the Village’s zoning regulations and districts.

## 2. Future Land Use Map

### *a. Introduction*

The future land use map (Map 17) depicts application of the policies for growth and development as outlined in this plan, as well as the desired future patterns of land use and land development. Future infrastructure is not indicated on this map mainly due to the fact that a majority of the Village's planning jurisdiction currently receives both water and sewer service. The Future Land Use Plan Map was compiled utilizing a combination of existing land use, zoning regulations, and input from the Land Use Plan Committee. This map depicts how the Village will develop through total buildout. It is not anticipated that the uses as depicted will change. The future land use map must include the following:

- ▶ 14-digit hydrological units encompassed by the planning area.
- ▶ Areas and locations planned for conservation or open space and a description of compatible land uses and activities.
- ▶ Areas and locations planned for future growth and development with descriptions of the following characteristics:
  - Predominant and supporting land uses that are encouraged in each area;
  - Overall density and development intensity planned for each area; and
  - Infrastructure required to support planned development in each area.
- ▶ Existing and planned infrastructure, including major roads, water, and sewer.
- ▶ Reflect the information depicted on the Composite Map of Environmental Conditions (Map 11) and Map of Land Suitability Analysis (Map 16).

Map 17 - FLU

b. *Future Land Use Acreages*

Table 38 provides a summary of the estimated future land use acreages. Based on the results of the land suitability analysis, some areas are committed to the conservation category on the future land use map. The areas depicted as conservation on the map and corresponding acreages listed below will never be built upon. It should also be noted that the Smith Island Land Trust tracts shown on the map will also be preserved and remain as open space in perpetuity (for an explanation of the Smith Island Land Trust tracts located throughout the Village see page 50). The future land use plan map depicts areas for development which are geographically consistent with the land suitability map (Map I 6, page 92), and local ordinances. The future land use acreages are broken down into four categories or regions: Stage I, Stage II, Middle Island, and Other. The purpose of this is to show how these areas are intended to be developed. The following provides a brief description of each areas development characteristics:

**Stage I:** This was the original portion of the Village to be developed. This area is characterized by medium density single-family residential lots. There is some multi-family development in this area, but is not common. The ferry harbor and boat basin are also located within Stage I.

**Stage II:** This was the second phase of Bald Head Island to be developed and extends to the island's southeastern point. A large portion of Stage II is comprised of the Cape Fear Station PUD (shown on the future land use map), which is a mixed use development currently under construction.

**Middle Island:** Stage I and II discussed above were originally subdivided and developed by Bald Head Island Limited. This is the entity that controls the ferry which provides access to and from the island, and operated the water and sewer system that was recently acquired by the Village. Middle Island however, is controlled by a different entity without ties to Bald Head Island Limited. This area was developed with a focus on large lots (minimum lot size of 20,000 square feet) and reliance on private wastewater treatment facilities. This portion of the island is being developed at a slightly slower pace than Stages I and II.

**Other:** Areas that fall outside of the districts outlined above. This is comprise primarily of conservation areas and undeveloped land.

**Table 38. Village of Bald Head Island  
Future Land Use Acreages**

	Stage 1	Stage 2	Middle Island	Other	TOTAL	% of Total
Association Owned Properties	92.1	0.0	0.0	0.0	92.1	4.1%
Conservation	0.7	114.6	4.3	1,022.8	1,142.4	50.2%
Government	19.7	4.6	0.0	7.0	31.3	1.4%
Low Density Residential	0.0	0.4	84.3	0.0	84.7	3.7%
Medium Density Residential I	0.0	36.2	0.0	0.0	36.2	1.6%
Medium Density Residential II	437.6	29.7	0.0	0.0	467.3	20.6%
Mixed Use	23.7	26.0	0.0	0.0	49.7	2.2%
PUD	0.0	173.4	0.0	0.0	173.4	7.6%
Recreational	153.7	0.0	0.6	0.0	154.3	6.8%
Smith Island Land Trust	5.6	29.9	6.6	0.0	42.1	1.9%
Total	733.1	414.8	95.8	1,029.8	2,273.5	100.0%

Source: Holland Consulting Planners, Inc.

### 3. Descriptions of Future Land Use Categories

The following provides a description for each future land use category established on the Future Land Use Map. These categories are intrinsically tied to the policies set in this plan.

**Association Owned Property.** This district is defined as all properties that are owned and maintained by various property owners associations (POA) located throughout the Village's jurisdiction. These properties will remain under the ownership of a respective POA unless a request is made for transfer of ownership for a subject property to the Village. Determinations on whether the Village will accept ownership, and the resulting maintenance responsibilities associated with this transfer, will be made on a case-by-case basis.

*Allowable Density:* Development within this district will be prohibited and therefore no density thresholds have been established.

*Maximum Building Height:* N/A.

*Permitted Uses:* Recreational walking paths, educational signage, wooden walkways (slatted), navigational signage (within wetlands).



*Uses Not Permitted:* Any construction involving the establishment of stick-built/block structures and/or paved access paths.

**Conservation.** The conservation district was established with a focus on preserving the environmentally sensitive portions of the Village. The boundaries of this district correspond to portions of the Village determined to be least suitable for development through the land suitability analysis conducted earlier in the plan (see page 92). This area, as shown on the Future Land Use Map, is comprised largely of wetlands and the protected Bald Head Woods maritime forest. These portions of the Village will remain untouched and will be preserved as open space in perpetuity.

*Allowable Density:* Development within this district will be prohibited and therefore no density thresholds have been established.

*Maximum Building Height:* N/A.

*Permitted Uses:* Recreational walking paths, educational signage, wooden walkways (slatted), navigational signage (within wetlands).

*Uses Not Permitted:* Any construction involving the establishment of stick-built/block structures and/or paved access paths.

**Government.** This district is intended to define all properties that are utilized by the Village government for the purposes of administration and/or provision of public services. Examples of facilities located within this district include Village Hall, Village fire and police services, and parcels utilized for the provision of public utilities.

*Allowable Density:* 6.2 units per acre (minimum lot size 7,000 square feet).

*Maximum Building Height:* 45 feet.

*Permitted Uses:* This district is reserved for development related to the provision of government services. Development shall include: water and sewer system facilities, expansion of town government facilities, public recreation areas, public access facilities, public works facilities, stormwater management system facilities, transportation systems, educational facilities.

*Uses Not Permitted:* Mixed use/commercial development, single-family and multi-family residential development, private recreational facilities, private transportation systems.

**Mixed Use.** This district is located in areas where nonresidential development including commercial, planned development district, and office/professional uses are to be focused. These are portions of the Village where existing zoning will permit this type of development. At some point, mixed use residential/commercial development may be incorporated into these areas. Due to the medium density residential character of the island, commercial development needs to be cluster into specific locations so that the impact on surrounding neighborhoods is minimal. Additionally, the increased traffic flow generated by nonresidential development needs to be directed towards major thoroughfares traversing through the Village, and away from local access streets.

*Allowable Density:* Dependant on master plan to be reviewed and approved by Village Planning Board.

*Maximum Building Height:* 45 feet.

*Permitted Uses:* This district is intended to support a range of uses in an effort to establish mixed use nodes aimed at providing a pedestrian-friendly commercial center that does not conflict with adjacent residential areas. This development shall include: retail/commercial structures, mixed use development (i.e. residential above commercial/office space), government support services, recreation facilities, open space areas, transportation systems, parking areas.

*Uses Not Permitted:* Single-family residential is discouraged within this district but not prohibited. This district is intended to provide a centralized area for the development of non-residential development to support permanent and seasonal residents.

**Cape Fear Station PUD.** This district corresponds to the boundaries of the Cape Fear Station Planned Unit Development as approved by the Bald Head Island Village Council. A large portion of this property is being developed as single-family residential homes; however, due to flexibility related to development within a PUD the Cape Fear Station PUD will have single-family, multi-family, commercial/office space, and recreational uses once completed. In some instances residential and nonresidential uses may be combined into a single structure. Buildout of this development is expected to fall in line with the master plan currently on file with the Village planning and inspections office.

*Allowable Density:* Densities vary and are outlined on the approved Cape Fear Station PUD on file at the Village planning and inspections department.

*Maximum Building Height:* 45 feet.

*Permitted Uses:* This district consists of a planned community development aimed at providing a mix of uses including light commercial/office space, single-family and multi-family residential development, and open space/recreational areas. This plat has been approved by the Village, and construction is expected to transpire as indicated on the approved master plan.

*Uses Not Permitted:* Specific uses within this district are not prohibited; however, any significant changes to the master plan on file with the Village will require approval by the Planning Board and Village Council.

**Recreational.** This land use category involves all land that is occupied by the Bald Head Island Club golf course and clubhouse.

*Allowable Density:* Density thresholds have not been established for this district. Development within this district is expected to be minimal.

*Maximum Building Height:* 45 feet.

*Permitted Uses:* Development within this district shall be related directly to the Bald Head Island Club and the attached golf course facilities. This development shall include: expansions to the clubhouse facilities, golf course maintenance facilities, golf course support structures, golf course fairways and buffers, transportation systems required for golf course access, village stormwater management system components.

*Uses Not Permitted:* Mixed use/commercial development not related to the Bald Head Island Club, single-family and multi-family residential development.

**Residential.** This land use district accounts for all existing and proposed single-family residential development outside of the Cape Fear Station PUD. Residential land use throughout the Village is predominantly comprised of single-family homes; however, there are a few multi-family developments. As development moves forward, the trend toward single-family residential structures within the residential district is expected to continue. On average, lot sizes within the residential district range from Medium Density 1 (7,000 square feet or .16 acres) to Medium Density 2 (9,500 square feet or .22 acres) depending on what zoning district a specific property falls into. An exception to this general rule are those properties located within Middle Island. This area was developed with a focus on low density development, and has a minimum lot size of 20,000 square feet (.46 acres), which is considered Low Density. A majority of the land throughout the Village's jurisdiction has already been subdivided in preparation for development based on historical and existing Village land development code. There are a few tracts yet to be subdivided; however, future subdivision and subsequent development of these tracts is expected to be in line with the rest of the Village's planning jurisdiction.

*Allowable Density:* Medium Density 1 – 4.3 units per acre (minimum lot size 9,500 sq. ft.)

Medium Density 2 – 6.2 units per acre (minimum lot size 7,000 sq. ft.)

Low Density – 2.1 units per acre (minimum lot size 20,000 sq. ft.)

*Maximum Building Height:* 45 feet.

*Permitted Uses:* Medium Density 1 – single-family residential development (this includes multi-family in the form of townhouses and condominiums with access to the Village’s central sewer system); non-residential development as permitted by the Village Planning Board (should consist of low impact non-residential development which conforms with surrounding residential areas).

Medium Density 2 – single-family detached dwellings (central sewer service required).

Low Density – single-family detached dwelling (on-site wastewater treatment permitted).

*Uses Not Permitted:* non-residential development (mixed use/commercial) with the exception of low impact non-residential development within the Medium Density 1 district as permitted by the Village Planning Board.

**Smith Island Land Trust.** These tracts, as indicated on the Future Land Use Map, will essentially be treated as conservation areas. As discussed on page 49 of the plan (Protected Lands and Significant Natural Heritage Areas), these areas are protected by the Smith Island Land Trust which was merged with the Bald Head Island Conservancy in 2002. The conservancy has assumed the role of overseeing the protection of the properties, and it is anticipated that these areas will remain in their natural state.

*Allowable Density:* Development within this district will be prohibited and therefore, no density thresholds have been established.

*Maximum Building Height:* N/A.

*Permitted Uses:* Development within this district is prohibited.

*Uses Not Permitted:* Development within this district is prohibited.

**Right-of-Way.** This land use category includes all major and minor thoroughfares running throughout the Village’s planning jurisdiction. There are roads that do not fall under the Village’s jurisdiction, however, these areas have been included under the Association Owned Property land use category. The Village does have a policy that outlines the process through which the Village will assume ownership and maintenance responsibility of privately-owned streets (refer to Transportation Policies, page 122).

**Water.** All inter-island waterbodies have been included in this land use category. A majority of this area falls within the Bald Head Island Club golf course property.

#### **4. Land Use in Relation to Zoning**

The following provides a summary of how the future land use categories above correspond to the Village's existing zoning district. Refer back to page 97 for description of the intended uses within each of these districts.

##### **LAND USE CATEGORIES and CORRESPONDING ZONING CLASSIFICATIONS:**

Association Owned Property – PD-1

Conservation – PD-1, PD-2, PD-3, PD-4

Government – PD-1, PD-2, PD-2C, PD-3C-1

Mixed Use – PD-2, PD-2C, PD-3, PD-3C

Cape Fear Station PUD – PD-2, PD-2C, PD-4

Recreational – PD-1, PD-4

Residential – PD-1, PD-2, PD-2C, PD-3, PD-3C, PD-3C-1, PD-4, PD-NC

Smith Island Land Trust – PD-1, PD-2, PD-4

\*Zoning districts are defined beginning on page 97 of the plan.

\*Not all land within the Village has been zoned. Large conservation tracts on the North side of the Village's jurisdiction remain unzoned, and will never be built on.

#### **5. Land Demand Forecast (Carrying Capacity & Density/Intensity Analysis)**

Typically this section is intended to develop a forecast of how a jurisdiction is expected to develop over the next twenty years, through 2025. In the case of the Village, this effort does not seem to be very applicable. There are several reasons for making this statement. The most important reason for conducting these forecast is to address infrastructure carrying capacity needs through the planning period and beyond, in an effort to ensure that jurisdictions are prepared to address these needs. As town's and county's continue to feel the pressures of increased development, water and sewer availability become increasingly important issues. The Village, however, is acutely aware of their jurisdiction's infrastructure needs, and have devised a plan to support the these needs through buildout of the entire island.

As discussed in the Future Demands section of the plan (page 103), the Village has recently acquired the water and sewer systems from Bald Head Island Utilities. The acquisition of these utilities now puts the Village in control of ongoing maintenance and future improvements, but the day-to-day operation of these utilities and operations personnel will remain in place. According to Utilities officials currently employed by the Village, the plan is to increase the Village's sewer plant capacity from 400,000 GPD up to 800,000 GPD by the year 2027. The Village of Bald Head Island Utilities is currently researching how much the sewer plant capacity needs to be increased in order to support build-out of the corporate limits. A determination regarding the cost of these improvements has not been made. Once these improvements have been made, and all DENR

permits have been secured, it is expected that this will support the entire Village’s sewer needs through build-out. Additionally, due to the presence of a Brunswick County water line extending to the Village from Caswell Beach, there is not expected to be any issues related to water capacity. This trunk line supplements the Village’s existing water system which operates off wells located throughout the Village’s jurisdiction. It is anticipated that the current water system will be more than sufficient to support build-out.

The only exception to this rule is the Middle Island area. These properties, mainly due to their size, will continue to rely on private septic tank systems for wastewater treatment. The Village plans to extend sewer to Middle Island during the planning period.

Housing unit forecast through the year 2025 have been compiled and are included on page 78 of the plan. These forecast were generated based on the issuance of 68 residential building permits on average per year dating back to 1995 (see Table 8, page 17). This steady trend is expected to continue and by the year 2025 it is anticipated that there will be approximately 2,180 residential dwelling units within the Village’s corporate limits.

The forecasted residential growth estimates outlined in Table 34 (page 78) make assumptions regarding the development of housing units throughout the Village’s corporate limits. It is difficult to make a determination regarding the number of new structures or operations under these land use categories based on acreage and minimum lot size calculations; therefore, the forecasts have been based on an average lot size of 0.3 acres combined with an average building permit issuance rate of 68 per fiscal year. Table 39 summarizes the estimated infrastructure capacity demands through the year 2025. Average usage rates for each land use category have been established as follows. The rates outlined in this table are average usage rates as reported by the American Water Works Association (AWWA). The sewer usage rates assume that 95% of all potable water use will be channeled through a respective jurisdictions wastewater treatment system.

Water System Average Daily Usage Rates (Gallons Per Day)	
Residential:	170
Commercial:	100
Office & Institutional:	100
Industrial:	200

Sewer System Average Daily Usage Rates (Gallons Per Day)	
Residential:	161
Commercial:	95
Office & Institutional:	95
Industrial:	190

Current Infrastructure System Capacity and Usage:

**Water System:**

System Capacity: 170 GPM (244,800 GPD)

Capacity Utilized: 170 GPM (244,800 GPD)

\*supplemented by the Brunswick County Water System

**Sewer System (peak season):**

System Capacity: 400,000 GPD

Capacity Utilized: 152,000 GPD

**Table 39. Village of Bald Head Island  
Infrastructure System Demand Based on Residential Land Demand Forecast (see Table 34)**

	2005 (existing units)	2010	2015	2020	2025
Residential Unit Increase	820	340	340	340	340
Increased Water System Demand	N/A	57,800 GPD	57,800 GPD	57,800 GPD	57,800 GPD
Total Water System Capacity Required	139,400 GPD	197,200 GPD	255,000 GPD	312,800 GPD	370,600 GPD
Total Sewer System Capacity Required	132,430 GPD	187,340 GPD	242,250 GPD	297,160 GPD	352,070 GPD

\*In the year 2025 it is anticipated that Village of Bald Head Island will rely on the Brunswick County Water system for the production of approximately 147,869 GPD (42%) of water to serve the Village's municipal water supply.

\*Based on the estimates above the Village should have all sewer system upgrades in place no later than 2020.

Source: Holland Consulting Planners, Inc.

## **6. Summary of General Principles Used to Develop the Land Use Plan**

The Village of Bald Head Island Land Use Plan was drafted with consideration given to the following:

- ▶ Key land use issues
- ▶ Existing plans for the development of public facilities
- ▶ Development constraints
- ▶ Existing zoning patterns
- ▶ Limiting potential land use conflicts
- ▶ Preservation of existing single-family residential neighborhoods

## **SECTION VII. TOOLS FOR MANAGING DEVELOPMENT**

### **A. GUIDE FOR LAND USE DECISION MAKING**

This document should be an integral part of the Village's decision making process concerning future land use. The plan should be consulted prior to any decision being made by Village staff, Planning Board, and/or Village Council concerning land use and development.

### **B. EXISTING DEVELOPMENT PROGRAM**

The existing management program includes the following ordinances: Village of Bald Head Island Land Use Ordinance (includes zoning and subdivision regulations, and flood damage prevention ordinance), North Carolina Building Code, National Flood Insurance Program, and the 1997 Brunswick County Land Use Plan. Preparation of the 1997 Land Use Plan was coordinated with the land use related codes.

### **C. ADDITIONAL TOOLS**

The Village of Bald Head Island will utilize the following additional tools to implement this plan:

- ▶ The Village Planning Director shall prepare an annual report assessing the effectiveness of plan implementation. This report shall be presented to the Village Council.
- ▶ At a minimum, update the Land Use Plan and implementation process every five years.

### **D. ACTION PLAN/SCHEDULE**

#### **I. Citizen Participation**

For the preparation of this plan, the Village Council adopted a citizen participation plan on September 17, 2004. A copy of that plan is included as Appendix I. Following adoption of this plan, the Village will implement the following to ensure adequate citizen participation:

- ▶ The Village will encourage public participation in all land use decisions and procedure development processes and encourages citizen input via its boards and committees.
- ▶ The Village will advertise all meetings of the Planning Board and Board of Adjustment through newspaper advertisements and notice postings.



- ▶ The Village will utilize advisory committees to assess and advise the Village on special planning issues/needs.
- ▶ The Village will, at least annually, conduct a joint meeting of the Village Council and the Village's Planning Board to identify planning issues/needs.
- ▶ The Village's website will be updated to include this plan.
- ▶ All public hearings for changes to land use related ordinances which affect AECs shall include in the notice a specific description of the impact of the proposed change on the AECs.
- ▶ Ensure that the membership of all planning related and ad hoc advisory committees has a broad cross section of the Village's citizenry.

## 2. Action Plan/Schedule

The following describes the priority actions that will be taken by the Village of Bald Head Island to implement this CAMA Core Land Use Plan and the fiscal year(s) in which each action is anticipated to begin and end. This action plan will be used to prepare the implementation status report for the CAMA Land Use Plan.

Policy References	Implementing Actions	Schedule	
		Begin	End
P.1-P.5	The Village will prepare a shoreline access and public facilities plan and request Division of Coastal Management funding for the preparation of the plan.	FY2007	FY2009
P.1-P.5	The Village will pursue funding under the North Carolina CAMA Shoreline Access funding program.	FY2007	FY2010
P.6-P.11 P.12-P.14 P.15-P.19	The Village will review and revised as necessary its zoning and subdivision ordinances to address the policies contained in this Land Use Plan.	FY2007	FY2009
P.20-P.22	The Village will consider adopted and enforcing a soil erosion and sediment control ordinance.	FY2008	FY2010
P.20-P.22	The Village will review its stormwater control ordinance and include updates regarding regulations for water detention and/or retention facilities in new developments as new state and federal policy requires.	FY2007	FY2008
P.20-P.22	The Village supports ongoing planning and capital improvement efforts to address the drainage problem associated with flooding from tropical storm events.	FY2007	FY2009

Policy References	Implementing Actions	Schedule	
		Begin	End
P.20-P.22	The Village will continue to seek grant funding from state and federal agencies for assistance in funding capital improvement projects that will aid the Village in alleviating flooding and storm drainage problems which exist throughout the Village.	FY2007	FY2009
P.23-P.27	The Village will rely on its existing land use and development ordinances to regulate development and may amend or modify regulations to encourage or require the provision of central water service to lots or parcels proposed in new developments.	FY2007	FY2008
P.23-P.27	The Village will consider adopting an operating and capital financing plan for the development of water and sewer system extensions and upgrades in preparation for future demand.	FY2006	FY2008
P.28-P.34	The Village will establish a no wake zone at the mouth of Bald Head Creek. This will be implemented through the installation of buoys and signage specifying where this zone will begin.	FY2007	FY2008
P.35-P.42	In response to sea level rise, the Village will review all local building and land use-related ordinances and consider establishing setback standards, density controls, bulkhead restrictions, buffer vegetation protection requirements, and building designs which will facilitate the movement of structures in the event that sea level rise poses a threat to existing development.	FY2009	FY2010
P.35-P.42	The Village will work with the US Army Corps of Engineers to ensure that the existing six-year cycle for beach renourishment is maintained.	FY2007	FY2010
P.43-P.58	The Village will comply with CAMA and NC Division of Water Quality stormwater runoff regulations. This will include implementation of an NPDES Phase II program when the Village becomes a named community.	FY2007	FY2009
P.43-P.58	The Village will require that wetland areas be surveyed and delineated on all preliminary and final subdivision plats.	FY2007	FY2008
P.43-P.58	In responding to the requirements of the Phase II program, the Village will outline and implement a five-year stormwater management program aimed at reducing pollutants into receiving waterbodies. This program will focus on improving water quality in order to maintain adjacent waterbodies for the purposes of recreation and shellfishing.	FY2007	FY2008
P.64-P.65	To effectively manage the Village's investment in existing and proposed community facilities and services, the Village will develop a specific capital improvements plan with emphasis placed on services and facilities which affect growth and development.	FY2007	FY2009

E. RESOURCE CONSERVATION MANAGEMENT ACTION PLAN/POSITIVE AND NEGATIVE IMPACTS OF LAND USE PLAN POLICIES

The Village believes that the policies, management goals, planning objectives, and land use plan requirements contained in this document will have positive impacts for the Village. However, the following could have some negative impacts:

- ▶ Transportation improvements in sensitive and non sensitive areas.
- ▶ Potential infringement of growth on sensitive areas.
- ▶ Increased stormwater runoff.
- ▶ Possible degradation of water quality.

The management objectives, policies, and implementing actions address the issues associated with these possible negative impacts. Mitigating policies are stated in the conservation policies, page 117; stormwater control policies, page 118; infrastructure carrying capacity, page 120; and water quality, page 127.

Table 40 provides an analysis matrix which summarizes this plan's policies and identifies them as beneficial, neutral, or detrimental.

**Table 40: Village of Bald Head Island  
Policy Analysis Matrix – Land Use Plan Management Topics**

Management Topics	Policy Benchmarks – Indicate whether policy <u>beneficial</u> (B), <u>neutral</u> (N), or <u>detrimental</u> (D)					
	Public Access	Land Use Compatibility	Infrastructure Carrying Capacity	Natural Hazards	Water Quality	Local Concerns
<b>Land Use and Development Policies</b>	<ul style="list-style-type: none"> <li>• more planned access locations</li> <li>• upgrades to existing access locations</li> <li>• increase pedestrian access</li> <li>• comply with state access standards to enhance opportunities for state funding</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in habitat loss and fragmentation related to impacts of land use and development</li> <li>• reduction of water resource and water quality degradation</li> <li>• balance growth demands with protection of the environment</li> </ul>	<ul style="list-style-type: none"> <li>• water, sewer, and other key community facilities and services being available in required locations at adequate capacities to support planned community growth and development patterns</li> <li>• during construction of infrastructure systems, AECs and other fragile areas should be protected</li> <li>• transportation improvements should support the efficiency of traffic flow and pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• land uses and development patterns that reduce vulnerability to natural hazards</li> <li>• land uses and development patterns that take into account the existing and planned capacity of evacuation infrastructure</li> <li>• minimize development in floodplains, AECs, wetlands, and other fragile areas</li> </ul>	<ul style="list-style-type: none"> <li>• land use and development criteria and measures that abate impacts that degrade water quality</li> <li>• coordinate water quality efforts with Brunswick County</li> </ul>	<ul style="list-style-type: none"> <li>• preservation of cultural, historic, and scenic areas</li> <li>• support of economic development</li> <li>• development of human resources</li> <li>• preservation of the town's rural character</li> <li>• decrease residential density within town</li> </ul>
<b>Public Access:</b> P.1	B	B	B	N	B	B
P.2	B	B	N	N	N	B
P.3	B	N	N	N	N	B
P.4	B	B	N	N	N	B
P.5	B	N	N	N	N	B
<b>Land Use Compatibility:</b> P.6	N	B	B	B	N	B
P.7	N	B	B	N	N	B
P.8	B	B	B	B	B	B
P.9	N	B	B	N	B	B
P.10	N	B	B	B	B	B
P.11	N	N	N	N	N	B
P.12	N	B	B	N	N	B

Table 40 (continued)

Management Topics	Policy Benchmarks – Indicate whether policy <u>beneficial</u> (B), <u>neutral</u> (N), or <u>detrimental</u> (D)					
	Public Access	Land Use Compatibility	Infrastructure Carrying Capacity	Natural Hazards	Water Quality	Local Concerns
<b>Land Use and Development Policies</b>	<ul style="list-style-type: none"> <li>• more planned access locations</li> <li>• upgrades to existing access locations</li> <li>• increase pedestrian access</li> <li>• comply with state access standards to enhance opportunities for state funding</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in habitat loss and fragmentation related to impacts of land use and development</li> <li>• reduction of water resource and water quality degradation</li> <li>• balance growth demands with protection of the environment</li> </ul>	<ul style="list-style-type: none"> <li>• water, sewer, and other key community facilities and services being available in required locations at adequate capacities to support planned community growth and development patterns</li> <li>• during construction of infrastructure systems, AECs and other fragile areas should be protected</li> <li>• transportation improvements should support the efficiency of traffic flow and pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• land uses and development patterns that reduce vulnerability to natural hazards</li> <li>• land uses and development patterns that take into account the existing and planned capacity of evacuation infrastructure</li> <li>• minimize development in floodplains, AECs, wetlands, and other fragile areas</li> </ul>	<ul style="list-style-type: none"> <li>• land use and development criteria and measures that abate impacts that degrade water quality</li> <li>• coordinate water quality efforts with Brunswick County</li> </ul>	<ul style="list-style-type: none"> <li>• preservation of cultural, historic, and scenic areas</li> <li>• support of economic development</li> <li>• development of human resources</li> <li>• preservation of the town's rural character</li> <li>• decrease residential density within town</li> </ul>
P.13	N	B	N	B	B	B
P.14	N	B	D	B	B	B
P.15	N	B	N	B	B	N
P.16	N	B	N	B	B	N
P.17	N	B	B	N	B	N
P.18	B	B	N	N	B	D
P.19	N	B	N	B	N	B
P.20	N	N	N	N	B	B
P.21	N	B	N	B	N	N
P.22	N	B	N	N	B	D
<b>Infrastructure Carrying Capacity:</b> P.23	B	N	B	B	B	B
P.24	N	B	B	N	B	B

Table 40 (continued)

Management Topics	Policy Benchmarks – Indicate whether policy <u>beneficial</u> (B), <u>neutral</u> (N), or <u>detrimental</u> (D)					
	Public Access	Land Use Compatibility	Infrastructure Carrying Capacity	Natural Hazards	Water Quality	Local Concerns
<b>Land Use and Development Policies</b>	<ul style="list-style-type: none"> <li>• more planned access locations</li> <li>• upgrades to existing access locations</li> <li>• increase pedestrian access</li> <li>• comply with state access standards to enhance opportunities for state funding</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in habitat loss and fragmentation related to impacts of land use and development</li> <li>• reduction of water resource and water quality degradation</li> <li>• balance growth demands with protection of the environment</li> </ul>	<ul style="list-style-type: none"> <li>• water, sewer, and other key community facilities and services being available in required locations at adequate capacities to support planned community growth and development patterns</li> <li>• during construction of infrastructure systems, AECs and other fragile areas should be protected</li> <li>• transportation improvements should support the efficiency of traffic flow and pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• land uses and development patterns that reduce vulnerability to natural hazards</li> <li>• land uses and development patterns that take into account the existing and planned capacity of evacuation infrastructure</li> <li>• minimize development in floodplains, AECs, wetlands, and other fragile areas</li> </ul>	<ul style="list-style-type: none"> <li>• land use and development criteria and measures that abate impacts that degrade water quality</li> <li>• coordinate water quality efforts with Brunswick County</li> </ul>	<ul style="list-style-type: none"> <li>• preservation of cultural, historic, and scenic areas</li> <li>• support of economic development</li> <li>• development of human resources</li> <li>• preservation of the town's rural character</li> <li>• decrease residential density within town</li> </ul>
P.25	N	B	B	N	N	B
P.26	N	N	D	N	N	B
P.27	B	B	N	N	N	B
P.28	N	B	B	N	N	B
P.29	N	B	B	N	N	N
P.30	N	B	B	B	N	B
P.31	B	N	B	B	N	B
P.32	N	N	B	N	B	B
P.33	B	N	N	B	N	B
P.34	N	N	B	N	N	B
<b>Natural Hazards:</b> P.35	N	N	N	B	N	B
P.36	B	N	N	B	N	B
P.37	N	B	N	B	N	B

Table 40 (continued)

Management Topics	Policy Benchmarks – Indicate whether policy <u>beneficial</u> (B), <u>neutral</u> (N), or <u>detrimental</u> (D)					
	Public Access	Land Use Compatibility	Infrastructure Carrying Capacity	Natural Hazards	Water Quality	Local Concerns
<b>Land Use and Development Policies</b>	<ul style="list-style-type: none"> <li>• more planned access locations</li> <li>• upgrades to existing access locations</li> <li>• increase pedestrian access</li> <li>• comply with state access standards to enhance opportunities for state funding</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in habitat loss and fragmentation related to impacts of land use and development</li> <li>• reduction of water resource and water quality degradation</li> <li>• balance growth demands with protection of the environment</li> </ul>	<ul style="list-style-type: none"> <li>• water, sewer, and other key community facilities and services being available in required locations at adequate capacities to support planned community growth and development patterns</li> <li>• during construction of infrastructure systems, AECs and other fragile areas should be protected</li> <li>• transportation improvements should support the efficiency of traffic flow and pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• land uses and development patterns that reduce vulnerability to natural hazards</li> <li>• land uses and development patterns that take into account the existing and planned capacity of evacuation infrastructure</li> <li>• minimize development in floodplains, AECs, wetlands, and other fragile areas</li> </ul>	<ul style="list-style-type: none"> <li>• land use and development criteria and measures that abate impacts that degrade water quality</li> <li>• coordinate water quality efforts with Brunswick County</li> </ul>	<ul style="list-style-type: none"> <li>• preservation of cultural, historic, and scenic areas</li> <li>• support of economic development</li> <li>• development of human resources</li> <li>• preservation of the town's rural character</li> <li>• decrease residential density within town</li> </ul>
P.38	N	N	B	B	N	N
P.39	N	B	B	B	N	B
P.40	B	N	N	N	N	B
P.41	N	B	N	B	N	B
P.42	N	B	N	B	B	B
<b>Water Quality:</b> P.43	B	N	N	B	B	B
P.44	N	N	B	N	N	B
P.45	B	N	N	N	B	B
P.46	N	N	N	N	B	N
P.47	N	N	B	N	B	B
P.48	N	B	N	B	B	N
P.49	N	N	N	N	B	N
P.50	N	B	N	N	B	N

Table 40 (continued)

Management Topics	Policy Benchmarks – Indicate whether policy <u>beneficial</u> (B), <u>neutral</u> (N), or <u>detrimental</u> (D)					
	Public Access	Land Use Compatibility	Infrastructure Carrying Capacity	Natural Hazards	Water Quality	Local Concerns
<b>Land Use and Development Policies</b>	<ul style="list-style-type: none"> <li>• more planned access locations</li> <li>• upgrades to existing access locations</li> <li>• increase pedestrian access</li> <li>• comply with state access standards to enhance opportunities for state funding</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in habitat loss and fragmentation related to impacts of land use and development</li> <li>• reduction of water resource and water quality degradation</li> <li>• balance growth demands with protection of the environment</li> </ul>	<ul style="list-style-type: none"> <li>• water, sewer, and other key community facilities and services being available in required locations at adequate capacities to support planned community growth and development patterns</li> <li>• during construction of infrastructure systems, AECs and other fragile areas should be protected</li> <li>• transportation improvements should support the efficiency of traffic flow and pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• land uses and development patterns that reduce vulnerability to natural hazards</li> <li>• land uses and development patterns that take into account the existing and planned capacity of evacuation infrastructure</li> <li>• minimize development in floodplains, AECs, wetlands, and other fragile areas</li> </ul>	<ul style="list-style-type: none"> <li>• land use and development criteria and measures that abate impacts that degrade water quality</li> <li>• coordinate water quality efforts with Brunswick County</li> </ul>	<ul style="list-style-type: none"> <li>• preservation of cultural, historic, and scenic areas</li> <li>• support of economic development</li> <li>• development of human resources</li> <li>• preservation of the town's rural character</li> <li>• decrease residential density within town</li> </ul>
P.51	B	N	N	N	B	B
P.52	N	N	N	N	B	B
P.53	N	B	B	B	B	N
P.54	N	B	N	B	B	N
P.55	N	B	N	B	B	N
P.56	B	B	N	B	B	B
P.57	B	N	N	B	B	N
P.58	N	N	B	N	B	N



Table 40 (continued)

Management Topics	Policy Benchmarks – Indicate whether policy <u>beneficial</u> (B), <u>neutral</u> (N), or <u>detrimental</u> (D)					
	Public Access	Land Use Compatibility	Infrastructure Carrying Capacity	Natural Hazards	Water Quality	Local Concerns
<b>Land Use and Development Policies</b>	<ul style="list-style-type: none"> <li>• more planned access locations</li> <li>• upgrades to existing access locations</li> <li>• increase pedestrian access</li> <li>• comply with state access standards to enhance opportunities for state funding</li> </ul>	<ul style="list-style-type: none"> <li>• reduction in habitat loss and fragmentation related to impacts of land use and development</li> <li>• reduction of water resource and water quality degradation</li> <li>• balance growth demands with protection of the environment</li> </ul>	<ul style="list-style-type: none"> <li>• water, sewer, and other key community facilities and services being available in required locations at adequate capacities to support planned community growth and development patterns</li> <li>• during construction of infrastructure systems, AECs and other fragile areas should be protected</li> <li>• transportation improvements should support the efficiency of traffic flow and pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• land uses and development patterns that reduce vulnerability to natural hazards</li> <li>• land uses and development patterns that take into account the existing and planned capacity of evacuation infrastructure</li> <li>• minimize development in floodplains, AECs, wetlands, and other fragile areas</li> </ul>	<ul style="list-style-type: none"> <li>• land use and development criteria and measures that abate impacts that degrade water quality</li> <li>• coordinate water quality efforts with Brunswick County</li> </ul>	<ul style="list-style-type: none"> <li>• preservation of cultural, historic, and scenic areas</li> <li>• support of economic development</li> <li>• development of human resources</li> <li>• preservation of the town's rural character</li> <li>• decrease residential density within town</li> </ul>
<b>Local Concerns:</b> P.59	N	B	N	N	N	B
P.60	B	N	N	N	N	B
P.61	B	B	B	N	N	B
P.62	N	B	B	N	N	B
P.63	N	N	B	N	N	B
P.64	N	B	B	B	B	B
P.65	N	B	B	N	B	B

## **Notes to the Policy Analysis Matrix:**

### **I. Public Access**

**P.1 (B) - P.5 (B)** - Policies P.1 through P.5 address public access within Bald Head Island's planning jurisdiction. These policies are intended to improve existing access facilities and provide for acquisition or donation of additional public access sites in compliance with NC CAMA standards. The town does not include specific locational access site standards. Locational decisions will be based on land availability, environmental conditions, and available funding. State funding will be essential, therefore, state access standards will be followed.

### **2. Land Use Compatibility**

**P.6 (B) - P.7 (B), P.10 (B)** - These policies are intended to reinforce the Village's goal of maintaining the moderate density residential character of the Village. Single family residential low impact development is what the Village was founded upon, and therefore these policies statements will serve to ensure that future growth does not have an adverse impact on this trend.

**P.8 (B)** - This policy states the Village's understanding that community facilities and services must keep pace with rapidly increasing development.

**P.9 (B)** - The Village promoted the establishment of wooded buffers along major thoroughfares to protect adjacent residential areas, however these buffers should not impeded on visibility at traffic intersections.

**P.11 (N)** - This policy recognizes the importance of Property Owners Associations (POA's) to the sound and uniform development of the Village. POA codes work in conjunction with municipal ordinances to ensure that residential and non residential development is in conformity with adjacent properties.

**P.12 (B) - P.13 (B)** - These policies express the Village's desire to limit nonresidential development to very specific portions of the island. The Village feels that commercial development should be focused in portions of the Village that will not have any adverse impacts on adjacent residential neighborhoods. The Village also prohibits the development of any industrial operation or noxious commercial operations.

**P.15 (B) - P.19 (B)** - The policies outline the views of the Village with respect to protecting the natural environment that exist throughout its jurisdiction. Significant steps have been taken over the years to ensure that the maritime forest, and overall natural beauty of the island is protected from rapid development. These efforts are supported through programs such as the Bald Head Island Conservancy and the Smith Island Land Trust.

**P.20 (B) - P.22 (B)** - These policies state the Village's support of stormwater management and control in an effort to reduce impacts on adjacent properties as development moves forward. Stormwater is a significant issue for the Village especially following tropical storm events. Based on these policies, the Village will continue to research solutions for reducing and managing stormwater runoff.

### **3. Infrastructure Carrying Capacity**

**P.23 (B) - P.25 (B)** - These policies state the Village's intention of continuing to provide an adequate level of public infrastructure and community service to its permanent and seasonal residents. The Village is unique in that population levels shift substantially from winter to summer months. These policies ensure that the Village will continue to monitor its public service facilities and programs to ensure that they are meeting the required demands.

**P.26 (B)** - This policy recognizes that certain portions of the Village do not currently have access to the municipal central sewer system. In an effort to extend this service to as many customers as possible, the Village may consider requiring all new developments to tie into the central system. This will be enforced through making revisions to the Village's existing land development code.

**P.28 (B)** - Many citizens within the Village would like to see an increase in the availability of public recreational facilities. The Village will consider the establishment of such facilities during the planning period.

### **4. Transportation**

**P.28 (B) - P.30 (B), P.32 (B)** - These policies state that the Village will aim to provide a safe, efficient, and well planned transportation network throughout its jurisdiction. The Village is unique in that all roads on the island are private and not open to private automobiles. Due to this fact the Village faces a unique challenge in regulating the use of golf carts, while overseeing the use of commercial trucks and delivery vehicles.

**P.31 (B), P.33 (B)** - The Village must continue to ensure that the Intracoastal Waterway, Ferry Channel and Ferry Basin remain dredged and navigable. This is the only means of travel to and from the municipality, and is essential to providing public safety and a means of access to the mainland.

**P.34 (B)** - The Village will carefully monitor the use of motorized watercraft within Bald Head Creek. Use of engines in excess of 25 horsepower not only poses a threat to property and public safety, but also contributes to the degradation of water quality in the creek.

## **5. Natural Hazard Areas**

**P.35 (B) - P.36 (B)** - The Village recognizes these two construction and development as outlined in these two policies may have potentially harmful effects on the environment. The Village does not currently oppose this development, as long as projects are approved and permitted by NC DENR, the Village Planning and Inspections Office, and all other applicable State and Federal agencies.

**P.37 (B) - P.39 (B)** - These states the Village's recognition of the dynamic environment that exist on a barrier island community. Due to these hazards these policies have been adopted to not only protect property owners, but also to ensure that the Village is prepared for the effects of sea level rise, and the potential damage caused by tropical storm events.

**P.40 (B)** - This policy underscores the policies outlined in P.35 and P.37, which aim to ensure that a safe means of transportation to and from the island are maintained. Additionally, it is important that the Cape Fear River Channel remain clear and dredged to ensure the vitality of the regional economy.

**P.41 (B) - P.42 (B)** - These policies state the importance and dedication that the Village has to protecting the primary dune line traversing through the center of the island. Maintenance of this dune line is imperative to the survival of the island as a habitable barrier island. One of the most important issues that needs to be enforced, is the regulation fo removing trees and brush that anchor the dune system, and protects it from wind and water erosion.

## **6. Water Quality**

**P.43 (B) - P.58 (B)** - All policies listed in this section, outline the Village's dedication to improving and maintaining water quality within all waterbodies adjacent to its jurisdiction. As tourist destination, and environmentally sensitive area, water quality is a very important issue to the

Village's citizens and property owners. The Village will continue to monitor water quality through the Bald Head Island Conservancy, and seek ways to minimize water pollution as development moves forward.

## **7. Local Areas of Concern**

**P.59 (B)** - The Village is very aware of the historic resources that are located throughout its jurisdiction. These resources are a key part of the character and charm that make the Village such a desirable destination. This policy acknowledges that fact, establishes the stance that the town intends to protect these resources.

**P.60 (B)** - The Village recognizes the importance of tourism, and will continue to welcome seasonal visitors.

**P.61 (N) - P.62 (N)** - Commercial development within the Village should be focused into areas as indicated on the Future Land Use Map. The Village does not discourage commercial development, but would like to focus this development into areas within the Village that will not have adverse impacts on residential neighborhoods.

**P.63 (B)** - This policy ties back to the infrastructure statements made earlier in the plan. The Village does not currently provide service to all residents. This is a goal of the Village, and all new development will be connected to the Village's central sewer system if possible. At this time this policy does not apply to those properties located on Middle Island.

**P.64 (B) - P.65 (B)** - These policies are fairly general statements of the Village's intent to provide a high level of public service to its citizens. These services include: fire/EMS, infrastructure services, solid waste removal, stormwater management, and transportation.

## APPENDIX I

### VILLAGE OF BALD HEAD ISLAND CITIZEN PARTICIPATION PLAN

#### PREPARATION OF A CORE LAND USE PLAN PHASE I

The Village of Bald Head Island has received a Coastal Area Management Act grant for preparation of a Core Land Use Plan, Phase I. Adequate citizen participation in the development of the plan is essential to the preparation of a document responsive to the needs of the citizens of the Village of Bald Head Island. To ensure such input, the following citizen participation program will be utilized by the Village.

The Bald Head Island Village Council will appoint a Village of Bald Head Island Land Use Plan Committee (LUPC) to work with the Village's planning consultant to ensure that the final product will be a plan suitable for adoption by the Village. The committee will include representatives from the Planning Board and Village Council.

Specifically, the planning consultant and the LUPC will be responsible for ensuring accomplishment of the following:

- Develop and adopt the Citizen Participation Plan; conduct public information meeting; and conduct a meeting to identify community concerns, key planning issues, and aspirations. In addition, prepare analysis of existing and emerging conditions.
- Complete analysis of existing and emerging conditions; prepare natural systems analysis and analysis of land use and development (including Existing Land Use Map).
- Prepare community facilities analysis; prepare/review land suitability analysis and map; review existing CAMA plan, ordinances, and policies.

The following schedule will be utilized for Phase I:

1. September, 2004
  - Conduct public information meeting.
  - Village Council adopt the Citizen Participation Plan.
2. October, 2004
  - Conduct initial meeting with LUPC and review Citizen Participation Plan and process for preparing the land use plan.
  - Conduct Village issues identification meeting.
3. November, 2004 to April, 2005 – Prepare preliminary draft land use plan which will include analysis of existing conditions, land suitability analysis, natural systems analysis, and community facilities analysis. Conduct monthly meetings with the LUPC.
4. May, 2005 – Present draft of Phase I to the Planning Board.

5. June, 2005 - Present draft of Phase I to the Village Council.

All meetings of the LUPC and Village Council at which the Plan will be discussed will be advertised in a local newspaper. The public information meeting, Village meeting, and public hearing will also be advertised in a local newspaper. In addition, public service announcements will be mailed to local radio stations and posted at the Village Hall and other public buildings as directed by the LUPC and Village Council. All meetings will be open to the public. The Village will encourage and consider all economic, social, ethnic and cultural viewpoints. No major non-English speaking groups are known to exist in the Village of Bald Head Island.

8/30/04

VILLAGE OF BALD HEAD ISLAND  
CITIZEN PARTICIPATION PLAN

PREPARATION OF A CORE LAND USE PLAN  
PHASE II

The Village of Bald Head Island has received a Coastal Area Management Act grant for preparation of a Core Land Use Plan, Phase II. Adequate citizen participation in the development of the plan is essential to the preparation of a document responsive to the needs of the citizens of the Village of Bald Head Island. To ensure such input, the following citizen participation program will be utilized by the Village.

The Bald Head Island Village Council has appointed the Village of Bald Head Island Land Use Plan Committee (LUPC) to work with the Village's planning consultant to ensure that the final product will be a plan suitable for adoption by the Village. The committee will include representatives from the Planning Board and Village Council.

Specifically, the planning consultant and the LUPC will be responsible for ensuring accomplishment of the following:

- Adopt and implement Citizen Participation Plan for Phase II.
- Revise preliminary plan based on public review.
- Complete plan for the future (including future land use map and tools for managing development).
- Present the draft plan to the Village Council.
- Submit plan to state/DCM for review; provide plan to adjacent jurisdictions for review; conduct public information hearings.
- Review plan based on state and local review; conduct public hearing; Village Council adoption; submit for CRC certification.

The following schedule will be utilized for Phase II:

1. August - September, 2005
  - Update Citizen Participation Plan
  - Begin preparation of Phase II portion of LUP
2. October, 2005 - January, 2006
  - Hold monthly meetings with LUPC
  - Revise preliminary plan based on public review
3. February, 2006 – Provide plan to adjacent jurisdictions to review
4. March, 2006 – Submit plan (with any revisions) to the Bald Head Island Planning Board for review and preliminary approval
5. April, 2006 – Submit draft plan to state for DCM review



6. May, 2006
  - Revise plan based on state and local review
  - Conduct public hearing for Village Council to adopt plan
  - Submit to CRC for certification

All meetings of the LUPC and Village Council at which the Plan will be discussed will be advertised in a local newspaper. The public hearing will also be advertised in a local newspaper. In addition, public service announcements will be posted at the Village Hall and other public buildings as directed by the LUPC and Village Council. All meetings will be open to the public. The Village will encourage and consider all economic, social, ethnic and cultural viewpoints. No major non-English speaking groups are known to exist in the Village of Bald Head Island.

7/14/05

## APPENDIX II

### VILLAGE OF BALD HEAD ISLAND CORE LAND USE PLAN ISSUES IDENTIFICATION (RANKED IN PRIORITY ORDER)

Rank	Issue	Score
1	Protect maritime forests	25
2*	Beach erosion	22
2*	Address carrying capacity and future needs of the Island. Build-out?	22
3	Water quality in Bald Head Creek	21
4	Need to address redevelopment of a public restroom/shower facility at East Beach	18
5	Wildlife management	16
6*	Allow for adequate commercial development	13
6*	Preservation of vegetation and dune lines (Live Oaks)	13
6*	Protect conservation areas	13
6*	Coordinate LUP with restrictive covenants	13
7	Stormwater management	11
8*	Maintenance of ferry basin	10
8*	Protection of water table (foreign water affecting aquifer)	10
9*	Restriction of gas powered engines	9
9*	Processing of waste	9
9*	Address utilities – Size (7) – Disposal of waste of golf courses (2)	9
10	Preservation of the dune ridge	8
11	Adequate provision of emergency services	7
12*	Effect of condominiums, rentals, and time shares on Island	6
12*	Establish minimum and maximum building (residential) square footage	6
12*	Protect AECs	6
13	Waste management in and around public areas	5
14*	List East Beach as a conservation area	3
14*	Corn Cake Inlet filling and connecting to Fort Fisher	3
15*	Address the concern over stormwater contaminants	1
15*	Education effort to address landscaping and protection of vegetated areas	1
15*	Address the establishment of additional landing sites for public safety vehicles	1
16	Development of a branch library	0

\*Indicates a tie score.

### APPENDIX III

#### Village of Bald Head Island Land Use Plan Survey Results

1. The Village needs to provide more public access recreational facilities and programs to its citizens.

Disagree	No Opinion	Agree
257	83	133

2. The Village should increase its efforts to improve surface water quality (i.e., creeks, marshes, and estuarine areas).

Disagree	No Opinion	Agree
54	112	307

3. The Village is taking the proper steps to maintain the quiet, residential, and eco-friendly environment throughout the Village in response to increased development pressures.

Disagree	No Opinion	Agree
79	122	272

4. In light of the recent increased restrictions regarding stormwater runoff control currently being implemented in a majority of towns and counties across the state, the Village should continue to take a pro-active approach to stormwater control.

Disagree	No Opinion	Agree
23	65	385

5. The Village should aim to establish more local retail establishments within areas where zoning will permit commercial growth.

Disagree	No Opinion	Agree
153	28	292

6. The Village should work with developers, citizens, and state grant funding agencies to provide better facilities at beach access locations.

Disagree	No Opinion	Agree
169	82	222

7. The Village is currently taking adequate steps to protect the Village's valuable natural resources such as: the Maritime Forest, Bald Head Creek, Fishing Grounds, Shellfishing Beds, and Wetland areas.

Disagree	No Opinion	Agree
70	181	222

8. The Village infrastructure facilities are adequate to handle the permanent and seasonal population increase that will be experienced over the next ten years.

Disagree	No Opinion	Agree
221	172	80

9. The Village should provide more public bathroom facilities throughout the corporate limits.

Disagree	No Opinion	Agree
195	81	197

10. **Ranking of key issues:** The following issues were identified and ranked by permanent residents of the Village at a public meeting held on January 17, 2005. Absentee property owners were asked to rank each issue identified from 1 to 17, with 1 being the most important need and 17 being the least important need. Following are the results of the ranking (1613 being the most important need and 5839 being the least important need):

<u>SCORE</u>	<u>KEY ISSUE</u>	<u>RANK</u>
1613	● Mitigate beach erosion	1
2575	● Protect the maritime forest	2
2683	● Preservation of vegetation and dune lines (live oaks)	3
2916	● Preservation of dune ridge	4
3153	● Address carrying capacity and future needs of the island (build-out)	5
3479	● Protect conservation areas and easements	6
3820	● Protection of water table (foreign water affecting aquifer)	7
3891	● Water quality in Bald Head Creek	8
3901	● Restriction of gas powered engines	9
3932	● Coordinate land use plan and restrictive covenants	10
4019	● Processing of waste	11
4250	● Stormwater management	12
4606	● Wildlife management	13
4615	● Maintenance of ferry basin	14
4846	● Address utilities	15
	– size	
	– disposal of golf course waste	
5047	● Allow for adequate commercial development	16
5839	● Need to address redevelopment of a public restroom/shower facility at East Beach	17

### ***Mitigation Strategy***

This section of the Plan summarizes study conclusions, outlines community goals and objectives, and describes the action plan to reduce vulnerability to the effects of natural hazards on Bald Head Island. Mitigation objectives are designed to support community goals while further defining the parameters for development of mitigation actions. Mitigation actions describe specific steps that are to be undertaken to achieve the state objectives and are intended to serve as benchmarks for evaluating progress on plan implementation.

With limited financial and staff resources to dedicate to hazard mitigation, it is essential that those hazards with the highest likelihood of occurrence and greatest potential impact receive the highest investment of Island resources.

This section of the plan takes a look at all the information that has been collected and reviewed by the HMP Steering Committee. From the data collected a series of mitigation goals has been formulated in order to reduce the vulnerability of the effects of the natural hazards that have been identified in Step #1. Each of the following strategies can be classified in one of five categories:

1. Category 1 – Prevention – activities that keep problems from getting worse and may include zoning & subdivision ordinances, floodplain regulations, stormwater management, and shoreline/fault zone setbacks.
2. Category 2 – Property Protection – protection of existing structures by modifying the building to withstand a natural hazard or removing structures from hazardous locations and may include relocation, acquisition, building elevation and windproofing.
3. Category 3 – Natural Resource Protection – activities to reduce the impacts of natural hazards by preserving and/or restoring natural areas. This may include areas such as floodplain, wetlands, and dunes. Examples of mitigation strategies are floodplain protection policies, beach and dune preservation and riparian buffers.
4. Category 4 – Structural Projects – protection to lessen the impact of a natural hazard by modifying that environment and might include levees/dams, diversions, beach nourishment, and reservoirs.
5. Category 5 – Public Information – activities that let anyone in the area know about the potential natural hazard and consists of outreach projects, real estate disclosure, warning systems and library.

Looking at the categories above the HMP Steering Committee has identified the following the goals and objectives for Hazard Mitigation:

1. Reduce personal injury, loss of life, and property damage resulting from natural hazards.
2. Reduce damage to equipment, public and private infrastructure, and public and private buildings resulting from natural hazards.
3. Continue to monitor development to ensure adherence to federal, state, and local laws and current construction standards.
4. Continue to work with the Army Corps of Engineers for future beach nourishment projects.
5. Maintain a responsive post-hurricane damage assessment team and reduce recovery time to allow residents, property owners, and visitors to promptly return to the Island.
6. Reduce post-disaster clean up, repair and construction timeframe.
7. Maintain public facilities in a proper functioning order.
8. Continued reduction of fire risk on the Island.
9. Protect the environmentally sensitive areas of Bald Head Island.

Next is a list of new policies, programs, ordinances or initiatives, assigned responsibility, and target date for completion that have been identified by the HMP Steering Committee that will mitigate natural hazards.

1. **Improve Stormwater drainage on Bald Head Island** – The Village of Bald Head Island is in the process of implementing its Stormwater Improvement Plan. This plan will help reduce the level of floodwater on the Island after a major rain event. Areas on the Island that have significant standing water following a severe rain event shall continue to be identified and addressed. *Assistant Manager, Public Works Committee, Public Works Department (present – 2006)*
2. **Maintain the Lowest Possible Residential Fire Rating** – The NC Response Rating System (formerly the ISO rating system) currently rates the Village at the lowest possible residential fire rating of six (6). The chief of Emergency Services maintains that there is adequate water supply, appropriate number of hydrants, and that hydrants are properly located to ensure sufficient fire suppression. Communications shall be updated as necessary to provide for the most efficient dispatch and response time as is possible. The necessary inventory of safety and rescue vehicles, equipment, certified personnel, and updated training shall be maintained. *Chief of Emergency Services (on-going)*

3. **Enforce the Dunes Protection Ordinance** – Prevent dune degradation by restricting access over the dune ridge thus preserving the dunes' natural barrier. *Police Department Personnel, Building Inspector (on-going)*
4. **Install 911 Phones at Central Locations and Beach Accesses** – The acquisition and installation of 911 telephones at beach accesses and other key locations in order to reduce response time to fire, medical emergencies, and safety concerns. *Chief of Emergency Services (as needed)*
5. **Offer Homeowners Free Safety and Fire Inspections** – Inspect homes upon request for safety and fire hazards and make recommendations to homeowner to improve safety and reduce fire hazard vulnerability. *Emergency Services Personnel (on-going)*
6. **Safety Training** – Provide complimentary CPR and first aid classes to the public in an effort to increase the number of persons trained in these life saving techniques. Subsequently, response time is reduced due to an increased number of trained responders. *Chief of Emergency Services, Emergency Services Personnel (on-going)*
7. **Reduce Fire Risk** – Maintain and enforce stringent outdoor burning ordinance to reduce the risk of wildfire and structural fire. *Chief of Emergency Services, Emergency Services Personnel (on-going)*
8. **Property Acquisition** – With current property values, the ability of the Village to purchase land that is located within vulnerable areas is severely limited. Therefore, non-profit organizations, such as The Smith Island Land Trust (SILT), contribute indirectly to hazard mitigation. SILT obtains, through donations or purchase, property that will remain natural and undeveloped. These properties are typically located in hazard areas. The Village will also look for opportunities to acquire, elevate, and/or demolish those repetitive loss properties that have been identified. Also, the Village will continue to monitor the availability of property which could be dedicated to or acquired by the Village. *Village Manager, Tax Administrator, Finance Director, Assistant Village Manager (on-going)*
9. **Educate Contractors and Builders on Construction Methods that can Reduce Damage from Natural Hazards** – Offer an educational resource for contractors and builders to learn new construction methods and techniques, which will reduce structural damage from a natural hazard. *Building Inspector (on-going, last Wednesday of each month)*

# Worksheet #5: Geographic Planning Area Policies

(COPY THIS FORM AND COMPLETE FOR EACH DESIGNATED PLANNING AREA IN YOUR COMMUNITY.)

**GEOGRAPHIC PLANNING AREA: THE VILLAGE OF BALD HEAD ISLAND**

<b>Policy</b> (includes new initiatives, continuation and support of existing policies, and recommended policy changes)	<b>Type of Mitigation Strategy</b> (Preventive, Property Protection, Natural Resource Protection, Structural Projects, Public Information)	<b>Type(s) of Hazard This Policy Will Target</b>	<b>Funding</b> (amount and source; local match required?)	<b>Responsible Party/ Start &amp; Completion Dates</b>	<b>Benchmarks and Indicators of Progress</b> (Monitoring and Evaluation)	<b>Priority Ranking</b> (High, Medium, Low)
<i>Village of Bald Head Island Emergency Mitigation Plan (BHIEMP)</i>	<i>All</i>	<i>All</i>	<i>Local</i>	<i>EMS, Admin., Bldg. Insp., Police, Public Works</i>  <i>On-going</i>	<i>Monitoring and Evaluating</i>	<i>High</i>
<i>Village of Bald Head Island Zoning Ordinance</i>	<i>All</i>	<i>All</i>	<i>Local</i>	<i>Planning Bldg. Insp.</i>  <i>On-going</i>	<i>Monitoring</i>	<i>Medium</i>
<i>Village of Bald Head Island Subdivision Regulations</i>	<i>All</i>	<i>All</i>	<i>Local</i>	<i>Planning Bldg. Insp.</i>  <i>On-going</i>	<i>Monitoring</i>	<i>Low</i>
<i>Village of Bald Head Stormwater Management Plan</i>	<i>All</i>	<i>Flood</i>	<i>Local</i>	<i>Planning Bldg. Insp.</i>  <i>2005-2006</i>	<i>Monitoring</i>	<i>High</i>
<i>Brunswick County Land-Use Plan</i>	<i>All</i>	<i>All</i>	<i>Local</i>	<i>Planning Bldg. Insp.</i>  <i>Completed 1997</i>	<i>In 2-year, 2 phase to write own plan</i>	<i>Medium</i>
<i>Maintain Lowest Residential Fire Rating</i>	<i>Preventive &amp; Property Protection</i>	<i>Wildfire</i>	<i>Local</i>	<i>EMS, Planning &amp; Bldg. Insp.</i>  <i>On-going</i>	<i>Monitoring</i>	<i>High</i>

Source: Keeping Natural Hazards from Becoming Disasters – A Mitigation Planning guidebook for Local Governments, North Carolina Division of Emergency Management, May 2003, p.73.



# Worksheet #5: Geographic Planning Area Policies

(COPY THIS FORM AND COMPLETE FOR EACH DESIGNATED PLANNING AREA IN YOUR COMMUNITY.)

**GEOGRAPHIC PLANNING AREA: THE VILLAGE OF BALD HEAD ISLAND**

<b>Policy</b> (includes new initiatives, continuation and support of existing policies, and recommended policy changes)	<b>Type of Mitigation Strategy</b> (Preventive, Property Protection, Natural Resource Protection, Structural Projects, Public Information)	<b>Type(s) of Hazard This Policy Will Target</b>	<b>Funding</b> (amount and source; local match required?)	<b>Responsible Party/ Start &amp; Completion Dates</b>	<b>Benchmarks and Indicators of Progress</b> (Monitoring and Evaluation)	<b>Priority Ranking</b> (High, Medium, Low)
<i>Improve Stormwater drainage</i>	<i>Preventive &amp; Property Protection</i>	<i>Hurricanes &amp; Flooding</i>	<i>Local</i>	<i>Admin, Public Works Committee &amp; Dept.</i>	<i>Present - 2006</i>	<i>High</i>
<i>Enforcement of Dunes Protection Ordinance</i>	<i>Preventive, Property Protection &amp; Natural Resource Protection</i>	<i>Hurricanes &amp; Flooding</i>	<i>Local</i>	<i>Police Dept. &amp; Bldg. Insp.</i>	<i>On-going</i>	<i>Medium</i>
<i>Installation of 911 phones at central locations and beach accesses</i>	<i>Preventive</i>	<i>Wildfires</i>	<i>Local</i>	<i>EMS</i>	<i>As needed</i>	<i>Medium</i>
<i>Free Safety and Fire Inspections to Homeowners</i>	<i>Preventive &amp; Property Protection</i>	<i>Wildfires</i>	<i>Local</i>	<i>EMS</i>	<i>On-going</i>	<i>Medium</i>
<i>Safety Training</i>	<i>Preventive</i>	<i>All</i>	<i>Local</i>	<i>EMS</i>	<i>On-going</i>	<i>Medium</i>
<i>Reduce Fire Risk</i>	<i>Preventive &amp; Property Protection</i>	<i>Wildfires</i>	<i>Local</i>	<i>EMS</i>	<i>On-going</i>	<i>Medium</i>

Source: Keeping Natural Hazards from Becoming Disasters – A Mitigation Planning guidebook for Local Governments, North Carolina Division of Emergency Management, May 2003, p.73.

# Worksheet #5: Geographic Planning Area Policies

(COPY THIS FORM AND COMPLETE FOR EACH DESIGNATED PLANNING AREA IN YOUR COMMUNITY.)

**GEOGRAPHIC PLANNING AREA: THE VILLAGE OF BALD HEAD ISLAND**

<b>Policy</b> (includes new initiatives, continuation and support of existing policies, and recommended policy changes)	<b>Type of Mitigation Strategy</b> (Preventive, Property Protection, Natural Resource Protection, Structural Projects, Public Information)	<b>Type(s) of Hazard This Policy Will Target</b>	<b>Funding</b> (amount and source; local match required?)	<b>Responsible Party/Start &amp; Completion Dates</b>	<b>Benchmarks and Indicators of Progress</b> (Monitoring and Evaluation)	<b>Priority Ranking</b> (High, Medium, Low)
<i>Property Acquisition</i>	<i>Preventive &amp; Property Protection</i>	<i>Hurricanes &amp; Floods</i>	<i>State &amp; Federal</i>	<i>Village Mngr., Tax Admin., Finance Dir. &amp; Asst. Village Mngr.</i>	<i>On-going</i>	<i>Low</i>
<i>Educate Contractors &amp; Builders on Construction Methods to reduce damage from hazards</i>	<i>Preventive &amp; Property Protection</i>	<i>All</i>	<i>Local</i>	<i>Bldg. Insp.</i>	<i>On-going</i>	<i>Medium</i>

Source: Keeping Natural Hazards from Becoming Disasters – A Mitigation Planning guidebook for Local Governments, North Carolina Division of Emergency Management, May 2003, p.73.

## Appendix V

### Policy/Implementing Action

### Definitions of Common Terms

1. Should: An officially adopted course or method of action intended to be followed to implement the community goals. Though not mandatory as “shall,” it is still an obligatory course of action unless clear reasons can be identified that an exception is warranted. Village staff and Planning Board involved at all levels from planning to implementation.
2. Continue: Follow past and present procedures to maintain desired goal, usually with Village staff involved at all levels from planning to implementation.
3. Encourage: Foster the desired goal through Village policies. Could involve Village financial assistance.
4. Enhance: Improve current goal to a desired state through the use of policies and Village staff at all levels of planning. This could include financial support.
5. Identify: Catalog and confirm resource or desired item(s) through the use of Village staff and actions.
6. Implement: Actions to guide the accomplishment of the Plan recommendations.
7. Maintain: Keep in good condition the desired state of affairs through the use of Village policies and staff. Financial assistance should be provided if needed.
8. Prevent: Stop described event through the use of appropriate Village policies, staff actions, Planning Board actions, and Village finances, if needed.
9. Promote: Advance the desired state through the use of Village policies and Planning Boards and staff activity at all levels of planning. This may include financial support.
10. Protect: Guard against a deterioration of the desired state through the use of Village policies, staff, and, if needed, financial assistance.
11. Provide: Take the lead role in supplying the needed financial and staff support to achieve the desired goal. The Village is typically involved in all aspects from planning to implementation to maintenance.
12. Strengthen: Improve and reinforce the desired goal through the use of Village policies, staff, and, if necessary, financial assistance.
13. Support: Supply the needed staff support, policies, and financial assistance at all levels to achieve the desired goal.
14. Work: Cooperate and act in a manner through the use of Village staff, actions, and policies to create the desired goal.

## Appendix VI

### VILLAGE OF BALD HEAD ISLAND

Operational (On-Site) Systems  
Maintained by Utilities Department

STREET	ADDRESS	TOTAL UNITS
Seagull Trail	#11, #16, #17, #20	4
Cape Fear Trail	#11, #17, #21, #27, #33, #41	6
Royal Tern Court	#8	1
Morning Warbler Trail	#33	1
Starrush Trail	#11	1
Silversides Trail	#2, #3, #4, #5, #7, #17, #21	7
Laughing Gull Trail	#11, #15, #18, #20	4
Stede Bonnet Wynd	#301, #305	2
Clapper Rail Court	#2	1
Edward Teach Wynd	#109, #122	2
Three Flipper Trail	#26	1
Dogwood Trail	#14	1
Fort Holmes Trail	#37, #64	2
Earl of Craven	#7	1
North Bald Head Wynd	#102	1
Red Cedar Trail	#23	1
Progress Energy Building	#254 Edward Teach Extension	1
		<b>37</b>

### PRIVATE SEWER SYSTEM

Maintained by Owner or Others

STREET	ADDRESS	TOTAL UNITS
North Bald Head Wynd	#106	1
Morning Warbler Trail	#35	1
Laughing Gull Trail	#7, #23	2
Silversides	#9	1
Bay Tree Trail	#7	1
Middle Island Plantation	Properties with Septic System	36
		<b>42</b>

STATE OF NORTH CAROLINA

SETTLEMENT AGREEMENT

This SETTLEMENT AGREEMENT is entered into this the 24 day of March, 2005, by and among the Village of Bald Head Island ("Village" or "Plaintiff") and the United States Army Corps of Engineers ("the Corps" or "Defendant") (collectively the "Parties").

WHEREAS, the Village contends that the Corps is responsible for damages caused by the certain acts and omissions further detailed in the Second Amended Complaint in Civil Action No: 7:03-CV-243-FL(1) (all capitalized terms not otherwise defined in this Settlement Agreement shall be as defined in this Second Amended Complaint), such damages including, but not limited to, the continued sloughing and shoaling of the South Beach shoreline into the modified Navigation Channel that results in severe erosion of certain portions of the South Beach shoreline causing the consequent inundation of, damage to, and now closure of, South Bald Head Wynd and the infrastructure for Village water, sewer, and electrical utilities.

WHEREAS, the Corps does not agree with these contentions and does not believe that sufficient study has been undertaken to determine the extent, if any, of a causal link between its channel dredging activities in the vicinity of South Beach, and the erosion of the South Beach shoreline and related damage.

WHEREAS, the Village has received assurances that the Corps will fulfill its obligations detailed in the Environmental Assessment – Preconstruction Modifications of Authorized Improvements, particularly the Appendix A - Sand Management Plan ("the Sand Management Plan"), dated February 2000, including the removal of beach quality material from the navigation channel and subsequent disposal on the South Beach area of the Village of Bald Head, as specified in the construction contract referred to as Clean Sweep, and originally intended to occur in FY 2004. The Village has also received assurances that the Corps will regularly meet and consult with the Village regarding the schedule and location for placement of beach quality sand on the Village South Beach shoreline for those future occasions when the Sand Management Plan contemplates disposal on Bald Head Island.

WHEREAS, the Village and the Corps have agreed to a schedule for monitoring, meetings and consultations between the Corps and the Village, including such experts and consultants as the Village may from time to time employ, regarding appropriate response to any further beach sloughing.

WHEREAS, the Village and the Corps desire that they work together to solve the problem of South Beach sloughing and shoaling into the Navigational Channel and wish to do so through mutual communication and cooperation and, if possible, to avoid further litigation.

NOW, THEREFORE, in consideration of the premises stated and the terms and conditions hereinafter set forth, the parties agree:

1. The Corps commenced the Clean Sweep contract in November 2004 and completed the work on January 25, 2005. This work included the excavation of material from the Wilmington Navigation Channel and the placement of all beach quality sand thus excavated onto South Beach, with the fill taper beginning at station 47+00 and the full design section continuing eastward to station 125+00 with a five hundred foot transition to existing shoreline at station 130+00, a location that was determined in consultation with the Village.

2. The dredging and sand disposal contractors employed by the Corps completed all work for the phase of Clean Sweep between station 47+00 and station 110+00, including beach-fill, beach-tilling, and removal of all equipment, temporary grade stakes and beach-fill pipelines, by January 20, 2005. During the time between January 20, 2005 and April 30, 2005, this area will not be available to the Corps, but will be exclusively available to the Village to allow installation and completion of a groin field (discussed below) before the April 30, 2005 deadline set by permit.

3. The Village agrees and intends to reconstruct a soft groin field consisting of approximately sixteen (16) sand filled tube groins spaced roughly 400 feet apart along approximately 6,600 feet of shoreline between stations 47+50 and 104+00. Construction of this new sand filled tube groin field is slated to begin in Fiscal Year 2005, **however**, construction of the groin field is **contingent** upon the following:

a. The Corps' placement schedule for beach quality material onto the westernmost portion of the south beach shoreline as part of Clean Sweep. This work was accepted as complete from the contractor as of January 25, 2005. Therefore, groin field construction will take place between January 20<sup>th</sup> and April 30<sup>th</sup>, 2005.

b. The Corps' placement of a minimum effective design beach berm width of 200' at elevation +8' NGVD along the westernmost segment of south beach within the limits of the proposed groin field. The filled beach foreshore will extend seaward therefrom at an expected slope of 20 H:1V (TYP). This work was accepted as complete from the contractor as of January 25, 2005.

4. Dredging schedule for FY 2005 Clean Sweep Beach Disposal.

a. In order to minimize the potential for impacts to the Point, the Corps required that material be removed from Baldhead Shoal Navigation Channel Reach 1, the area immediately adjacent to the Point, as the last order of dredging work for its dredging contractor.

b. In order to further minimize potential impacts associated with the Navigation Channel dredging in the vicinity of the Point, the Corps did not require its contractor to perform redundant dredging in order to meet the authorized channel width for the Baldhead Shoal Channel Reach 1.

c. Further, the Corps informed its dredging contractor of the Village's plan to install a new sand filled tube groin field and required its contractor to coordinate with the Village's groin field construction contractor in order to facilitate synchronization of the beach quality sand placement and sand filled tube groin field construction. In addition, the Village assisted the Corps' contractor in the selection of suitable temporary beach access location for equipment, personnel etc. outside the limits of the groin field if possible. The Corps required its dredging contractor to pay for and repair any damage to the new sand filled tube groin field arising from its fault or negligence.

#### 5. Project Milestones for Monitoring

The following milestones were established by the parties for (a) conducting monitoring activities in response to placement of material from the Clean Sweep -- Beach Disposal contract on South Beach in FY2005 and (b) making decisions about future plans for maintenance of navigation in the vicinity of Village:

##### a. Contract Milestones:

Contract Award	September 21, 2004
Issuance of Notice to Proceed	October 26, 2004
Preconstruction Conference	October 26, 2004
Commencement of Dredging & Beach Disposal	November 16, 2004
Beach Disposal Complete (Sta.46+00 to Sta 110+00)	
Sufficient to Allow Groinfield Construction to Commence	January 21, 2005
Remaining Beach Disposal Complete	January 25, 2005

b. Post-construction Milestones: Monitoring by the Corps of the Navigation Channel will commence in March 2005 (60 days after final acceptance of the Navigation Channel). These hydrographic surveys will occur on a regular basis, with the time elapsed between surveys not to exceed 60 days. Each monitoring event will consist of a full channel survey of three channel segments: the Smith Island Channel, Baldhead Shoal Channel 1 and Baldhead Shoal Channel 2. The channel surveys for Channels 1 & 2 will extend a minimum of 250 ft beyond the east channel line or to the minimum depth for safe operation of the survey boat. The physical surveying data for each channel segment will be processed by Navigation Branch within 5 days of receipt of the data. Within 2 days thereafter, Navigation Branch will provide hardcopy and electronic files to the chiefs of the Corps' Coastal H&H Section and Design Section, and to such independent contractor as the Village may designate, for review. Within 10 calendar days of receipt, the Chief of Engineering will meet with the Corps' Project Manager and representatives from its Navigation Branch, Coastal Section and Design Section to provide an assessment of the findings. Within 3 days after this meeting, the Corps' Project Manager will provide or make available the most recent navigation survey findings to John Morris, who represents the State of

North Carolina as the non-Federal sponsor; the Cape Fear River Pilots; the Brunswick Beaches Consortium; Village of Bald Head Island and the Towns of Caswell Beach and Oak Island.. Copies of each survey will be transmitted to the Village, both to the Village Manager and to such independent contractor as the Village may designate, within 2 business days of completion. Proper representatives of the Corps shall promptly meet with the Village and/or its consultants to discuss each survey.

c. Subsequent Decision-making: There will be a meeting or meetings with the Village, the Project Delivery Team ("PDT"), and other participants as may be appropriate and feasible to determine whether the three channel segments of interest can be maintained for safe navigation for a minimum of two years without maintenance dredging. The minimum dimensions needed for safe navigation will be deemed to be a bottom width of no less than 500 feet at a depth of no less than - 42 feet MLW. In the event there is a consensus that these minimum dimensions cannot be maintained for at least two years, then the Corps, in concert with the non-Federal cost-sharing sponsor, will consider options to continued maintenance of the problem areas. Specifically, it will assess alternative means of maintaining safe navigation, to include, but not be limited to, an alignment alteration in the vicinity of Jaybird Shoal, westward of the current authorized alignment. The potential use of structures shall be considered. A consideration of alternatives to the current maintenance program will likely require preparation of an Environmental Assessment and Finding of No Significant Impact (EA/FONSI), together with a Post Authorization Change (PAC) Report. In order to accommodate the possibility that some alternative may become the preferred plan of action for the next maintenance dredging cycle in these channels, it will be necessary to commence the EA/FONSI and PAC coordination a minimum of 12 months prior to the anticipated solicitation date for the next maintenance contract. Any proposed change will be fully coordinated with the Cape Fear River Pilots, interested agencies and the public, consistent with the Corps' normal practices for coordination of such documents. Implementation of any recommended plan of action in future Federal fiscal years beyond FY2005 is contingent on the required Federal and non-Federal funds being made available in future fiscal year budgets.

6. Minimum Survey of Village Beach Erosion.

At least twice each calendar year a monitoring survey shall be performed, one by the Corps and one by the Village, to observe and record the erosion of the Village beaches and to gather data regarding the effects of any channel dredging upon the Village beaches, and the effects upon any efforts to retain sand disposed of on the beaches (e.g. the sand filled tube groin field). Following each survey, the Village and the Corps shall meet to discuss the results of those surveys and to discuss whether the measures contemplated in this agreement are effective for their desired purpose (to retain disposed of material on the shoreline, which in turn may have a side benefit of providing stabilization of the erosion area of the affected Village beaches). If the efforts contemplated by this agreement are not achieving their purpose, the Village and the Corps agree to consider additional action to achieve that purpose including, but not limited to:

a. Applying for such additional authorization and approvals as may be needed to institute further action, including permits for the construction of stabilizing structures intended to



prevent channel induced beach erosion and authorization, permits and approvals for any necessary alteration in channel alignment;

b. Seeking such additional funding as may be necessary to institute further action. The Corps agrees to implement any alternative it determines to be reasonable, and for which it has the necessary authority, funding, and permits or other approvals.

7. This agreement contemplates that further maintenance of the Navigational Channel will proceed in the manner contemplated by the Sand Management Plan, i.e. with the Village and Caswell Beach/East Oak Island receiving beach quality sand in future years as per the schedule established in the Sand Management Plan. The Village, and the Corps agree that, prior to future disposal of beach quality sand on the Village beaches pursuant to the Sand Management Plan, the Parties shall meet and confer regarding the timing, facilitation and location of such placement, so as to maximize the beneficial effect of such placement.

8. Interim Dredging.

Should it become necessary, for safety reasons, to conduct interim dredging in the vicinity of the Baldhead Shoal, the Corps agrees to notify the Village as soon as is practicable, in no event later than the date upon which such dredging work is put out for bid, but ideally as soon as surveys or other observations suggest to the Corps that such interim dredging may be necessary, and to work with the Village to conduct such interim dredging in such a manner as to minimize the negative effect of such dredging on the Village and its beaches.

9. The parties acknowledge that this is a settlement of disputed claims and that the agreement and actions set forth herein are by way of settlement and are not an admission of liability by the Corps, nor are they a limitation to the remedies that may be sought by the Village in the event of default of this agreement.

10. The Village agrees to dismiss, without prejudice, the claims contained in the Second Amended Complaint.

11. The Village's agreement to this settlement is contingent upon the Corps' express waiver of any and all statutes of limitation, and of any defense of laches, and defense based upon the doctrines of estoppel or res judicata as might applicable to future claims by the Village against the Corps, including renewal of the claims contained in the Second Amended Complaint filed by the Village on March 18, 2005, arising from the Corps activities in the vicinity of Bald Head Island, Jaybird Shoals, and Bald Head Shoals during the Wilmington Harbor - 96 Act Deepening Project. This waiver shall extend to and including December 31, 2010.

12. The parties agree they have been represented in these discussions by attorneys of their own choosing and that they have had adequate time to discuss this settlement with their respective attorneys.

13. If any term of this Settlement Agreement is determined by a court of competent jurisdiction to be unenforceable, then the remaining terms of the Settlement Agreement which are capable of construction and capable of providing meaningful relief to the Village and to the Corps without the unenforceable term(s), shall be deemed severable and valid.

This agreement is made this the 24 day of March 2005.

THE VILLAGE OF BALD HEAD

By: 

Name: Jon Middleton

Title: Village Manager

THE UNITED STATES ARMY  
CORPS OF ENGINEERS

By: 

Charles R. Alexander, Jr.

Colonel, U.S. Army

District Engineer, Wilmington

SIGNATURES CONTINUE ON THE FOLLOWING 2 PAGES

STATE OF NORTH CAROLINA

COUNTY OF Brunswick

I, Heather L. Hardee, a Notary Public of the County and State aforesaid, certify that Jon Middleton personally appeared before me this day and acknowledged the execution of the foregoing instrument.

WITNESS my hand and official stamp or seal, this 24 day of March, 2005.

Heather L. Hardee  
Notary Public

My Commission Expires: 8-9-05

[NOTARY SEAL]

STATE OF NORTH CAROLINA

COUNTY OF New Hanover

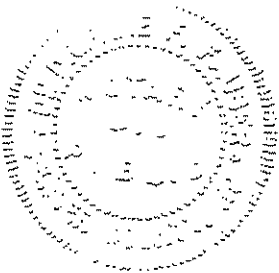
I, Diedrienne F. Fausser Jr., a Notary Public of the County and State aforesaid, certify that Charles R. Alexander personally appeared before me this day and acknowledged the execution of the foregoing instrument.

WITNESS my hand and official stamp or seal, this 7th day of April, 2005.

Diedrienne F. Fausser  
Notary Public

My Commission Expires: 3/27/2009

[NOTARY SEAL]



## **APPENDIX A**

### **SAND MANAGEMENT PLAN**



# WILMINGTON HARBOR

## SAND MANAGEMENT PLAN OCEAN ENTRANCE CHANNELS AND INNER HARBOR FROM SNOWS MARSH THROUGH HORSESHOE SHOAL CHANNELS

1. **General.** Deepening of Wilmington Harbor will involve the removal of large quantities of material including beach quality sand. Most of the beach quality material to be removed during deepening will come from the Ocean Entrance Channels consisting of the following ranges: Baldhead Shoal; Smith Island; Baldhead – Caswell; Southport; Battery Island, and Snows Marsh seaward of station 10+00. These ranges are shown on *Figure 1*. Beach quality sands will also be removed from portions of the Inner Harbor channel extending from the upper 1000 feet of the Snows Marsh Range through the Horseshoe Shoal Range. These Inner Harbor channel ranges are also shown on *Figure 1*. A maximum of 6.0 million cubic yards of beach quality material will be removed from the lower portion of the Snows Marsh Range seaward through the Baldhead Shoal Range. Approximately 0.6 million cubic yards of beach quality material will be removed from the upper Snows Marsh Range through the Horseshoe Shoal Range. Sand management plans for these two segments of the harbor are developed below for both the new work material; i.e., the beach quality material to be removed during deepening; and future maintenance of these harbor segments that will involve the removal of littoral shoal material.

### Ocean Entrance Channels – Sand Management Plan

2. **Introduction.** The sand management plan for the ocean entrance channels addresses dredging and disposal issues associated with the realigned Baldhead Shoal Channel as well as the Smith Island, Baldhead – Caswell, Southport, Battery Island, Lower Swash, and Snows Marsh Channels. Construction of the ocean entrance channels into Wilmington Harbor will entail the removal of approximately 15.5 million cubic yards of material, up to 6.0 million cubic yards of which is beach quality sand. Beach quality sand exists throughout all of the entrance channel except the new Baldhead Shoal Channel. Within the Baldhead Shoal Channel, beach quality sand is located between stations 0+00 and 120+00. Between station 0+00 and approximately 66+00, the entire channel prism is considered to be beach quality material. Between station 66+00 and 120+00, beach quality material is layered with the material lying above elevations ranging from -30 to -41 feet MLLW. Material below these depths contains a high percentage of clay and silt and is not suitable for beach disposal. Seaward of station 120+00, the new work material contains high concentrations of silt and clay and is not suited for placement on the beach. The beach quality material will be dredged primarily from the portion of Jay Bird Shoal which overlays the west side of the realigned bar channel and from Baldhead Shoal. Baldhead Shoal forms the east boundary of the existing channel, however, the realigned bar channel will cut across the seaward portion of this shoal. The present alignment of the ocean bar channel and that of the new bar channel are shown on *Figure 1*. As shown on *Figure 1*, the new bar channel passes through the eastern side of the existing Ocean Dredged Material Disposal Site (ODMDS).

3. The Brunswick County beach towns of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach have expressed an interest in receiving the beach quality material. Under Section 933 of the Water Resources Development Act of 1986 (Public Law 99-662), the Federal Government can cost share up to 50 percent of the added cost of depositing the material on the beach providing certain criteria are met. The primary requirement for Federal participation is that any added cost for placing sand on a particular beach segment must be economically justified. A base disposal plan associated with the least costly means of placing the beach quality material and a Section 933 disposal plan are discussed in the following paragraphs. In addition, a disposal plan for the annual maintenance material is presented following the disposal plan for the new work material.

#### **4. Plan Formulation – Ocean Entrance Channels New Work Material Disposal Plan.**

The disposal plan for the new work material contained in the 1996 project feasibility report had all of the material from the Lower Big Island Range through the existing Baldhead Shoal Channel going to the ODMDS. It should be mentioned that the disposal plan in the feasibility report did not include consideration of the realigned Baldhead Shoal Channel. The alignment of the new Baldhead Shoal Channel came from a recommendation contained in a Value Engineering Study that demonstrated significant construction cost savings could be realized by avoiding rock in the existing Baldhead Shoal Channel. In any event, increased utilization of the existing ODMDS for disposal of maintenance and new work material has resulted in the existing ODMDS for Wilmington Harbor approaching full capacity. This combined with the passage of the realigned Baldhead Shoal Channel through the existing ODMDS has necessitated the development of a new ODMDS. The new ODMDS, which is being developed in cooperation with the Environmental Protection Agency (EPA), is located approximately 5 miles offshore of the existing ODMDS as shown on *Figure 1*. The new ODMDS is expected to be available for use by the end of 2001, consequently, the existing ODMDS must have sufficient capacity to accommodate the new work and maintenance material expected to be removed through the year 2001.

5. The remaining capacity of the existing ODMDS was estimated assuming that the area could be filled to an average elevation of 26 feet below mean lower low water (mllw). All future placement of dredge material in the existing ODMDS will take place west of the new channel alignment. In addition, no material would be placed in a 2,500-foot wide corridor parallel to and west of the new entrance channel in order to reduce the chance deposited material will move into and shoal the new channel (see *Figure 1*). The size of the corridor through the ODMDS is needed to prevent the return of deposited material into the channel and was based on the distance between the western toe of the existing ODMDS and the existing ocean entrance channel, which, as shown on *Figure 1*, is about 2,500 feet. Based on these assumptions, the remaining capacity of the existing ODMDS is approximately 17.8 million cubic yards.

6. Deepening of the Wilmington Harbor project is scheduled to begin in May 2000 with the award of a contract to construct the offshore portion of the Baldhead Shoal Channel seaward of station 120+00. The material to be removed from this segment of the new channel, which totals about 6.6 million cubic yards, contains significant quantities of silt and clay and will have to be deposited in the existing ODMDS. The contract for the



landward segment of Baldhead Shoal Channel and the other ocean entrance channels, which will include up to 6.0 million cubic yards of beach quality sand and 2.8 million cubic yards of material not suited for placement on the beach, will be awarded near the end of calendar year 2000. Work on the inner portions of the project from upper Snows Marsh Range to Horseshoe Shoal Range that contains 0.6 million cubic yards will also be performed in early 2001. The economic and engineering viability of options for the disposal of the beach quality material to be removed from upper Snows Marsh to Horseshoe Shoal is presented later in the section of this report entitled "Inner Harbor - Sand Management Plan." Finally, a contract for removal of rock and other sediments from the Big Island Range will be awarded in 2000 as a test to help determine contract scopes for rock removal from other sections of the harbor. All of the material from the Big Island Range (approximately 2.2 million cubic yards) will be deposited in the ODMDS. In summary, construction of the deeper channel between 2000 and 2001 will involve the removal of approximately 18.2 million cubic yards of material with all of this material scheduled to be placed in the existing ODMDS.

7. During the new ocean entrance channel construction period, periodic maintenance of the existing ocean entrance channel will have to continue as will the maintenance of the interior portions of the harbor. This maintenance material, which averages around 800,000 cubic yards per year from the entrance channel and 300,000 cubic yards from the interior channels, is normally placed in the ODMDS. In addition to the Wilmington Harbor maintenance material, material removed for maintenance of the Military Ocean Terminal at Sunny Point (MOTSU) is also normally placed in the ODMDS. Maintenance of MOTSU averages 1 million cubic yards per year. Thus, the combined volume of new work and maintenance material to be removed from Wilmington Harbor and MOTSU between 2000 and 2001 could total 22.4 million cubic yards, exceeding the remaining capacity of the existing ODMDS by more than 4.6 million cubic yards.

8. **Base Disposal Plan-New Work Material.** With the capacity of the existing ODMDS insufficient to accommodate the dredged material disposal volume requirements through 2001, the logical solution is to place up to 6.0 million cubic yards of beach quality material on adjacent beaches. The only other option would be to delay the construction of the harbor deepening project by at least one year which is not acceptable to the State of North Carolina, the project sponsor. Placement of up to 6.0 million cubic yards of new work material on the beach would reduce the volume of material to be placed in the existing ODMDS through the year 2001 to 16.4 million cubic yards, effectively depleting the remaining capacity of the existing ODMDS. Once the new ODMDS becomes operational, all future dredge material requiring ocean disposal will be placed in the new area.

9. The disposal of up to 6.0 million cubic yards of new work beach quality material would be distributed along 16,000 feet on Bald Head Island and 25,000 feet on Oak Island-Caswell Beach. Deposition on Bald Head Island would occur along 2,000 feet of West Beach, which faces the Cape Fear River Entrance, and along 14,000 feet of South Beach. Disposal on Oak Island-Caswell Beach would begin at the west boundary of the Fort Caswell Baptist Assembly grounds and proceed west. The 25,000-foot disposal area on Oak Island-Caswell Beach would extend the fill to the east end of the sea turtle habitat area

work is to put a beach...

on Oak Island. These disposal areas are shown on Figure 2. The sea turtle habitat, which is basically a beach fill with a small dune feature to prevent nesting sea turtles from crossing into the ocean front road, will be constructed under authority of Section 1135 of the Water Resources Development Act of 1986. Construction of the sea turtle habitat will be completed in April 2001. The combined total of new work material to be deposited on Bald Head Island under the base plan would be 2,580,000 cubic yards. The balance of the new work beach quality material (up to 3,420,000 cubic yards) would be equally distributed along the 25,000-foot disposal area on Oak Island-Caswell Beach. The base plan beach fill placement characteristics associated with placement of up to 6.0 million cubic yards of new work material are presented in *Table 1*. Based on the characteristics of the sediment to be removed, about 83 percent of the dredged material is expected to remain in place. The lower placement rates used on West Beach and at the west end of South Beach are intended to reduce the possibility of increased sediment transport from the disposal area back into the navigation channel. Following initial adjustments, the deposited material will begin to erode at a rates comparable to or slightly faster than the erosion rates experienced on the existing beach. The base disposal plan addresses provisions for the disposal of up to 6.0 million cubic yards of beach quality material, however, the maximum volume may be reduced by 20 to 30 percent depending on the final quantitative and qualitative sand analysis and actual dredging operations associated with the dredging contractors decisions to obtain the total allowable overdepth.

**Table 1**  
**Base Plan Beach Disposal Characteristics**

Location	Length along Shoreline (feet)	Disposal Rate (cubic yds per ft)	Initial Placement Width Range (feet)	Adjusted Placement Width Range (feet)	Initial Placement Volume (cubic yds)	Net In-place Volume (cubic yds)
Bald Head Island	16,000				2,580,000	
West Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	12,000	175	280 to 300	140 to 150	2,100,000	1,734,000
Oak Is - Caswell Beach	25,000	137	220 to 240	110 to 120	3,420,000	2,839,000
Totals	41,000				6,000,000	4,973,000

10. **Section 933 Disposal Plan – New Work Material.** The Brunswick County beach towns of Bald Head Island, Caswell Beach, Oak Island, Holden Beach, Ocean Isle, and Sunset Beach formed the Brunswick County Consortium for the purpose of working together to assure that the beach quality material is placed on the beach. Since Ocean Isle has received approval for a Federal Storm Damage Reduction Project, it is not vying for any of the Wilmington Harbor material. Construction of the Ocean Isle project is scheduled to begin in 2000. As mentioned above, a segment of Oak Island, lying between East 26<sup>th</sup> Street and East 58<sup>th</sup> Street, has been approved for a Section 1135 sea turtle habitat. The length of shoreline included in the sea turtle habitat consist of an 8,900-foot main section and 1,600-foot transitions on each end of the main fill. Construction of the sea turtle habitat will involve the removal of about 1.6 million cubic yards of material from an existing upland dredged material disposal area located adjacent to the Atlantic Intracoastal Waterway (AIWW). The expected in place volume resulting from this project is 1.34 million cubic yards. Within the main portion of the sea turtle habitat, the placement rate will be approximately 130 cubic yards/foot of beach. Accordingly, no material from the Wilmington Harbor project will be placed in the main portion of the sea turtle habitat. Some harbor material will be placed in the habitat transition areas to make up the difference in the volume that will be placed under Section 1135 and the rate of fill proposed under Section 933. This volume difference is around 25,000 to 30,000 cubic yards. As discussed below, disposal of material from the Wilmington Harbor project along Oak Island could occur at rates varying from 78 to 110 cubic yards/foot of beach. While these placement rates are less than the placement rate within the main portion of the Sea Turtle Habitat project, the relative protrusion in the shoreline resulting from the sea turtle project would be less than that which would have been produced in the absence of the harbor material. The reduction in the relative seaward protrusion of the shoreline within the habitat area resulting from the placement of the harbor material on the beach would also reduce the expected rate of loss from the habitat project due to end losses.

11. The shoreline segments that could receive material from Wilmington Harbor as a result of the Section 933 study include: 16,000 feet on Bald Head Island; 25,000 feet on Caswell Beach and the east end of Oak Island; 25,600 feet on the west end of Oak Island lying west of the sea turtle habitat; and 10,600 feet on the east end of Holden Beach. This represents a total shoreline length of 77,200 feet. These shoreline segments are shown on *Figure 2*. The distribution of available beach quality sand along the Brunswick County beaches will depend on the final results of the Section 933 study, analysis of project engineering and economic constraints, and the desires of the project sponsor and the Brunswick County consortium. To account for variations in sand placement along the Brunswick County beaches under the section 933 authority, *Table 2* presents the maximum beach fill disposal characteristics associated with the maximum beach fill for each beach segment resulting from the various possible distributions of beach quality material. Although the final distribution of the beach quality material for the Section 933 work along the Brunswick County beaches has not been determined, the total placement will not exceed 6.0 million cubic yards. Six million cubic yards of beach quality material to be removed from the channel equates to 5.0 million cubic yards of in place sand on the beach based on a retention rate of 83 percent discussed previously. Following the initial adjustments, erosion of the fill material will occur at rates equal to or slightly higher than the historic erosion

rates. The Section 933 disposal plan addresses provisions for the disposal of up to 6.0 million cubic yards of beach quality material, however, the maximum volume may be reduced by 20 to 30 percent depending on the final quantitative and qualitative sand analysis and actual dredging operations associated with the dredging contractors decisions to obtain the total allowable overdepth.

**Table 2**  
**MAXIMUM**  
**Section 933 Disposal Characteristics**

Location	Length along Shoreline (feet)	Disposal Rate (cubic yds per ft)	Initial Placement Width Range (feet)	Adjusted Placement Width Range (feet)	Initial Placement Volume (cubic yds)	Net In-place Volume (cubic yds)
Bald Head Island	16,000				2,200,000	1,826,000
West Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	2,000	120	190 to 210	95 to 105	240,000	200,000
South Beach	12,000	143	220 to 240	110 to 120	1,720,000	1,426,000
Oak Island	50,500				4,740,000	3,933,000
East Oak Island - Caswell Beach	25,000	110	170 to 190	85 to 95	2,750,000	2,283,000
West Oak Island - Caswell Beach	25,600	78	120 to 140	60 to 70	1,990,000	1,650,000
Holden Beach	10,600	78	120 to 140	60 to 70	830,000	690,000

### **Inner Harbor – Snows Marsh Range to Horseshoe Shoal Range Sand Management Plan**

12. **Introduction.** The sand management plan for the inner harbor addresses dredging and disposal issues associated with the Snows Marsh and Horseshoe Shoal channels. An estimated 0.6 million cubic yards of beach quality material will be removed from this

portion of the project. Disposal islands 3 and 4, located near the intersection of Horseshoe and Snows Marsh channels, are at maximum capacity and contain an estimated 1.3 million cubic yards of beach quality material. Maintenance material removed from this area is predominately sand of beach quality. Existing maintenance dredging operations in this area utilizes the offshore disposal area. The removal of the existing material from disposal islands 3 and 4 in conjunction with the new work dredging will facilitate placement of future maintenance material in islands 3 and 4. Future maintenance material placed in islands 3 and 4 would be used to nourish adjacent beaches.

**13. Plan Formulation.** The disposal plan for material presented in the June 1996 Cape Fear-Northeast Cape Fear Rivers project feasibility report proposed the placement of all dredge material from these channel reaches in the offshore disposal area. Subsequent investigations of material characteristics have shown that this material is of beach quality and this valuable resource would be best utilized to meet nourishment needs of the nearby beaches. Placement options for the 0.6 million cubic yards of new work material from the navigation channel includes potential placement of this material on Carolina Beach, Kure Beach, or Fort Fisher for 7,000 feet south of the southern terminus of the rock revetment. Placement options for the new work material from the navigation channel combined with pump out of islands 3 and 4 includes provisions for placement of 1.9 million cubic yards of material on adjacent beaches including Carolina Beach, Kure Beach, the Fort Fisher area, Bald Head Island, or Caswell Beach. Final placement decisions for the new work and maintenance material associated with the inner harbor from the Snows Marsh reach through the Horseshoe Shoal reach will assure that the dredge material disposal occurs in the least costly, environmentally acceptable manor, consistent with engineering requirements established for the project.

### **Maintenance Material Disposal Plan**

**14. Plan Formulation.** Maintenance of the Wilmington Harbor Entrance Channel has historically required the removal of between 850,000 to 1,000,000 cubic yards of material each year. The maintenance material has normally been deposited in the ODMDS. Of the total volume removed each year, about 300,000 to 400,000 cubic yards has been littoral material derived from the adjacent beaches on Oak Island and Bald Head Island. This volume of littoral sediment constitutes 40 to 50 percent of the gross littoral transport along the Brunswick County beaches. Littoral material deposits in the bar channel primarily as a result of the eastward movement of Jay Bird Shoal and the westward movement of Bald Head Shoal into the channel area. The littoral sands generally deposit in channel reaches between channel stations 0+00 and 120+00. Seaward of station 120+00, the shoal material consist primarily of riverine silts and clays. While the new ocean bar channel will have an alignment different from the existing bar channel, shoaling patterns in the new channel, particularly in the vicinity of Jay Bird Shoal and Bald Head Shoal, are expected to be similar to the existing channel. The rate of shoaling of littoral sand in the new channel is estimated to be 545,000 cubic yards per year. The higher rate of deposition of littoral material in the new bar channel compared to the existing is due to channel modifications that would widen the channel to the west along the Smith Island Range and portions of the Baldhead Shoal range and cut across the seaward portions of Bald Head Shoal, as shown

on *Figure 1*. The volume of riverine silts and clays that will shoal the seaward portions of the new entrance channel are projected to be 538,000 cubic yards per year or about the same as that which occurs in the existing entrance channel.

15. The dredged material disposal plan for the entrance channel maintenance material was developed in accordance with U.S. Army Corps of Engineers policy with regard to the disposal of dredged material from Federal navigation channels. The Corps policy is contained in 33 CFR Parts 335-338 reads as follows:

**“It is the Corps’ policy to regulate the discharge of dredged material from its projects to assure that dredged material disposal occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project.”**

The policy further states:

**“The least costly alternative, consistent with sound engineering practices and selected through the 404(b)(1) guidelines or ocean disposal criteria, will be designated the Federal standard for the proposed project.”**

(Note: Section 404 guidelines of the Clean Water Act apply to beach nourishment, island creation, or construction of underwater berms whereas ocean disposal is covered by the Ocean Dumping Act.)

Finally, with specific reference to the disposal of maintenance material, the policy states (33 CFR Part 337.9):

**“(a) District engineers should identify and develop dredged material disposal management strategies that satisfy the long-term (greater than 10 years) needs for Corps projects. Full consideration should be given to all practicable alternatives including upland, open water, beach nourishment, within banks disposal, ocean disposal, etc.”**

16. The Federal policy notwithstanding, the State of North Carolina adopted a set of policies in 1992 designated to insure that beach quality sand not be removed from the active beach system. The U.S. Department of Commerce, pursuant to the Federal Coastal Zone Management Act of 1972, has incorporated these policies into the North Carolina Coastal Management Program. As a result, the State of North Carolina includes these policies in its consistency review of Federal activities. In 1993, the North Carolina General Assembly enacted a statute that put the coastal management policy into law. While there is continuing legal debate over the applicability of the State Law to Federal projects, the Federal Government is required to be consistent with the State’s coastal management program to the maximum extent practicable. Accordingly, the disposal plan for the maintenance material removed from the Wilmington Harbor entrance channel will attempt to satisfy these State requirements.

17. Based on the Corps policy given above, three factors were considered in the development of a dredged material disposal plan for maintenance of the harbor entrance, namely; engineering requirements of the project, environmental impacts, and cost. These factors are discussed below.

18. **Engineering Requirements.** The construction and maintenance of a deep ocean entrance channel through a tidal inlet will have the same impact on the movement of littoral sediment past the entrance as stabilizing structures such as jetties. However, the impacts of a dredge channel on the adjacent shorelines are generally more subtle than the impacts associated with stabilizing structures. In the case of stabilizing structures, there is usually a visible build-up of material adjacent to the updrift structure with corresponding erosion downdrift of the opposite structure. These impacts are normally clearly visible and measurable within distances of thousands of feet of the structures. Navigation projects that include stabilizing structures are generally formulated to include some means to bypass sand from one side of the entrance to the other in order to prevent project induced erosion on the adjacent beaches. Dredged channels, on the other hand, do not cause material to build-up on one side of the inlet or the other, rather, the impact of sediment removal from the dredged channel tends to be diffused throughout the impacted area. Since this diffusion process can extend over miles of shoreline, the erosive impact of the sediment removed from the navigation channel and its deposition outside the active littoral zone is difficult to detect in the short term since the magnitude of the impact may be of the same order as normal temporal fluctuations in the shoreline position. Also, where stabilizing structures generally have a well-defined impact on the predominant downdrift beach, channel projects affect both sides as material is deposited in the navigation channel from both the updrift and downdrift beaches.

19. The Wilmington Harbor project, historically, has not included the disposal of littoral sands on the adjacent beaches or in the active littoral zone. This has been primarily due to the maintenance practices that were established with the inception of the project over 100 years ago. Dredging technology that existed during the early history of the project dictated maintenance procedures and dredged material disposal practices. In this regard, hopper dredges, with hopper doors that opened by swinging down, were highly efficient in removing shoal material from channels but were restricted by their loaded drafts and swinging hopper doors to depositing the dredged material in relatively deep water. As a result, the "Federal Standard" for maintaining navigation projects, like Wilmington Harbor, became the cost and impacts associated with hopper dredging and ocean disposal of the dredged material in water depths of 30 feet or more.

20. The early establishment of the "Federal Standard" for maintenance of Wilmington Harbor did not consider the overall impacts of removing littoral sediment from the littoral system. This was due in part to the limited coastal development that existed when the projects were first constructed, but also due to lack of sufficient scientific understanding of coastal processes and the sand sharing system associated with tidal inlets and adjacent beaches. Years of research by the U.S. Army Corps of Engineers and practical knowledge gained from the operation of the numerous coastal navigation projects around the country has resulted in the realization that littoral material must be conserved. Natural supplies

from rivers and streams are not replenishing littoral sediments, particularly on the East Coast of the United States. Thus, the removal of a cubic yard of littoral sediment from a tidal entrance or inlet with deposition outside the active littoral zone of the beach will ultimately cause a cubic yard deficit somewhere within the sand sharing system affected by that particular entrance or inlet. The impact of the removal of littoral sediment from the active littoral zone through channel maintenance is identified as a major cause of man-induced erosion in the U.S. Army Corps of Engineers Shore Protection Manual. From an engineering perspective, the primary requirement for the Wilmington Harbor maintenance program, apart from assuring that the channel remains open year-round, is to prevent project induced erosion of the adjacent beaches by conserving the limited natural resource, sand, through deposition directly on the adjacent beaches.

21. Wave transformation/sediment transport studies were conducted by the Coastal and Hydraulics Laboratory (CHL), U.S. Army Corps of Engineers, Engineer Research and Development Center, for the Wilmington District, to determine the theoretical rate of longshore sediment transport moving toward the Cape Fear River Entrance. The results of this study are reported in reference 3.

22. The results of the sediment transport analysis for the existing condition near the Cape Fear River entrance found that sediment transport potential to the east off Caswell Beach is 270,000 cubic yards per year while a comparable rate to the west off Bald Head Island is about 527,000 cubic yards per year. Combining these two transport rates results in a gross transport of littoral sediment moving into the entrance of 797,000 cubic yards per year. In terms of percentages, approximately 66 percent of the sediment shoaling the entrance channel comes from Bald Head Island while 34 percent is derived from Caswell Beach. In order to maintain the sediment balance on both islands, littoral material removed from the entrance channel will be placed back on the beach from whence it came. Accordingly, two out of every three cubic yards of littoral shoal material removed from the entrance channel will be placed back on Bald Head Island and the remaining cubic yard placed on East Oak Island-Caswell Beach. The disposal locations on each island will be based on the results of annual beach profile monitoring surveys. In general, the material will be placed primarily along portions of South Beach and West Beach on Bald Head Island and on East Oak Island-Caswell Beach beginning at a point just east of the Carolina Power and Light Company cooling water discharge canal.

23. The distribution of littoral shoal material between Bald Head Island and East Oak Island - Caswell Beach given above will be accomplished by placing material from two consecutive maintenance operations on Bald Head Island with the third operation involving placement on Oak Island-Caswell Beach. Historically, littoral sediment shoaling in the entrance channel has been the highest in the Smith Island Range as a result of the eastward encroachment of Jay Bird Shoal into the channel. In 1991, a 50-foot channel widener was constructed along the west side of the Smith Island Range and was effective in trapping east moving sediment off of Jay Bird Shoal but was not large enough to significantly increase the time between maintenance dredging operations. In 1996, the widener was increased to 100 feet, which increased the maintenance cycle for this segment of the entrance channel to approximately every two years. The design of the deeper



channel into Wilmington Harbor includes a 150-foot channel widener west of the Smith Island Range, as shown on *Figure 1*. Consequently, maintenance dredging of the Smith Island Range and the landward end of the Baldhead Shoal Range should only be required every two years. Based on a two year maintenance cycle, 1,090,000 cubic yards of littoral material will be placed on Bald Head Island in year 2 and year 4 following the initial deepening of the harbor with this same volume placed on Oak Island-Caswell Beach during the 6<sup>th</sup> year following channel deepening. This disposal cycle is planned for the life of the project. The equivalent annual deposition of material would be 363,000 cubic yards per year to Bald Head Island and 182,000 cubic yards per year to Oak Island-Caswell Beach.

24. **Environmental Impacts.** The dredged material disposal plan for the new work material and that for the sandy maintenance material would not only improve the condition of the beaches adjacent to the harbor entrance but would maintain the beaches in a more stable condition. The wider more stable beaches, particularly along Bald Head Island and the East Oak Island-Caswell Beach disposal areas, would provide improved sea turtle nesting habitat compared to the present condition of these beaches. Even in their present state, the shorelines of East Oak Island, Caswell Beach, and Bald Head Island provide some of the most important sea turtle nesting habitat in North Carolina. In this regard, statistics compiled by the North Carolina Wildlife Resources Commission over the last 6 years (1994 to 1999 inclusive) show that approximately 33 percent of the sea turtle nest in North Carolina occurred on these three beaches. This relative high percentage of the total statewide nests is even more impressive given that these beaches constitute only 5 percent of the entire shoreline of North Carolina.

25. The disposal of material on the beach will have some short term negative impacts including the temporary increase in turbidity during the disposal operation and the smothering or otherwise displacement of organisms that live in or near the beach foreshore. Turbidity caused by the disposal operation normally does not persist more than one or two tidal cycles (12 to 24 hours) following the cessation of the disposal operation. With regard to the smothering or displacement of the nearshore organisms, studies by the University of Virginia for the U.S. Fish and Wildlife Service on Pea Island have shown that the organisms generally return to the area in about one year. The disposal plan for the maintenance material discussed above would involve the placement of material on Bald Head Island in intervals of 2, 4, and 8 years while disposal on Oak Island-Caswell Beach would occur in 6 year intervals. Thus, the nearshore organisms would not be completely eliminated from the area as a result of the disposal operation. In summary, the positive environmental impacts associated with the deposition of the littoral shoal material on the beach versus depositing it in an ocean disposal site far outweigh the negative impacts.

26. **Cost.** The "Federal Standard" for constructing and maintaining navigation channels focuses on the least costly method of disposing the material, even though policy dictates that the environmental and engineering requirements must also be considered. With respect to the disposal plan for the new work entrance channel material, the limited capacity of the existing ODMDS dictates that the beach quality material be placed on the adjacent beaches, otherwise, the construction of the deeper project would have to be

delayed by about a year. Even if the project were to be delayed a year to allow ocean disposal of the beach quality material, cost comparisons indicate that beach disposal would still be the most cost effective disposal option.

27. **Maintenance Material Disposal.** Even if beach disposal of the maintenance material resulted in some additional cost, the Corps of Engineers, under authority of Section 207 of the Water Resources Development Act of 1996, can elect to use a slightly more costly disposal method if there are overriding environmental and erosion control benefits associated with the more costly disposal scheme.

28. Future disposal of maintenance material in the ocean will be in the new ODMDS located 5 miles farther offshore than the existing ODMDS. This additional haul distance almost doubles the cost of ocean disposal. As a result, beach disposal of the beach quality maintenance material becomes the least costly option, particularly if maintenance of the beach quality material is only required every two years. While the intent of the sand management plan is to return littoral material to the beach, the primary purpose of the project is to provide safe navigation through the ocean entrance into Wilmington Harbor. In this regard, there may be occasions during the life of the project when problem shoals occur in the entrance channel between normal 2-year maintenance cycle. In order to prevent disruption of navigation, these shoals must be removed in an expedient manner. If the size of these problem shoals are small (for example less than 100,000 cubic yards), mobilization and demobilization of an ocean certified pipeline dredge may not be economical. Therefore, on these occasions, removal of the shoals could be accomplished with a hopper dredge with disposal of the material in the ODMDS. In any event, a comparison of the cost for ocean disposal versus beach disposal of the littoral material is provided in *Table 3*. This cost comparison is made over a 6 year period which corresponds to the time period associated with the sand sharing formula between Bald Head Island and Oak Island-Caswell Beach.

29. **Summary.** The sand management plan developed for the new work beach quality material and maintenance material to be removed from the entrance channels into Wilmington Harbor includes the following:

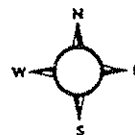
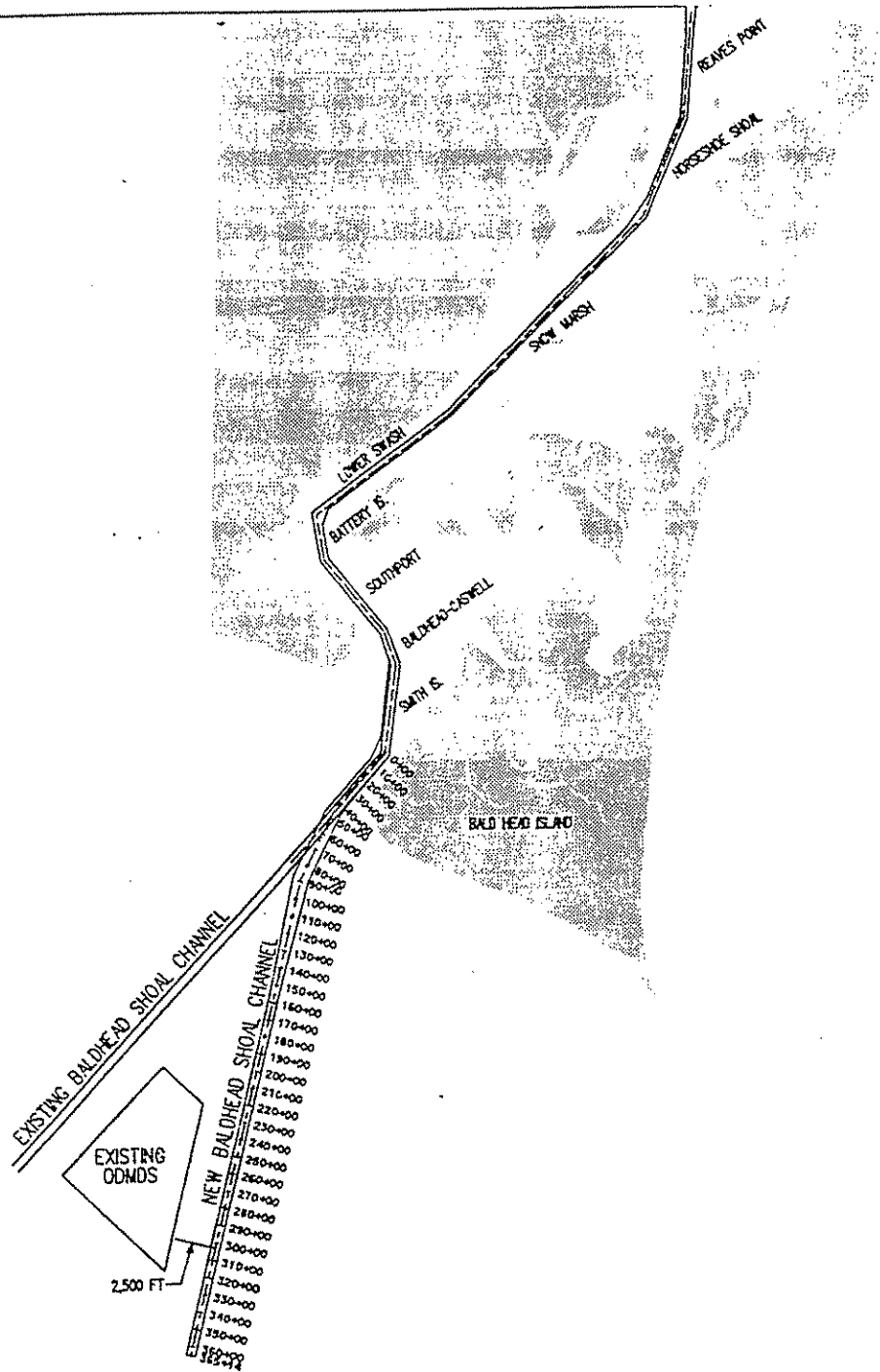
- (a) Disposal of the new work beach quality material on Bald Head Island and Oak Island-Caswell Beach.
- (b) In the absence of Section 933, up to 2,580,000 cubic yards of the new work material would be placed on Bald Head Island and up to 3,420,000 on Oak Island-Caswell Beach.
- (c) Under Section 933, the material would be distributed along Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.
- (d) Beach quality maintenance material will be deposited directly on Bald Head Island and Oak Island-Caswell Beach with Bald Head Island receiving 2 yards for every yard placed on Oak Island-Caswell Beach.

**Table 3**  
**Cost Comparison – Ocean Disposal versus Beach Disposal**  
**Ocean Entrance Channel Maintenance Material**

Item	Quantity	Unit	Unit Cost	Cost
Beach & Ocean Disposal – Maintenance Material				
<b>Year 1: Hopper Dredge Silt &amp; Clay</b>				
Mob & Demob Hopper	1	job	\$331,000	\$331,000
Dredging w/ Ocean Disposal	538,000	CY	\$4.00	\$2,152,000
<b>Total Year 1 Dredging Cost</b>				<b>\$2,483,000</b>
<b>Year 2: Hopper Dredge Silt &amp; Clay</b>				
Mob & Demob Hopper	1	job	\$331,000	\$331,000
Dredging w/ Ocean Disposal	538,000	CY	\$4.00	\$2,152,000
Mob & Demob Pipeline Dredge	1	job	\$948,000	\$948,000
Dredging-Disposal on Bald Head	1,090,000	CY	\$3.10	\$3,379,000
<b>Total Year 2 Dredging Cost</b>				<b>\$6,810,000</b>
<b>Year 3: Hopper Dredge Silt &amp; Clay</b>				
Mob & Demob Hopper	1	job	\$331,000	\$331,000
Dredging w/ Ocean Disposal	538,000	CY	\$4.00	\$2,152,000
<b>Total Year 3 Dredging Cost</b>				<b>\$2,483,000</b>
<b>Year 4: Hopper Dredge Silt &amp; Clay</b>				
Mob & Demob Hopper	1	job	\$331,000	\$331,000
Dredging w/ Ocean Disposal	538,000	CY	\$4.00	\$2,152,000
Mob & Demob Pipeline Dredge	1	job	\$948,000	\$948,000
Dredging-Disposal on Bald Head	1,090,000	CY	\$3.10	\$3,379,000
<b>Total Year 4 Dredging Cost</b>				<b>\$6,810,000</b>
<b>Year 5: Hopper Dredge Silt &amp; Clay</b>				
Mob & Demob Hopper	1	job	\$331,000	\$331,000
Dredging w/ Ocean Disposal	538,000	CY	\$4.00	\$2,152,000
<b>Total Year 5 Dredging Cost</b>				<b>\$2,483,000</b>
<b>Year 6: Hopper Dredge Silt &amp; Clay</b>				
Mob & Demob Hopper	1	job	\$331,000	\$331,000
Dredging w/ Ocean Disposal	538,000	CY	\$4.00	\$2,152,000
Mob & Demob Pipeline Dredge	1	job	\$1,275,000	\$1,275,000
Dredging-Disposal on Oak Island-Caswell	1,090,000	CY	\$4.60	\$5,014,000
<b>Total Year 6 Dredging Cost</b>				<b>\$8,772,000</b>
<b>Total 6-Year Dredging Cost</b>				<b>\$29,841,000</b>

<b>Ocean Disposal of All Maintenance Material</b>				
Yearly Hopper Dredge Cost for Ocean				
Disposal of all Maintenance Material				
Mob & Demob	1	job	\$331,000	\$331,000
Dredging w/ Ocean Disposal	1,083,000	CY	\$4.40	\$4,765,200
<b>Total Annual Dredging Cost</b>				<b>\$5,096,200</b>
<b>Total 6-Year Dredging Cost</b>				<b>\$30,577,200</b>

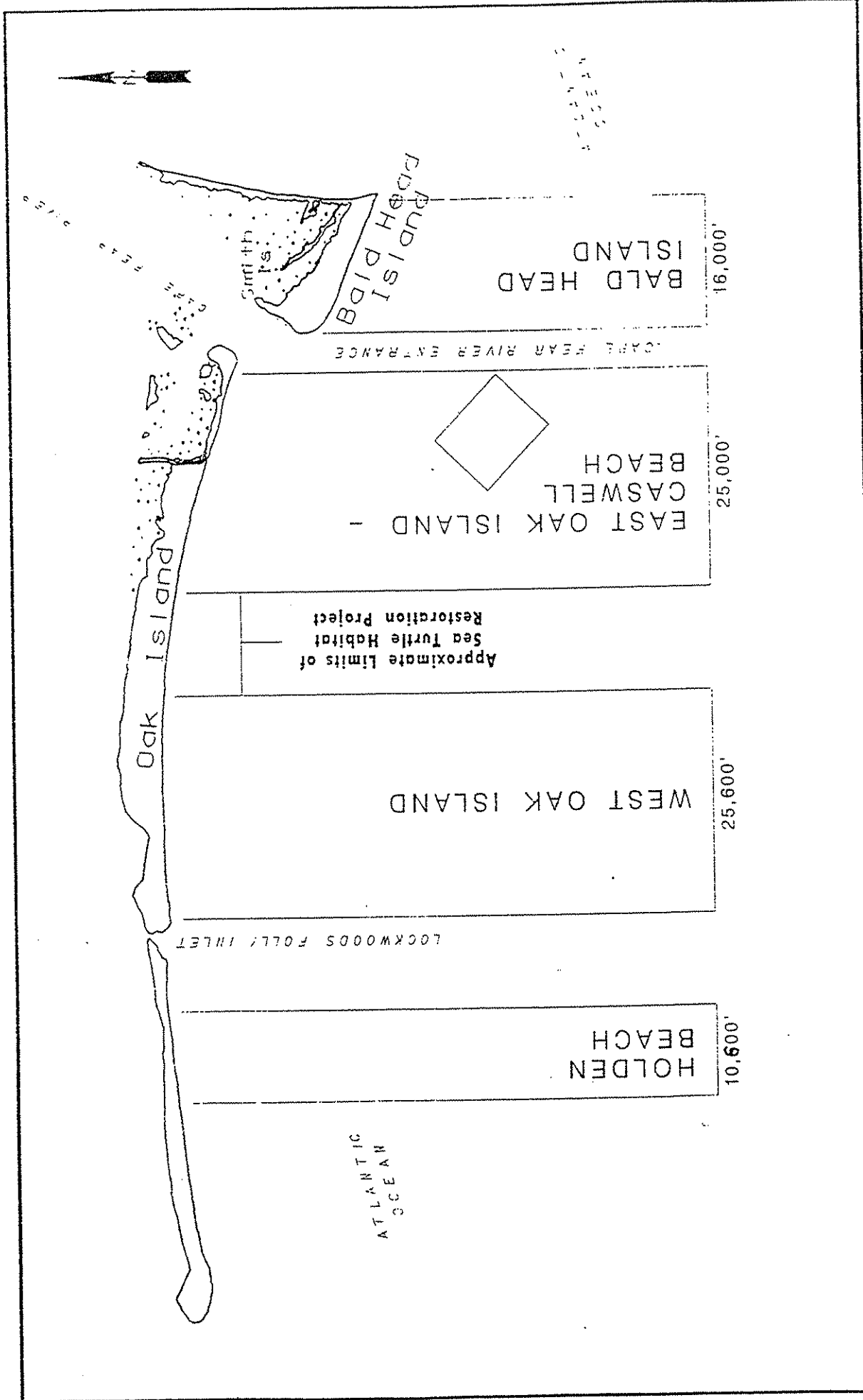
**Date Revised: 02/04/00-sv**



1 1/2 0 1 2 MILES

WILMINGTON HARBOR  
SAND MANAGEMENT PLAN

BALDHEAD SHOAL ALIGNMENTS



POTENTIAL BEACH DISPOSAL AREAS  
BRUNSWICK COUNTY, N.C.



JAMES B. HUNT JR.  
GOVERNOR

BILL HOLMAN  
SECRETARY

DONNA D. MOFFITT  
DIRECTOR

NORTH CAROLINA DEPARTMENT OF  
ENVIRONMENT AND NATURAL RESOURCES  
DIVISION OF COASTAL MANAGEMENT  
**RECEIVED**  
EXECUTIVE OFFICE

June 15, 2000

2000 JUN 26 A 11:03

Colonel James W. DeLony  
District Engineer  
U.S. Army Corps of Engineers  
Wilmington District  
P.O. Box 1890  
Wilmington, NC 28402-1890

Action: PM-C

CF: DE

DX

DP

TS

OC

REFERENCE: DCM00-14 EA and CD - Preconstruction Modifications of  
Authorized Improvements, Wilmington Harbor 96 Project

Dear Col. DeLony:

On May 17, 2000 the State of North Carolina completed its review, pursuant to 15 CFR 930 Subpart C - Consistency for Federal Activities, of the referenced document describing proposed modifications to the authorized Wilmington Harbor 96 Project in New Hanover and Brunswick Counties, North Carolina. The Corps of Engineers submitted the document to the state on February 17, 2000, and the project was assigned the number DCM00-14 for our review purposes.

During the course of our review several environmental concerns were raised by state agencies regarding potential impacts on the resources of the coastal zone. These comments were forwarded to the Corps for its consideration. As the consistency deadline was approaching, we extended our original consistency deadline 15 days, pursuant to 15 CFR 930.41, at the end of March. On April 10, 2000, our review was again extended to allow concerned state agencies to review the Corps' responses to comments on the Environmental Assessment (EA). The Division of Coastal Management received the Corps' responses on May 3 and again solicited comments from concerned state agencies.

The modifications that the Wilmington District Corps of Engineers seeks authorization for are as follows:

1. Construction and maintenance of the Wilmington Harbor entrance channel along a new alignment across the ocean bar.
2. Backfilling the abandoned channel length with dredged material not suited for beach or littoral zone disposal.



MAILING: 1638 MAIL SERVICE CENTER, RALEIGH, NORTH CAROLINA 27600-1638

PHYSICAL: 2728 CAPITAL BLVD., RALEIGH, NC 27604

PHONE: 919-733-2293 FAX: 919-733-1495

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER - 50% RECYCLED / 10% POST-CONSUMER PAPER

DENR TOLL FREE HOTLINE: 1-877-623-6748

Col. James W. DeLony

June 15, 2000

Page 2

3. Placement of material dredged from the new channel alignment and other portions of the project on area beaches in New Hanover and Brunswick Counties.
4. Establishment of a comprehensive plan for dredging and disposal operations for each portion of the harbor, including hopper dredge with overflow.
5. Utilization of blast pressure criteria to measure impacts of blasting on aquatic resources and the elimination of the bubble curtain during blasting operations.
6. Placement of dredged material that does not go to the old channel, the littoral zone, the beaches, or other existing disposal sites, into the Offshore Dredged Material Disposal Site (ODMDS).

The Corps proposes to construct the new entrance channel alignment and place all suitable material on the nearby beaches over an approximately eighteen month period covering two winter seasons and one summer season. Turtle monitoring and shorebird surveys of affected beaches will be conducted. Details of the disposal operations for construction and maintenance of the channel are documented in a Sand Management Plan (SMP). In addition, the Corps has clarified details of the placement, timing, costs, and amount of sand to be deposited on the beaches of Bald Head Island, Caswell Beach, Oak Island, and Holden Beach in a letter dated June 9, 2000 from Colonel James W. DeLony, District Engineer, to the mayors of the respective beach towns. We understand that disposal of dredged material from construction and maintenance of the project will be conducted according to the SMP and letter, as agreed to by the NC Division of Water Resources, the Brunswick County beach communities and the Corps of Engineers. We also understand that the use of hopper dredge with overflow will be limited to times of year and reaches of the project in which impacts on coastal resources will be minimized.

Based upon our review of the EA and the Corps of Engineers' response to comments, we do not disagree with your determination that the proposed construction and changes in harbor maintenance procedures are consistent with the North Carolina Coastal Management Program to the maximum extent practicable, provided that the project is performed according to the EA (including the Sand Management Plan and other appendices) and the Corps' responses to comments from the EA, and to Colonel DeLony's letter of June 9, 2000 (including attachments), and that the conditions below are met.



Col. James W. DeLony

June 15, 2000

Page 3

1. Principal amongst the issues raised were potential impacts on sea turtles, shore and water birds, beach and benthic infauna, fisheries, and water quality parameters. It is extremely important that the impacts of this multifaceted project be well documented in order to evaluate the effects on these resources and on the overall coastal environment. The Corps of Engineers will pursue an integrated monitoring plan to address the resources noted in the first sentence of this paragraph, and will coordinate all monitoring efforts with the appropriate state agencies. This will include but not be limited to the North Carolina Division of Coastal Management, the Wildlife Resources Commission, the Division of Marine Fisheries, and the Division of Water Quality. We understand that the Corps intends to initiate monitoring coordination with the resource agencies in June of 2000.
2. As additional mitigation for impacts on fisheries resources, a fish passage structure will be constructed at Lock and Dam 1 on the Cape Fear River. In addition, fish passage alternatives for Lock and Dams 2 and 3 will be investigated. The Corps of Engineers and, as the Wilmington Harbor Project Sponsor, the State of North Carolina, have agreed to these actions.
3. The placement, timing, costs, and amount of sand to be deposited on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach, both during construction and future maintenance; monitoring; and response to impacts shall be in accordance with Col. DeLony's letter of June 9, 2000, to the mayors of the respective towns receiving the sand (attached and incorporated by reference). If the towns, Corps, and project sponsor's representative mutually agree to modifications to the SMP or Col. DeLony's June 9, 2000 letter, those modifications shall be submitted to the North Carolina Division of Coastal Management for a determination of whether another consistency review is necessary on the modifications.
4. The state must have the opportunity to review the project, including monitoring results, to determine if it continues to be consistent with the North Carolina Coastal Management Program in two situations: 1) After five years from the date of this letter, and 2) before any subsequent modifications for future maintenance or other requests to modify the Wilmington Harbor 96 Project are considered. The Corps shall request this review and provide documentation of impacts (or lack thereof) on the coastal resources of concern.

Col. James W. DeLony

June 15, 2000

Page 4


5. If in the future the Corps considers requesting authorization to conduct hopper dredging with over flow or to place maintenance dredge spoil on a beach, outside of the established time periods or locations, a separate consistency review will be required for each of these activities.

While the State of North Carolina supports beach nourishment and the placement of suitable spoil material on the beaches, we remain concerned about the short term and long term impacts on the biologic and ecologic resources of the coast. We maintain that the best time for such beach nourishment and renourishment is outside of the period of peak impacts on infauna, sea turtles, and fisheries. The State discourages individuals and agencies from seeking authorization to perform work outside established moratoria, and caution that our response is not to be interpreted as a precedent assuring authorization for future renourishment or disposal of sand on beaches outside of established dredging and disposal moratoria. We understand that summer beach disposal is necessary only during the construction phase of the project and that maintenance of the harbor channels will be conducted within established biological time frames.

Finally, with the increasing number of beach disposal and renourishment projects, much of the state's southern coast beaches will be in the placement or recovery phases in any given year. To this end, the Division of Coastal Management requests that the Corps consider combining the monitoring studies and environmental considerations of this project, the Wrightsville Beach, Carolina Beach, Kure Beach projects, and all of the Brunswick County Beaches projects to achieve a more comprehensive and cumulative impact analysis. Although these projects are separate in authorization and funding, we feel that concurrent studies could provide beneficial insights on impacts to resources from beach disposal and nourishment along this extended reach of shoreline.

If you have any questions regarding our findings, conditions, or recommendations, please contact Ms. Caroline Bellis, Division of Coastal Management, at (919) 733-2293. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

  
Donna D. Moffitt

Col. James W. DeLony  
June 15, 2000  
Page 5

Attachment

cc: Bob Stroud, Division of Coastal Management, Wilmington  
Franklin McBride, NC Wildlife Resources Commission  
Bennett Wynne, NC Wildlife Resources Commission  
Ruth Boettcher, NC Wildlife Resources Commission  
Fritz Rohde, NC Division of Marine Fisheries  
Mike Street, NC Division of Marine Fisheries  
John Dorney, Division of Water Quality  
Frank Yelverton, US Army Corps of Engineers  
John Meshaw, US Army Corps of Engineers



DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 1890  
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO

June 9, 2000

Project Management Branch

Honorable Freeman A. Berne  
Mayor of the Village of Bald Head Island  
Post Office Box 3009  
Baldhead Island, North Carolina 28461

Honorable Harry Simmons  
Mayor of Caswell Beach  
707 Caswell Beach Road  
Caswell Beach, North Carolina 28465

Honorable Joan Altman  
Mayor of Oak Island  
4601 East Oak Island Drive  
Oak Island, North Carolina 28465

Honorable James W. Lowell  
Mayor of Holden Beach  
110 Rothschild Street  
Holden Beach, North Carolina 28462

Dear Mayors:

After years of effort by many, it is a pleasure to see the various elements of the Wilmington Harbor Navigation project (hereinafter the "Project") coming together. As we approach the decision point for the Finding of No Significant Impact (FONSI), I want to bring everyone up to date on the status of our plan to place beach quality sand excavated for the project on Bald Head Island, Caswell Beach, Oak Island, and Holden Beach.

As you know, the details of our plan are presented in the Environmental Assessment, in particular, Appendix A - Sand Management Plan, in the Wilmington Harbor Monitoring Plan, and in the Section 933 Evaluation Report. The shoreline segments recommended to receive sand are the Village of Bald Head Island (up to 16,000 linear feet), Caswell Beach (up to 25,000 linear feet), Oak Island (up to 25,600 linear feet), and Holden Beach (up to 10,600 linear feet). This represents a maximum shoreline length of 77,200 linear feet.

Bald Head Island will be the site of initial beach disposal associated with construction. This site, along with the easternmost 25,000 linear feet of Caswell Beach-Oak Island, represents the least cost alternative of disposal available to the Project; accordingly, placement will be accomplished at Project cost and at no cost to the Village of Bald Head Island.

RECEIVED

JUN 16 2000

COASTAL MANAGEMENT

AM. 2

Placement will be according to the March 31, 2000 memorandum from Erik J. Olsen, consultant to the Village of Bald Head Island referencing the Village of Bald Head Island Beach Disposal Plan (2000/2001) (enclosed and incorporated by reference) to the U.S. Army Corps of Engineers, Wilmington District (hereinafter "Corps").

Once disposal has begun at the Village of Bald Head Island, fill operations will continue until the estimated minimum of 1,536,000 cubic yards of sand in the channel prism allocated to the Village of Bald Head Island (based on channel surveys conducted in October and December 1999) have been dredged and placed on the beach in accordance with the March 31, 2000 memorandum. Assuming a potential effective reduction of 20 percent in the gross fill dredged, the final in-place fill volume is expected to range between 1,228,000 cubic yards and 1,536,000 cubic yards.

Project construction beach disposal operations at the Village of Bald Head Island will be performed along both West Beach and South Beach, as indicated by the March 31, 2000 memorandum. The Village of Bald Head Island will provide all requisite easements necessary to construct the template(s) provided for by the March 31, 2000 memorandum.

Once the placement of beach quality sand at the Village of Bald Head Island is complete, placement along approximately 25,000 linear feet of shoreline at the easternmost end of Caswell Beach-Oak Island will be accomplished. Placement will be made in accordance with the template agreed to by the Corps, NCDENR, and the communities of Caswell Beach and Oak Island. The final in-place fill volume is expected to range between 1,451,000 cubic yards and 1,814,000 cubic yards. Since this reach comprises the balance of the least cost alternative for disposal available to the Project, placement will be at Project cost and at no cost to those communities. All requisite easements will be provided by the communities at no cost to the Project.

Under the provisions of the draft Section 933 report, the remaining beach quality sand will be placed along approximately 25,600 linear feet of the westernmost shoreline of Oak Island and along approximately 10,600 linear feet of the eastern shoreline of Holden Beach. Placement will be made in accordance with the template agreed to among the Corps, NCDENR, and the affected beach communities and cost shared at the rate of 65 percent Federal (currently estimated at \$6,500,000) and 35 percent non-Federal (currently estimated at \$3,500,000). The final in-place fill volume along the cost shared reach of Oak Island is expected to range between 1,272,000 cubic yards and 1,590,000 cubic yards. The final in-place fill volume along the cost shared reach of Holden Beach is expected to range between 528,000 cubic yards and 660,000 cubic yards. The communities will provide all required easements at no cost to the Project.

After construction of the Smith Island and Bald Head Island Shoal portions of the project, the U.S. Army Corps of Engineers will conduct periodic maintenance dredging of the navigation channels. The disposal of all beach quality dredged material will be accomplished in accordance with the Environmental Assessment of Preconstruction Modifications of Authorized Improvements, Wilmington Harbor, North Carolina, dated February 2000 and its Sand Management Plan (Appendix A), and the Wilmington Harbor Monitoring Plan (enclosed and incorporated by reference). The associated disposal will be as called for therein, namely:

- Year 2: Placement at Bald Head Island (estimated @ 1Mcy)
- Year 4: Placement at Bald Head Island (estimated @ 1 Mcy)
- Year 6: Placement at Caswell Beach and easternmost end of Oak Island (estimated @ 1 Mcy).

This disposal cycle is planned for the life of the project. As provided on page 8 of the Environmental Assessment and on page 12 of the sand management plan, in some cases problem shoaling involving small quantities of sand may develop in the channel between regular dredging events, making use of a pipeline dredge unfeasible and the sand may need to be deposited in the ocean disposal area.

Prior to each disposal operation at either the Village of Bald Head Island, or Caswell Beach, or the easternmost shoreline of Oak Island, the community receiving the sand may provide advance guidance to the Corps regarding placement distributions and fill template design. The Corps will follow that guidance to the maximum extent practicable.

The Corps will conduct a monitoring program as referred to in the Environmental Assessment and Sand Management Plan, and as set out in the Wilmington Harbor Monitoring Plan, which is enclosed and incorporated by reference. An annual report will be prepared, as described in the Monitoring Plan. The Corps will use this monitoring data to evaluate and adjust the Sand Management Plan, as determined necessary, after coordination with interested parties.

All initial and future disposal activities at the Village of Bald Head Island, Caswell Beach, and easternmost Oak Island, (as described in the Environmental Assessment and its Sand Management Plan, and in the Wilmington Harbor Monitoring Plan) will be at no cost to either community.

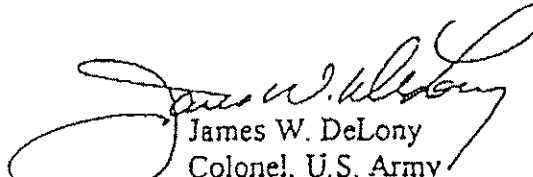
If the Project causes significant adverse effects on adjacent beaches, the Corps and the Sponsor will respond by adjusting the Sand Management Plan, after consultation with interested parties. If the Project causes significant adverse effects that cannot be dealt with by

modifications to the Sand Management Plan, the Corps and the Sponsor will promptly seek and use their best efforts to implement appropriate corrective measures, such as additional nourishment, subject to consistency review.

Our current schedule for execution of the FONSI is June 14, 2000. Our current schedule for our higher headquarters approval of the draft Section 933 Evaluation Report is July 31, 2000. We expect to award a contract to construct the inshore reaches of the Ocean Bar entrance channel on or about November 15, 2000. We are moving prudently but aggressively to make this important Project a reality.

The support of the members of the Brunswick Beaches Consortium and our Project sponsor represented by Mr. John Morris in optimizing this unique opportunity for nourishing your beaches has been wise, energetic, and timely. We salute your efforts and look forward to continued close coordination through to the successful completion and operation of the Project and the associated beneficial use of beach quality sand.

Sincerely,



James W. DeLony  
Colonel, U.S. Army  
District Engineer

Enclosures

Copies Furnished:

Mr. John N. Morris, Director  
Division of Water Resources  
North Carolina Department of Environment  
and Natural Resources  
1611 Mail Service Center  
Raleigh, North Carolina 27699-1611

Ms. Donna D. Moffitt, Director  
Division of Coastal Management  
North Carolina Department of  
Environment and Natural Resources  
1638 Mail Service Center  
Raleigh, North Carolina 27699-1638

VILLAGE OF BALD HEAD ISLAND  
CAMA CORE LAND USE PLAN  
EXECUTIVE SUMMARY

**TABLE OF CONTENTS**

	<u>PAGE</u>
I. INTRODUCTION .....	I
2. VILLAGE OF BALD HEAD ISLAND COMMUNITY VISION .....	I
3. KEY ISSUES/DOMINANT GROWTH-RELATED ISSUES .....	2
4. POPULATION SUMMARY .....	3
5. HOUSING SUMMARY .....	4
6. EMPLOYMENT AND ECONOMY SUMMARY .....	5
7. ENVIRONMENTAL CONDITIONS .....	5
a. Introduction .....	5
b. Cape Fear River Basin .....	6
c. Hydrologic Unit 03030005 (Subbasin 03-06-17) .....	7
d. Summary of Water Quality Subbasin 03-06-17 .....	7
i. Introduction .....	7
ii. Registered Animal Operations/Population Density within Cape Fear River Basin .....	10
iii. Growth Trends .....	11
e. Wastewater Treatment Facilities .....	12
f. Natural Hazards .....	12
g. Natural Resources .....	14
8. ANALYSIS OF EXISTING LAND USE AND DEVELOPMENT .....	14
9. LAND USE/DEVELOPMENT GOALS AND IMPLEMENTING ACTIONS .....	16
a. Introduction .....	16
b. Impact of CAMA Land Use Plan Policies on Management Topics .....	17
c. Public Access .....	17
d. Land Use Compatibility .....	19
e. Infrastructure Carrying Capacity .....	24
f. Transportation .....	26
g. Natural Hazard Areas .....	28



h.	Water Quality .....	31
i.	Local Areas of Concern .....	36

## TABLES

Table 1	Village of Bald Head Island and Brunswick County Population Growth and Percent Change .....	3
Table 2	Village of Bald Head Island Seasonal Population, 2003 .....	3
Table 3	Village of Bald Head Island Permanent and Seasonal Population Projections, 2000-2025 .....	3
Table 4	Characteristics of Subbasin 03-06-17 .....	8
Table 5	Cape Fear River Basin-Subbasin 03-06-17 Registered Animal Operations .....	10
Table 6	Cape Fear River Basin Population Density, 2000 .....	11
Table 7	Village of Bald Head Island Developable Land Use Acreage within Flood Hazard Areas .....	13
Table 8	Village of Bald Head Island Existing Land Use .....	15

---

---

# VILLAGE OF BALD HEAD ISLAND



## CAMA CORE LAND USE PLAN EXECUTIVE SUMMARY

Adopted by the Village of Bald Head Island Village Council: April 11, 2008

Certified by the Coastal Resources Commission: May 22, 2008

Prepared by:



Wilmington, North Carolina

The preparation of this document was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

---

---

## **EXECUTIVE SUMMARY**

### **I. INTRODUCTION**

This Fiscal Year 2004/2006 CAMA Land Use Plan is prepared in accordance with the requirements of the North Carolina Coastal Area Management Act (CAMA). Specifically, this document complies with Subchapter 7B, "CAMA Land Use Planning Requirements," of the North Carolina Administrative Code, as amended, August 1, 2002.

The 7B guidelines provide that each of the twenty coastal counties prepare and adopt a CAMA Land Use Plan that meets the planning requirements adopted by the Coastal Resources Commission (CRC). If a county chooses not to prepare a plan, the guidelines specify that the CRC will prepare and adopt a CAMA Land Use Plan for that county.

In general, 7B requires that a plan include analysis of existing and emerging conditions, a plan for the future including specific land use/development goals/policies, and tools for managing development. The management tools must specify the actions which the Village of Bald Head Island will take to ensure implementation of this plan. Hereinafter, the Village of Bald Head Island will be referred to as the Village.

At the beginning of the preparation of this document, the Village adopted a Citizen Participation Plan which is intended to ensure that all interested citizens have an opportunity to participate in the development of this plan through both oral and written comments.

Following adoption of the plan by the Bald Head Island Village Council, it was submitted to the CRC for certification. Certification of the plan was achieved on May 22, 2008.

### **2. VILLAGE OF BALD HEAD ISLAND COMMUNITY VISION**

Bald Head Island is a residential, family oriented community and major family vacation destination committed to living in harmony with nature while being supportive of activities and services necessary to enhance the quality of life on the Island.

### 3. KEY ISSUES/DOMINANT GROWTH-RELATED ISSUES

On January 17, 2005, the Village conducted a publicly advertised meeting with the purpose of identifying key issues and concerns for the Village. The intent of this effort was to identify issues related to the Village that can be addressed in the context of this plan. All permanent Village residents were mailed a letter inviting them to attend the meeting, and advertisements were also run in the local newspaper and on the Bald Head Island Association public cable channel. Approximately 30 people attended the meeting. The following provides the top ten issues:

Rank	Issue	Score
1	Protect maritime forests	25
2*	Beach erosion	22
2*	Address carrying capacity and future needs of the Island. Build-out?	22
3	Water quality in Bald Head Creek	21
4	Need to address redevelopment of a public restroom/shower facility at East Beach	18
5	Wildlife management	16
6*	Allow for adequate commercial development	13
6*	Preservation of vegetation and dune lines (Live Oaks)	13
6*	Protect conservation areas	13
6*	Coordinate LUP with restrictive covenants	13
7	Stormwater management	11
8*	Maintenance of ferry basin	10
8*	Protection of water table (foreign water affecting aquifer)	10
9*	Restriction of gas powered engines	9
9*	Processing of waste	9
9*	Address utilities	9
	– Size (7)	
	– Disposal of treated reuse quality wastewater of golf courses (2)	
10	Preservation of the dune ridge	8

\*Indicates a tie score.

Additionally, surveys were mailed out to 1,348 absentee property owners. A total of 473 completed questionnaires were received. Results of the responses to the village meeting and absentee property owners were very similar.

#### 4. POPULATION SUMMARY

Historical population growth, seasonal population, and forecast of population growth are summarized in the following tables.

**Table 1: Village of Bald Head Island and Brunswick County  
Population Growth and Percent Change**

Municipality	Total Population			% Change		Overall '90-'03
	1990	2000	2003 Estimate	'90-'00	'00-'03	
Bald Head Island	78	173	205	121.8%	18.5%	162.8%
Brunswick County	50,985	73,141	81,810	43.5%	11.9%	60.5%

Source: US Census Bureau & NC Office of State Planning.

**Table 2: Village of Bald Head Island  
Seasonal Population, 2003**

Housing Type	Number of Units	Persons Per Unit	Seasonal Population
Parking Spaces	973	4.00	3,892
Marina Boat Slips	25	4.50	113
Total			4,005
Permanent Population	205		
Peak Seasonal Population	4,005		
Total Peak Population	4,210		

\*It should be noted that when parking at Indigo Plantation is not sufficient, additional parking is available at Southport Elementary School, as well as the old Roses Parking Lot. These parking spaces are not accounted for in these figures.  
Source: Holland Consulting Planners, Inc.

**Table 3: Village of Bald Head Island  
Permanent and Seasonal Population Projections, 2000-2025**

	2000	2007	2010	2020	2025	% Change '00-'25
Permanent Population	173	210	319	428	537	210.4%
Peak Seasonal Population	N/A	4,215	5,537	7,284	9,789	132.2%*

\*Percentage change is for 2003-2025.

Source: US Census Bureau, North Carolina Office of State Planning, Village of Bald Head Island.

The following provides a summary of the population demographic information for the Village:

- ▶ The permanent population in the Village increased by 127 individuals or 162.8% between 1990 and 2003.
- ▶ The total peak seasonal population for the Village is 4,210.
- ▶ The permanent population within the Village is predominantly Caucasian (95.4%); the remaining population is predominantly African American comprising 3% of the total population.
- ▶ A majority of the Village population is between the ages of thirty-five and sixty-four (72%).
- ▶ Approximately 69% of Village residents age 25 and over have received an education equivalent to a Bachelor's Degree or higher.

## **5. HOUSING SUMMARY**

The following provides a summary of significant points identified through the housing demographics discussion contained in the CAMA Core Land Use Plan:

- ▶ A majority of the housing units in the Village (87.1%) are vacant; of these 67.2% are considered to be for seasonal, recreational, or occasional use.
- ▶ The median for the year in which residential structures have been built within the Village is 1992.
- ▶ Since the year 2000, 340 residential building permits have been issued by the Village Planning and Inspections department.
- ▶ Residential housing units on average have 5.4 rooms per unit, and 76.5% have three or more bedrooms.
- ▶ Nearly the entire housing stock (89.6%) within the Village is comprised of single-family residential homes.

## **6. EMPLOYMENT AND ECONOMY SUMMARY**

The following is a summary of the economic data that has been discussed in the CAMA Core Land Use Plan:

- ▶ The per capita income for the Village's residents is \$45,585.
- ▶ Out of the total families recorded in the 2000 Census within the Village, approximately 80% reported an annual house hold income of \$50,000 or greater.
- ▶ The largest employer of the Village's working age population is the finance, insurance, real estate, and rental and leasing industries. This figure only takes into account the occupations of permanent residents.
- ▶ Approximately 44% of the Village's working population reported working out of their homes.

## **7. ENVIRONMENTAL CONDITIONS**

### *a. Introduction*

A river "basin," or watershed, is the entire land area drained by a river. All life that resides within the defined boundaries of a particular river basin are linked by this water course. Due to this linkage, any pollution that occurs in a basin, even if it occurs far away from the river itself, can eventually wind up in the river, and in turn affect water quality throughout the basin.

In response to this issue, the NC Department of Environment and Natural Resources launched the Basinwide Water Quality Planning Program. The Village falls completely within the Cape Fear River Basin, and therefore falls under the recommendations and analysis included in the Cape Fear River Basinwide Water Quality Plan. The Cape Fear River Basinwide Water Quality Plan was adopted by the Division of Water Quality in 1996 with updates occurring in 2000 and 2005. The following are the goals of DWQ's basinwide program:

- ▶ Identify water quality problems and restore full use to Impaired waters.
- ▶ Identify and protect high value resource waters.
- ▶ Protect unimpaired waters while allowing for reasonable economic growth.

These goals are accomplished through the following objectives:

- ▶ Collaborate with other agencies to develop appropriate management strategies.
- ▶ Assure equitable distribution of waste assimilative capacity.
- ▶ Better evaluate cumulative effects of pollution.
- ▶ Improve public awareness and involvement.

As existing and future land uses are considered within the Village, these goals should be kept in mind. More detailed water quality information is available for municipal jurisdictions at the subbasin level. Subbasins are geographic areas that represent part of a watershed, made up of a combination of drainage areas and/or distinct hydroponic features, all draining to the primary watershed. Within the Cape Fear River Basin, the Village is located entirely within subbasin 03-06-17.

*b. Cape Fear River Basin*

The Cape Fear River Basin is the largest river basin in the State of North Carolina. The basin encompasses 9,149 square miles and covers a total of 26 different counties. There are 6,386 miles of rivers and streams traversing through the river basin. The Cape Fear River Basin forms at the confluence of the Deep and Haw rivers adjacent to the border of the Chatham/Lee County line.

Within this river basin, there are several large urban centers including: Greensboro, High Point, Burlington, Chapel Hill, Durham, Fayetteville, and Wilmington. The Fort Bragg Military Base is also centrally located within the Cape Fear River Basin. Rapid growth within and adjacent to these urban areas has resulted in significant impacts on water quality throughout the Cape Fear River Basin. According to information provided in the 2005 Cape Fear Basinwide Water Quality Plan, almost 11% of the land within the basin was considered urban and built up by the Natural Resources Inventory. Comparatively, the Natural Resources Inventory reported that 6.3% of land was urban and built up in 1982. Swine operations are also detrimental to water quality within the Cape Fear River Basin. This basin alone is home to approximately 54% of the state's overall swine operations. These operations are scattered throughout the river basin, although a majority of them are located inland away from coastal and estuarine waters.



The Cape Fear River Basin supports a wide variety of aquatic ecosystems, as well as many species of aquatic and recreational fish. These include wetlands, estuaries, blackwater rivers, and rocky streams, all of which support varying aquatic wildlife including 30 endangered species.

c. *Hydrologic Unit 03030005 (Subbasin 03-06-17)*

Most federal government agencies, including the US Geological Survey (USGS) and the US Natural Resources Conservation Service (NRCS), use a system of defining watersheds that is different from that used by the Division of Water Quality (DWQ) and many other state agencies in North Carolina. Under the federal system, the Cape Fear River Basin is made up of six hydrologic areas referred to as hydrologic units. Each hydrologic unit is defined by an 8-digit number. DWQ has a two-tiered system in which the state is subdivided into 17 river basins with each basin further subdivided into subbasins. The Village falls within Hydrologic Unit 03030005 (Lower Cape Fear River), which is broken down into three subbasins by the North Carolina Division of Water Quality. Subbasin 03-06-17 encompasses the extreme southern portion of the Cape Fear River Basin including the Village and the City of Southport.

The Village is not a major contributor to water quality problems within subbasin 03-06-17 of the Cape Fear River Basin. Development within the Village has been steady over the years, but as growth has occurred careful steps have been taken to ensure the long term environmental quality of the island and its surrounding waters. Rapid growth and urban expansion on the mainland portions of Brunswick County have had a much more substantial impact on water quality within the subbasin, as well as the entire Cape Fear River Basin. The following section is an excerpt from the 2005 Cape Fear River Basinwide Plan that summarizes the condition of water quality within subbasin 03-06-17. This excerpt also includes recommendations for improving water quality.

d. *Summary of Water Quality Subbasin 03-06-17*

i. Introduction

Subbasin 03-06-17 is located in the outer coastal plain and in estuarine regions of the basin. The subbasin contains portions of the City of Wilmington, City of Southport, and the Village. Most tributaries in this subbasin are backwater and slow moving or tidal. The primary land uses are forest and agriculture. However, Wilmington and surrounding suburban areas also contribute to nonpoint source pollution. There are currently no defined Outstanding Resource

Waters (ORW) within or adjacent to the corporate limits of the Village. The following table provides a summary of population and land cover characteristics for subbasin 03-06-17.

**Table 4: Characteristics of Subbasin 03-06-17**

**Land and Water Area (sq. miles):**

Total Area	547
Land Area	498
Water Area	49

**Land Cover (%):**

Forest/Wetland	74.7%
Surface Water	9.3%
Urban	4.1%
Cultivated Crop	7.6%
Pasture/Managed Herbaceous	4.3%

Source: NC Division of Water Quality 2005 Cape Fear River Basinwide Water Quality Management Plan.

There are 41 individual NPDES wastewater discharge permits in subbasin 03-06-17 with a permitted flow of 99.9 MGD. The largest of them are International Paper (50 MGD), Progress Energy (3.5 MGD), New Hanover County WWTP (4 MGD), Northside WWTP (16 MGD), and Southside WWTP (12 MGD).

Use support ratings were assigned for waters in the subbasin in the aquatic life, recreation, fish consumption, and water supply categories. All waters are Impaired on an evaluated basis in the fish consumption category because of fish consumption advice that applies to the entire basin. In the water supply category, all WS classified waters (1.6 miles) are Supporting on an evaluated basis based on reports from DEH regional water treatment plan consultants. The stressor for Impaired waters in subbasin 03-06-17 is Fecal Coliform Bacteria.

In the aquatic life category, 97.8 stream miles (31.2%), 407 freshwater acres (32.5%), and 20,592 estuarine acres (87.8%) were monitored during this assessment period. There were 6,457 estuarine acres (27.5%) identified as Impaired in this category. In the recreation category, 21,188.9 estuarine acres (90.4%), 44.1 freshwater miles (14.1%), and 10.3 coastline miles (45.2%) were monitored during the assessment period. There were 96.6 estuarine acres (<1%) and 4.7 coastline miles (20.6%) identified as Impaired in this category. In the shellfish harvesting category, 8,286.1 estuarine acres (100%) were monitored during the assessment period. There were 2,061.6 estuarine acres (24.8%) identified as Impaired in this category.

The Division of Water Quality has concluded that current coastal stormwater rules have not adequately addressed water quality impacts to public trust waters. Additionally, DWQ's review of scientific studies has resulted in a determination that local governments' simply deferring to state and federal rules to address water quality issues still results in impaired local water quality based on the following conclusions:

- ▶ Areas that have impervious surfaces of 10% or greater can be linked to local stream degradation.
- ▶ Biological diversity has been shown to drop when areas of impervious surface increase beyond 10-15%.
- ▶ Stream stability is affected when impervious surface approaches 10% in an area.
- ▶ Estuaries generally degrade when areas have 10% impervious surface areas.
- ▶ Sensitive fish species loss increases with 12% impervious surface.

#### 2005 Recommendations:

The following recommendations were provided in the Basinwide Water Quality Management Plan for water bodies within Bald Head Island.

**Bald Head Creek.** From source to the Cape Fear River (79.9 acres) is Impaired for shellfish harvesting because this segment is classified by DEH SS as prohibited in growing area B-2. Bald Head Creek will be added to the 303(d) list of Impaired waters.

**Cape Fear River.** The 2000 basinwide plan recommended that a TMDL be developed for dissolved oxygen and that the TMDL be used to guide wasteload allocations for new and expanding discharges. The Cape Fear River from Polly Gully Creek to ICWW (11.3 miles) is Impaired for shellfish harvesting because these segments are classified by DEH SS as prohibited in growing areas B-1 and B-4. Segment 18-(87.5)a is Supporting aquatic life and recreation because no criteria were exceeded at sites BA722 and S-43. Segment 18-(87.5)b is Supporting shellfish harvesting and aquatic life because this area is approved and no criteria were exceeded at site BA734.

DWQ is developing a TMDL to address the low dissolved oxygen in these segments. TMDL targets and allocations will be addressed as part of the process. Modeling efforts will include a watershed model of the Northeast Cape Fear River and hydrodynamic and water quality modeling of the estuary. The TMDL was scheduled to be submitted to EPA in late 2005. Until the TMDL is approved by EPA, new and expanding discharges will be carefully considered on a case-by-case basis. The NPDES compliance process will be used to address the significant permit violations noted above.

**Fishing Creek.** From source to Bald Head Creek (7.9 acres) is Impaired for shellfishing harvesting because this segment is classified by DEH SS as prohibited in growing area B-1. Fishing Creek will be added to the 303(d) list of Impaired waters.

ii. Registered Animal Operations/Population Density within Cape Fear River Basin

The following table provides a summary of registered swine operations within Cape Fear River subbasin 03-06-17. The numbers only reflect those operations required by law to be registered. There are no registered cattle or poultry operations in the subbasin or adjacent to the Village.

**Table 5. Cape Fear River Basin - Subbasin 03-06-17  
Registered Animal Operations**

Subbasin	Swine*		
	No. of Facilities	No. of Animals	Total Steady State Live Weight**
03-06-17	7	40,866	6,381,110

\*There are no other registered animal operations located within subbasin 03-06-17.

\*\*Steady State Live Weight (SSLW) is the result, in pounds, after a conversion factor has been applied to the number (head count) of swine, cattle, or poultry on a farm. The conversion factors, which come from the Natural Resource Conservation Service (NRCS) guidelines, vary depending on the type of animals on the farm and the type of operation (for example, there are five types of hog farms). Since the amount of waste produced varies by the size of the animal, SSLW is the best way to compare the sizes of the farms.

Source: NC Division of Water Quality 2005 Cape Fear River Basinwide Water Quality Plan.

Table 6 provides population density by subbasin for the Cape Fear River Basin. This information is useful in determining what streams are likely to be affected by population growth.

**Table 6. Cape Fear River Basin  
Population Density, 2000**

Subbasin	Population Density (Persons/Sq. Mile)
03-06-01	352
03-06-02	441
03-06-03	508
03-06-04	181
03-06-05	419
03-06-06	315
03-06-07	257
03-06-08	510
03-06-09	180
03-06-10	101
03-06-11	98
03-06-12	82
03-06-13	162
03-06-14	166
03-06-15	344
03-06-16	85
03-06-17	143
03-06-18	173
03-06-19	63
03-06-20	42
03-06-21	113
03-06-22	66
03-06-23	148
03-06-24	361
Total	197

Source: NC Division of Water Quality 2005 Cape Fear River Basinwide Water Quality Plan.

iii. Growth Trends

Between 1990 and 2000, the population within the Cape Fear River Basin increased an estimated 19.4%. The Cape Fear River Basinwide Water Quality Plan projects percent growth between 2000 and 2020 for counties in the basin. Since river basin boundaries do not coincide with county boundaries, these numbers are not directly applicable to the Cape Fear River Basin. They are estimates of county-wide population changes.

Population growth trends for the basin between 2000 and 2020 indicate eight counties with growth rates in excess of 30% and ten counties with growth rates of 20% to 30%,

with a total population increase in the basin of 28.9%. According to the Water Quality Plan, Brunswick County is expected to experience a 35.2% population increase between 2000 and 2020. Growth rates and demographic information specific to the Village has been discussed earlier in the plan.

e. *Wastewater Treatment Facilities*

Originally the Village relied solely on private septic tank systems for the disposal and treatment of wastewater. As development increased within the Village, it became very apparent that an alternative method would be required due to the rapid increase in development that occurred between 1980 and 1990. In response to concerns related to wastewater treatment, Bald Head Island Utilities installed two 50,000 gpd package treatment plants, and began installing central sewer system lines throughout main thoroughfares of the Village. Bald Head Island Utilities, Inc., was the original owner of the utilities. The Village has acquired the water and sewer utility systems and assumed responsibilities regarding oversight and maintenance of the system.

This system became antiquated over time, so the two plants were replaced by a single batch processing plant that is capable of serving the entire Village. The Village is working toward running the central sewer system to all portions of its corporate limits; however, this process is taking time. Although a majority of the Village is currently served, several private septic systems still exist. Eventually it is anticipated that all properties will be served by the system, except those located at Middle Island. Currently, the Village's policy is to extend sewer service to properties as they are developed or when property owners experience problems with their on-site septic systems. It is anticipated that over time this will result in the sewer extension to all portions of Stage I and Stage II, as well as Middle Island. It is anticipated that all properties within the Village will be on central sewer by the year 2027.

According to the Brunswick County Health Department, the private septic tank systems that do still exist within the Village are operating properly and do not pose a threat to water quality conditions within or adjacent to the Village.

f. *Natural Hazards*

The Village is very vulnerable to the effects of natural hazards in the form of hurricanes, coastal flooding, and nor'easters. One of the most significant impacts of these events is the flooding and beach erosion that occurs. The Village has a proactive approach to dealing with the

issue of beach erosion; however, there is no straight forward approach to ensuring the safety of personal property when a hurricane and/or flooding event occurs. The locations of both flood zones and storm surge inundation areas have been discussed in detail in the CAMA Core Land Use Plan. These two areas aim to define boundaries around portions of land that will potentially flood in storm events of varying magnitude.

In order to further define how significant an impact a major storm event may have on the Village, the following table provides the acreage within the AE and VE flood zones by land use type. These two flood zones are considered to be high hazard areas, where there is a one percent annual chance of a flooding event. The primary distinction between these two zones is that properties within the VE zone are also vulnerable to coastal wave action. All properties within these two zones are required to carry federal flood insurance. Additionally, development within these areas must comply with the Village's Flood Damage Prevention Ordinance, which has provisions for construction and finished floor elevation to increase the safety of a structure if a flooding event occurs. Table 7 provides the Village's acreage that falls within the AE and VE flood zones by land use. According to this table, 693 or 84.5% of the housing units within the Village fall within or are immediately adjacent to a flood hazard area. This includes both single- and multi-family housing units.

**Table 7: Village of Bald Head Island  
Developable Land Use Acreage within Flood Hazard Areas**

Land Use	Acres	% of Total
Association Owned Properties	125.5	6.3%
Commercial	12.7	0.6%
Government	9.0	0.5%
Multi-Family Residential	12.3	0.6%
Office & Institutional	2.2	0.1%
Right-of-Way	104.4	5.3%
Recreation	116.2	5.9%
Single-Family Residential	195.2	9.8%
Utilities	9.9	0.5%
Vacant	1,396.2	70.4%
Total	1,983.6	100.0%

NOTE: There are 654.8 undevelopable acres within the Village. These areas are comprised of wetlands, estuarine areas, and other water bodies.

Source: Holland Consulting Planners, Inc., Brunswick County GIS, and Bald Head Island.

g. *Natural Resources*

The Village is home to many natural resources including significant natural heritage areas, wetlands, public trust areas, and state-defined protected lands. These areas have been discussed in detail earlier in the CAMA Core Land Use Plan. This discussion begins on page 25 of the Land Use Plan and includes maps showing the locations of all natural resources and areas of environmental concern within the jurisdiction of the Village.

## 8. ANALYSIS OF LAND USE AND DEVELOPMENT

In order to address future development within the Village, it is necessary to establish a snapshot of what is currently developed within the Village's jurisdiction. Conducting a detailed land use survey allows for a review of existing land use patterns. This survey will assist in identifying land use patterns and trends that exist within the Village's planning jurisdiction. This process will serve two main purposes: identifying key conflicts in land use and addressing the issue of future housing demand. This review will provide a solid foundation for decisions regarding future land use and policy development.

A detailed land use survey was conducted for the entire planning jurisdiction of the Village. This survey was completed through the use of aerial photography, county tax data, and on-site windshield surveys. The existing land use map was then submitted to the Village Planning and Inspections Department for review to address any errors. Land use within the Village was broken into the following land use categories: multi-family residential, commercial, office & institutional, recreational, single-family residential, governmental, utility, right-of-way, and undeveloped.

The following provides a summary of what types of facilities are included in each of the land use categories listed above:

**Multi-Family Residential** - all residential structures with two or more attached dwelling units on a single property.

**Commercial** - This land use category includes private business operations located throughout the Village. These include restaurants, the marina, retail shopping facilities, and any commercially operated overnight accommodations (bed & breakfast operations)



**Office & Institutional** - These properties include all professional office-related uses, as well as any institutional uses. Institutional uses include churches, membership organization meeting facilities.

**Recreational** - Recreational land uses on the land use map correspond to all public/private recreational facilities. In the case of the Bald Head Island Golf Course, the entire complex has been shown as recreational. The clubhouse and pro shop facilities, although a commercial establishment, have been classified as recreational, due to the fact that they are a service facility tied to the golf course.

**Single-Family Residential** - This land use category includes all single-family residential dwellings.

**Governmental** - This includes all structures that support government activities. This includes administration buildings, as well as police and fire department facilities.

**Utility** - This land use category is reserved for all properties that have utility system components or other infrastructure components situated on them.

**Right-of-Way** - This land use category includes all land utilized for the Village's road infrastructure network.

**Undeveloped** - All vacant land falls under this category.

The following table provides a breakdown of land use acreage that corresponds to the existing land use map contained in the CAMA Core Land Use Plan. All data regarding land use acreage have been provided for the Village's total jurisdiction.

**Table 8: Village of Bald Head Island  
Existing Land Use\***

Land Use	Acreage	% of Total
Association Owned Properties	115.7	4.8%
Commercial	14.2	0.6%
Government	14.0	0.6%
Multi-Family Residential	15.7	0.6%
Office & Institutional	2.4	0.1%
Right-of-Way	149.3	6.2%
Recreation	134.7	5.5%
Single-Family Residential	240.5	9.9%

Table 8 (continued)

Land Use	Acreage	% of Total
Utilities	21.0	0.9%
Vacant	1,696.6	69.9%
Water	23.2	1.0%
Total	2,427.2	100.0%

\*The existing land use map is intended to show existing uses. The map does not take into account who owns the property, or whether there is public access to a given property.

Source: Holland Consulting Planners, Inc., Brunswick County GIS, and Village of Bald Head Island.

## 9. LAND USE/DEVELOPMENT GOALS AND IMPLEMENTING ACTIONS

### a. Introduction

The purposes of the Coastal Resources Commission (CRC) management topics are to ensure that CAMA Land Use Plans support the goals of CAMA, to define the CRC's expectations for the land use planning process, and to give the CRC a substantive basis for review and certification of CAMA Land Use Plans. Each of the following management topics (Public Access, Land Use Compatibility, Infrastructure Carrying Capacity, Transportation, Natural Hazard Areas, Water Quality, and Local Areas of Concern) include three components: a management goal, a statement of the CRC's planning objective, and requirements for the CAMA Land Use Plan. These policies apply to the entire Village. The local concerns which should be addressed in this plan are identified on page 2. These concerns and issues were utilized to develop the goals and objectives which are included in this plan. Additionally, the survey results obtained through the absentee property owner questionnaires will also be taken into account. Most of the implementing actions are continuing activities. In most situations, specific timelines are not applicable. The policies and implementing actions frequently utilize the following words: should, continue, encourage, enhance, identify, implement, maintain, prevent, promote, protect, provide, strengthen, support, work. The intent of these words is defined in Appendix V of the CAMA Core Land Use Plan. Please note: Policies and Implementing Actions are numbered consecutively throughout this document with the letter "P" denoting a policy and the letter "I" denoting an implementing action.

b. *Impact of CAMA Land Use Plan Policies on Management Topics*

The development of this land use plan has relied in some part on the CAMA-prescribed existing land suitability analysis which is included in Section V(E) of the CAMA Core Land Use Plan. Reliance on this map is based in large part on the intent that this document is supportive of the CAMA regulations for protection of AEC's (15A NCAC 7H). This analysis was performed to identify pockets of land that are particularly poorly suited for development with respect to environmentally sensitive areas.

This plan is intended to support the Village vision statement which was developed under the Community Vision 2010 long range planning process. No negative impacts are anticipated by the implementation of the goals, objectives, and policies which are included in this plan.

Note: It is intended that all policies are, at a minimum, consistent with applicable State and Federal requirements when State and Federal requirements apply. If a policy goes beyond federal requirements, it shall be interpreted as a policy established by the Village of Bald Head Island.

c. *Public Access*

i. Management Goal

The Village will maximize public access to the beaches and the public trust waters bordering its primary corporate limits.

ii. Planning Objective

The Village will develop comprehensive policies that provide beach and public trust water access opportunities for the public along the shoreline and estuarine areas within the planning jurisdiction.

iii. Land Use Plan Requirements

The following are the Village's policies/implementing actions for waterfront access.

### **Policies:**

- P.1 The Village supports the Brunswick County Economic Development Commission and recreational related developments that protect and preserve the natural environment while promoting the Village as a family vacation destination. It supports the private and public development of public waterfront access through private funds and grant monies.
- P.2 The Village supports providing shoreline access for persons with disabilities.
- P.3 The Village supports the frequency of shoreline access as defined by 15A NCAC 7M, Section .0300, Shorefront Access Policies.
- P.4 The Village supports state/federal funding of piers for crabbing and fishing, as well as other facilities to serve the public at beach and estuarine access sites.
- P.5 The Village supports the development of estuarine access areas to ensure adequate shoreline access within all areas of the Village.

### **Implementing Actions:**

- I.1 The Village will prepare a shoreline access and public facilities plan and request Division of Coastal Management funding for the preparation of the plan. **Schedule: Fiscal Years 2007-2009.**
- I.2 The Village will pursue funding under the North Carolina CAMA Shoreline Access funding program (15A NCAC 7M, Section .0300, Shorefront Access Policies). **Schedule: Fiscal Years 2007-2010.**
- I.3 The Village will pursue private sources of funding for the establishment of additional properties to be protected under the Smith Island Land Trust, including donation of land. **Schedule: Continuing Activity.**
- I.4 The Village will cooperate with state and federal agencies as well as private interest to secure estuarine access areas, including Bald Head Creek, to ensure adequate shoreline access within all areas of the Village. **Schedule: Continuing Activity.**

d. *Land Use Compatibility*

i. Management Goal

The Village will ensure that development and use of resources or preservation of land minimize direct and secondary environmental impacts, avoid risks to public health, safety, and welfare, and are consistent with the capability of the land based on considerations of interactions of natural and manmade features.

ii. Planning Objectives

- ▶ The Village will adopt and apply local development policies that balance protection of natural resources and fragile areas with continued growth and development.
- ▶ The Village's policies will provide clear direction to assist local decision making and consistency findings for zoning, divisions of land, and public and private projects.

iii. Land Use Plan Requirements

The following are the Village's policies/implementing actions for land use compatibility:

**Policies - Residential:**

P.6 The Village supports discouraging the re-zoning of existing residentially-developed or zoned areas to a non-residential classification in an effort to maintain the overall residential character of the Village. Such re-zoning and amendments in classifications to the future land use map should be carefully balanced with a demonstrated need for such proposed development that will be the best overall land development policy for the Village.

P.7 The Village supports quality development reflecting the spectrum of housing needs ranging from single-family homes to multi-family and cluster type developments.

- P.8 The Village supports the approval of growth to coincide with the provision of public facilities and services.
- P.9 The Village supports wooded buffers along thoroughfares while allowing for maximum sight line visibility at intersections.
- P.10 The Village supports providing adequate conservation/open space buffers between areas designated for residential development as indicated on the future land use map and any adjacent non-residential land use, including commercial and utility areas.
- P.11 The Village supports the ability of all Property Owners Associations (POA) to establish restrictive covenants throughout its planning jurisdiction. Proposals for development or redevelopment should not only comply with Village land development policies and ordinances, but should also abide by all restrictions established under a given properties respective POA restrictive covenants.

#### **Implementing Actions - Residential:**

- I.5 All re-zoning and subdivision approvals will consider the future land use and land suitability maps and analyses which are included in this plan. ***Schedule: Continuing Activity.***
- I.6 The Village will permit residential development to occur in response to market needs provided that the following criteria are met:
- (1) Current codes and ordinances in conjunction with NCDCM oversight will ensure that due respect is offered to all aspects of the environment.
  - (2) If deficient community facilities and services are identified, the Village shall attempt to improve such to the point of adequately meeting demands.
  - (3) Additional residential development shall concurrently involve planning for improvements to community facilities and services if excess capacity does not exist within those facilities and services.
  - (4) Residential development is consistent with other Village policies and the Future Land Use Map as contained in the CAMA Core Land Use Plan.

This implementing action will be enforced through the Village zoning and subdivision ordinances. **Schedule: Continuing Activity.**

- I.7 The Village will consider revisions to the zoning ordinance for non-residential sites to ensure adequate buffering and landscaping to separate residential and incompatible non-residential uses, and adequate regulation of off-site lighting, hours of operation, and vehicular access and parking locations. **Schedule: Fiscal Years 2007-2009.**
- I.8 The Village will regulate through its zoning and subdivision ordinance the development of conflicting land uses in areas where non-residential development is permitted. The Village will aim to minimize these impacts through promoting mixed use development. **Schedule: Continuing Activity.**

**Policies - Commercial:**

- P.12 The Village supports commercial development consistent with the Village's future land use map and current zoning ordinance.
- P.13 The Village opposes the establishment of any industrial operations within its planning jurisdiction.
- P.14 The Village opposes additional private or public solid waste collection sites within the Village's planning jurisdiction.

**Implementing Actions - Commercial:**

- I.9 The Village will enforce its zoning regulations and rely on state permitting agencies to ensure that all commercial development within or adjacent to Areas of Environmental Concern is carried out properly. **Schedule: Continuing Activity.**
- I.10 The Village will review its zoning and subdivision ordinances to ensure compliance with policies P.13-P.16. **Schedule: Fiscal Years 2008-2009.**

### **Policies - Conservation:**

- P.15 Except as otherwise permitted in this plan, residential, commercial, and office/institutional development should not be supported in natural heritage areas, conservation areas, or coastal wetlands. Residential and commercial development which meets 15A NCAC 7H use standards will be allowed in estuarine shoreline, estuarine water, and public trust areas. In all other areas, development will be allowed that is consistent with applicable local, state, and federal regulations.
- P.16 The Village will support larger lots in conservation classified areas as designated on the future land use map through enforcement of the Village subdivision and zoning ordinances in zoned areas.
- P.17 The Village aims to maintain its character as an eco-friendly residential community. Commercial development should be permitted only in areas outlined on the future land use map.
- P.18 It is the policy of the Village to encourage the construction of dune walkover platforms at all private beach access points. If individual walkovers are not established, then property owners will be required to utilize municipal dune crossings for beach access.
- P.19 The Village recognizes that major updates and revisions need to be made to the current landscaping ordinance to address tree trimming and removal procedures.

### **Implementing Actions - Conservation:**

- I.11 The Village will continue to promote the Smith Island Land Trust program in an effort to preserve additional portions of the Island as conservation/open space. ***Schedule: Continuing Activity.***
- I.12 The Village will review its zoning and subdivision ordinances to ensure compliance with policies P.17-P.19. ***Schedule: Fiscal Years 2008-2009.***



### **Policies - Stormwater Control:**

- P.20 The Village supports reducing soil erosion, runoff, and sedimentation to minimize the adverse effects on surface and subsurface water quality.
- P.21 The Village supports the enforcement of all controls and regulations, specifically design standards, tie-down requirements, construction and installation standards, elevation requirements, flood-proofing, CAMA regulations, and FEMA regulations, and locally adopted Hazard Mitigation Plan, deemed necessary by the Village Council to mitigate the risks to lives and property caused by severe storms and hurricanes.
- P.22 The Village supports the Brunswick County National Pollutant Discharge Elimination System (NPDES) Phase II stormwater management program, due to its role in reducing the impact of stormwater runoff to waterbodies throughout the county.

### **Implementing Actions - Stormwater Control:**

- I.13 The Village will consider adopting and enforcing a soil erosion and sediment control ordinance. ***Schedule: Fiscal Years 2008-2010.***
- I.14 The Village will review its stormwater control ordinance and include updates regarding regulations for water detention and/or retention facilities in new developments as new state and federal policy requires. ***Schedule: Fiscal Years 2007-2008.***
- I.15 The Village supports ongoing planning and capital improvement efforts to address the drainage problem associated with flooding from tropical storm events. ***Schedule: Fiscal Years 2007-2009***
- I.16 The Village will seek grant funding from state and federal agencies for assistance in funding capital improvement projects that will aid the Village in alleviating flooding and storm drainage problems which exist throughout the Village. ***Schedule: Fiscal Years 2007-2009.***

e. *Infrastructure Carrying Capacity*

i. Management Goal

The Village will ensure that public infrastructure systems are appropriately sized, located, and managed so the quality and productivity of AECs and other fragile areas are protected or restored. It is acknowledged that to achieve the infrastructure carrying capacity goals, policies, and implementing actions, some utility lines may have to extend through some environmentally sensitive areas.

ii. Planning Objective

The Village will establish level of service policies and criteria for infrastructure consistent with the projections of future land needs.

iii. Land Use Plan Requirements

The following are the Village's policies for infrastructure carrying capacity.

**Policies:**

- P.23 The Village supports providing adequate community services and facilities which meet the needs of the Village's citizens and businesses.
- P.24 The Village supports providing sufficient water and sewer service to promote continued growth and to alleviate public health problems created by the absence of public water and sewer services in the Village. Extensions of central sewer service will be provided as required.
- P.25 The Village supports the extension of water services from existing systems and encourages the use of central systems for new developments whether residential, commercial, or office/institutional in nature. It also supports the continued public provision of solid waste disposal, law enforcement, and educational services to all citizens of the Village.

- P.26 The Village supports the ongoing maintenance and use of properly permitted septic tank systems and the enforcement of District Health Department regulations and local development regulations regarding lot sizes and waste disposal system placement until FY2027, whereby all existing systems must be connected to the Village's Central Sewer System.
- P.27 The Village supports the provision of public recreational facilities and areas and will pursue grant funds and private donations for public open space and recreation facilities.

**Implementing Actions:**

- I.17 The Village will rely on its existing land use and development ordinances to regulate development and may amend or modify regulations to encourage or require the provision of central water service to lots or parcels proposed in new developments. This change will reflect the current policy of the Village of Bald Head Island Utilities. ***Schedule: Fiscal Years 2007-2008.***
- I.18 The Village will consult the future land use map when considering new public facilities and private development. ***Schedule: Continuing Activity.***
- I.19 The Village will rely on the NC Division of Water Quality and the Brunswick County Department of Environmental Health to oversee the proper operation, management, and maintenance of all wastewater treatment facilities within portions of the Village where sewer is not available. ***Schedule: Continuing Activity.***
- I.20 The Village will consider adopting an operating and capital financing plan for the development of water and sewer system extensions and upgrades in preparation for future demand. ***Schedule: Fiscal Years 2006-2008.***
- I.21 The Village will provide sufficient emergency management personnel and facilities to adequately serve the projected peak seasonal population growth. ***Schedule: Annually.***

- I.22 The Village will coordinate the development of any Village facility with all applicable property owners' associations in order to maximize the potential quality, access, and use of these facilities. Additionally, the Village will consider taking over jurisdiction and maintenance of POA facilities, if requested, assuming that these facilities comply with Village standards and requirements. ***Schedule: Continuing Activity.***

*f. Transportation*

i. Management Goal

The Village will achieve a safe, efficient, reliable, environmentally-sound, and economically feasible road system within the Village.

ii. Planning Objective

The Village will provide a safe and efficient road system throughout the Village's planning jurisdiction.

iii. Land Use Plan Requirements

**Policies:**

- P.28 The Village supports interconnected street systems for residential and non-residential development.
- P.29 The Village supports limited access from development along all roadways to provide safe ingress and egress.
- P.30 The Village supports maintaining an effective signage and addressing system for all right-of-ways including private drives and access streets.
- P.31 The Village supports state and federal funding for maintenance/dredging of the Intracoastal Waterway including the ferry channel which is utilized as the primary transportation route to and from the mainland.

- P.32 The Village will maintain strict enforcement of its regulations against gas powered engines. Gas powered engines should be limited to emergency management/police vehicles, as well as all required contractor traffic including solid waste removal vehicles.
- P.33 The Village supports the developer's careful monitoring of the ferry basin to ensure safe travel into and out of the basin. This will serve to maintain safe, consistent, and efficient travel to and from the mainland.
- P.34 The Village will aim to ensure the safe operation of watercraft within waters immediately adjacent to its jurisdiction. Specifically, the Village will enforce its regulations regarding watercraft in Bald Head Creek. This policy specifies that there shall be no boat with a horsepower rating greater than 25 or greater than 16 feet in length stored or launched from the Village's boat access.

**Implementing Actions:**

- I.23 The Village will continue to consider the dedication of all street right-of-ways for Village maintenance. Dedication of all existing and proposed streets will be determined on a case-by-case basis, and will be determined based on whether the respective street right-of-way meets the design specifications of the Village. ***Schedule: Continuing Activity.***
- I.24 The Village will periodically review its ordinances regarding the restriction of gas powered engines as growth continues, in an effort to minimize the impacts of noise and water pollution throughout the Village's planning jurisdiction. ***Schedule: Annually.***
- I.25 The Village will establish a no wake zone at the mouth of Bald Head Creek. This will be implemented through the installation of buoys and signage specifying where this zone will begin. This rule will be primarily enforced by NC Marine Fish and Wildlife, as well as the Brunswick County Sheriff's Department. ***Schedule: Fiscal Years 2007-2008.***

- I.26 The Village will consider options for establishing a public Inter-Island Transportation System. This system will focus on alleviating traffic from areas of the Village where traffic flow has historically been a problem. **Schedule: Ongoing.**

g. *Natural Hazard Areas*

i. Management Goal

The Village will conserve and maintain shorelines, floodplains, major dune ridges, and other coastal features for their natural storm protection functions and their natural resources giving recognition to public health, safety, and welfare issues.

ii. Planning Objective

The Village will develop policies that minimize threats to life, property, and natural resources resulting from development located in or adjacent to hazard areas, such as those subject to erosion, high winds, storm surge, flooding, or sea level rise.

iii. Land Use Plan Requirements

The following are the Village's policies/implementing actions for natural hazard areas.

**Policies:**

- P.35 The Village supports the installation of properly engineered and permitted bulkheads.
- P.36 The Village supports the US Army Corps of Engineers' regulations and the applicable guidelines of the Coastal Area Management Act and the use of local land use ordinances to regulate development within or immediately adjacent to freshwater swamps, marshes, and 404 wetlands.
- P.37 The Village supports relocation of structures endangered by erosion, if the relocated structure will be in compliance with all applicable policies and regulations.

- P.38 The Village recognizes the uncertainties associated with sea level rise. The rate of rise is difficult to predict. Thus, it is difficult to establish policies to deal with the effects of sea level rise. The Village supports cooperation with local, state, and federal efforts to inform the public of the anticipated effects of sea level rise.
- P.39 The Village supports the land use densities that are specified on page 140 (Future Land Use) of the CAMA Core Land Use Plan. Through enforcement of the zoning ordinance, these densities will minimize damage from natural hazards and support the hazard mitigation plan.
- P.40 The Village continues to believe the US Army Corps of Engineers is responsible for the damages to South and West Beach and the Village infrastructure resulting from the sloughing and shoaling of the South Beach Shoreline into the federal navigation channel caused by the deepening of the channel pursuant to the Wilmington Harbor Deepening Project, NC-96 Act ("The Deepening Project"). The Village supports the remediation provided by the Sand Management Plan, as interpreted by Colonel James W. DeLony's letter of June 9, 2000, that was incorporated into the Environmental Assessment to obtain a Finding of No Significant Impact for the Deepening Project and a Consistency Determination from the NC Division of Coastal Management for the Deepening Project. The Village also relies upon the Settlement Agreement entered into between the Village and the US Army Corps of Engineers dated March 24, 2005, and the requirements for communication and cooperation required therein. The Village opposes any further deepening of the federal navigation channel and believes the Corps needs to explore additional measures to protect South and West Beach from the effects of the 2000-2001 Deepening Project.
- P.41 The Village recognizes the significance of protecting the primary dune line along oceanfront portions of the Village, as well as the inter-Island dune ridge system. The Village supports continued efforts to protect these dunes through a proactive dune stabilization and protection program.
- P.42 The Village will continue to enforce its requirement for a landscape permit in an effort to protect all existing dunes, berms, vegetative cover, and tree species. Furthermore, it is imperative that the inner island dune ridge system, which traverses east to west across the island, be preserved.

### **Implementing Actions:**

- I.27 The Village supports hazard mitigation planning. The Village's Hazard Mitigation Plan may be viewed at the Village Hall during normal office hours. The Land Use Plan and the Hazard Mitigation Plan should be consistent with one another. Should there be conflicting policies, the Land Use Plan takes precedence. **Schedule: Continuing Activity.**
- I.28 The Village will continue to enforce its Floodplain Ordinance and participate in the National Flood Insurance Program. It will rely on the North Carolina Department of Environment and Natural Resources, Division of Coastal Management to monitor and regulate development in areas up to five feet above mean high water susceptible to sea level rise and wetland loss. Subdivision regulations will be enforced – requiring elevation monuments to be set so that floodplain elevations can be more easily determined. **Schedule: Reviewed Annually.**
- I.29 The Village will monitor development proposals for compliance with Section 404 of the Clean Water Act and will continue to enforce local land use ordinances to regulate development within or adjacent to freshwater swamps, marshes, and 404 wetlands. **Schedule: Continuing Activity.**
- I.30 In the event of a natural disaster, the Village permits redevelopment of previously developed areas, provided all applicable policies, regulations, and ordinances are complied with. Redevelopment, including infrastructure, should be designed to withstand natural hazards. **Schedule: Continuing Activity.**
- I.31 The Village will enforce the density controls in the zoning ordinance and subdivision ordinance in potential redevelopment areas to control growth intensity. **Schedule: Continuing Activity.**
- I.32 In response to possible sea level rise, the Village will review all local building and land use related ordinances and consider establishing setback standards, density controls, bulkhead restrictions, buffer vegetation protection requirements, and building designs which will facilitate the movement of structures in the event that sea level rise poses a threat to existing development. **Schedule: Fiscal Years 2009-2010.**



I.33 The Village will utilize the future land use maps to control development. These maps are coordinated with the land suitability map and existing infrastructure maps. ***Schedule: Annually.***

I.34 The Village will vigorously enforce its rights to protect its beaches and infrastructure under the Sand Management Plan, Colonel DeLony's June 9, 2000 letter, the Consistency Determination of the Division of Coastal Management, and the March 24, 2005 Settlement Agreement. ***Schedule: Fiscal Years 2007-2010.***

I.35 The Village will continue its dune stabilization efforts by continuing to install rope and pole fence enclosures around the primary dune line along oceanfront portions of the Village. This effort will also involve the planting of sea oats and Bitter Panicum to increase the stability of the dune line. ***Schedule: Continuing Activity.***

h. *Water Quality*

i. Management Goal

The Village will maintain, protect, and where possible, enhance water quality in all coastal wetlands, rivers, streams, and estuaries. This should include a means of addressing the complex problems of planning for increased development and economic growth while protecting and/or restoring the quality and intended uses of the basin's surface waters.

ii. Planning Objective

The Village will adopt policies for surface waters within the Village to help ensure that water quality is maintained if not impaired and improved if impaired.

iii. Land Use Plan Requirements

The following provides the Village's policies/implementing actions on water quality.

**Policies:**

P.43 The Village supports the guidelines of the Coastal Area Management Act and the efforts and programs of the North Carolina Department of Environment and

Natural Resources, Division of Coastal Management and the Coastal Resources Commission to protect the coastal wetlands, estuarine waters, estuarine shorelines, and public trust waters of the Village.

- P.44 The Village supports conserving its surficial groundwater resources.
- P.45 The Village supports commercial and recreational fishing in its waters and will cooperate with other local governments and state and federal agencies to control pollution of these waters to improve conditions so that commercial and recreational fisheries will not be depleted. It also supports the preservation of nursery and habitat areas.
- P.46 The Village opposes the disposal of any toxic wastes, as defined by the US Environmental Protection Agency's Listing of Hazardous Substances and Priority Pollutants (developed pursuant to the Clean Water Act of 1977), within its planning jurisdiction.
- P.47 The Village recognizes the value of water quality maintenance to the protection of fragile areas and to the provision of clean water for recreational purposes and supports the control of stormwater runoff to aid in the preservation of water quality. The Village will support existing state regulations relating to stormwater runoff resulting from development (Stormwater Disposal Policy 15 NCAC 2H.001-.1003). Additionally, the Village supports all efforts of the Brunswick County NPDES Phase II stormwater management program.
- P.48 The Village supports regulation of underground storage tanks within the marina area for storing fuel in order to protect its groundwater resources. The Village will continue to rely on the NCDENR UST Division to regulate this policy.
- P.49 The Village supports the policy that all State of North Carolina projects should be designed to limit to the extent possible stormwater runoff into coastal waters.
- P.50 The Village supports implementation of the Cape Fear River Basin Water Quality Management Plan.

- P.51 The Village supports protection of those waters known to be of the highest quality or supporting biological communities of special importance.
- P.52 The Village supports management of problem pollutants, particularly biological oxygen demand and nutrients, in order to correct existing water quality problems and to ensure protection of those waters currently supporting their uses. This effort should focus on residential development adjacent to Bald Head Creek.
- P.53 The Village opposes the installation of package treatment plants and septic tanks or discharge of waste in any areas classified as coastal wetlands, freshwater wetlands (404), or natural heritage areas. This policy does not apply to constructed wetlands.
- P.54 The Village supports the following actions by the General Assembly and the Governor:
- Sufficient state funding should be appropriated to initiate a program of incentives grants to address pollution of our rivers from both point sources and nonpoint sources.
  - An ongoing source of state funding should be developed to provide continuous support for an incentives grant program.
  - The decision-making process for the award of incentives grants should involve river basin organizations representing local governments and other interest groups in the review of all applications for state funding.
  - The ongoing effort of the Department of Environment and Natural Resources to develop administrative rules implementing the Cape Fear River Basin Management Strategy should continue to involve local government officials in the development, review, and refinement of the proposal.
- P.55 The Village does not support the location of floating homes within its jurisdiction.

P.56 The Village supports the following goals of the NC Coastal Habitat Protection Program (CHPP):

- Document the ecological role and function of aquatic habitats for coastal fisheries.
- Provide status and trends information on the quality and quantity of coastal fish habitat.
- Describe and document threats to coastal fish habitat, including threats from both human activities and natural events.
- Describe the current rules concerning each habitat.
- Identify management needs.
- Develop options for management action using the above information.

P.57 The Village supports the efforts of the Bald Head Island Conservancy to monitor, and research methodologies to improve water quality throughout the Village's planning jurisdiction.

P.58 The Village of Bald Head Island will comply with all Phase II Stormwater Requirements, if the Village becomes a named community under the program by the NC Environmental Management Commission.

#### **Implementing Actions:**

I.36 The Village will comply with CAMA and NC Division of Water Quality stormwater runoff regulations. This will include implementation of an NPDES Phase II program when the Village becomes a named community. **Schedule: Fiscal Years 2007-2009.**

I.37 The Village will enforce its zoning and subdivision regulations to aid in protecting sensitive shoreline areas. It will rely on state and federal agencies to promote and protect the Cape Fear River, as well as other nursery and habitat areas adjacent to the Village. **Schedule: Continuing Activity.**

I.38 The Village will rely on the technical requirements and state program approval for underground storage tanks (40 CFR, Parts 280 and 281), and any subsequent state

regulations concerning underground storage tanks adopted during the planning period. **Schedule: Continuing Activity.**

- I.39 The Village will continuously enforce, through the development and zoning permit process, all current regulations of the NC State Building Code and North Carolina Division of Health Services relating to building construction and septic tank installation/replacement in areas with soils restrictions. **Schedule: Continuing Activity.**
- I.40 The Village will implement the following actions through local ordinances to improve water quality (Note: these actions are especially significant in areas adjacent to Bald Head Creek):
- Use watershed-based land use planning
  - Minimize impervious cover in site design
  - Limit erosion during construction
  - Maintain coastal growth measures
  - Restoration of impaired waters
  - Reduction of nutrients in the Village waters. **Schedule: Review local ordinances annually.**
- I.41 Preservation of wetlands is important to the protection/improvement of water quality in the Village. The following will be implemented:
- Coordinate all development review with the appropriate office of the US Army Corps of Engineers and the Soil Conservation Service. **Schedule: Continuing Activity.**
  - Require that wetland areas be surveyed and delineated on all preliminary and final subdivision plats. **Schedule: Fiscal Years 2007-2008.**
- I.42 In responding to the requirements of the Phase II program, the Village will outline and implement a five-year stormwater management program aimed at reducing pollutants into receiving waterbodies. This program will focus on improving water quality in order to maintain adjacent waterbodies for the purposes of recreation

and shellfishing. Specifically, this program will address the following minimum control measures (MCMs) in relation to stormwater management:

- Public Education and Outreach
- Public Participation
- Illicit Discharge Detection and Elimination
- Construction Site Runoff
- Post Construction Runoff Control
- Municipal Operations

***Schedule: Fiscal Year 2007-2008.***

i. *Local Areas of Concern*

i. Management Goal

The Village will integrate local concerns with the overall goals of CAMA in the context of land use planning.

ii. Planning Objective

The Village will identify and address local concerns and issues, such as cultural and historic areas, scenic areas, economic development, or general health and human services needs.

iii. Land Use Plan Requirements

The following provides the Village's policies/implementing actions on local areas of concern. All policies are continuing activities.

**Policies - Cultural, Historic, and Scenic Areas:**

- P.59 The Village supports local, state, and federal efforts to protect historic properties within its borders and to perpetuate its cultural heritage. This specifically refers to the following recognized historic properties within the Village: Bald Head Creek Boathouse, Bald Head Island Lighthouse, Fort Holmes.

### **Implementing Actions - Cultural, Historic, and Scenic Areas:**

- I.43 The Village will guide development so as to protect historic and potentially historic properties in the Village and to perpetuate the Village's cultural heritage. ***Schedule: Continuing Activity.***
- I.44 The Village will coordinate all Village public works projects with the NC Division of Archives and History, to ensure the identification and preservation of significant archaeological sites. ***Schedule: Continuing Activity.***

### **Policies - Economic Development:**

- P.60 Visitors are important to the Village and will be supported by the Village.
- P.61 The Village will encourage both residential and mixed use (commercial/residential/office & institutional) development while aiming to protect the Village's resources and preserve its environmentally friendly atmosphere. Support for commercial development is limited to those areas specified on the future land use map.
- P.62 The Village will encourage moderate mixed use development in areas with existing infrastructure that does not infringe on existing medium density residential areas.
- P.63 The Village supports the extension of water services from existing systems and encourages the use of central systems for new developments.

### **Implementing Actions - Economic Development:**

- I.45 The Village will continue to support the activities of the Brunswick County Economic Development Commission. ***Schedule: Annual Membership.***
- I.46 The Village will support projects that will increase public access to shoreline areas. ***Schedule: Continuing Activity.***

**Policies - General Health and Human Services Needs:**

- P.64 The Village supports the continued public provision of solid waste disposal, law enforcement, and educational services to all citizens of the Village.
- P.65 In an effort to improve health conditions, the Village supports the following water and sewer policies:
- The Village supports the extension of central water service into all areas of the Village shown on the land suitability analysis map as suitable for development, including the construction of lines to and through conservation areas to serve development which meets all applicable state and federal regulations.
  - The Village is aware that inappropriate land uses near well fields increase the possibility of well contamination. Land uses near groundwater sources are regulated by the North Carolina Division of Water Quality, Public Water Supply Section through NCAC Subchapter 2L and Subchapter 2C. The Village recognizes the importance of protecting potable water supplies, and therefore supports the enforcement of these regulations.
  - The Village supports all efforts to secure available state and federal funding for the construction and/or expansion of public and private water/sewer systems.
  - The Village supports the construction of water systems with adequate line sizes to ensure adequate water pressure and fire protection.
  - The Village will continue to ensure provision of water services to Village residents and will continue the process of studying the role of Village government in providing sewage treatment facilities for rapidly growing areas of the Village, including the construction of lines to and through conservation areas to serve development which meets all applicable state and federal regulations. The Village will secure federal and state grants, when feasible, to help carry out this policy.

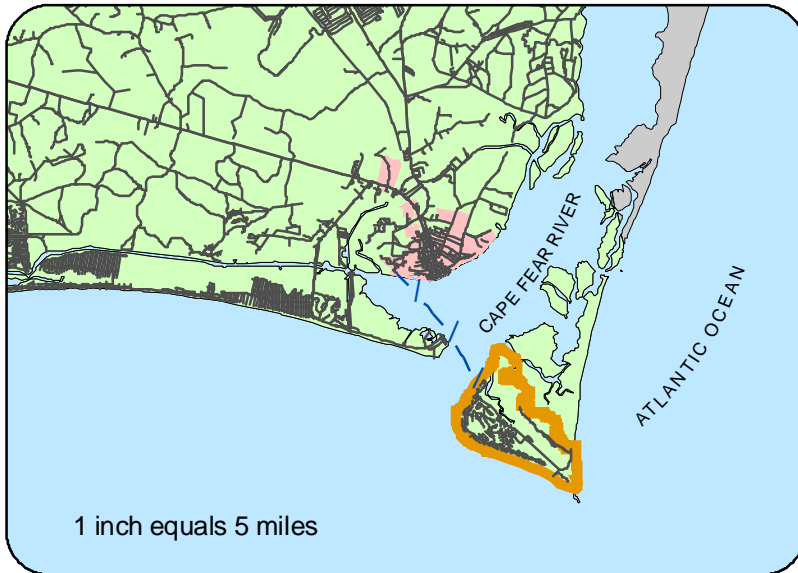
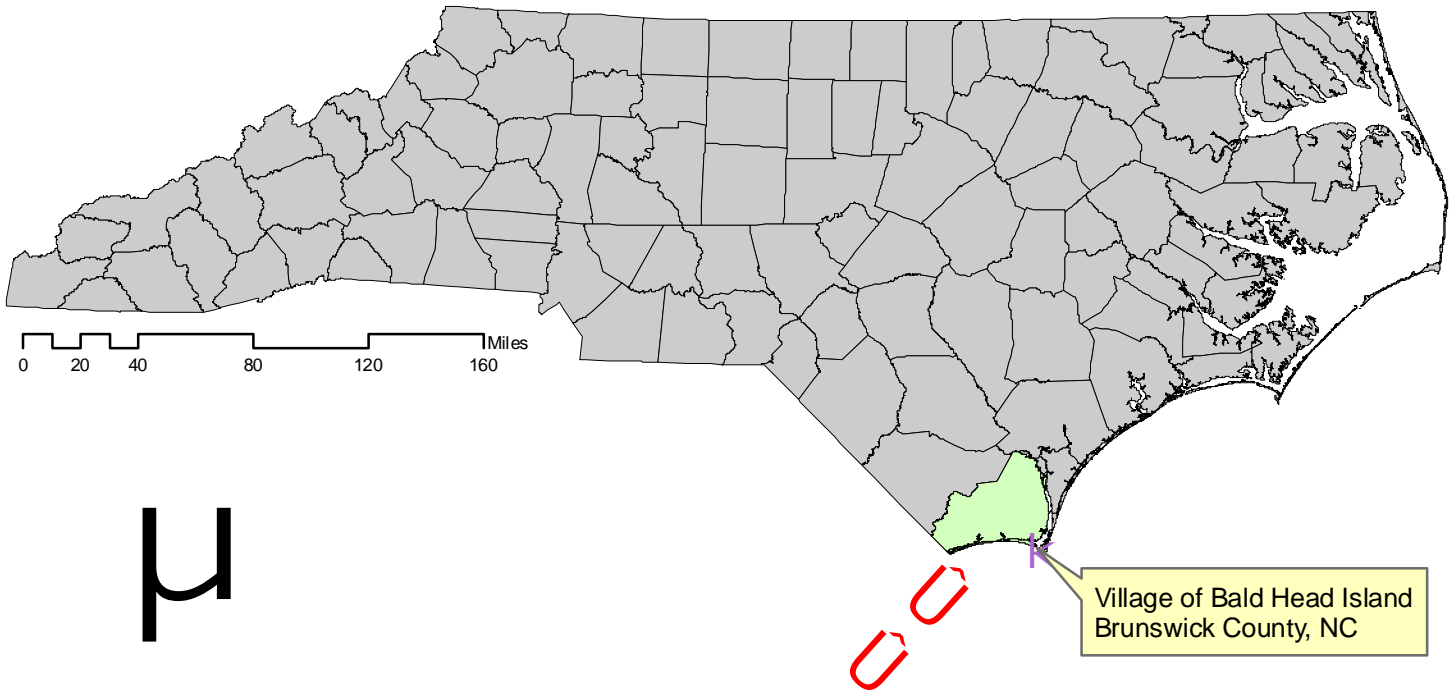


### **Implementing Actions - General Health and Human Services Needs:**

- I.47 Floodplain regulation is a concern in the Village. To accomplish protection of public health and service needs, The Village will:
- Continue to enforce the flood hazard reduction provisions of the Village Land Development Ordinances. **Schedule: Continuing Activity.**
  - Prohibit the installation of underground storage tanks in the 100-year floodplain. **Schedule: Continuing Activity.**
  - Zone for open space, recreational, residential (at densities outlined under future land use), or other low-intensity uses within the floodplain. **Schedule: Continuing Activity.**
- I.48 To effectively manage the Village's investment in existing and proposed community facilities and services, the Village will develop a specific capital improvements plan (CIP) with emphasis placed on services and facilities which affect growth and development. **Schedule: Fiscal Years 2007-2009.**
- I.49 The Village will provide sufficient emergency services to all residents. The Village will implement the following:
- Require that all necessary infrastructure firefighting capability/capacity be provided in new subdivisions and developments. **Schedule: Review Annually.**
  - Continue to maintain an effective signage and addressing system for all streets, roads, and highways. **Schedule: Continuing Activity.**
- I.50 The Village will manage the deer population within the Village in consultation with NC Wildlife and Fisheries and the BHI Conservancy. **Schedule: Annually.**

### **Implementing Actions - Funding Options:**

- I.51 The Village will continue to support state and federal programs that are deemed necessary, cost-effective, and within the administrative and fiscal capabilities of the Village. ***Schedule: Continuing Activity.*** These include:
- Community Development Block Grant Program
  - Area Agency on Aging
  - Emergency Medical Services
  - Coastal Area Management Act, including shoreline access funds
  - Small Business Association
  - Economic Development Administration Funds
  - Federal Emergency Management Program
  - MEDICAID
  - Crisis Intervention
- I.52 The Village will selectively support state and federal programs related to the Village. The Village, through its boards and committees, will monitor state and federal programs and regulations. It will use opportunities as they are presented to voice support for or to disagree with programs and regulations that are proposed by state and federal agencies. ***Schedule: Continuing Activity.***
- I.53 The Village officials will continue to work with the Army Corps of Engineers and any other state and federal agencies to ensure continued dredging and maintenance of channels and rivers as needed to keep these facilities open to navigation. These efforts shall comply with applicable state and federal regulations. Providing borrow or spoil areas and provision of easements for work will be determined on case-by-case basis. The Village encourages spoil material being placed on those areas where beach renourishment efforts are necessary. Channel maintenance has major economic significance and is worthy of state and federal funding. ***Schedule: Program Reviewed Annually.***



### Legend

- NC County Boundary
- Brunswick County
- Village Corporate Limits
- Southport Corporate Limits
- Bald Head Island Ferry Route
- NC DOT Roads

Source: North Carolina Center for Geographic Information,  
Brunswick County GIS, Holland Consulting Planners

**HCP**  
Holland Consulting Planners, Inc.

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.



MAP 1

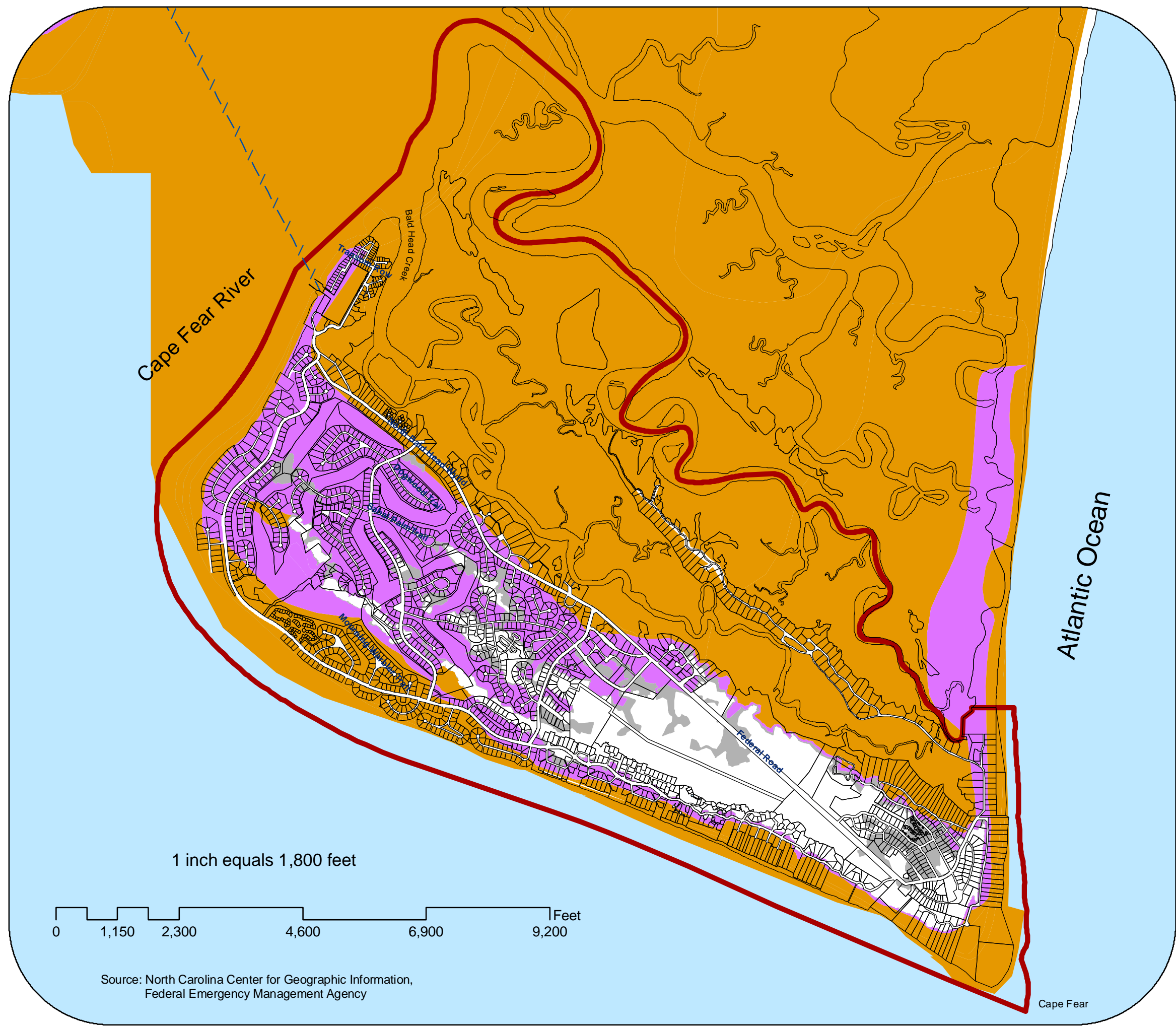
## Village of Bald Head Island

### Regional Location

# Village of Bald Head Island

## Land Use Plan

### Flood Hazard



**Legend**

- Village of Bald Head Island Corporate Limits
- Bald Head Island Ferry Route
- Hydrology

**Flood Zones**

- Not in Flood Hazard Area
- AE
- SHADED X
- VE

•  
•

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.



Source: North Carolina Center for Geographic Information,  
Federal Emergency Management Agency









# Village of Bald Head Island

## Land Use Plan

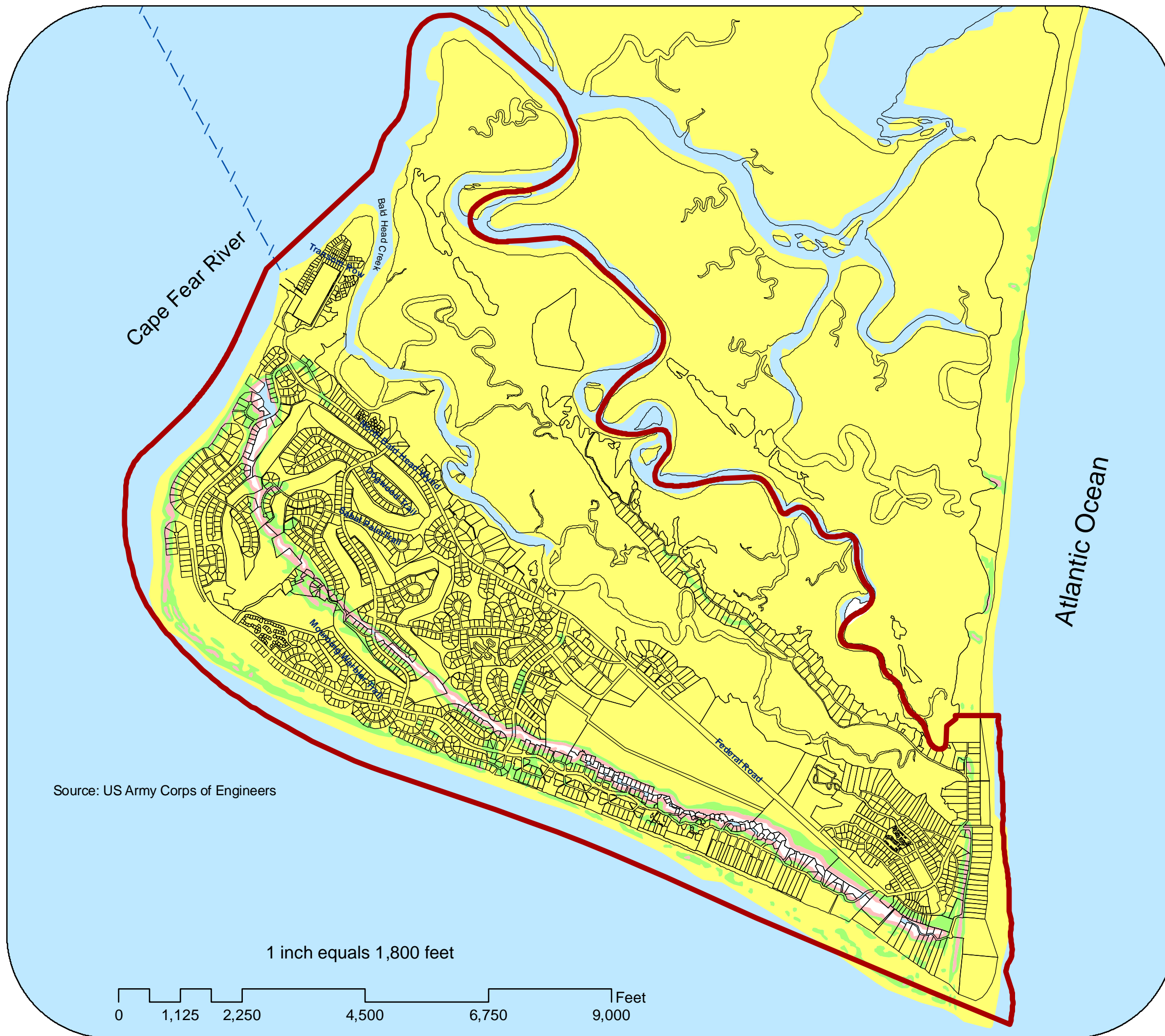
### SLOSH MODEL Storm Surge - Fast Moving Hurricane

#### Legend

-  Village of Bald Head Island Corporate Limits
-  Bald Head Island Ferry Route
-  Hydrology
- SLOSH-Fast Moving Hurricane**
  -  Category 1 and 2
  -  Category 3
  -  Category 4 and 5

•  
•

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.



Source: US Army Corps of Engineers







1 inch equals 1,800 feet

0 1,125 2,250 4,500 6,750 9,000 Feet

# Village of Bald Head Island Land Use Plan

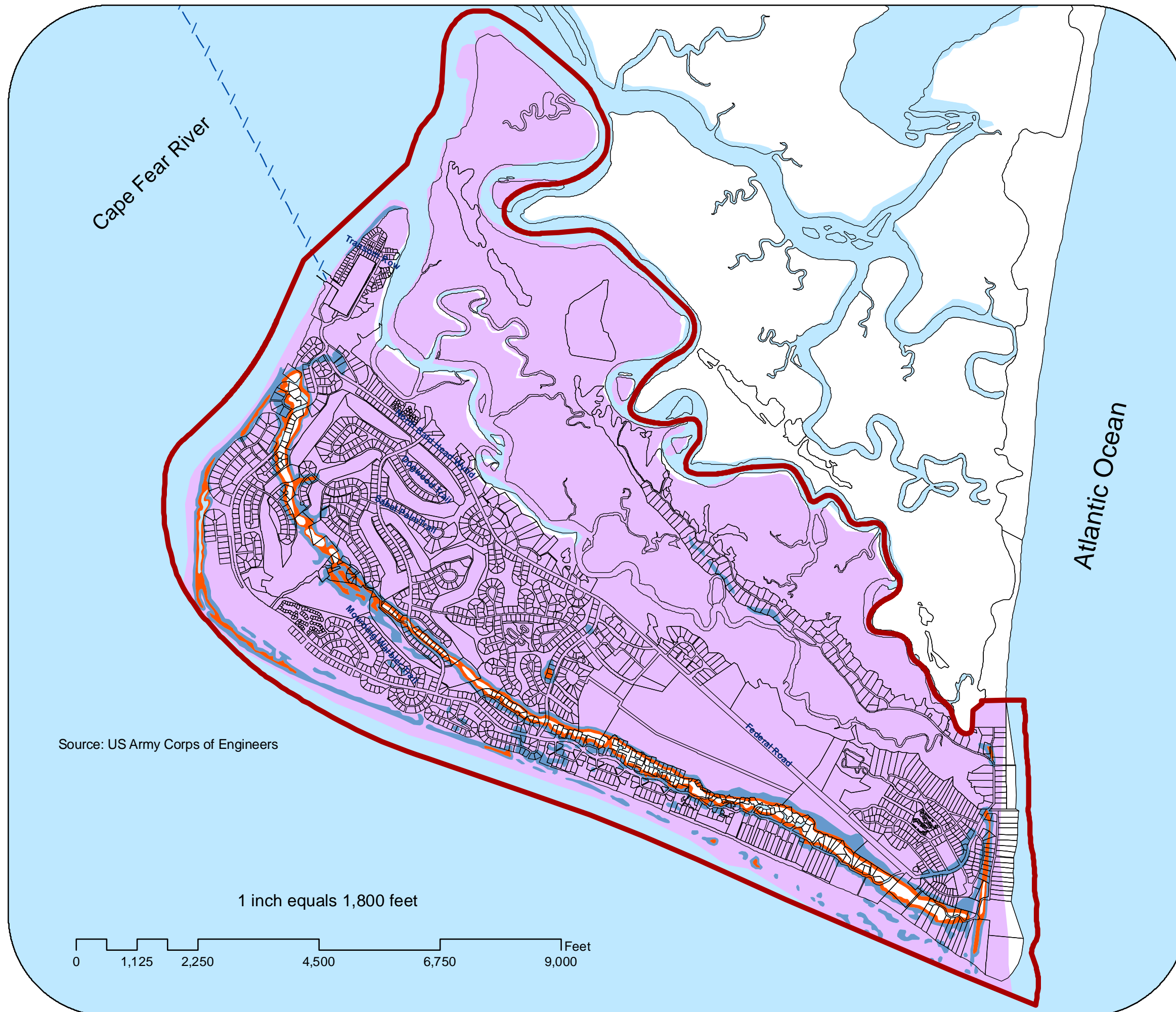
## SLOSH MODEL Storm Surge - Slow Moving Hurricane

### Legend

-  Village of Bald Head Island Corporate Limits
-  Bald Head Island Ferry Route
-  Hydrology
- SLOSH-Slow Moving Hurricane**
  -  Category 1 and 2
  -  Category 3
  -  Category 4 and 5

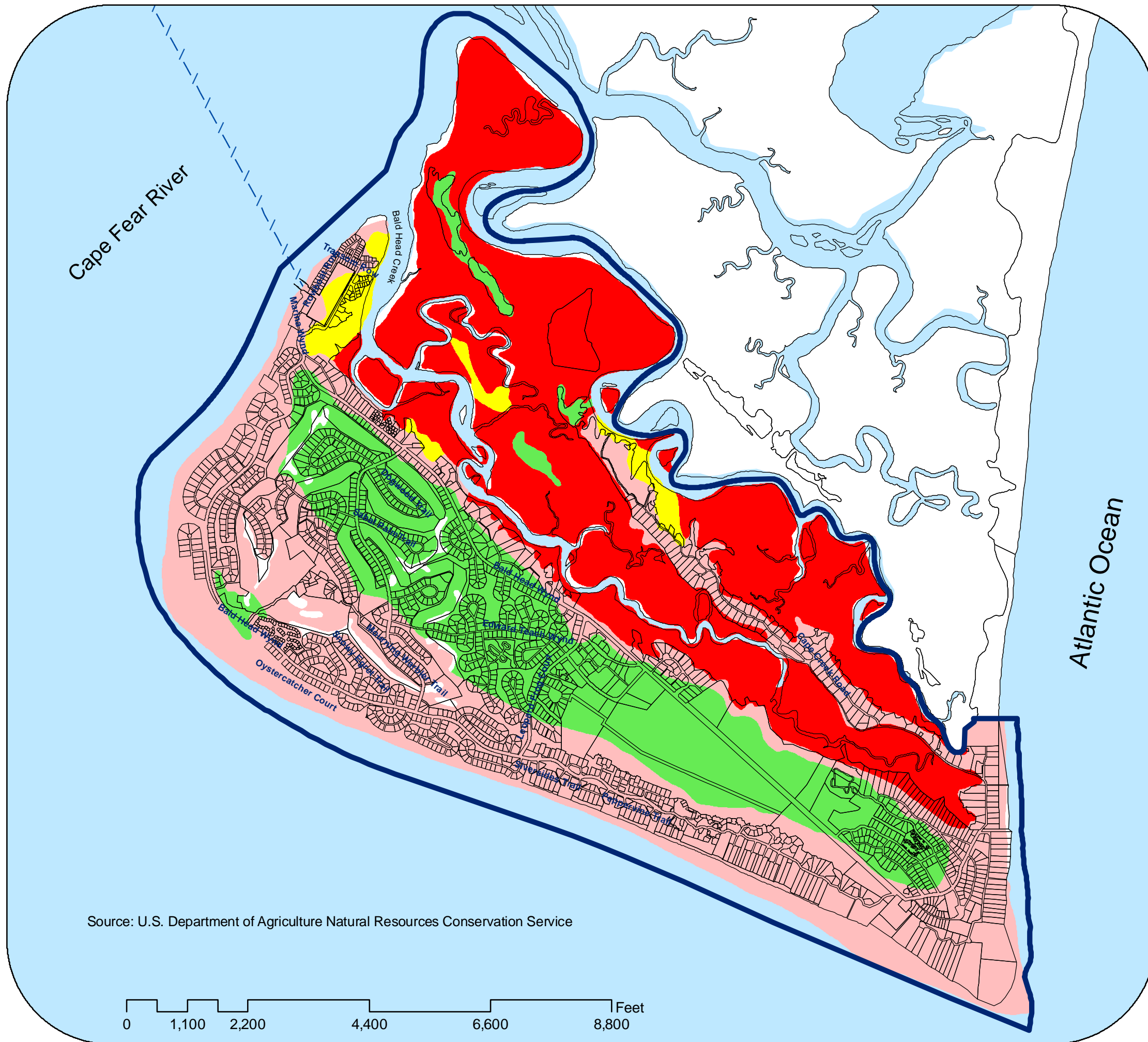
- 
- 

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.





# Village of Bald Head Island Land Use Plan Soil Classification



## Legend

Village of Bald Head Island Corporate Limits

Bald Head Island Ferry Route

Hydrology

## Soil Classification

BO-Bohicket silty clay loam

Co-Corolla fine sand

Du-Duckston fine sand

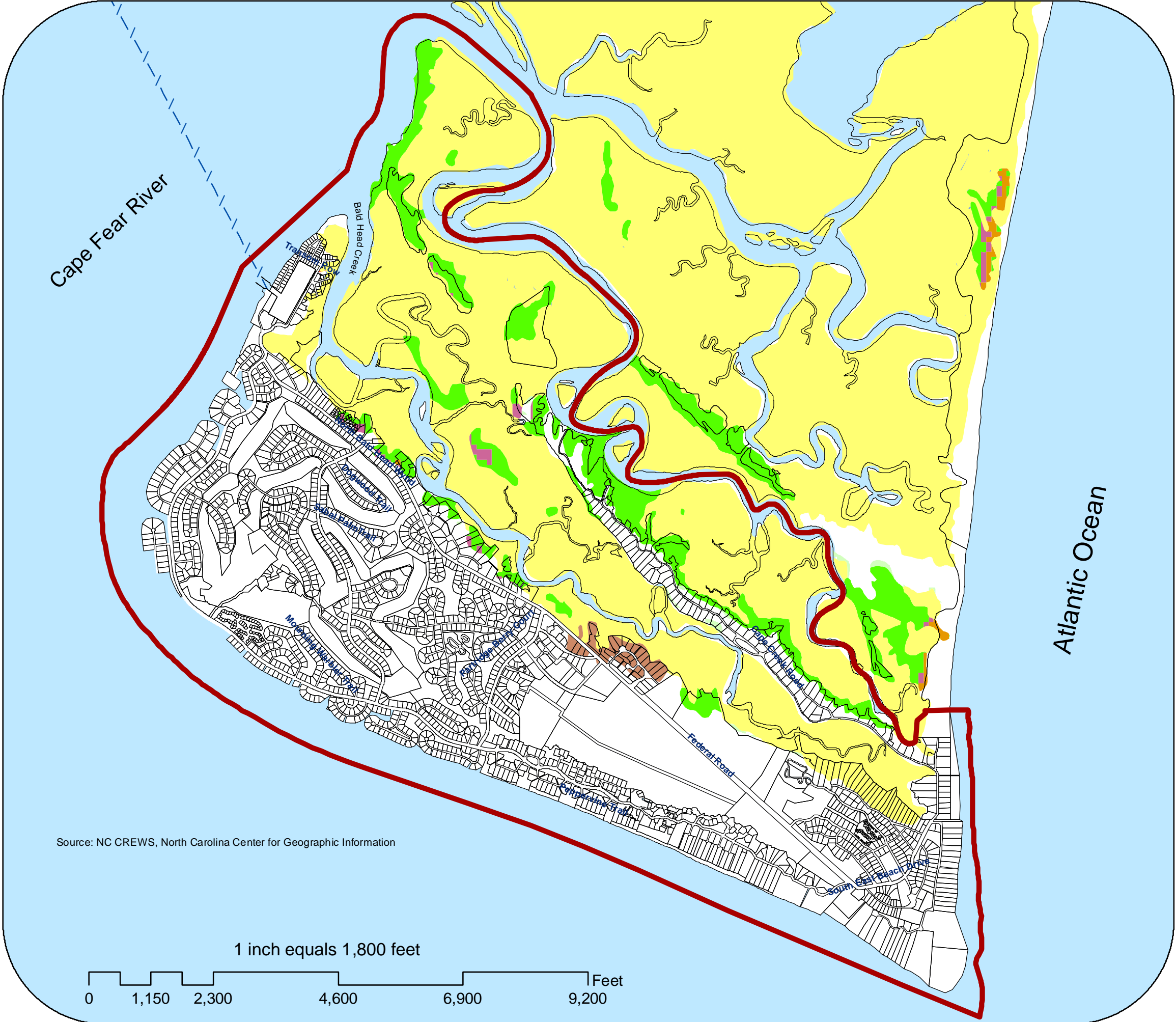
NeE-Newhan fine sand-2 to 30 percent slopes

Source: U.S. Department of Agriculture Natural Resources Conservation Service

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

Village of  
Bald Head Island  
Land Use Plan

Areas  
of Environmental Concern-  
Wetlands



**Legend**

- Village of Bald Head Island Corporate Limits
- Bald Head Island Ferry Route
- Hydrology
- Wetlands**
- Cleared Depressional Swamp Forest
- Cleared Estuarine Shrub/Scrub
- Cutover Depressional Swamp Forest
- Cutover Estuarine Shrub/Scrub
- Depressional Swamp Forest
- Estuarine Forest
- Estuarine Shrub/Scrub
- Managed Pineland
- Salt/Brackish Marsh

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.






















The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

MAP 7  
**Village of  
 Bald Head Island**  
 Land Use Plan

**Long-term  
 Average Annual Shoreline Change  
 and Setback Factors**

**Legend**

-  Village of Bald Head Island Corporate Limits
-  Brunswick County
-  Streets
- Setback Factor**
  -  2.0 Ft./Yr
  -  3.0 Ft./Yr
  -  3.5 Ft./Yr
  -  4.0 Ft./Yr
  -  5.0 Ft./Yr
  -  7.0 Ft./Yr
  -  8.0 Ft./Yr
  -  9.0 Ft./Yr
  -  12.0 Ft./Yr
  -  15.0 Ft./Yr
- Grandfathered Setbacks**
  -  60 Feet (STAGE I)
  -  120 Feet (STAGE II)
  -  210 Feet (STAGE II)
  -  250 Feet (STAGE II)
-  Hydrology
-  Inlet Hazard Area

Page 47

Cape Fear River

North Bald Head Wynd  
 Dogwood Trail

South Bald Head Wynd  
 Snowy-Egret Trail

Cape Creek Road

South East Beach Drive

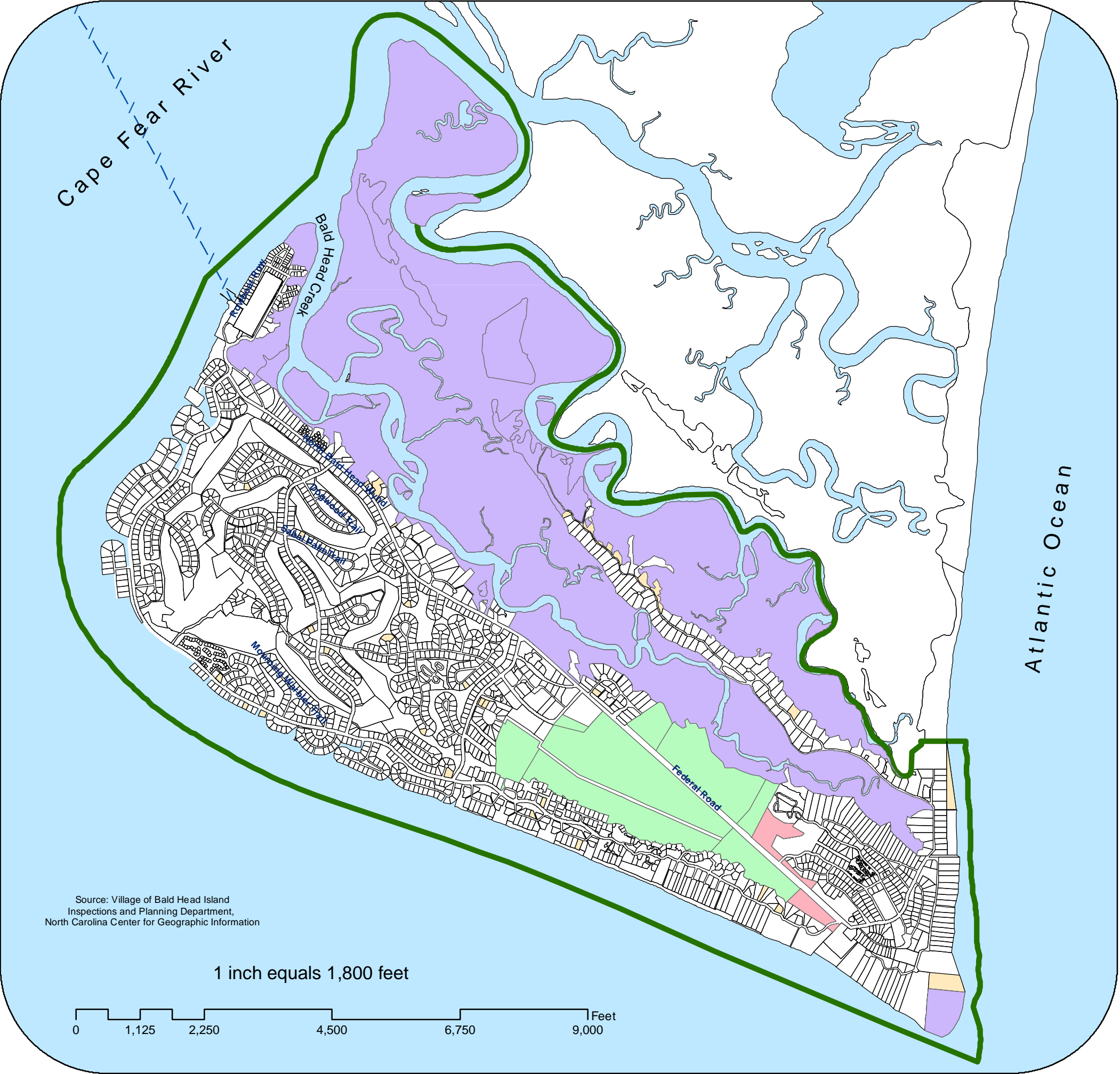
0 1,000 2,000 4,000 6,000 Feet

Source: North Carolina Division of Coastal Management

Atlantic Ocean



Village of  
Bald Head Island  
Land Use Plan  
Protected Lands



Source: Village of Bald Head Island  
Inspections and Planning Department,  
North Carolina Center for Geographic Information

1 inch equals 1,800 feet

0 1,125 2,250 4,500 6,750 9,000 Feet

**Legend**

- Village of Bald Head Island Corporate Limits
- Bald Head Island Ferry Route
- Hydrology

**Protected Lands**

- Bald Head Island Natural Area
- Bald Head Woods Coastal Reserve
- Silt Tracts
- Smith Island Land Trust Tract

•












•

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

# Village of Bald Head Island Land Use Plan

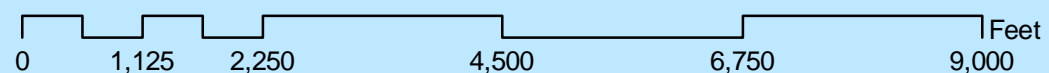
## Significant Natural Heritage Areas

### Legend

-  Village of Bald Head Island Corporate Limits
-  Bald Head Island Ferry Route
-  Hydrology
- Significant Natural Heritage Areas**
  -  BALD HEAD ISLAND
  -  BLUFF ISLAND AND EAST BEACH
  -  LOWER CAPE FEAR RIVER AQUATIC HABITAT
  -  MIDDLE ISLAND
  -  Smith Island Land Trust Tract 1
  -  Smith Island Land Trust Tract 2
  -  Smith Island Land Trust Tract 3
  -  Smith Island Land Trust Tract 4

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

1 inch equals 1,800 feet






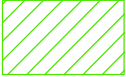
Village of  
Bald Head Island  
Land Use Plan

Locations of Water Bodies


**Legend**



Village of Bald Head Island Corporate Limits



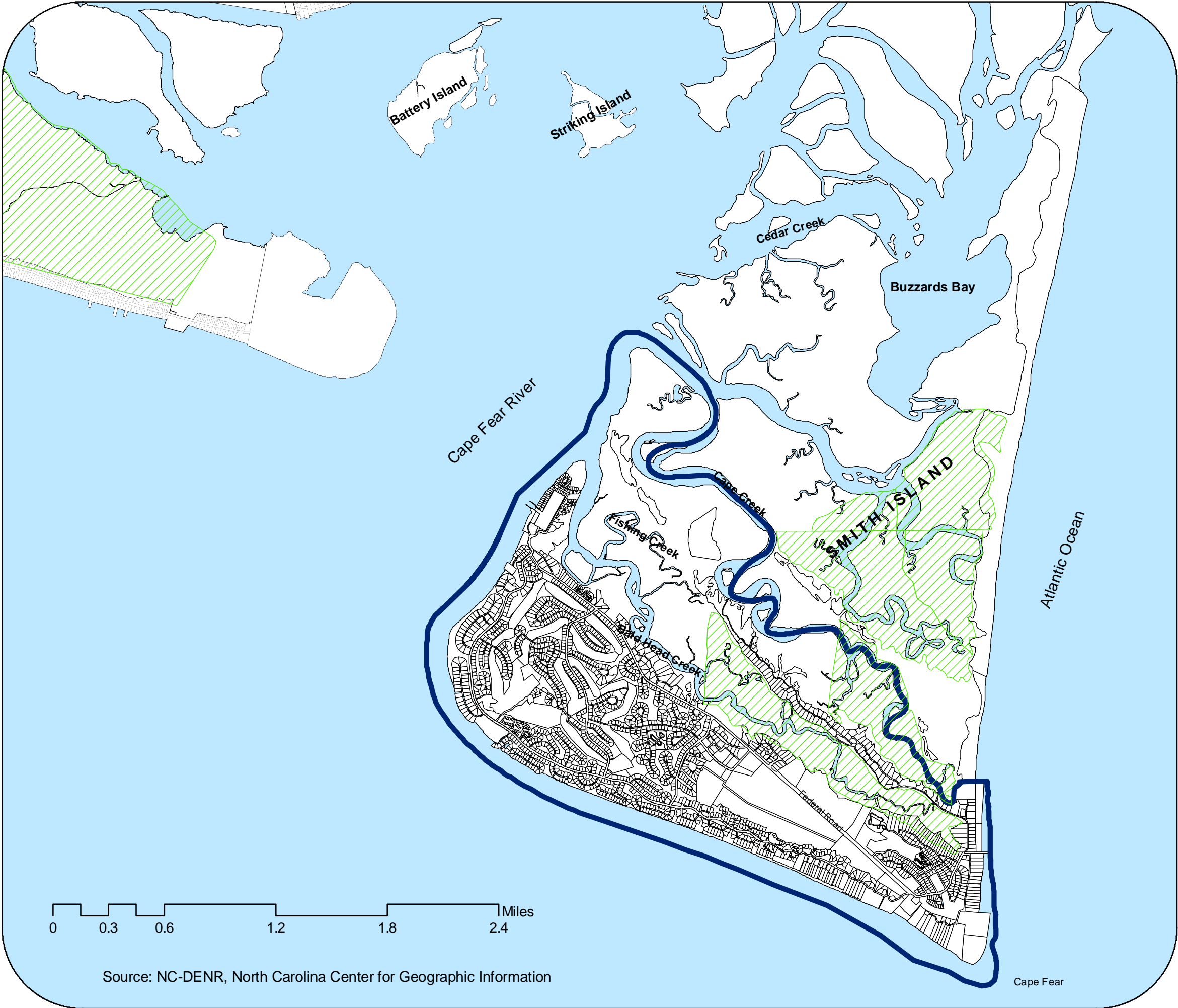
Fisheries Nursery Areas



Hydrology

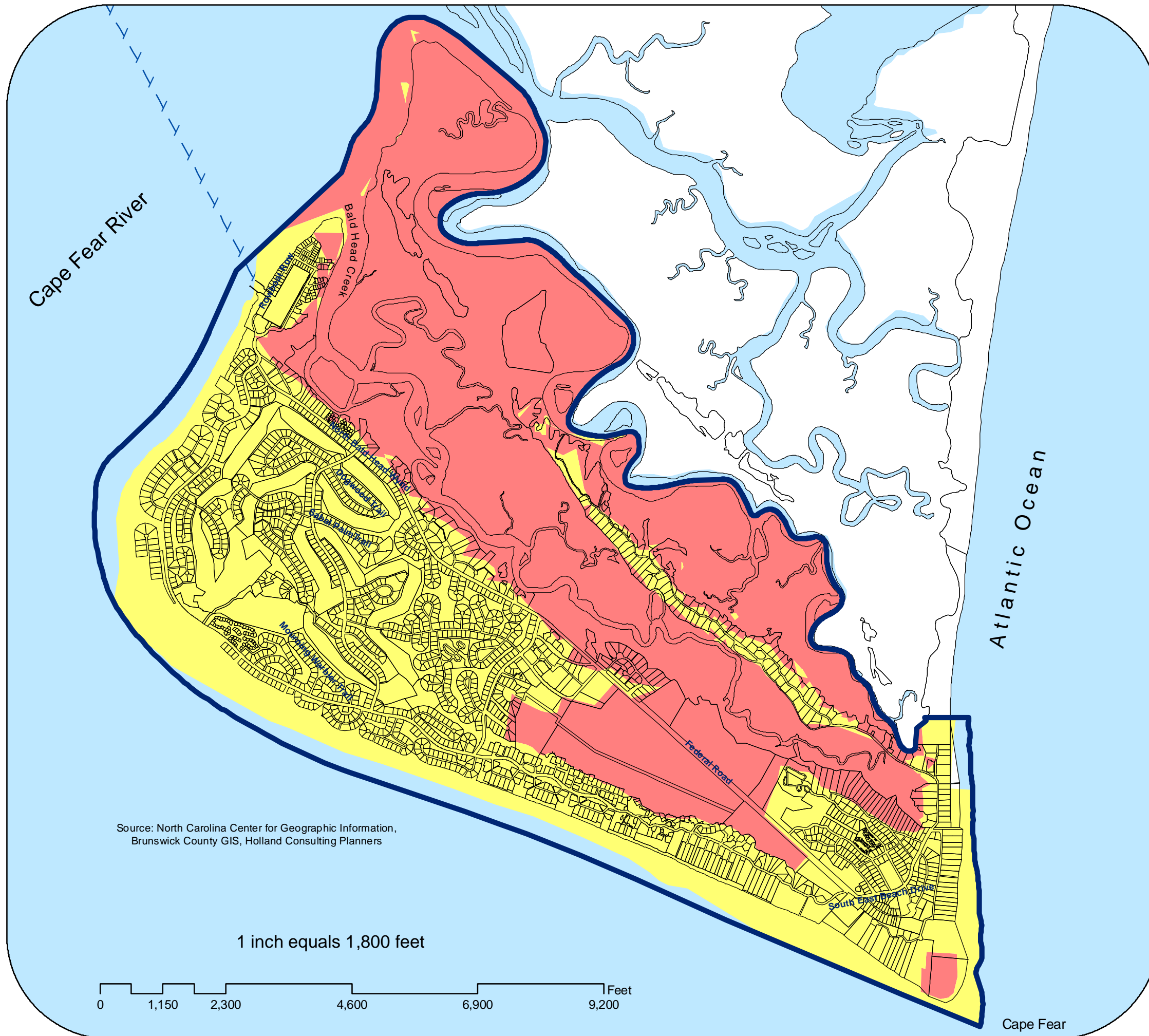
•  
•

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.



# Village of Bald Head Island Land Use Plan

## Environmental Composite



### Legend

- Village of Bald Head Island Corporate Limits
- Bald Head Island Ferry Route
- Hydrology
- Environmental Composite
  - No Class I located on Bald Head
  - Class II
  - Class III

Source: North Carolina Center for Geographic Information,  
Brunswick County GIS, Holland Consulting Planners

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.



The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

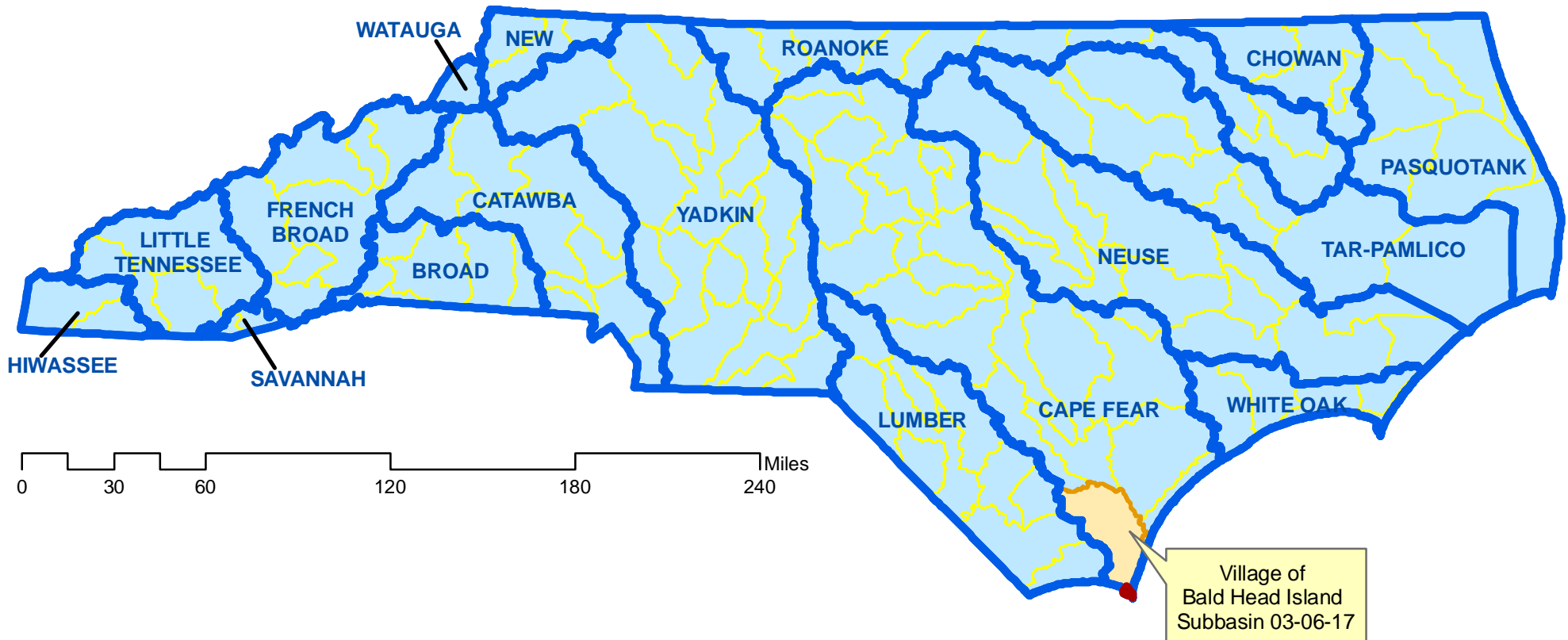
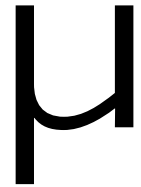
# MAP 12

## North Carolina

### River Basins and Subbasins

#### Land Use Plan

#### Village of Bald Head Island



Source: North Carolina Center for Geographic Information

### Legend

- Village of Bald Head Island Corporate Limits
- River Basins
- Subbasins
- Subbasin 03-06-17



# Village of Bald Head Island Land Use Plan

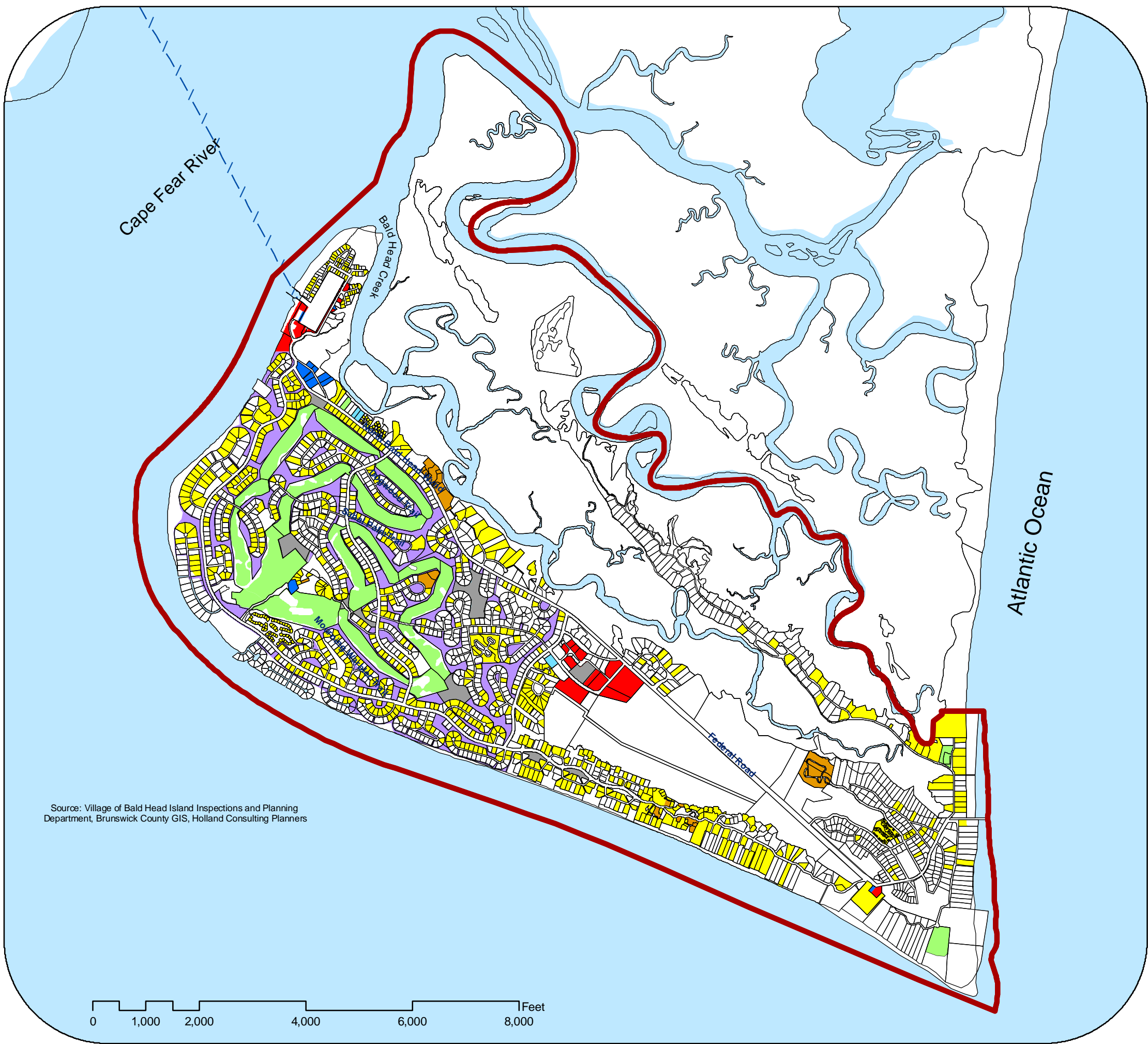
## Existing Land Use

**Legend**

- Village of Bald Head Island Corporate Limits

**Existing Land Use**

- Association Owned Property
- Commercial
- Government
- Multi-Family
- Office & Institutional
- Recreation
- Single-Family Residential
- Utilities
- Vacant
- Bald Head Island Ferry Route
- Hydrology







The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

Village of  
Bald Head Island  
Land Use Plan

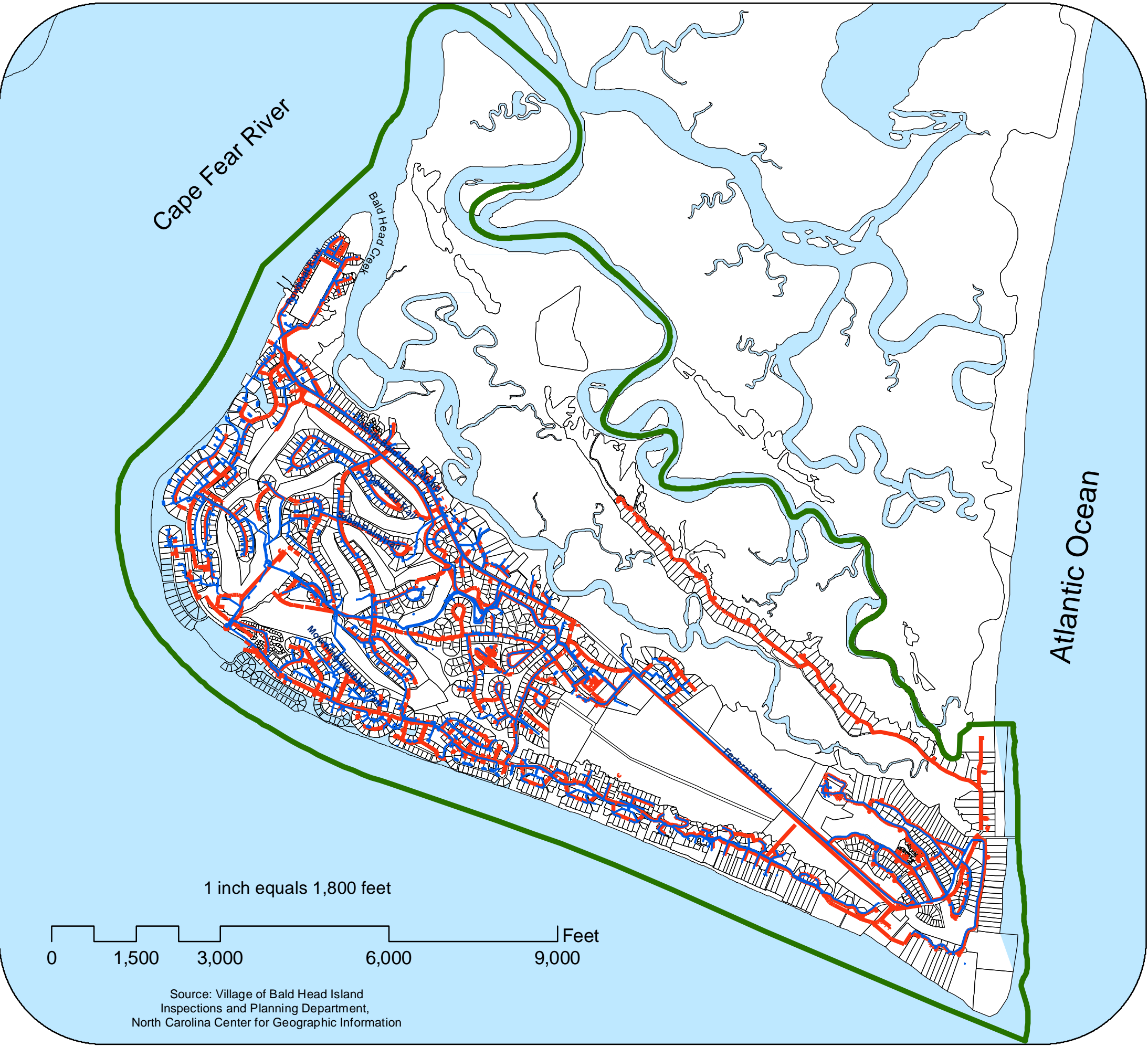
Existing Infrastructure

Legend

-  Village of Bald Head Island Corporate Limits
-  Existing Water Lines
-  Existing Sewer Lines
-  Hydrology

•  
•

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.










Village of  
Bald Head Island

Land Use Plan

Areas of  
Stormwater Concern

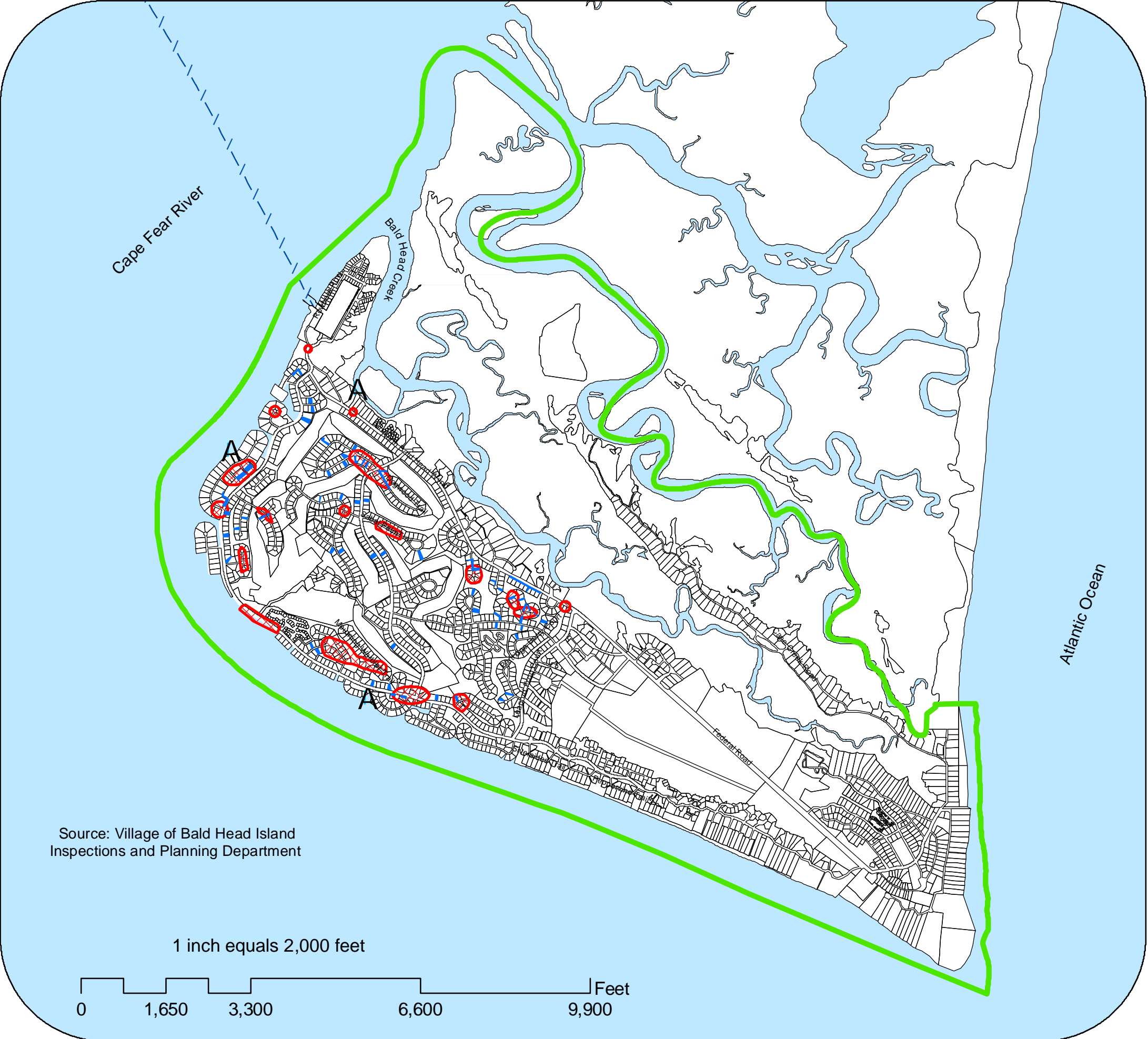
Legend

-  Village of Bald Head Island Corporate Limits
-  Areas of Stormwater Concern
-  Stormwater Easements
-  Stormwater Outfall Pipes
-  Bald Head Island Ferry Route

Note:  
All easements reflected on the attached map  
have not been recorded or deeded to the Village.

•  
•

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.









Village of  
Bald Head Island

Land Use Plan

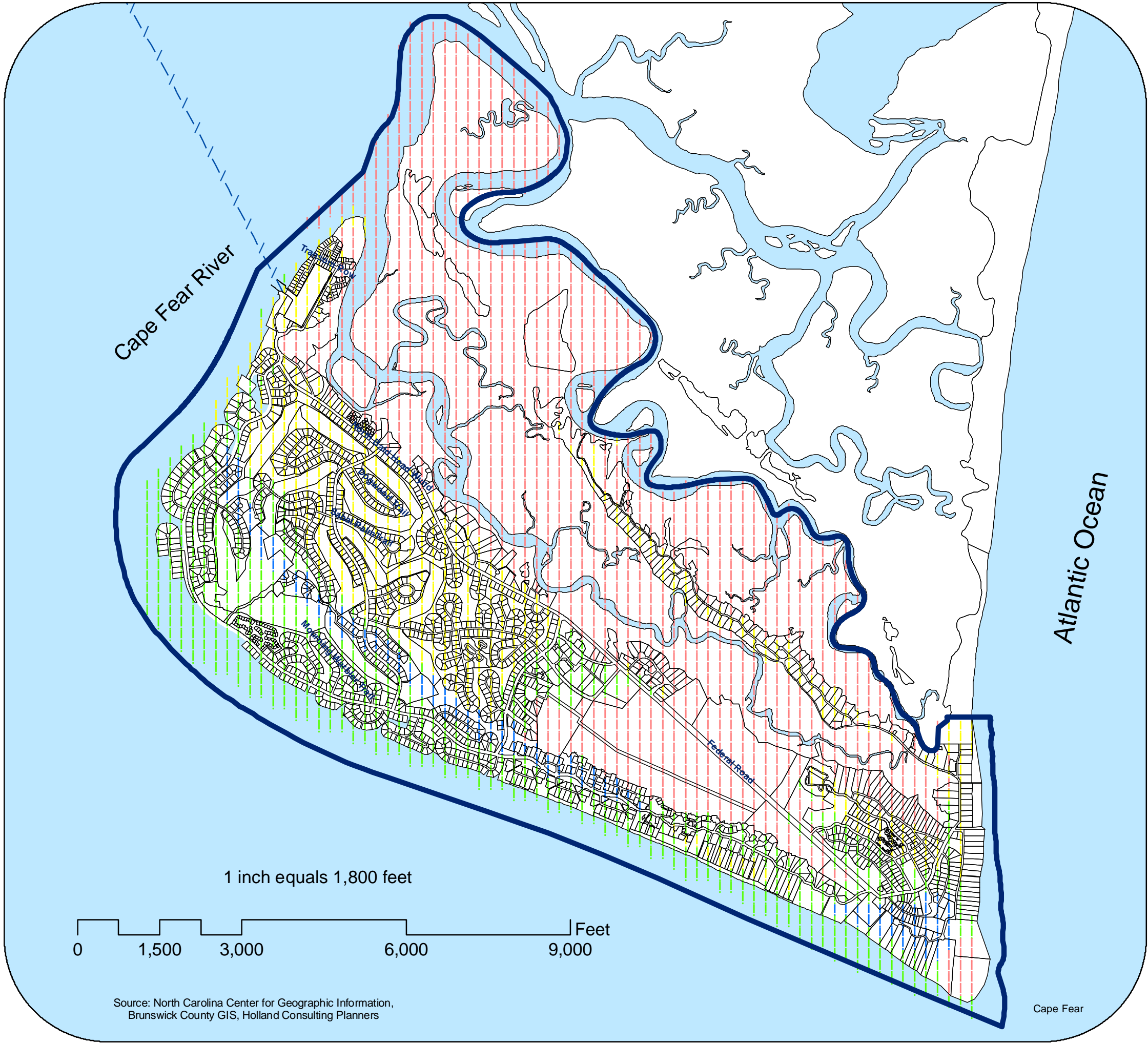
Land Suitability Analysis

Legend

-  Village of Bald Head Island Corporate Limits
-  Bald Head Island Ferry Route
- Land Suitability Analysis**
  -  Least Suitable
  -  Low Suitability
  -  Moderate Suitability
  -  High Suitability

•  
•

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.












# Village of Bald Head Island











## Land Use Plan

### Future Land Use

#### Legend

-  Village of Bald Head Island Corporate Limits
-  Bald Head Island Ferry Route
-  Hydrology
-  Stage I
-  Stage II
-  Stage 1 and 2
-  Middle Island

#### Future Land Use

-  AOP
-  Conservation
-  Government
-  LDR
-  Medium Density Residential 2
-  Medium Density Residential I
-  Mixed Use
-  PUD
-  REC
-  SILT Tracts

The preparation of this map was financed in part through a grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration.

