

SECTION I. INTRODUCTION

This Fiscal Year 2004/2005 - 2005/2006 Core 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 and the municipalities within those counties prepare and adopt a Core 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 and the municipalities in the county which choose not to prepare their own plan. Municipalities not preparing their own plan will be included in the plan for the county in which the municipality is located.

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 Town of Indian Beach will take to ensure implementation of this plan.

At the beginning of the preparation of this document, the Town of Indian Beach 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 Indian Beach Board of Commissioners, it was submitted to the CRC for certification. Certification of the plan was achieved on _____, 2006.

SECTION II. HISTORY

Bogue Banks is one of 23 barrier islands along the North Carolina coast. The island, which is approximately 28 miles long, runs east to west along its length and from north to south along its narrow width. To its north lies Bogue Sound and to its south, the Atlantic Ocean.

The first permanent settlers began arriving on Bogue Banks in the mid-1800s. They came from Shackleford Banks, Hunting Quarter, Straits, and other "down-east" locations in Carteret County. The houses were nestled among the trees on the sound side of the island. A few of the homes were built of lumber that had washed ashore in hurricanes. Other houses were built of wood obtained from the mainland. The framing of the homes were made of heart pine to which rough weatherboarding was attached. The windows were covered with mosquito netting in warm weather and boarded up in cold weather. Some of the homes had been moved by boat to the banks from other settlements in the county.

The families brought their livestock with them, and the cattle roamed freely on the banks, grazing and drinking water at the various fresh water creeks. The hogs ate the wild grapes, roots, and acorns supplemented by corn given them by their owners. The settlers cultivated a variety of vegetables and supplemented their seafood, pork, and beef with the meat of wildlife on the banks.

During the Civil War, these individuals reacted differently from those living in other parts of the south. They had nothing in common with the slave owners, and their isolation kept them apart from the usual grievances that the secessionists felt. With Fort Macon located at the extreme east end of Bogue Banks, the settlers were in contact with soldiers escaping from imprisonment and with a number of unruly characters.

The first four families to move to the Salter Path/Indian Beach area were those of Rumley Willis, Henry Willis, Alonza Guthrie, and Damon Guthrie. They cleared land that was located near the path named for Riley Salter. They took their houses down, brought them by sail skiff to their chosen spot, and reassembled them. Alonza Thomas of Beaufort, one of the owners of the land, gave them permission to settle there.

The houses, scattered here and there, were partially hidden among the close-growing oak and yaupon trees. Due to the thickness of the vegetation, one could only catch a glimpse of light here and there put off by kerosene lamps in those few houses perched upon the sand hills. The people continued to raise livestock and gardens and to fish and hunt. By the early 1900s, well-worn paths were established through the woods from one house to another. In addition to the Salter path on the eastern end of the village, other paths were worn from individual houses to the sound and ocean.

SECTION III. REGIONAL SETTING

The Town of Indian Beach is centrally located on Bogue Banks in southeastern Carteret County. Indian Beach is located between Pine Knoll Shores to the east and Emerald Isle to the west. Indian Beach is unique in that its corporate limits are split in the center by an unincorporated portion of Carteret County, known as Salter Path. Salter Path takes up roughly a 4,415 foot stretch of NC Highway 58 separating Indian Beach's eastern and western sides. Maps 1 and 2 provide an overview of the town's regional location, as well as a detailed street level map which indicates the location of the town's eastern and western portions.

Indian Beach is also centrally located for access by residents of several large urban centers throughout the state's coastal plain and Piedmont regions. This is one reason that the town is such a desirable tourist destination. The following summarizes the distance in miles to several major urban centers in close proximity to the Town of Indian Beach: Beaufort (15 miles), Morehead City (11 miles), New Bern (46 miles), Jacksonville (34 miles), Greenville (88 miles), Rocky Mount (133 miles), Raleigh (151 miles), and Wilmington (86 miles).

MAP 1 - REGIONAL LOCATION

MAP 2 - STREET LEVEL MAP

SECTION IV. INDIAN BEACH COMMUNITY CONCERNS AND ASPIRATIONS

A. DOMINANT GROWTH-RELATED ISSUES/KEY ISSUES

In compliance with the 15A NCAC 7B requirements and the town's Citizen Participation Plan, Indian Beach conducted a town-wide meeting on October 13, 2004. This meeting was held to solicit input from town residents, as well as the Land Use Plan Committee, regarding key issues and concerns in the community. The meeting was advertised twice in the Carteret County News-Times, and flyers were distributed and placed in key locations throughout town. The input received at this meeting will serve as a tool for guiding the development of policy statement and implementing actions discussed later in this document. The following list of key issues is a direct result of the input received at the October 13th meeting. Additionally, a separate survey was sent to a sampling of absentee property owners (see Appendix II for results).

RANK	ISSUE	SCORE
1	Traffic on 58	9*
2	Oppose 3 rd bridge in Indian Beach	9*
3	Maintain quality EMS service	8
4	Solution to beach erosion	6
5	Storm water runoff	5*
6	Improve public estuarine access	5*
7	Need central sewer service	3*
8	Beach vehicular traffic	3*
9	Address upland marinas	1
10	Improve inter-governmental cooperation	0

*Indicates a tie score.

B. INDIAN BEACH COMMUNITY VISION

The Town of Indian Beach will maintain its quaint oceanfront character in an effort to continue serving as a desirable tourist destination for individuals throughout North Carolina. This focus will provide residences and businesses with improved infrastructure and public services. Significant efforts will be made to preserve the natural environment in and around Indian Beach through ongoing beach renourishment efforts and municipal stormwater runoff controls. The town recognizes the significant impact that seasonal tourism has on Indian Beach, as well as the region, and will work with other communities along Bogue Banks to ensure that a coordinated effort is made to establish a stable future for both the economy and natural environment. Indian Beach views itself as a safe, clean, and friendly community and will maintain this image through provision of quality public services and logical development controls.

SECTION V. ANALYSIS OF EXISTING AND EMERGING CONDITIONS

A. POPULATION, HOUSING, AND ECONOMY

1. Indian Beach Population

a. *Indian Beach Permanent and Seasonal Population*

Table 1 is a comprehensive report on the population growth throughout Carteret County from 1970 to the year 2000. The data provided accounts for each municipality, as well as the county overall. According to the Town of Indian Beach, the population information provided in the 1980 and 1990 census reports was based on estimates. Due to this fact, the number of citizens within Indian Beach was never accurately recorded. For the 2000 census, census workers made a first effort at establishing an actual census figure for the Town of Indian Beach. In the year 2000, it was determined that there are 95 permanent year-round residents within Indian Beach. Rather than look at this figure as a population decline, it is more appropriate to utilize this figure as an accurate determination of the town's population.

Table 1: Town of Indian Beach and Carteret County
Population Growth by Municipality and County

Municipality	1970	1980	1990	2000	'70-'80	'80-'90	'90-'00	Overall '70-'00
Atlantic Beach	300	941	1,938	1,781	213.7%	106.0%	-8.1%	493.7%
Beaufort	3,368	3,826	3,808	3,771	13.6%	-0.5%	-1.0%	12.0%
Cape Carteret	616	944	1,008	1,214	53.2%	6.8%	20.4%	97.1%
Cedar Point	0	0	628	929	0.0%	628.0%	47.9%	929.0%
Emerald Isle	122	865	2,434	3,488	609.0%	181.4%	43.3%	2759.0%
Indian Beach	0	154	153	95	154.0%	-0.6%	-37.9%	95.0%
Morehead City	5,233	4,359	6,046	7,691	-16.7%	38.7%	27.2%	47.0%
Newport	1,735	1,883	2,516	3,349	8.5%	33.6%	33.1%	93.0%
Pine Knoll Shores	0	646	1,360	1,524	646.0%	110.5%	12.1%	1524.0%
Total Municipalities	11,374	13,618	19,891	23,842	19.7%	46.1%	19.9%	109.6%
Total Unincorporated Areas	20,229	27,574	32,662	35,537	36.3%	18.5%	8.8%	75.7%
Total County	31,603	41,192	52,553	59,379	103.6%	27.6%	13.0%	193.5%

Source: US Census Bureau.

Table 2 provides a summary of seasonal population for the Town of Indian Beach. Seasonal population has a substantial impact on the town, and is essentially the primary, if not the sole source, for economic development within Indian Beach. The estimates provided in Table 2 are based on a study conducted by Paul D. Tschetter of East Carolina University in 1988. This study focused on recreational population for the Albemarle-Pamlico region. This study established average per capita figures for a variety of seasonal housing types including: motel/hotel, campsites, boat slips, and private housing units. Based on these averages, the peak seasonal population for Indian Beach is estimated to be 8,330. This figure may slightly increase due to day visitors to Indian Beach; however, there is no simple way to calculate this figure with the data available.

Table 2: Town of Indian Beach
Seasonal Population

Housing Type	Number of Units	Persons Per Unit	Seasonal Population
Campsites	478	3.50	1,673
Public Access Parking Spaces	138	4.00	552
Private Housing Units	1,202	5.00	6,010
Total			8,235
Permanent Population	95		
Peak Seasonal Population	8,235		
Total Peak Population	8,330		

Source: Holland Consulting Planners, Inc.

b. Population Profile

The permanent population for Indian Beach is almost entirely comprised of Caucasians at 95.8%. There is a small minority population which makes up 4.2% of the population. The gender breakdown for Indian Beach is very evenly split, with males making up 49.5% of the population and females comprising 50.5%. Table 3 below provides a detailed overview of racial composition for Indian Beach and Carteret County.

Table 3: Town of Indian Beach and Carteret County
Racial Composition, 1970-2000

	Indian Beach		Carteret County	
	Total	Percentage	Total	Percentage
1990 Population*	153	100.0%	52,556	100.0%
White	148	96.7%	47,445	90.3%
Black	0	0.0%	4,385	8.3%
Asian or Pacific Islander	5	3.3%	293	0.6%
American Indian, Eskimo, Aleut	0	0.0%	269	0.5%
Other	0	0.0%	164	0.3%
2000 Population**	95	100.0%	59,383	100.0%
White	91	95.8%	53,443	90.0%
Black or African American	0	0.0%	4,191	7.1%
Asian or Pacific Islander	3	3.2%	282	0.5%
American Indian and Alaska Native	0	0.0%	341	0.6%
Some Other Race	0	0.0%	392	0.7%
Two or More Races	1	1.0%	734	1.2%
Hispanic or Latino (of any race)***	2	N/A	929	N/A
Male	47	49.5%	29,041	48.9%
Female	48	50.5%	30,342	51.1%

*Racial breakdown available for the 1990 Census.

**Racial breakdown available for the 2000 Census.

***In the 2000 Census, the Hispanic race was not considered an ethnic group. However, this is the number of individuals who reported being of Hispanic origin.

Source: 2000 US Census.

The small permanent population within Indian Beach is generally comprised of an older population. This can be attributed to the fact that the area is a very desirable retirement destination. Approximately fifty-six percent (55.8%) of the town's population is over the age of 55. Although the working age population within Indian Beach is 55.8%, a majority of the permanent population is made up of retirees. This is evidenced by the low percentage school-age population of 10 individuals, or 10.5%, of the total population. Table 4 and Chart 1 provide a detailed summary of age composition for Indian Beach as well as Carteret County.

Table 4: Town of Indian Beach and Carteret County Age Composition, 1990 and 2000

	Indian Beach				Carteret County
	1990 Total	1990 % of Total	2000 Total	2000 % of Total	2000 % of Total
0 to 14 years	14	9.2%	8	8.4%	16.7%
15 to 34 years	32	20.9%	10	10.5%	21.9%
35 to 54 years	59	38.6%	24	25.3%	31.5%
55 to 64 years	25	16.3%	19	20.0%	12.7%
65 to 74 years	21	13.7%	24	25.3%	10.1%
75 and over	2	1.3%	10	10.5%	7.1%
Total population	153	100.0%	95	100.0%	100.0%
Median Age	N/A	N/A		N/A	42.3
School Age Population (5-18)	14	9.2%	10	10.5%	17.7%
Working Age Population (16-64)	114	74.5%	53	55.8%	66.0%
Elderly Population (65+)	23	15.0%	34	35.8%	17.2%

Source: 2000 US Census.

Chart 1: Town of Indian Beach Age Composition

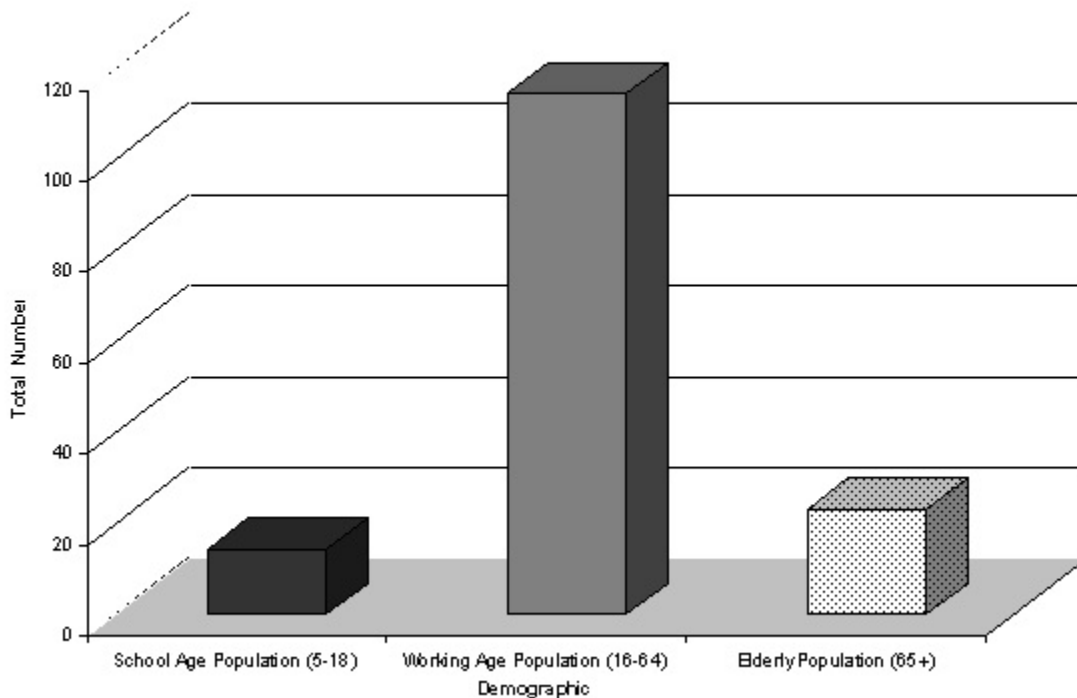


Table 5 shows a breakdown of educational attainment for Indian Beach citizens age 25 and over. A large majority of the town's citizens have a high school degree (91.5%), and 54.9% have some college education.

Table 5: Town of Indian Beach and Carteret County
Education Attainment, 2000 (Based on Persons 25 Years Old or Older)

	Indian Beach		Carteret County
	Total	% of Total	% of Total
Less than 9 th grade	0	0.0%	5.1%
Ninth to twelfth grade, no diploma	6	8.0%	12.8%
High school graduate	26	34.7%	29.6%
Some college, no degree	23	30.7%	25.7%
Associate degree	5	6.7%	6.9%
Bachelor's degree	4	5.3%	13.1%
Graduate/Professional degree	11	14.7%	6.7%
Total population 25 years and over	75	100.0%	100.0%

Source: 2000 US Census.

c. *Population Summary*

- ❖ The year 2000 population for Indian Beach according to the US Census Bureau was 95.
- ❖ The peak seasonal population for Indian Beach is 7,138.
- ❖ Approximately ninety-six percent (95.8%) of the Indian Beach population is Caucasian.
- ❖ Approximately thirty-six percent (35.8%) of the town's population is age 65 or older.
- ❖ Over ninety percent (91.5%) of Indian Beach's citizens have a high school diploma.

2. Housing

a. *Housing Occupancy and Tenure*

According to the 2000 Census, nearly the entire housing stock (97.1%) for the Town of Indian Beach is vacant. Approximately 99.3% of these vacant residential structures are considered to be for seasonal, recreational, or occasional use. There are only 36 occupied housing units in Indian Beach making up 2.9% of the town's entire housing stock. This data really expresses the town's reliance on tourism and seasonal visitors. Table 6 is a summary of housing occupancy and tenure for Indian Beach.

Table 6: Town of Indian Beach and Carteret County
Housing Occupancy and Tenure, 1990 and 2000

	Indian Beach				Carteret County
	1990		2000		2000
	Total	% of Total	Total	% of Total	% of Total
Vacant:	758	91.7%	1,208	97.1%	38.4%
For rent*	10	1.3%	3	0.2%	5.4%
For sale only*	1	10.0%	6	0.5%	2.9%
Rented or sold, not occupied*	2	0.3%	0	0.0%	2.2%
For seasonal, recreational or occasional use*	742	97.9%	1,199	99.3%	86.0%
For migrant workers*	0	0.0%	0	0.0%	0.1%
Other vacant*	3	0.4%	0	0.0%	3.4%
Occupied:	69	8.3%	36	2.9%	61.6%
Owner-Occupied**	56	81.2%	30	83.3%	76.6%
Renter-Occupied**	13	18.8%	6	16.7%	23.4%
Total Housing Units	827	100.0%	1,244	100.0%	100.0%

*Indicates breakdown of vacant household types.

**Indicates breakdown of occupied household types.

Source: US Census Bureau.

b. *Structure Age*

Approximately 86% of all residential units have been constructed, or in the case of mobile home units moved onto the beach, since 1980. There are three residences within Indian Beach whose construction dates back to before 1939, but a majority of development within Indian Beach took place between 1980 and 1995. Table 7 provides a summary of the year in which residential structures were constructed for all of Indian Beach.

Table 7: Town of Indian Beach
Housing Structure, 2000

Year	Number of Structures	% of Total
1999 to March, 2000	2	0.2%
1995 to 1998	11	0.9%
1990 to 1994	235	18.9%
1980 to 1989	822	66.1%
1970 to 1979	73	5.9%
1960 to 1969	98	7.9%
1950 to 1959	0	0.0%
1940 to 1949	0	0.0%
1939 or earlier	3	0.2%
Total Structures	1,244	100.0%
Median Year Structure Built	1985	

Source: US Census Bureau.

c. *Housing Conditions*

The average rooms per unit for structures within Indian Beach is 4.4 compared to 5.2 for Carteret County and 5.5 for the state. Additionally, 20.7% of structures have three or more bedrooms compared to 62.6% for the county. This large discrepancy can mainly be attributed to the large number of mobile homes within the town's jurisdiction. Table 8 below provides an overview of residential structural conditions for Indian Beach, Carteret County, and North Carolina.

Table 8: Town of Indian Beach, Carteret County, and North Carolina
Housing Conditions

	Indian Beach	Carteret County	North Carolina
Average Rooms Per Unit	4.4	5.2	5.5
Percent with no bedroom	0.0%	0.5%	1.1%
Percent with 3+ bedrooms	20.7%	62.6%	60.8%
Percent lacking complete kitchen facilities	0.0%	0.4%	1.1%
Percent lacking complete plumbing	0.0%	0.5%	1.1%
Percent occupied with telephones	100.0%	59.6%	86.2%

Source: US Census Bureau.

d. *Single and Multi-Family Units*

An overwhelming majority of the housing stock within Indian Beach is comprised of mobile homes. These mobile homes are utilized almost solely as vacation or second homes. The remaining housing stock is made up of multi-family units and single-family homes. It should be noted, however, that only 34, or 2.7% of the town's residential units, are single-family structures. Within Indian Beach, there are also two large campgrounds. Within these campgrounds, there are 295 campsites. Although the sites in these campgrounds are not accounted for in the census, there are many additional seasonal housing units in each of these locations. This issue has been addressed in the seasonal population calculation discussed earlier.

Table 9: Town of Indian Beach and Carteret County
Units in Structure and Mobile Home Count, 2000

Units in Structure	Indian Beach		Carteret County
	Total	% of Total	% of Total
1-unit, detached	34	2.7%	55.7%
1-unit, attached	2	0.2%	4.5%
2 units	0	0.0%	3.7%
3 or 4 units	0	0.0%	2.9%
5 to 9 units	5	0.4%	2.5%
10 to 19 units	0	0.0%	1.1%
20 units or more	361	29.0%	3.9%
Mobile home	832	66.9%	25.7%
Boat, RV, van, etc.	10	0.8%	0.0%
Total	1,244	100.0%	100.0%

Source: US Census Bureau.

e. *Housing Summary*

- ❖ Approximately ninety-nine percent (99.3%) of all residential structures within Indian Beach are considered to be for seasonal, recreational, or occasional use.
- ❖ A majority of the residential structures within Indian Beach (66.1%) were constructed between the years 1980 and 1989.
- ❖ There are no residences within the town lacking adequate kitchen or plumbing facilities.
- ❖ Approximately 67% of all housing units within Indian Beach are comprised of mobile homes.

3. Employment and Economy

a. *Introduction (General Economic Indicators)*

Both the per capita income (\$25,826) and the mean income (\$50,950) for Indian Beach residents compares favorably to Carteret County and North Carolina residents overall. The unemployment rate for Indian Beach is slightly inflated; however, it should be noted that the working age population within the town is only made up of 35 individuals. Table 10 provides an overall summary of economic indicators for Indian Beach, Carteret County, and North Carolina.

Table 10: Town of Indian Beach, Carteret County, and North Carolina
Summary of Economic Indicators

	Year	Indian Beach	Carteret County	North Carolina
Per Capita Income	1999	\$25,826	\$21,260	\$20,307
Mean Income	1999	\$50,950	\$49,509	\$50,814
Unemployment Rate	2000	5.4%	2.9%	3.4%
% of population in labor force	2000	52.7%	60.0%	65.7%
Poverty Rate	2000	5.0%	10.7%	15.2%

Source: NC Department of Commerce and US Census Bureau.

b. *Household Income*

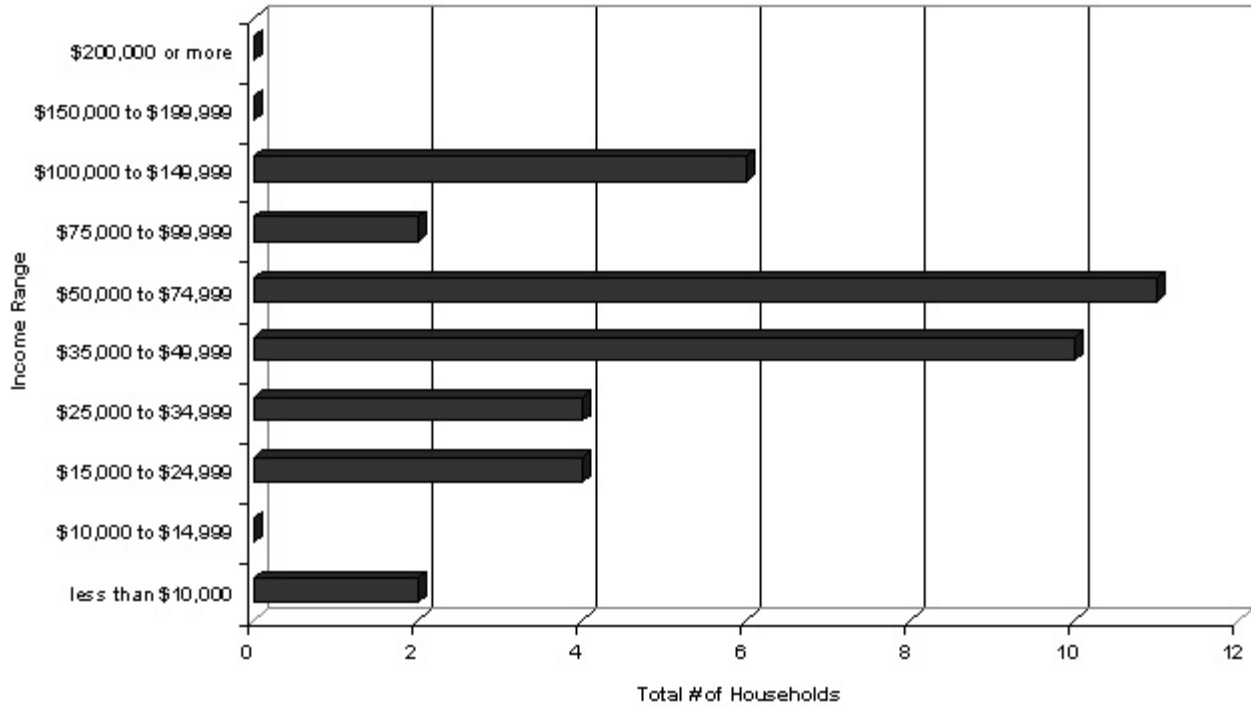
The median household income for Indian Beach according to the 2000 US Census is \$47,250 compared to \$42,307 for Carteret County overall. Nearly fifty percent (48.7%) of all recorded Indian Beach households reported an annual income of \$50,000 or greater. Table 11 and Chart 2 provide an overall summary of household incomes for Indian Beach and Carteret County.

Table 11: Town of Indian Beach and Carteret County
Household Income, 2000

	Indian Beach		Carteret County
	Total	% of Total	% of Total
Less than \$10,000	2	5.1%	9.4%
\$10,000 to \$14,999	0	0.0%	7.7%
\$15,000 to \$24,999	4	10.3%	14.6%
\$25,000 to \$34,999	4	10.3%	13.5%
\$35,000 to \$49,999	10	25.6%	18.1%
\$50,000 to \$74,999	11	28.2%	19.8%
\$75,000 to \$99,999	2	5.1%	8.8%
\$100,000 to \$149,999	6	15.4%	5.4%
\$150,000 to \$199,999	0	0.0%	1.2%
\$200,000 or more	0	0.0%	1.5%
Total Families	39	100.0%	100.0%
Median Income	\$47,250		\$42,307

Source: 2000 US Census.

**Chart 2: Town of Indian Beach
Household Income**



c. *Employment By Industry*

Out of the 35 individuals over 25 years of age and employed within the Town of Indian Beach, 15 or 42.9% are employed in the finance, insurance, real estate, and rental and leasing category as defined by the US Census. The second largest employer of Indian Beach residents is the retail trade industry. Table 12 summarizes the number of individuals employed by industry within Indian Beach.

Table 12: Town of Indian Beach
Employment By Industry, 2000

Industry	# Employed	% Employed
Agriculture, Forestry, Fishing, and Mining	4	11.4%
Construction	0	0.0%
Manufacturing	0	0.0%
Wholesale Trade	0	0.0%
Retail Trade	8	22.9%
Transportation, Warehousing, and Utilities	0	0.0%
Information	3	8.6%
Finance, Insurance, Real Estate, and Rental and Leasing	15	42.9%

Table 12 (continued)

Industry	# Employed	% Employed
Professional, Scientific, Management, Administrative, and Waste Management Services	0	0.0%
Education, Health, and Social Services	3	8.6%
Arts, Entertainment, Recreation, Accommodation, and Food Services	2	5.7%
Other Services (except Public Administration)	0	0.0%
Public Administration	0	0.0%
Total Persons Employed 16 Years and Over	35	100.0%

Source: US Census Bureau.

d. *Earnings By Industry*

Table 13 provides a summary of average weekly wages by industry for Carteret County. This data is provided by the North Carolina Department of Commerce, and is only available at the county level. Based on the census data discussed in the table above, the two largest employers of Indian Beach residents are: finance, insurance, real estate, and rental and leasing; and retail trade. According to the NC Department of Commerce, these two industry categories pay an estimated weekly wage of \$437 and \$265 respectively within Carteret County.

Table 13: Carteret County and North Carolina
Wages by Industry, 2000

Industry	Average Weekly Earnings	
	Carteret County	North Carolina
Agriculture, Forestry, Fishing, and Mining	\$381	\$496
Construction	\$431	\$693
Manufacturing	\$412	\$801
Wholesale Trade	\$454	\$960
Retail Trade	\$265	\$439
Transportation, Warehousing, and Utilities	\$552	\$732
Information	\$352	\$928
Finance, Insurance, Real Estate, and Rental and Leasing	\$437	\$844
Professional, Scientific, Management, Administrative, and Waste Management Services	\$708	\$1,095
Education, Health, and Social Services	\$631	\$655
Arts, Entertainment, Recreation, Accommodation, and Food Services	\$395	\$558
Other Services (except Public Administration)	\$344	\$453
Public Administration	\$616	\$692

Source: NC Department of Commerce.

e. *Employment Commuting Patterns*

Out of the 30 Indian Beach residents that reported not working at home, 60% have a commuting to work time of fifteen minutes or greater. A majority of these individuals must travel to the mainland for job opportunities in the communities of Beaufort and Morehead City. The mean travel time to work for Indian Beach citizens is 20.7 minutes. Table 14 summarizes the commuting times for Indian Beach residents.

Table 14: Town of Indian Beach
Travel Times to Work

Travel Time	Total	% of Total
Less than five minutes	12	40.0%
5 to 9 minutes	0	0.0%
10 to 14 minutes	0	0.0%
15 to 19 minutes	8	26.7%
20 to 24 minutes	3	10.0%
25 to 29 minutes	0	0.0%
30 to 34 minutes	4	13.3%
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	3	10.0%
Did not work at home	30	100.0%
Worked at home	5	
Total workers 16 years and over	35	
Mean travel time	20.7	

Source: 2000 US Census.

f. *Industries*

There is no industrial activity within Indian Beach due to the fact that this is a barrier island community focused on tourism. The economy and revenue that the town relies on comes primarily from property taxes. There are only a handful of commercial operations within Indian Beach, and no hotels or motels. Indian Beach exists almost solely as a vacation destination. The population within town fluctuates wildly with the seasons, and can put a strain on town resources. Throughout this plan, there will be a focus on the importance of seasonal visitors to the Town of Indian Beach. Policy decisions

should be made in an attempt to protect the town's resources that will have a significant impact on the industry such as beach renourishment and water quality.

g. Employment and Economy Summary

- ❖ The mean income for Indian Beach residents is \$50,950.
- ❖ According the 2000 US Census, only 35 individuals age 16 and over are reported to be in the labor force.
- ❖ The highest paying industry in which Indian Beach residents are employed is education, health, and social services which has an average weekly wage of \$631 in Carteret County.
- ❖ The average commuting time for Indian Beach residents is 20.7 minutes.

4. Population Projections

Projecting population increase within Indian Beach is difficult due to the lack of accurate population estimates since the town's incorporation. The 2000 population as provided by the US Census Bureau was 95 permanent residents, and according to projections by the NC Office of State Planning, this total dropped to 92 as of 2003. According to the US Census Bureau and the Office of State Planning, the permanent population within Indian Beach has shown a constant decline since the town's incorporation. This trend has been questioned by town officials, and is not expected to continue.

The Town of Indian Beach is aware of its reliance on seasonal population; however, the permanent population is expected to increase at a very moderate rate over the next ten years. In order to provide some idea of population increase within Indian Beach, we will look at two primary factors: the availability of vacant land, and the percentage of owner-occupied versus vacant housing. Based on these two factors, a very general estimate of potential population increase will be formulated. Additionally, a peak seasonal population forecast will be compiled. Projections for peak seasonal population will be estimated based on trends throughout Bogue Banks beach communities.

There are currently 124 vacant pieces of property located within Indian Beach's corporate limits. All of this property that is considered developable is located within a zoning district that will accommodate single-family residential development. Over the last five years, there have been thirteen single-family residences constructed within Indian Beach. The estimates provided below will assume that

this trend will continue to 2015, and general population estimates will be based on this fact. Permanent residents will be estimated based on the percentage of homes that will be owner-occupied multiplied by the town's average household size of 1.9 persons.

Table 15: Town of Indian Beach
Population Projections, 2000-2015

Population	2000	2010	2015	% Change
Permanent Population	95	119	131	37.9%
Peak Seasonal Population	8,235	8,894	9,134	10.9%
Total Peak Seasonal Population	8,330	9,013	9,265	N/A

Source: US Census Bureau, NC Office of State Planning, and Holland Consulting Planners, Inc.

B. NATURAL SYSTEMS ANALYSIS

1. Mapping and Analysis of Natural Features

a. *Topography/Geology*

Indian Beach is located within subbasin 03-05-03 of the White Oak River Basin, along the Bogue Banks of Carteret County. Bogue Banks is encompassed by water, and is predominantly a low-lying area. The Town of Indian Beach is bordered on the north by Bogue Sound and the south by the Atlantic Ocean. Topography along this stretch of the island varies from sea level or zero along the shoreline to 17 feet further inland. Higher elevations within Indian Beach are generally located along a ridge line located adjacent to Salter Path Road. The majority of the town's land has slopes within the 0 to 8 percent range; however, along dune lines the slopes may be as great as 30 percent. The shoreline along Indian Beach is constantly shifting. The town has a proactive beach renourishment effort that is ongoing, and will be specifically addressed during the policy development phase of this plan.

Carteret County is underlain by an eastward thickening wedge of sedimentary deposits of Pleistocene-age, ranging from 2,000 feet thick in the northwest portions of the county to almost 7,000 feet thick beneath the easternmost sections of the offshore strand. Because of the depth of the surficial sand/siliceous deposits, little is known of the composition of underlying deposits. Well logs indicate that shell fragments and calcareous material are consolidated into limestone at a depth of less than 120 feet west of Morehead City.

b. *Climate*

Indian Beach is hot and humid in the summer, but the coast is frequently cooled by sea breezes. Winter is cool with occasional brief cold spells. Rain occurs throughout the year, and can be fairly heavy at times. In winter, the average temperature is 47° F, and the average daily minimum temperature is 38° F. The lowest temperature on record within the county was 9° F and occurred in 1977.

In summer, the average temperature is 78° F, and the average daily maximum temperature is 85° F. The highest recorded temperature to date was 107° F occurring in 1952. The average annual precipitation within Indian Beach is 52.5 inches; 57% of this rainfall typically occurs between April and September. Thunderstorms typically occur on an average of 45 days per year. The average seasonal snowfall in the area is one inch.

c. *Flood Hazard Areas*

Within jurisdictions adjacent to water bodies there are two types of flooding concerns: riverine flooding and ocean flooding. Riverine flooding occurs when rivers and streams overflow their banks, and is caused by rainfall. When the amount of water being carried by a river or stream exceeds the capacity of its channel, the water overflows onto the adjacent land. The land that is most likely to be flooded is commonly referred to as the floodplain.

Ocean flooding affects coastal areas. Beachfronts are particularly impinged on, but areas around bays or sounds and areas adjacent to streams that empty into bays or sounds are also at risk. Ocean flooding is caused by tropical storms and hurricanes because of the reduced atmospheric pressure and high winds associated with these storms. Reduced atmospheric pressure causes the level of the ocean to rise and effectively moves the shoreline further inland. This rise in the mean elevation of the ocean in localized areas is referred to as storm surge.

There are two primary methods used to gauge the impact of coastal flooding: Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), and the National Oceanic and Atmospheric Administration (NOAA) Storm Surge Inundation Model (SLOSH). FIRM maps address both the impact of riverine, as well as coastal or ocean flooding. The SLOSH model established by NOAA deals specifically with flooding associated with coastal storm events including both hurricanes and nor'easters.

Due to inaccuracies identified with existing FIRM maps subsequent to flooding associated with Hurricane Floyd in 1999, the State of North Carolina in conjunction with FEMA established a program to establish updated maps based on more accurate data and modern technology. These maps are being updated based on river basin, and will be established on a county-by-county basis. Carteret County adopted the new FIRM maps for the county in December of 2002.

Beyond determining the Base Flood Elevation (BFE) of an area, FIRMs can also be used to determine the flood zone for a particular area. The flood zone refers to a classification system of the characteristics of a flood that can be expected in the area. The flood zones represented within Indian Beach and their criteria as defined by FEMA are as follows:

Zone AE: Zone AE is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the Flood Insurance Study by detailed methods of analysis. In most instances, Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

Zone X: Zone X is the flood insurance rate zone that corresponds to areas outside the 1-percent annual chance floodplain, areas of 1-percent annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1-percent annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1-percent annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is not required in these zones.

Zone VE: Zone VE is the flood insurance rate zone that corresponds to areas within the 1-percent annual chance coastal floodplain that have additional hazards associated with storm waves. Base Flood Elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Mandatory flood insurance purchase requirements apply.

The flood zones for Indian Beach are shown on Map 3, and the acreages for the flood zones are provided in Table 16.

MAP 3 - FLOOD ZONES

Table 16: Town of Indian Beach
Flood Zones in Acres

Flood Zone	Acres	% of Total Town Acreage
AE	91.3	28.0%
Shaded X	117.4	36.0%
VE	101.1	31.0%
Total Acres in Floodplain	309.8	95.0%
Total Town Acres	326.1	

Source: Federal Emergency Management Agency.

Storm surge is a large dome of water often 50 to 100 miles wide that sweeps across the coastline near where a hurricane makes landfall. The surge of high water topped by waves is devastating. The stronger the hurricane and the shallower the offshore water, the higher the surge. Along the immediate coast, storm surge is the greatest threat to life and property. 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 which the hurricane's track, size, and intensity must be specified before the model is run. The data provided for Carteret County comes in two forms. The model was run assuming two different storm magnitudes: fast moving and slow moving. These two different situations will create different scenarios in terms of coastal flooding. Map 4 provide a view of how these two storm types will affect Indian Beach, and a summary of acreages that will fall within the flood limits associated with each storm event are provided in Table 17.

Table 17: Town of Indian Beach
Storm Surge Inundation Acreage (Fast & Slow Moving Hurricanes)

Hurricane Strength	Fast Moving		Slow Moving	
	Acreage*	% of Total Acreage	Acreage*	% of Total Acreage
Category 1 - 2	216.5	66.4%	91.8	28.2%
Category 3	260.1	79.8%	125.8	38.6%
Category 4 - 5	299.2	91.8%	226.7	69.5%
Total Town Acres	326.1			

*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.

MAP 4 - STORM SURGE INUNDATION

The breakdown of the data in Table 17 is based on the Saffir-Simpson classification system for hurricanes. The Saffir-Simpson scale breaks hurricanes down by magnitude. Storms are ranked based on strength from a Category 1 up to a Category 5. The definition of each category is as follows:

Category 1: Winds of 74 to 96 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 97 to 111 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 112 to 131 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 132 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.

d. *Man-made Hazards/Restrictions*

There are no significant man-made hazards within Indian Beach's corporate limits. The EPA requires that facilities report certain chemical substances located on site. Specifically, under this regulatory requirement, facilities with chemicals on the EPA's list of Extremely Hazardous Substances present in a quantity equal to or in excess of their established Threshold Planning Quantity or a 500 pound threshold (whichever number is less), as well as any hazardous chemical present on site in a quantity equal to or greater than 10,000 pounds must be included on an annual report called the Tier II. This report must be submitted by March 1st of each year to the North Carolina Emergency Response Commission, the County or Local Emergency Planning Committee, and the local fire department with jurisdiction over the reporting facility.

e. *Soils*

The most recent soil survey for Carteret County was issued in 1978. This survey supersedes the one that was compiled and adopted in 1938. This survey was drafted by the US Department of Agriculture in conjunction with The National Cooperative Soil Survey (NCSS). The NCSS is a nationwide partnership of federal, regional, state, and local agencies and institutions. This partnership works together to cooperatively investigate, inventory, document, classify, and interpret soils and to disseminate, publish, and promote the use of information about the soils of the United States and its trust territories.

There are ten different soil series that fall within the Town of Indian Beach corporate limits. Of these ten soil series, four are considered to be hydric soils. Table 18 provides a summary of the overall acreage and conditions of all soil series that fall within Indian Beach. Map 5 shows the location of these soils.

MAP 5 - SOILS

This table provides several factors with relation to soil conditions, including each soils ability to support septic tank installations. All soils within Indian Beach are considered to be poor for the use of septic tanks. This issue will be discussed further in subsequent sections of the plan, due to the fact that there is no central sewer system within Indian Beach.

Hydric soils are commonly associated with wetland areas and are strongly influenced by the presence of water. A soil is considered hydric if it has been flooded or saturated with water long enough to become anaerobic, meaning there is no oxygen present. Hydric soils and wetlands are not the same thing. An area must have hydric soils, wetland-adapted plants, and the presence of water for some time during the year to be considered a wetland. Typically, hydric soils are very poorly suited for development; however, they do not always fall under the same regulations as a delineated 404 wetland as defined in the Clean Water Act. The 404 wetlands within Indian Beach will be discussed in further detail later in the document.

Table 18: Town of Indian Beach
Soil Conditions

Map Symbol	Soil Name	Acreage	Septic Tank Conditions	Flooding Frequency
Bn*	Beaches-Newhan complex	14.7	Severe: poor filter, slope	None
CH*	Carteret sand	4.4	Severe: flooding, ponding, poor filter	Frequent
CL*	Carteret sand, low	0.6	Severe: flooding, ponding, poor filter	Frequent
Co	Corolla fine sand	18.0	Severe: wetness, poor filter	Rare
Cu	Corolla-Urban land complex	14.5	Severe: wetness, poor filter	Rare
Du*	Duckston fine sand	9.4	Severe: flooding, wetness, poor filter	Frequent
Fr	Fripp fine sand	5.8	Severe: poor filter, slope	None
Nc	Newhan-Corolla complex	112.8	Severe: poor filter, slope	None
Ne	Newhan-Urban land complex	76.8	Severe: poor filter	None
Nh	Newhan fine sand	51.0	Severe: poor filter, slope	None

*Indicates soil series that are made up of hydric soils.

Source: [Soil Survey of Carteret County, North Carolina](#).

f. *Water Supply*

Water resources are extremely abundant in and around Indian Beach. For many years, locals in the area have relied on this resource as an economic tool through fisheries and tourism. The

waters surrounding Indian Beach are comprised of the estuarine waters of the Bogue Sound to the north and the Atlantic Ocean to the south. Water quality in the area will be discussed in further detail later in the plan.

Indian Beach is currently served by a central water line. Water service is provided from the mainland by two separate companies serving the eastern and western portions of the town's jurisdiction. Groundwater is very plentiful throughout the county, and this water source resides near the surface. Thousands of feet of sedimentary deposits underlie the Bogue Banks area. The upper part of these deposits contains aquifers that supply water for domestic use. The surficial aquifer ranges from near the surface to a maximum of about 75 feet.

g. *Fragile Areas and Areas of Environmental Concern*

In coastal North Carolina, fragile areas are considered to include coastal wetlands, ocean beaches and shorelines, estuarine waters and shorelines, public trust waters, complex natural areas, areas sustaining remnant species, unique geological formations, registered natural landmarks, swamps, prime wildlife habitats, areas of excessive slope, areas of excessive erosion, scenic points, archaeological sites, historical sites, and 404 wetlands. While not identified as fragile areas in the 15A NCAC 7H use standards, maritime forests and outstanding resource waters (ORWs) should also be considered fragile areas. Indian Beach's 15A NCAC 7H Areas of Environmental Concern (AECs) include: estuarine waters, estuarine shorelines, public trust areas, coastal wetlands, ocean beaches and shorelines, areas of excessive erosion, natural resource fragile areas (including protected lands and significant natural heritage 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. Indian Beach's entire jurisdiction falls adjacent to the estuarine waters of the Pamlico Sound. Due to the urban development occurring within and adjacent to Indian Beach, 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. A majority of the western portion of the Indian Beach corporate limits falls adjacent to an ORW; however, in the eastern portion of town this is not the case. Development along estuarine shorelines can exacerbate water quality problems within estuarine waters, and expedite the threats of shorefront erosion and flooding.

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 Indian Beach. 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.

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 Indian Beach that falls immediately adjacent to waters of both the Pamlico Sound and Atlantic Ocean are considered public trust areas.

iii. Coastal Wetlands

Coastal wetlands include salt marshes, bottomland hardwood swamps, fresh marshes, seagrass beds, mangrove swamps, and shrubby depressions known in the southeast United States as "pocosins." NOAA defines coastal wetlands as all wetlands in coastal watersheds, i.e., watersheds that drain to the ocean or to an estuary or bay. Wetlands are part

of the overall estuarine environment discussed above. Although many people think of tidal saltmarshes when they hear the term coastal wetlands, there are many wetlands in coastal areas that are neither tidal nor salty.

Like all wetlands, coastal wetlands are sometimes easy to recognize, but also can be very difficult to distinguish from uplands. Coastal wetlands can occur in areas with standing water, tidal water, or only periodic or seasonal flooding. Since many coastal environments are shifting and changing due to erosion or human alteration, coastal wetlands are very dynamic places. Coastal wetlands are sensitive to not only natural processes, but also to human alterations to water sources and the surrounding landscape.

Within Indian Beach, there are seven different types of wetlands covering 30.8 acres or 9% of the town's corporate limits. The location of these wetlands is included on Map 6, and a summary of the wetland types and their respective acreage is provided in Table 19. All wetlands within Indian Beach fall under the jurisdiction of Section 404 of the Clean Water Act. Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. The basic premise of the program is that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded.

Table 19: Town of Indian Beach
Coastal Wetlands

Wetland Type	Acres	% of Total Town Acres
Cleared Pine Flat	0.07	0.02%
Cutover Maritime Forest	0.03	0.01%
Cutover Pine Flat	0.12	0.04%
Estuarine Shrub/Scrub	4.18	1.28%
Maritime Forest	10.92	3.35%
Pine Flat	14.40	4.42%
Salt/Brackish Marsh	1.14	0.35%
Total	30.86	9.47%

Source: North Carolina GIA and National Wetlands Inventory.

MAP 6 - WETLANDS

iv. Ocean Beaches and Shorelines

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 Indian Beach is an ocean beach. Indian Beach contains approximately 1.7 miles of ocean erodible areas and high hazard flood areas, but no unvegetated beach area (a dynamic area that is subject to rapid unpredictable landform change from wind and wave action). Unvegetated beach areas are only designated following detailed studies by the Coastal Resources Commission. There are no inlet hazard areas in Indian Beach.

v. Areas of Excessive Erosion

The ocean shoreline along Bogue Banks is extremely vulnerable to erosion associated with coastal storm events. Indian Beach has worked over the years to establish a beach renourishment program to address this issue. The town funded a renourishment project for the eastern and western portions of the Indian Beach corporate limits in FY2004. This project addressed the current demand for sand replenishment, but the length of time that this effort will remain without further treatment is unknown. In order to ensure that a comprehensive renourishment program is in place, the town took the steps required to comply with the US Army Corps of Engineers Section 933 Beach Renourishment Program. The Section 933 Program is a cost share program intended to assist coastal communities in funding the effort to renourish eroding coastlines.

vi. Natural Resource Fragile Areas (including protected lands 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.

The North Carolina Natural Heritage Program of the Division of Parks and Recreation works to identify and facilitate protection of the most ecologically significant natural areas remaining in the state. Natural areas may be identified because they provide important

habitat for rare species or because they contain outstanding examples of the rich natural diversity of this state.

There are three areas that should be noted within Indian Beach. Two significant natural heritage areas exist within the town including: Indian Beach Maritime Forest, and a portion of the Salter Path Maritime Forest. Additionally, the Salter Path Ballpark is considered a protected land by the State of North Carolina. Only a very small portion of this property falls within the town's jurisdiction. There are no known endangered plant or animal species within Indian Beach's jurisdiction. The natural heritage areas, as well as protected lands falling within Indian Beach, are shown on Map 7. A summary of the acreage of these areas is provided in Table 20.

Table 20: Town of Indian Beach
Significant Natural Heritage Areas and Protected Lands

Area	Acre	% of Total Town Acres
Indian Beach Maritime Forest*	47.4	14.54%
Salter Path Maritime Forest*	59.7	18.30%
Salter Path Ball Park**	0.1	0.03%
Total	107.2	32.87%

*Delineates areas that are significant natural heritage areas.

**Delineates areas that are defined protected lands.

Source: North Carolina GIA and North Carolina Natural Heritage Program.

vii. Outstanding Resource Waters

The western portion of Indian Beach is immediately adjacent to a designated outstanding resource water (ORW). The portion of the Pamlico Sound lying off the northern edge of western Indian Beach holds this classification. Outstanding resource waters are defined as unique and special surface waters which are unimpacted by pollution and have some outstanding resource values. The overall water quality of waterbodies adjacent to Indian Beach will be discussed later in the plan.

MAP 7 - NATURAL HERITAGE AREAS

h. Areas of Resource Potential

i. Regionally Significant Parks

There are no regionally significant parks within the corporate limits of Indian Beach. The eastern portion of Indian Beach is in close proximity to the Theodore Roosevelt Natural Area. The Theodore Roosevelt Natural Area is a 265-acre nature preserve adjacent to the NC Aquarium located in Pine Knoll Shores, and showcases the Barrier Island ecosystem including maritime forest and marsh habitats. The marsh habitat is a rich area for shellfish and abundant birdlife. The Theodore Roosevelt Natural Area also extends along the oceanfront portion of Salter Path which lies between the eastern and western sides of Indian Beach.

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. The only marina facility within Indian Beach is located within Sea Isle Plantation in the eastern portion of Indian Beach. This marina is a private facility and is used only by residents of the subdivision.

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 Indian Beach.

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 Indian Beach’s jurisdiction.

iv. Channel Maintenance

There are navigable channels throughout the Pamlico Sound adjacent to Indian Beach. These channels are marked and periodically dredged. At lower tides navigation into and out of shoreline within Indian Beach must go through these marked channels. The waters of the Pamlico Sound are generally very shallow even at high tides; therefore, these marked navigation channels are essential for recreational boaters and commercial fisherman.

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 21: NC Division of Water Quality
Water Body Classifications

PRIMARY FRESHWATER AND SALTWATER CLASSIFICATIONS*	
<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.

Table 21 (continued)

SUPPLEMENTAL CLASSIFICATIONS	
<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.
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 three different waterbodies or segments immediately adjacent to Indian Beach's jurisdiction. Table 22 provides a listing of all waterbodies that are classified by the NC Division of Water Quality. Also included are their subbasins and assigned classification. Map 8 identifies the location of these waterbodies.

Table 22: Town of Indian Beach
Alphabetical Listing of Waterbodies

Name of Stream	Description	Stream Index Number	Class
Bogue Sound (Including Intracoastal Waterway)	From Bogue Inlet (from a line running from the eastern mouth of Bogue Inlet to SR 1117 on the mainland) to a line across Bogue Sound from the southwest side of mouth of Gales Creek to Rock Point	20-36-(0.5)	SA; ORW
Bogue Sound (Including Intracoastal Waterway to Beaufort Inlet)	From a line across Bogue Sound from the southwest side of the mouth of Gales Creek to Rock Point to Beaufort	20-36-(8.5)	SA; HQW
Atlantic Ocean	The waters of the Atlantic Ocean contiguous to that portion of the White Oak River Basin that extends from the northern boundary of White Oak River Basin (southwest side of Drum Inlet) to the southern boundary of White Oak River Basin (northern boundary of Cape Fear River Basin) at the southwest side of the mouth of Goose Bay in the Intracoastal Waterway.	99-(4)	SB

Source: NC Division of Water Quality.

MAP 8 - WATER QUALITY

vi. Primary Nursery Areas, Anadromous Fish Spawning Areas, Submerged Aquatic Vegetation

The NC Marine Fisheries Commission (MFC) defines anadromous fish spawning areas as those areas where evidence of spawning of anadromous fish has been documented by direct observation of spawning, capture of running ripe females, or capture of eggs or early larvae as established under NCAC 15A 31.0101 (20) C. Anadromous fish nursery areas are those areas in the riverine and estuarine systems utilized by post-larval and later juvenile anadromous fish as established under NCAC 15A 31.0101 (20) D. The primary fish nursery areas and anadromous fish spawning areas adjacent to Indian Beach are shown on Map 8. The two primary nursery areas in close proximity to Indian Beach are located across the Pamlico Sound within Broad Creek and Gales Creek. The only anadromous fish spawning areas close to Indian Beach fall within the White Oak River, Pettiford Creek, and the Newport River. There are no recorded instances of submerged aquatic vegetation within close proximity to Indian Beach or any other portions of Bogue Banks.

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 23: Town of Indian Beach
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 town with a model that breaks the town's jurisdiction into one-acre cells. Breaking the town's planning jurisdiction into these one-acre cells distorts the outcome of this analysis, mainly because a majority of the lots within the town 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 Indian Beach, a different approach was taken.

Table 23 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 Indian Beach's jurisdiction. 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 9 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. The following table provides a summary of the land area within Indian Beach that falls within each of the defined classes.

Table 24: Town of Indian Beach
Environmental Composite Acreage

	Acres	% of Total
Class I	58.5	18.1%
Class II	238.9	74.1%
Class III	25.1	7.8%
Total	322.5	100.0%

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

3. Environmental Conditions

a. *White Oak River Basin*

The White Oak River Basinwide Water Quality Plan was adopted by the Division of Water Quality in 1997 and updated in November 2001. 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;
- ❖ Develop appropriate management strategies to protect and restore water quality;
- ❖ Assure equitable distribution of waste assimilative capacity for dischargers; and
- ❖ Improve public awareness and involvement in the management of the state's surface waters.

MAP 9 - ENVIRONMENTAL COMPOSITE MAP

As existing and future land uses are considered within Indian Beach, these goals should be kept in mind. Within the White Oak River Basin, Indian Beach is located entirely within subbasin 03-05-03. The White Oak River Basin and subbasin boundaries are shown on Map 10. It should be noted that there is currently a designated outstanding resource water located immediately adjacent to the Indian Beach planning jurisdiction. This waterbody includes the entire western portion of Bogue Sound.

The White Oak River Basin lies entirely within the southern coastal plain. The basin includes four separate river systems: the New River and its tributaries in the southwestern section; the White Oak River and its tributaries; the Newport River and its tributaries; and the North River in the eastern section. The basin also includes Bogue and Core Sounds. The corporate limits of Indian Beach is bordered to the north by Bogue Sound. The White Oak River Basin encompasses all or portions of four counties and sixteen municipalities.

Table 25 provides population densities and land area summaries for the White Oak River Basin. In using this data, it should be noted that some of the population figures are estimates because the census block group boundaries do not generally coincide with subbasin boundaries. The census data are collected within boundaries such as counties and municipalities. By contrast, the subbasin lines are drawn along natural drainage divides separating watersheds. Therefore, where a census block group straddles a subbasin line, the percentage of the population that is located in the subbasin is estimated, assuming that population density is evenly distributed throughout a census block group. This is not always the case; however, the level of error associated with this method is not expected to be significant for the purposes of this document. It is also important to note that the census block groups change every ten years so comparisons between years must be considered approximate. Subbasin 03-05-03 is overestimated, as there are very few residents in this subbasin.

Table 25: White Oak River Basin
Population Densities (1970, 1980, 1990) and Land Area Summaries

Subbasin	Population (Number of Persons)			Population Density (Persons/Sq. Mile)			Land and Water Areas			
	1970	1980	1990	1970	1980	1990	Total Land & Water (Acres)	Water Area (Sq.Miles)	Land Area (Sq.Miles)	Land Area (Sq.Miles)
03-05-01	27,748	30,640	39,388	86	95	122	224,923	351	29	322
03-05-02	58,060	63,497	84,359	138	152	201	295,882	462	43	419
03-05-03	6,858	8,917	11,404	41	53	68	146,026	228	60	168
03-05-04	5,120	6,657	8,514	50	65	83	108,875	170	67	103
03-05-05	1,549	2,014	2,575	0	0	0	33,063	52	44	8
Totals	99,335	111,725	146,240	96	107	141	808,769	1,263	243	1,020

Source: NC Department of Environment and Natural Resources, Basinwide Water Quality Planning Division.

MAP 10 - RIVER BASINS/SUBBASINS

The following table provides a summary of registered animal operations within White Oak River subbasin 03-05-03. It should be noted that the only registered animal operations within this subbasin consist of swine production. Additionally, none of these facilities are located in close proximity to Indian Beach or Bogue Banks overall. These facilities are centrally located within the mainland portion of Carteret County.

Table 26: Subbasin 03-05-03
Registered Animal Operations

Subbasin	Swine*		
	No. of Facilities	No. of Animals	Total Steady State Live Weight**
03-05-03	2	3,375	542,655

*There are no other registered animal operations located within subbasin 03-05-03.

**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 White Oak River Basinwide Water Quality Management Plan.

b. Subbasin 03-05-03 (Hydrologic Unit 03020106)

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 White Oak River Basin is made up of two hydrologic areas referred to as hydrologic units. One of these units includes the entire White Oak River Basin, except the New River watershed area, which is assigned to the other unit. 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. Table 27 compares the two systems. The White Oak River Basin is subdivided by DWQ into five subbasins.

Table 27: White Oak River Basin
Hydrologic Subdivisions

Watershed Name and Major Tributaries	USGS 8-digit Hydrologic Units	DWQ Subbasin 6-digit Codes
New River	03030001	03-05-02
Bogue-Core Sounds	03020106	03-05-01
White Oak River		03-05-01
Newport River		03-05-03
North River		03-05-04
Jarrett Bay and Nelson Bay		03-05-04
Core Sound and Back Sound		03-05-05

Sources: NC Division of Water Quality White Oak River Basinwide Water Quality Management Plan, and US Geological Survey.

Water quality within subbasin 03-05-03 is generally good. Some problems do exist within the subbasin, which can mainly be attributed to increased development along Bogue Banks, as well as the northern shore of the Bogue Sound. Subbasin 03-05-03 lies in the center of Carteret County, extending from the U.S. Forest Service's Croatan National Forest to the Town of Beaufort and the Beaufort Inlet. Most of this subbasin is comprised of the estuarine waters of Bogue and Core Sounds. The only source of freshwater throughout the subbasin is the Newport River.

Most of the development within the subbasin is occurring within Morehead City, Atlantic Beach, Beaufort, Cape Carteret, Emerald Isle, and Newport. There are only two permitted major dischargers into this subbasin: the Newport Wastewater Treatment Plant (WWTP) discharging into the Newport River, and the Morehead City WWTP which discharges into Calico Creek. The following table summarizes the characteristics of subbasin 03-05-03.

Table 28. Characteristics of Subbasin 03-05-03

Land and Water Area (sq. miles):	
Total Area	228
Land Area	168
Water Area	60
Land Cover (%):	
Forest/Wetland	59%
Surface Water	26.5%
Urban	4%
Cultivated Crop	6.5%
Pasture/Managed Herbaceous	4%

Table 28 (continued)

Water Area:	
Stream Miles	18
Estuarine Acres	34,723
Coastal Miles	25
Shellfish Harvest Acres	34,146

Source: NC Division of Water Quality White Oak River Basinwide Water Quality Management Plan.

There are two Outstanding Resource Waters within subbasin 03-05-03. A portion of one of these designated water bodies is located within the corporate limits of Indian Beach. The two ORW water bodies include the swamp and salt waters of the Theodore Roosevelt Natural Area and the western portion of the Bogue Sound, which is adjacent to the northern shoreline of Indian Beach.

Within subbasin 03-05-03, there approximately 25,150 acres of estuarine bottom. Of this acreage, 3,749 acres, or 14.9%, are currently closed for shellfishing. A majority of this acreage is located within or adjacent to the Newport River and Beaufort Inlet. The Department of Environmental Health lists three primary reasons for these closures:

- ❖ Development - Salter Path, Pine Knoll Shores, Atlantic Beach, Morehead City, and Beaufort;
- ❖ Fecal coliform bacterial contamination in freshwater runoff – Jumping Run, Spooner Creek, Wading Creek, Peletier Creek, Calico Creek, Gable Creek, Russell Creek, Upper Harlowe Creek, and the Upper Newport River;
- ❖ Marinas – shellfishing is prohibited around a number of marinas scattered throughout the subbasin.

There is a one portion of Bogue Sound immediately adjacent to Indian Beach that is currently closed for shellfishing. This closed area runs from Rock Point approximately one mile eastward toward the eastern portion of Indian Beach. Additionally, the waters of the Bogue Sound located off the shoreline of Salter Path are currently closed for shellfishing. It should be noted that there are currently 1,200 acres within the subbasin that are conditionally approved to re-open for shellfishing. These areas include: Core Creek, lower Harlowe Creek, and the northern shoreline of Bogue Sound from Gales Creek to Gull Harbor Marina. This is a sign that water quality within the Bogue Sound portion of the subbasin may be improving. Additionally, the Division of Marine Fisheries has classified waters in

subbasin 03-05-03 as having fair to good commercial fisheries value. It should also be noted that all waters in this subbasin are currently Partially Supporting (PS) on an evaluated basis for the fish consumption use support category. This is in response to a concern over fish tissue samples taken from bowfin, as well as mercury levels in king mackerel. The consumption advisory currently only applies to these two fish species.

c. *Water Treatment Facilities*

Communities along Bogue Banks have been concerned with wastewater treatment and a long term strategy for dealing with wastewater for many years. According to the Carteret County Department of Environmental Health (DEH), it is anticipated that Indian Beach will continue to rely on private septic tank systems and package treatment plants. Reliance on these systems has slowed growth and redevelopment of large multi-family and hotel complexes due to the significant expense associated with package treatment facilities. There are currently four package treatment plants located within the jurisdiction of Indian Beach. These systems vary in age and require weekly maintenance. All facilities have operators who are responsible for maintenance and upkeep of the systems. Additionally, the county health department inspects the systems annually to ensure that there are no problems or deficiencies that need to be addressed. As these facilities age, the health department requires that upgrades and/or replacement systems be put in place.

There are a large number of private septic tank systems located throughout Indian Beach. Although the soil survey reports that soils within Indian Beach are poorly suited for septic tank systems, the existing systems appear to be in good working order. According to the Carteret County DEH, there are no significant problems with private septic tank systems within Indian Beach. One concern within Indian Beach is the density of development. As redevelopment continues throughout the town's jurisdiction, many times single-family homes are being converted to multi-family units. This could lead to problems associated with the increased volume of waste generated through higher density development. These new developments are using new technologies when installing septic tanks. The new systems require a much smaller drain field than the older systems. Although this new technology is more efficient, the effectiveness of these systems has not yet been proven, and therefore, these system are being closely monitored by the county's health department. Future sewer service needs will be discussed further in the future demands section of the plan. This discussion will involve a review of new septic tank technologies.

Carteret County is currently working on a comprehensive database that will locate and document problems experienced with septic systems throughout the county, including Indian Beach. Once completed, this system will allow for the county to identify specific areas where there is a concentration of septic tank problems, and can address these problems before they have a significant effect on water quality. At this time, however, there do not seem to be any problems of note with respect to wastewater treatment facilities in Indian Beach. Carteret County DEH reports that surface runoff, and the contaminants associated with it, have had a much greater impact on water quality in Bogue Sound than septic tank systems or package treatment plants. One of the biggest problems affecting water quality is the runoff of waste associated with pets and wildlife along Bogue Banks and the northern shore of Bogue Sound. Additionally, there are no public health hazards currently within the jurisdiction of Indian Beach.

d. Natural Hazards

Indian Beach 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 town 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 23). 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 Town of Indian Beach, 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 town'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 29 provides the town's acreage that falls within the AE and VE flood zones by land use. According to this table, 630 or 91.4% of the housing units within Indian Beach fall within or are immediately adjacent to a flood hazard area. This includes both single- and multi-family housing units.

Table 29: Town of Indian Beach
Land Use Acreage within Flood Hazard Areas

Land Use	Parcels	% of Total Town Parcels	Acreage by Land Use	% of Total Town Acreage
Campground	7	1.0%	15.5	8.2%
Commercial	4	0.5%	2.9	1.5%
Common Area	16	2.2%	29.9	15.8%
Multi-Family Residential	483	66.0%	15.9	8.4%
Mobile Home Park	75	10.2%	42.7	22.6%
Single-Family Residential	72	9.8%	37.9	20.1%
Vacant	75	10.2%	44.2	23.4%
Total	732	100.0%	189.0	100.0%

Sources: Holland Consulting Planners, Inc., Carteret County GIS, and NC Center for Geographic Analysis.

e. *Natural Resources*

Indian Beach 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 32 of the plan and includes maps showing the locations of all natural resources and areas of environmental concern within the jurisdiction of Indian Beach.

C. ANALYSIS OF LAND USE AND DEVELOPMENT

1. Introduction

a. *Existing Land Use Map*

In order to address future development within the Town of Indian Beach it is necessary to establish a snapshot of what is currently developed within the town'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 town's planning jurisdiction. In the case of Indian Beach this process will serve two main purposes: identifying key conflicts in land use and addressing the issue of build out and the time frame within which this may occur. This review will provide a solid foundation for decisions about future land use and policy development.

A detailed land use survey of Indian Beach was conducted for the entire planning jurisdiction of Indian Beach. This survey was completed through the use of aerial photography and on-site windshield surveys. The existing land use map was then submitted to the Land Use Planning Committee for review to address any errors that exist. Land use within Indian Beach was broken into the following land use categories: campground, common area, commercial, multi-family, mobile home park, office and institutional, single-family residential, utility, and vacant. A large number of modular homes and recreational vehicles are located within Indian Beach.

Because of the number of manufactured homes and recreational vehicles it was important to distinguish between campgrounds and mobile home parks. The mobile home parks within the town are generally comprised of manufactured homes while several large campgrounds within town contain a large number of recreational vehicles. Common areas were given a separate land use because there is quite a bit of acreage within the town that is dedicated to parking, recreation, and beach access for housing developments. This includes not only three large multi-family complexes within town, but also the planned development district located in the eastern portion of town.

Map 11 provides an overview of existing land use within Indian Beach based on the land use categories listed above. Table 30 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 town's total jurisdiction as well as for the eastern and western portions of town.

Table 30: Town of Indian Beach
Existing Land Use

Land Use	<u>West Indian Beach</u>		<u>East Indian Beach</u>		<u>Indian Beach Total</u>		
	Acreage	% of Total	Acreage	% of Total	Acreage	% of Total	Parcel Count
Campground	34.4	16.5%	0.0	0.0%	34.4	10.5%	8
Common Area	24.5	11.8%	19.4	16.2%	43.9	10.7%	17
Commercial	8.8	4.2%	0.0	0.0%	8.8	2.7%	6
Multi-Family	22.4	10.7%	1.2	1.0%	23.6	9.9%	484
Mobile Home Park	70.6	33.8%	0.0	0.0%	70.6	21.5%	107
Office and Institutional	0.9	0.5%	0.0	0.0%	0.9	0.3%	4
Single-Family Residential	16.1	7.7%	40.0	33.4%	56.1	17.1%	95
Utility	0.0	0.0%	6.2	5.2%	6.2	1.9%	3
Vacant	30.9	14.8%	52.9	44.2%	83.8	25.5%	110
Total	208.6	100.0%	119.7	100.0%	328.3	100.0%	834

Source: Carteret County GIS and Holland Consulting Planners, Inc.

MAP 11 - EXISTING LAND USE

b. *Land Use Conflicts*

Land use conflicts often exist within a town'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 development of land not suited for a particular land use. The rate of development within Indian Beach has been very rapid dating back to the early 1980's. Because of this demand several problems have arisen with respect to land use. These issues can be summarized as follows:

Encroachment of residential and urban type uses into forested areas. The maritime forest areas within Indian Beach have diminished over the years to make way for the increased residential and multi-family developments that now exist. The forest areas cannot be replaced; however, measures can be taken to account for the impact on water quality that this development has had. Increased development over the past twenty years is having a profound impact on water quality within Bogue Sound.

Residential Development within Flood Hazard Areas. Indian Beach lies on a barrier island and is extremely vulnerable to coastal flooding associated with tropical storm events. Indian Beach's vulnerability to flood hazards is discussed in detail on page 23. As with other barrier island communities this fact has not slowed development. Indian Beach is somewhat unique in that approximately 67% of the town's housing stock is comprised of manufactured homes. Additionally, there are four large campgrounds located within the town's jurisdiction that house year round units, primarily consisting of travel trailers. The town recognizes the need to address this issue, and will discuss this issue further in the policy development portion of the plan. The town aims to ensure the safety of all property within the town's jurisdiction including the manufactured housing which comprises a substantial portion of the town's seasonal housing stock. All manufactured and stick built structures are subject to requirements outlined in the town's Flood Damage Prevention Ordinance, as well as the North Carolina State Building Code.

High density development in areas with soils having severe septic tank limitations. There is currently no central sewer system serving the municipalities along Bogue Banks. Sewage treatment within Indian Beach is primarily handled either through individual septic tank systems or package treatment plants. Use of these facilities is a concern for the town. The reliance on package treatment plants for multi-family developments is a concern for the town. This issue has been an impediment to new construction and redevelopment within the town's jurisdiction. This issue was identified as a key concern for the town to address in the context of this document. Because all soils within the town's jurisdiction are considered unsuitable for septic tank installation, this has been a topic of debate for all

municipalities along Bogue Banks for many years. It is an issue that will be discussed in more detail within the community facilities portion of this plan.

c. *Land Use Trends*

The Town of Indian Beach is primarily a seasonal destination. This is evidenced by the demographic information presented earlier in the plan. The town has experienced extremely rapid growth dating back to 1980. Between the years of 1980 and 1994, approximately 85% of the town's housing structures were developed. There is very little land still available within Indian Beach for development. All land that does remain undeveloped has already been platted. Out of the town's total tax parcel inventory, approximately 13% (110 parcels) remain vacant. Of the 113 remaining vacant parcels, 105 are located within the Sea Isle Plantation Planned Development District. This area is a planned subdivision that consists entirely of stick built single-family homes. A majority of the lots that remain vacant have been sold and will eventually be developed as additional single-family homes. It is anticipated that some portions of this development will remain as open space.

Of the remaining eight vacant lots scattered throughout the town's jurisdiction, four are platted oceanfront lots. These lots will be developed as single-family homes. There is also one small lot located on the north side of Salter Path Road toward the western end of the town's corporate limits, which is also zoned for single-family residential development. Two large undeveloped parcels are located on the northern side of Salter Path Road in the western end of Indian Beach. This property is approximately 26 acres in size, and is zoned as a Planned Development District. The town expects this property to eventually be developed as either a single-family or multi-family residential development.

The only other vacant parcel within the town's jurisdiction is an abandoned commercial site on the northern side of Salter Path Road. This property is zoned as commercial, and the lot size will not permit much flexibility in the use of this property. It is anticipated that this will remain a commercial use. The town will eventually face the issue of redevelopment with respect to some of the manufactured home parks within the town's jurisdiction. It is not anticipated that this will occur during the planning period, however, this will be addressed in the policy statement section of this plan. The existing land use map (Map 11) provides the locations of the vacant parcels discussed in this section.

2. Historical, Cultural, and Scenic Areas

There are several Protected Lands and state-defined Natural Heritage areas that fall within the planning jurisdiction of Indian Beach. These areas have been thoroughly discussed in the Natural Systems Analysis portion of this plan, beginning on page 22. All fragile areas are discussed and maps detailing the locations of these areas are provided.

3. Estimates of Future Land Demands

Developing a land use demand forecast for the Town of Indian Beach is a very difficult task. There are only two undeveloped parcels within the town's jurisdiction that have not been platted for a particular type of development. These two parcels lying on the northern side of Salter Path Road, as discussed earlier have been zoned as a planned development district. This will result in some form of residential development. What is not clear is the density that will result from this development. All of the remaining vacant land within the town will be developed as single-family residential with the exception of one commercial property north of Salter Path Road.

Peak seasonal population estimates have been established within the context of this plan. In order to establish a general estimate of how much residential development will be required to accommodate the seasonal population increase, these estimates will be utilized. Land use demand estimates for the permanent population will not be established because the housing stock currently within Indian Beach will be adequate to support this population for many years. The unique issue present in a community such as Indian Beach is that the seasonal population will increase in relation to development. If 300 condominium units are constructed, the town's peak population will likely increase in response to this development. There is no methodology available to foresee how rapidly this development will occur. Because of this fact, estimates of land use demand will be based on estimated seasonal population growth.

Based on the estimates established on page 20 of this document, the peak seasonal population of Indian Beach in the year 2000 was 7,778 persons. This figure was then used to calculate a figure for acres needed per person. The total residential acres were divided by this peak population estimate to establish an acres per person estimate of 0.3 acres. This estimate of 0.3 persons per acre was then used to calculate the residential acreage demand needed to accommodate the increase in peak seasonal population through the year 2020. The results of these estimates are provided in Table 31. Based on these estimates through the year 2020, 32.6 acres of the town's 83 vacant acres should be developed as residential to accommodate the estimated increase in seasonal population.

Table 31: Town of Indian Beach
Estimate of Land Use Demand

	2000 - 2005	2005 - 2010	2010 - 2020	Total
Peak seasonal population growth	311	324	454	45.9%
Residential acres per person required	0.03	0.03	0.03	N/A
Total residential acres required	9.3	9.7	13.6	32.6

Source: Holland Consulting Planners, Inc.

D. ANALYSIS OF EXISTING COMMUNITY FACILITIES/SERVICES

1. Transportation

There is only one major thoroughfare running through the corporate limits of Indian Beach, NC Highway 58. This thoroughfare is a two-lane road with a shoulder lane available for pedestrians and cyclists. The remaining roads within the jurisdiction are considered by North Carolina Department of Transportation (NCDOT) to be collector and local access streets providing access to housing developments and multi-family complexes. The NCDOT performs maintenance on all public right-of-ways within the town. According to the NCDOT, there are approximately 8.7 miles of roadway located within the corporate limits of Indian Beach. The NCDOT performs average daily traffic counts (ADT) on an annual basis. The closest ADT station to Indian Beach is within Salter Path. According to NCDOT, the average daily traffic count within Salter Path is 6,500.

2. Health Care

Citizens and visitors of Indian Beach have access to a wide variety of local physicians, as well as regional care facilities. Along Bogue Banks, there are two emergency medical clinics and four dentist offices. The nearest urgent care facility is Carteret County General Hospital. The hospital has 117 beds with an average of 87 inpatients each day and performs over 410 surgeries each month. In addition, over 4,000 outpatient tests or treatments are provided each month. Services provided by the hospital include:

- ❖ Cancer care center
- ❖ Outpatient clinics for neurology and blood transfusions
- ❖ Nuclear medicine
- ❖ CT Scanning
- ❖ Mobile lithotripsy

- ❖ Laser surgery
- ❖ Laparoscopic surgery
- ❖ Maternity facilities
- ❖ Urgent and emergency care
- ❖ Extended care facilities
- ❖ Home health

For services not provided at Carteret County General Hospital, citizens of Indian Beach also have regional access to both Craven County Regional Medical Center, located in New Bern, and University Health Systems of Eastern North Carolina located in Pitt County. The Pitt County facility is located approximately 95 miles from Indian Beach, and provides service to 29 counties throughout eastern North Carolina. University Health Systems includes Pitt County Memorial Hospital in Greenville, NC, community hospitals, physician practices, home health, and other independently operated health services. University Health Systems is affiliated with the Brody School of Medicine at East Carolina University.

3. Law Enforcement

The Town of Indian Beach Police Department is located within the town's municipal building. The Town of Indian Beach Police Department provides law enforcement services for all areas of town. The staff consists of four officers, including the Police Chief. At least one officer is on duty at all times. The full-time staff is supported by three auxiliary officers. Five patrol cars are maintained. Based on National Standards, a community would normally provide two staff police personnel per 1,000 persons in population. The town has a 2000 population of 95, and therefore exceeds the two per 1,000 population ratio.

4. Fire/Rescue Services

The Town of Indian Beach relies on the Salter Path Volunteer Fire Department for fire protection. The Salter Path Volunteer Fire Department is located immediately adjacent to the town's municipal building. The department is comprised solely of volunteers. Emergency response calls within the town's jurisdiction are forwarded to the department from the Carteret County Emergency Response Call Center. Staffing for the department consists of a fire chief and 21 total volunteers. Equipment utilized by the volunteer fire department includes: one ladder truck, four additional support trucks, and two ambulances. The Salter Path Volunteer Fire Department has an ongoing mutual aid agreement with the Atlantic Beach, Pine Knoll Shores, and Emerald Isle municipal fire departments.

Indian Beach currently has an Insurance Services Office rating of 6. Many insurance companies use the ISO rating as one factor in setting the amount of premium that is paid on a particular property. Ratings of departments go from a Class 1 (the best) to Class 10 (unprotected).

5. Administration

The Town of Indian Beach is governed by a Mayor-Commissioner form of government. These include the administration department, comprised solely of the town clerk, and the police department which employs four full-time officers. The town currently has a mayor, as well as four active Town Commissioners. In addition to the acting board, the town also has a Planning Board and a Board of Adjustment. Each of these boards has five members, and these members are appointed by the Town Board of Commissioners.

6. Water System

Indian Beach does not operate a municipal water system. Water service to the town is provided by Carolina Water Service and Bogue Banks Water Service. The eastern portion of Indian Beach receives their water from Carolina Water, while the western portion of town is served by Bogue Banks Water. The locations of all water lines within Indian Beach are shown on Map 12. It is difficult to quantify the amount of water used by the Town of Indian Beach because Bogue Banks and Carolina Water report usage to NC Department of Environment and Natural Resources for their entire service area. For Bogue Banks Water Service, this includes Salter Path and Emerald Isle as well as Indian Beach. Carolina Water Service provides water to eastern Indian Beach, as well as Pine Knoll Shores.

The water supplied to Indian Beach is gathered from wells, which are tapped into the Castle Hayne Aquifer running beneath the mainland portions of Carteret County. The Castle Hayne Aquifer, underlying the eastern half of the North Carolina coastal plain, is the most productive aquifer in the state and the primary water source for the town. 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.

MAP 12 - WATER LINES

7. Sewer System

The Town of Indian Beach relies on a combination of private septic tank systems and package treatment plants for wastewater treatment. A majority of single-family homes, as well as manufactured homes, utilize private septic tank systems. In several of the manufactured home communities, several units will share a single septic tank system. While these systems are suitable for moderate density residential development, these septic tank systems are not suitable for the high density developments that exist or are being developed within the corporate limits of Indian Beach.

Within Indian Beach, privately-owned central collection, treatment, and disposal systems are being utilized by high density and multi-family developments. These systems consist of mechanical package plants for wastewater treatment with land disposal of the effluent accomplished through nitrification line, rotary distributors, or low pressure disposal fields. These privately-operated package treatment plants are permitted and regulated by the Carteret County Department of Environmental Health (DEH). Table 32 provides a listing of all package treatment plants within Indian Beach, including their capacity and condition. The information regarding the condition of the plants was provided by Carteret County DEH.

Table 32: Town of Indian Beach
Package Treatment and Disposal Systems

Facility	Capacity (GPD)	Operator	Type
Ocean Glen/Ocean Bay	32,500	Kevin Mullineaux	Rotor Fields
Sea Isle Plantation	40,000	Dan Fortin	Rotor Fields
Windward Dunes	25,000	John Cunningham	Rotor Fields
Colony By The Sea	20,160	Joe Lawrence	Subsurface - LPP
Summerwinds	75,000	Joe Lawrence	Subsurface - LPP
Ocean Club	65,000	Joe Lawrence	Subsurface Drip

Source: Carteret County Department of Environmental Health.

As noted, the systems above are responsible for treating high density multi-family developments. Private septic tanks are relied upon for the treatment of waste from individual housing units including the substantial number of manufactured homes within Indian Beach. One concern of the County Health Department is that as redevelopment occurs higher density development will take place, and this will potentially create problems with respect to water treatment due to the lack of land available for utilization as a drain field. In order to address this issue many developers are moving toward new septic tank technologies. The new systems are supposed to extend the life of a drain field, can be used in poor soil conditions, takes less space than standard septic systems and is supposed to be better for the

environment. As redevelopment occurs within Indian Beach, it is anticipated that these new systems will be utilized. It is important that these systems are monitored closely to ensure that these systems are operating as expected.

8. Solid Waste

Solid waste trash removal within Indian Beach is contracted out to Waste Industries. Service is provided once per week on Tuesdays. Residents of Indian Beach are responsible for directly contacting Waste Industries to arrange establishment of an account for curb side trash service. All waste collected within Indian Beach is disposed of at the Carteret-Craven-Pamlico Tri-County Landfill. This three-county landfill was established in 1990, and is managed by the Coastal Regional Solid Waste Management Authority. It is projected that this facility has the capacity to support trash removal through 2010.

9. Schools

The school age population of Indian Beach is served by the Carteret County School System. All schools serving the area are located on the mainland of Carteret County. Bus service provides transportation to and from these schools on a daily basis. Table 33 provides a summary of the schools serving Indian Beach, along with some general statistics about those facilities. All schools have recreational facilities in place to serve students. The Boys and Girls Club of Carteret County was recently constructed immediately adjacent to Morehead City Primary School. This facility offers an after school program throughout the school year, as well as summer activities and programs.

Table 33: Town of Indian Beach
Educational Facilities

Facility	Enrollment	Staff/Teachers	Recreational Facilities
Morehead City Primary (PreK-3)	681	120	Playground, indoor gym
Morehead City Elementary (4-5)	361	45	Full size gym, multi-purpose room, playground, general open athletic field
Morehead City Middle (6-8)	582	66	Indoor gym, soccer field, softball field
West Carteret High (9-12)	1,198	134	Gym, athletic fields, track

Source: Carteret County Public School System.

Higher education is offered for Indian Beach citizens through Carteret Community College, located in Morehead City. The school offers more than 100 courses, and students can pursue programs leading to a certificate, diploma, or associate's degree. East Carolina University is a major four-year

university, and is part of the University of North Carolina system. The university is located in Greenville, North Carolina, roughly 110 miles from Indian Beach.

10. Recreation

The Town of Indian Beach does not own or operate any municipal park facilities. The town does, however, maintain several public beach access sites that provide the public with a place to traverse over the dune line to the beach. The town provides parking at several of these sites, but not all public beach access locations have parking available. Map 13 provides the location of all public beach access points within the Town of Indian Beach. Providing public beach access is a priority for the town, and will be addressed further within the policy statement section of the plan.

11. Electric Service

Electric service in Indian Beach is provided by the Carteret-Craven Electric Cooperative. This organization is one of 27 electric cooperatives throughout North Carolina. There are currently 2,051 customers within Indian Beach being served by the Carteret-Craven Electric Cooperative.

12. Telephone/Cable Service

Telephone service within Indian Beach is provided by Sprint, and cable television service is provided by Time Warner Cable.

13. Stormwater Management

a. Introduction

Stormwater is the water that flows over the land, roads, car parks, roofs, and gardens during rainfall. As stormwater flows over these surfaces, it carries with it pollutants such as oils, sediments, and nutrients. This polluted water washes into the stormwater drains or over impervious surfaces, which flow directly into creeks and bays. An increase in impervious surfaces such as roads and houses leads to a greater volume of stormwater quickly reaching the waterways. Stormwater pollution degrades water quality and habitats within urban waterways, impacting flora and fauna. It may also cause the closure of beaches and shellfishing areas due to high pollutant levels. 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. According to the Carteret County Health Department, the most significant problem with respect to pollutants in stormwater runoff is pet and animal waste.

MAP 13 - BEACH ACCESS POINTS

b. *Existing Drainage Problems*

The Town of Indian Beach does not operate a municipal stormwater system. There are several areas that experience drainage problems during periods of heavy rain, but storm drainage is not considered to be a substantial problem for the town. Map 14 shows the locations of stormwater problem areas within the town's corporate limits. Indian Beach has discussed addressing this issue through the installation of a comprehensive drainage system, however, at this time it is not anticipated that this will take place. At this time, stormwater drainage is not a significant enough problem to warrant construction of an infrastructure system to deal with the few problem areas that exist.

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 Indian Beach has been discussed in detail in the Natural Systems Analysis (page 22) and Environmental Conditions (page 47) sections of the plan. Indian Beach does not currently have a comprehensive stormwater management system, and as noted, does not have any intentions of establishing one at this time.

d. *Environmental Protection Agency (EPA) Regulations*

The 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). A 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 Town of Indian Beach is not required to meet the new EPA Phase II Stormwater Management Program regulations.

Indian Beach may be required to submit a stormwater management permit application under Phase III of the NPDES program. In order to address this requirement, Indian Beach is working with the other Bogue Banks communities (Emerald Isle, Atlantic Beach, Pine Knoll Shores) to develop a comprehensive stormwater management program that will comply with the Phase II rule as established by the Environmental Protection Agency.

MAP 14 - 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 between one and five 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 within the corporate limits of Indian Beach, 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 15). This map can be used as a foundation for the discussion and formation of town-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 15. There were no additions or adjustments to the default layer sets and weighting factors provided by the Division of Coastal Management to the town 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 town 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 34. Town of Indian Beach
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 15 - LAND SUITABILITY ANALYSIS

Overall, land in Indian Beach is moderately suitable for development. Table 35 provides a summary of land suitability acreage based on the results of the overlay analysis.

Table 35. Town of Indian Beach Acreage

Suitability	Acreage	% of Total
Least Suitable	25	6.6%
Low Suitability	50	13.3%
Medium Suitability	202	53.7%
High Suitability	99	26.3%
Total	376	100.0%

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

F. CURRENT PLANS, POLICIES, AND REGULATIONS

1. Introduction

The Town of Indian Beach has a comprehensive municipal code. This code governs a range of topics from issues related to development to day-to-day administration of the town. Indian Beach is governed by a Mayor-Commissioner form of government. There are currently four Commissioners who work in conjunction with the Mayor. Daily town operations are overseen by the Town Clerk. Town ordinances related to land development, although prepared and adopted by the Town Commissioners, are enforced through the Carteret County Planning and Inspections Department.

2. Zoning Ordinance

The current Town of Indian Beach Zoning Ordinance was adopted October 26, 1974. It contains the criteria for use of all land within the town along with requirements for land use, setback, different type uses, special requirements, etc. The town contracts with the county for enforcement of the ordinance.

Map 16 and Table 36 provide the location and acreage figures of all zoning districts within Indian Beach's planning jurisdiction. The two largest zoning districts within Indian Beach's planning jurisdiction are B-1 General Business and RR Residential Resort.

MAP 16 - ZONING CLASSIFICATION

Table 36: Town of Indian Beach
Acreages by Zoning District

Zoning District	Parcels	Acres	% of Total
General Business (B-1)	482	142.966	43.2%
Planned Development District (PDD)	194	162.689	49.1%
Single-Family Residential District (R-25)	17	12.476	3.8%
Residential Resort District (RR)	228	13.157	4.0%
Total	921	331.288	100.0%

Source: Holland Consulting Planners, Inc.

3. Subdivision Regulations

The Town of Indian Beach Subdivision Regulations were adopted on October 26, 1974. These regulations ensure that development within the corporate limits of Indian Beach will take place in an orderly fashion. The ordinance includes provisions for the coordination of streets within proposed subdivisions with existing or planned streets or with other public facilities; for the dedication or reservations of right-of-way easements for street and utility purposes; and for the distribution of population and traffic which shall avoid congestion and overcrowding, and which shall create conditions beneficial to or promotive of public health, safety, and the general welfare. Specifically, the regulations apply to the following conditions/circumstances:

- ❖ The combination or recombination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards of the town as stated in the subdivision regulations;
- ❖ The division of land into parcels greater than ten acres where no street right-of-way is involved;
- ❖ The public acquisition by purchase of strips of land for the widening or opening of streets;
- ❖ The division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right-of-way dedication is involved, and where the resultant lots are equal to or exceed the standards of the municipality, as shown in the subdivision regulations.

The subdivision regulations are managed and enforced by both the Planning Board and the Town Board of Commissioners, in conjunction with the Town Clerk. The town must approve all subdivision activity prior to the issuance of a building permit from the Carteret County Inspections Department.

4. NC State Building Code

The Town of Indian Beach utilizes the North Carolina State Building Code to oversee the erection of all structures within its planning jurisdiction. Enforcement of the building code is handled through the Carteret County Inspections Department.

The minimum use standards, provisions, and requirements for safe and stable design, methods of construction, and usage of materials in buildings and structures erected, enlarged, altered, repaired, moved, converted to other uses, or demolished, and the equipment, maintenance, use and occupancy of all buildings and structures in the town and its extraterritorial jurisdiction, are regulated in accordance with the terms of the North Carolina State Building Code.

5. Flood Damage Prevention Ordinance

The Town of Indian Beach enforces a Flood Damage Prevention Ordinance. This ordinance is intended to establish provisions for development within floodprone areas in an effort to protect property in the event of a natural disaster. The purpose of the 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 floodgates.
- (4) Control filling, grading, dredging, and other development which may increase erosion or flood damage.
- (5) Prevent or regulate the construction of flood barriers which will unnaturally divert floodgates or which may increase flood hazards to other lands.

6. Hazard Mitigation Plan

The Town of Indian Beach adopted a Hazard Mitigation Plan (HMP) on October 13, 2004, and the plan was approved by the Federal Emergency Management Agency (FEMA) on November 9, 2004. This plan was developed and adopted in response to federal legislation and state legislation. The Disaster Mitigation Act of 2000 (DMA2K), the federal legislation, and Senate Bill 300, the state legislation, requires that all local governments have a FEMA-approved Hazard Mitigation Plan in place in order to receive Hazard Mitigation Grant Program (HMGP) funding or Public Assistance (PA) funding following a natural disaster. The plan identifies those hazards to which the town is most susceptible, analyzes the vulnerability of the town to those hazards (i.e., building development and value, and number of people at risk), and analyzes the town's ability to respond to those hazards. The primary output of the plan is the Mitigation Strategies that assist with the prevention of loss due to hazards.

7. Review of the Town's 1996 CAMA Land Use Plan

In 1996, Indian Beach completed its current CAMA Land Use Plan Update. The Coastal Resources Commission certified this document on July 25, 1997. The current plan addresses a variety of issues, with a focus on transportation, community development, economic development, and hazard mitigation. This document has served as the town's primary land use management guide since its adoption by the Indian Beach Board of Commissioners on June 11, 1997.

The 1996 Town of Indian Beach CAMA Land Use Plan included 73 specific policy statements, and a detailed summary of the town's storm hazard mitigation procedures, post-disaster recovery operations, and evacuation plans. Of the 73 policy statements, 69 have been accomplished, and are listed below. There are four policy statements from the 1996 plan which have not been carried out. These are also listed below, and those actions that have not been completed will be revised and addressed in the policy action section of this plan. This list (pages 79 to 88) is a verbatim reproduction of the text from the 1996 Town of Indian Beach Land Use Plan; there are duplications in the text. Some of these statements are inconsistent with current circumstances and requirements. However, they were not changed in order to accurately reflect the contents of the 1996 plan.

ACCOMPLISHED

1. Indian Beach is supportive of resource protection. The town will pursue policies and actions which are protective of the town's resources. Of particular concern is the protection of its Areas of Environmental Concern and support of the 15A NCAC 7H minimum use standards for Areas of Environmental Concern.

2. Enforce all current regulations of the N.C. State Building Code and support the Carteret County Health Department in all matters relating to septic tank installation/replacement in areas with soils restrictions.
3. Coordinate all development activity with appropriate county and state regulatory personnel.
4. The Town of Indian Beach will cooperate with the U.S. Army Corps of Engineers in the regulation/enforcement of the 404 wetlands permit process.
5. All commercial, institutional, and residential subdivision development should be sensitive to the character of prevailing soil types, flood prone areas, and physiographic conditions which impact septic tank use, private wells, and construction feasibility.
6. Density of development will be regulated by the Town of Indian Beach zoning.
7. Indian Beach opposes the installation of package treatment plants and septic tanks, or discharge of waste in any areas classified as coastal wetlands.
8. Support and cooperate with the efforts of Carteret County to develop a central sewer system to serve the developed areas of the county, including the municipalities.
9. Indian Beach will coordinate any development within the special flood hazard area with the North Carolina Division of Coastal Management, FEMA, and the U.S. Corps of Engineers.
10. Indian Beach will continue to enforce its existing zoning and flood damage prevention ordinances and follow the storm hazard mitigation plan. (See Storm Hazard Mitigation, Post-Disaster Recovery, and Evacuation Plans).
11. It is the policy of Indian Beach to conserve its surficial groundwater resources by supporting CAMA and N.C. Division of Water Quality stormwater runoff regulations, and by coordinating local development activities involving chemical storage or underground storage tank installation/abandonment with Carteret County Emergency Management personnel and the Groundwater Section of the N.C. Division of Water Quality.
12. Indian Beach will support strict county administration of septic tank regulations.

13. The Town of Indian Beach will encourage and support water conservation efforts.
14. With the exception of industrial development and the construction of privately owned signs in public trust areas, the Town of Indian Beach will support development in ORW waters and ORW estuarine shoreline areas that is consistent with the policies contained in this plan, local ordinances, and the state's management strategies of ORW designated regulations.
15. Indian Beach recognizes the value of water quality maintenance to the protection of fragile areas and to the provision of clean water for recreational purposes. The town also supports state stormwater runoff criteria applicable to land development. (Stormwater Disposal Policy 15 NCAC 2H.001-.1003).
16. Indian Beach will support the technical requirements and state program approval for underground storage tanks (Chapter 40 of the Code of Federal Regulations, Parts 280 and 281), and any subsequent state regulations concerning underground storage tanks adopted during the planning period.
17. With the exception of bulk fuel storage tanks used for retail sales, and individual heating fuel storage tanks, Indian Beach opposes the bulk storage of manmade hazardous materials within its jurisdiction.
18. Indian Beach is opposed to the establishment of toxic waste dump sites within Carteret County.
19. Indian Beach supports Carteret County's participation in a regional multi-county approach to solid waste management. This includes disposal of solid waste in the Tri-County Landfill.
20. Indian Beach will cooperate with any efforts to educate people and businesses on waste reduction and recycling. The town vigorously supports recycling and supports setting up practical collection methods and education efforts to achieve a high degree of county-wide recycling.
21. Indian Beach supports the siting of recyclable collection centers within developed commercial and developed institutional land classifications.
22. The town will coordinate all town public works projects with the N.C. Division of Archives and History, to ensure the identification and preservation of significant archaeological sites.

23. Industrial development is not seen as a significant factor in Indian Beach, and the town does not feel the need for further restrictions which deal with industrial impacts on fragile areas.
24. Indian Beach is opposed to the installation of package treatment plants in coastal wetlands. In other areas, Indian Beach will support the construction of package treatment plants which are approved and permitted by the State Division of Water Quality and by the Carteret County Health Department/Division of Health Services. If any package plants are approved, Indian Beach supports requirement of a specific contingency plan specifying how ongoing private operation and maintenance of the plant will be provided, and detailing provisions for assumption of the plant into a public system should the private operation fail.
25. Development standards for open water and upland marina construction and/or dry stack storage facilities for boats associated with or independent of marinas are important to Indian Beach. The town allows the development of open water and upland marinas and dry stack storage facilities at appropriate locations, provided such development is consistent with the policies contained in this plan, local ordinances, and 15A NCAC 7H minimum use standards.
26. Indian Beach opposes the location of floating homes and live-aboard boats within its planning jurisdiction. The town supports revisions to the zoning ordinance or adoption of a separate ordinance to prohibit floating homes and live-aboard boats.
27. Existing marinas, docks and piers may be reconstructed to their prior size so long as all other applicable policies of this plan are satisfied and met when reconstruction occurs.
28. The town will allow maintenance dredging of upland marinas including approach channels as long as this action meets all applicable local, state, and federal ordinances and regulations.
29. Indian Beach does not object to the establishment of mooring fields within its planning jurisdiction.
30. Indian Beach will support only uses within the ocean hazard areas which are allowed by 15A NCAC 7H and are consistent with the town's zoning ordinance.
31. Indian Beach supports beach nourishment and relocation as the preferred erosion control measures for ocean hazard areas.
32. The town supports state requirements pertaining to shoreline stabilization in ocean hazard areas.

33. Except for ocean hazard areas, Indian Beach does not oppose bulkhead construction within its jurisdiction as long as construction fulfills the use standards set forth in 15A NCAC 7H.
34. Indian Beach will allow the construction of bulkheads which satisfy 15A NCAC 7H in all non-ocean hazard areas to protect structures and property from rising sea level.
35. The Town of Indian Beach supports development consistent with the Planned Development (PDD) zoning district. Within the PDD district, regulations are principally designed to ensure the conservation of maritime forests while providing to landowners reasonable uses of their property.
36. Indian Beach supports addressing the following issues in the development of the White Oak Basinwide Management Plan:

Long-term Growth Management

- Wastewater management (non-discharge, regionalization, ocean outfall).
- Urban stormwater runoff/water quality.
- Role of local land use planning.

Shellfish Water Closures

- Increases in number of acres closed.
- Examine link between growth and closures.
- Opportunities for restoration and prevention.

Animal Operation Waste Management

- Between 1990-1991, swine population more than doubled.

Nutrients/Toxic Dinoflagellate

- Reduction in nitrogen and phosphorous levels.

37. The Town of Indian Beach supports addressing shellfish water closures and the reduction of nitrogen, phosphorous, and copper levels. These issues were identified in the White Oak Basinwide Management Plan as being specifically relevant to the town's planning jurisdiction.
38. Indian Beach supports development and adoption of a local ordinance by Carteret County to regulate swine production.

39. Indian Beach will encourage land development activities in all areas of the town. Within AEC's, development must be consistent with the 15A NCAC 7H minimum use standards and the policies contained in this plan. Resource production should not be allowed to adversely affect the town's sensitive coastal environment or estuarine shorelines.
40. All lands classified as coastal wetlands and estuarine shorelines are considered valuable passive recreation areas and should be protected in their natural state. Development will be allowed which is consistent with the policies contained in this plan, town codes and ordinances, and the 15A NCAC 7H use standards.
41. Indian Beach will pursue the establishment of additional shoreline access sites.
42. The Town of Indian Beach intends to apply to the Division of Coastal Management for grant funds provided through the North Carolina Public Beach and Coastal Waterfront Access Program. In the event that Indian Beach receives grant approval, state monies will be used to make improvements to a public beach access site located on SR 1192. Improvements include the repair of an existing retaining wall intended to stabilize the primary dune and prevent sand from inundating the parking lot. These improvements will strengthen the existing structure and enhance public access to the ocean for the local and visiting public. The town may also apply for access funds for other sites.
43. Indian Beach is opposed to all aquaculture activities. Indian Beach estuarine and public trust waters should be reserved for recreational water activities.
44. Residential and commercial development which meets 15A NCAC 7H use standards, Indian Beach zoning requirements, and the policies contained in this plan will be allowed in estuarine shoreline, estuarine water, and public trust areas. Industrial development will be prohibited within Indian Beach.
45. Except for navigational signage, Indian Beach opposes the construction of any privately owned signs in the coastal wetlands, estuarine waters, and public trust areas. Publicly owned instructional signage will be permitted.
46. The town opposes any Transportation Improvement Plan to construct a third bridge across Bogue Sound terminating in Indian Beach.

47. With the exception of the construction of signs, prohibition of aquaculture, and floating structures, Indian Beach supports the use standards for estuarine waters and public trust areas as specified in 15A NCAC 7H.0208.
48. Indian Beach reserves the right to review and comment on policies and requirements of the North Carolina Division of Marine Fisheries which govern commercial and recreational fisheries and activities, including trawling activities. The town recognizes the importance to its economy of commercial and recreational fishing resources and production activities, including nursery and habitat areas and trawling activities in estuarine waters.
49. The town supports current seasonal restrictions on off-road vehicle beach access and shall continue to monitor the effects of off-road vehicles on the beach to ensure that public and environmental safety not be adversely affected. The current local ordinance prohibits driving on dunes.
50. Indian Beach supports the implementation of responsible economic and community development projects throughout the area. It is the intent of Indian Beach to promote and preserve the resort environment by limiting activities that would detract from the town's present character by carefully drafting policies which apply to land classification, zoning and subdivision regulations, building permitting, and community promotion.
51. The Indian Beach water supply is adequate and does not present any constraint to redevelopment/development which is permitted by the town's zoning ordinance. It shall be the town's policy to promote water conservation by encouraging the use of residential and commercial water saving devices. Indian Beach will support preparation of a long-range study to assess the cost, quantity and quality of the town's water supply.
52. Indian Beach supports the development of a sewage collection system. This may be accomplished by the town acting independently or through a regional effort.
53. In the absence of a waste treatment plant and collection system, Indian Beach will support the issuance of permits for the construction of septic tanks and package treatment plants for residential, commercial, and public/semi-public land uses. Such permits must be issued consistent with the policies contained in this plan.

54. There are no electric generating or other power generating plants located in or proposed for location within the Indian Beach planning jurisdiction. The town will not support the location of permanent energy generating facilities within its jurisdiction.
55. Indian Beach supports Carteret County's policy of reviewing proposals for development of non-nuclear electric generating plants within Carteret County on a case-by-case basis, judging the need for the facility by the county against all identified possible adverse impacts. Indian Beach objects to all nuclear power plant construction. The town reserves the right to comment on the impacts of any energy facility proposed for location within Carteret County.
56. In the event that offshore oil or gas is discovered, Indian Beach will not oppose drilling operations and onshore support facilities in Carteret County or the town for which an Environmental Impact Statement has been prepared with a finding of no significant impact on the environment. Indian Beach supports and requests full disclosure of development plans, with mitigative measures that will be undertaken to prevent adverse impacts on the environment, the infrastructure, and the social systems of Carteret County or the town. Indian Beach also requests full disclosure of any adopted plans. Offshore drilling and the development of onshore support facilities in Carteret County or the town may have severe costs for the town and county as well as advantages. The costs must be borne by the company(ies) with profit(s) from offshore drilling and onshore support facilities.
57. The only significant redevelopment issue facing Indian Beach through 2000 will be reconstruction following a hurricane or other natural disaster. The town will allow the reconstruction of any structures demolished by natural disaster which will comply with all applicable local and state regulations and the policies contained in this plan. The town will not spend any local funds in order to acquire unbuildable lots but will accept donations of such unbuildable lots. Indian Beach will work with any owners who may have to move any threatened structures to safer locations. The town will support reconstruction only at densities specified by current zoning regulations.
58. Indian Beach supports ongoing efforts to maintain open and navigable waters. The town encourages regular deposit of dredge spoil on the beach by the U.S. Army Corps of Engineers, and considers such projects essential to the continuing redevelopment within the town.
59. Indian Beach is receptive to state and federal programs, particularly those which provide improvements to the town. The town will continue to support fully such programs, especially the following: North Carolina Department of Transportation road and bridge improvement programs, the CAMA planning process and permitting programs, the U.S. Army Corps of

Engineers regulatory and permitting efforts, dredging and channel maintenance by the U.S. Army Corps of Engineers, and federal and state projects which provide efficient and safe boat access for commercial and sport fishing. Federal programs which fund housing rehabilitation for low-to-moderate income individuals do not apply to Indian Beach.

60. The town opposes construction of a third bridge across Bogue Sound that terminates in Indian Beach. The negative impacts on residences, existing land uses, vegetation, noise, traffic, air pollution and runoff would be extremely detrimental to the economic development and general well being of the town.
61. Indian Beach will support efforts of the U.S. Army Corps of Engineers and state officials to provide proper channel maintenance. Usable spoil material for beach nourishment will be accepted from any dredging operation for spoil taken outside of Indian Beach regardless of location. The town will work to provide/locate spoil sites for dredge spoil taken from within Indian Beach's jurisdiction.
62. Indian Beach considers the interstate waterway to be a valuable economic asset. The town will provide non-economic support for maintaining the waterway by helping to obtain or providing dredge spoil sites and, when possible, providing easements across town-owned property for work.
63. Indian Beach will continue to support the activities of the North Carolina Division of Travel and Tourism; specifically, the monitoring of tourism-related industry, efforts to promote tourism-related commercial activity, and efforts to enhance and provide shoreline resources.
64. Indian Beach will continue to support the activities of the Carteret County Tourism Development Bureau.
65. The Town of Indian Beach does not support construction of a third bridge ending in the Indian Beach town limits.
66. Indian Beach is opposed to any widening of U.S. 58 to provide four lanes. However, the town supports the construction of turn lanes.
67. Indian Beach supports the development and adoption of a county-wide thoroughfare plan.

68. Indian Beach will work with the North Carolina Department of Transportation to ensure that all road hazards are clearly marked or corrected. The town will identify and report hazards to NCDOT.
69. Through enforcement of local ordinances including zoning, subdivision and the dune and vegetation ordinance, the Town of Indian Beach will strive to accomplish the following growth objectives:
- Maintain the town's resort environment.
 - Strive to protect the dunes.
 - Ensure an adequate water supply and sewage disposal.
 - Support the development of a town-wide sewer collection system.

The town will review all local ordinances to ensure consistency with these policies.

NOT ACCOMPLISHED

1. The town will continue to support and implement the community rating system which allows for reduced flood insurance rates.
2. The town will consider adoption of ordinances with severe penalties for illegal dumping.
3. Indian Beach will continuously monitor sea level rise and revise as necessary all local building and land use related ordinances to establish setback standards, long-term land use plans, density controls, buffer vegetation protection requirements, and building designs which will facilitate the movement of structures.
4. The town will study methods of providing public access to the sound and recreational fisheries for residents and vacationers.