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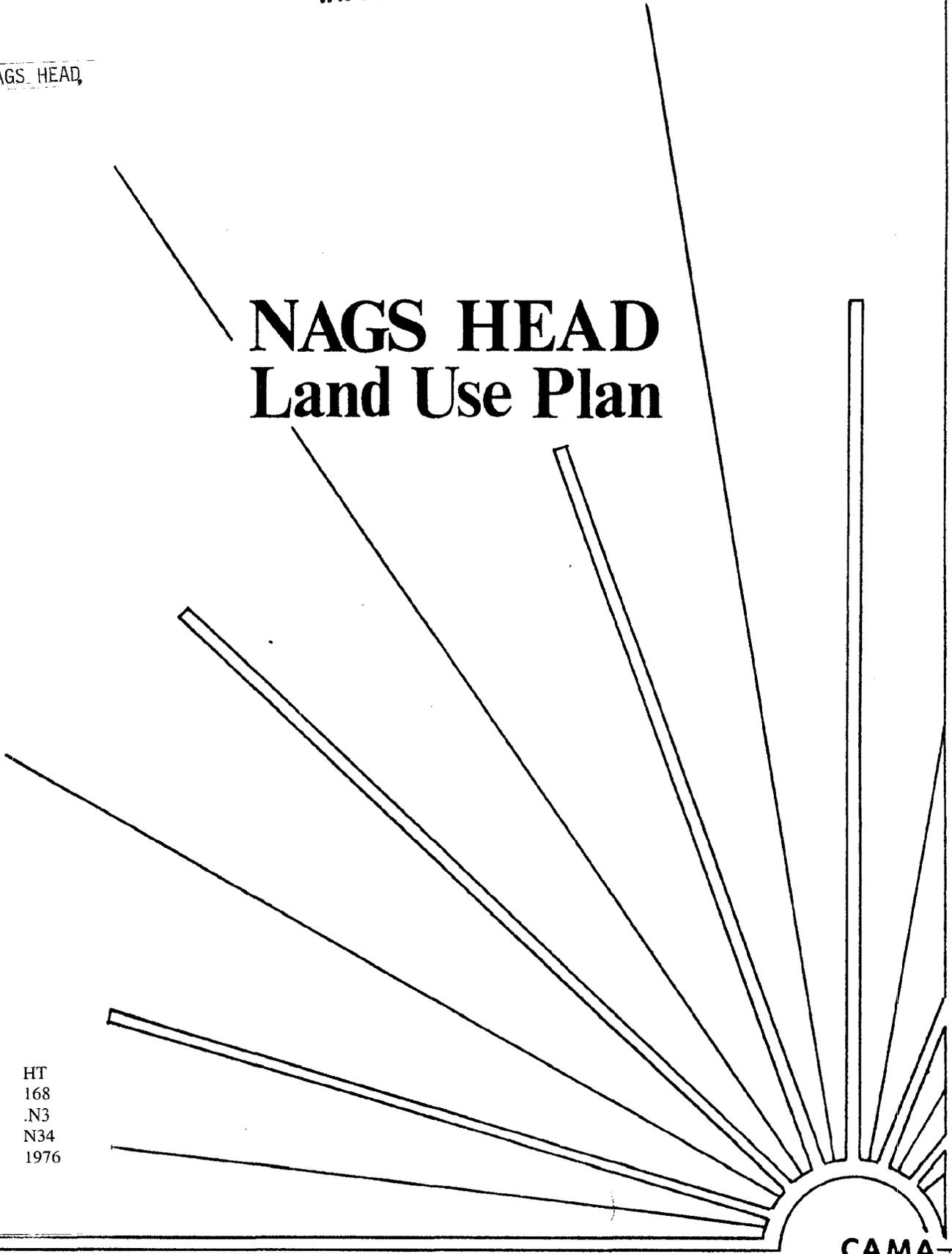
NAGS HEAD

# NAGS HEAD Land Use Plan

*N.C. COASTAL RESOURCES COMMISSION*

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COASTAL ZONE  
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NAGS HEAD LAND USE PLAN

IN ACCORDANCE WITH THE COASTAL AREA MANAGEMENT ACT

ADOPTED BY NAGS HEAD BOARD OF COMMISSIONERS

May 19, 1976

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N.C. COASTAL RESOURCES COMMISSION

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## NAGS HEAD SYNOPSIS

This Synopsis of the Nags Head Land Use Plan is included as pages 149 through 170 of this report. The Nags Head Commissioners propose to have a copy of the approved Synopsis mailed to every household within the Town.

## INTRODUCTION

The Coastal area of North Carolina is one of the most important regions in the United States for food production, future expansion of commerce, industry and recreation. To enable orderly growth and protection of important natural resources of the area, the 1974 General Assembly passed the Coastal Area Management Act (CAMA).

The CAMA is a state law that asks local government in 20 counties in Coastal North Carolina to adopt land use plans which reflect the desires and needs of coastal residents. When completed, these 20 individual county land use plans, along with certain municipal plans, will form the basis for a "comprehensive plan for the protection, preservation, orderly development and management of the coastal area of North Carolina."

The legislative goals of the Coastal Area Management Act as stated in G.S. 113A-102 (b) briefly are:

- 1) To provide a management system capable of preserving and managing the natural ecological conditions of the estuarine system, the barrier dune system, and the beaches, so as to safeguard and perpetuate their natural productivity and their biological, economic and aesthetic values.
- 2) To insure that the development or preservation of the land and water resources of the coastal area proceeds in a manner consistent with the capability of the land and water for development, use or preservation based on ecological considerations.
- 3) To insure the orderly and balanced use and preservation of our coastal resources on behalf of the people of North Carolina and the nation.
- 4) To establish policies, guidelines and standards for the conservation of resources, the economic development of the coastal area; the use of recreational lands and tourist facilities; the wise development of transportation and circulation patterns; the preservation and enhancement of historical, cultural and scientific aspects of the region; and the protection of common law and public rights in the lands and waters of the coastal area.

Finally, the law requires the input and the views of a wide cross section of citizens, representing not only each geographic area of the county, but also those who can ably represent the varying economic, social and cultural interests as well.

SECTION I  
PRESENT CONDITIONS

## GENERAL PHYSICAL CHARACTERISTICS OF NAGS HEAD

### Location and Geographic Data

Nags Head is located in Dare County on the Bodie Island sector of the barrier island chain in North Carolina approximately 50 miles north of Cape Hatteras and 50 miles south of the Virginia border. The Nags Head town limits extend for 11.6 miles along the Banks in a general north-south direction. At its widest point, the Town is approximately two miles across in central Nags Head and narrows to an average of 1200 feet in South Nags Head.

The town is bordered on the east by the Atlantic Ocean and on the west by the lands of the National Park Service and the waters of the Roanoke Sound, a shallow and narrow sound averaging approximately 3 feet in depth. Nags Head adjoins the Town of Kill Devil Hills to the north and National Park Lands on the south.

### Climate

The climate of Nags Head is considerably moderated by the presence of the waters of the Roanoke, Albemarle and Pamlico Sounds to the west, northwest and southwest respectively and the Atlantic Ocean to the east. Consequently, temperatures do not reach as high during the summer nor as low during the winter in Nags Head as they do in inland towns of the same latitude. The average July temperature for the Nags Head area is 79.2°F, while the average January temperature is 45.3°F. Normally freezing temperatures are not experienced between mid-March and mid-November. The average annual precipitation is 44.31 inches with no month averaging less than 2.5 inches. July and August normally receive more rainfall than any other months of the year and average approximately nine thunderstorms per month.

The shoreline of the town is exposed to waves induced by winds onshore and alongshore from the northeast, through east and south to southwest. Prevailing

winds are out of the southwest with speeds of less than 19 miles per hour. Stronger winds are more frequent from the northeast during September and October and from the north during the months of December through February.

The years 1914-1958 showed storms of all kinds in Dare County, tropical and extratropical, with winds of over 45 miles per hour. Changes in the Nags Head beaches are brought about principally by this powerful force of wind and water which acts on the coastline. There are more storms in March than any other month while the period August through October represents the greatest threat of hurricanes. Destructive hurricanes are relatively infrequent, averaging one in about every 10-12 years. Some effects of hurricanes along the Banks of North Carolina are experienced almost every year. Northeasters occur mainly in October through April and account for great damages in the form of beach and dune erosion.

#### Currents

The Gulf Stream flows to the northeast during all months of the year and merges with the Labrador current only ten miles east of Cape Hatteras. There is substantial seasonal character of offshore currents from Cape Hatteras to Chesapeake Bay. In the fall surface drift is southerly and has an onshore component. In winter, the pattern is basically indistinct with flow conforming closely to the prevailing northwest winds. In the spring, a transition to summer conditions is experienced with a somewhat southerly surface drift. In summer, the surface drift is somewhat variable with no discernible pattern.

Waves approaching the beaches at an angle generate alongshore currents called littoral currents. Observations made along the Dare Beaches have revealed that wave-induced littoral currents have a southward flow.

## Geology

The barrier island chain is a relatively recent geologic phenomenon, having been formed about 5,000 years ago. Theories concerning formation of the barrier islands conflict, but it is generally agreed that some of the islands were formed when rising seas surrounded mainland ridges and others were formed by the elongation of coastal sand spits. These barrier islands represent a delicate physical system which is undergoing continual change. The lagoons and sounds west of the barrier island collect sediment slowly from erosion of adjacent mainland and overwash from the ocean side creating marsh areas.

## Soils, Topography, and Vegetation

The elevation of Nags Head ranges from sea level to over 100 feet at the peaks of the larger sand dunes. A line of barrier dunes averaging between 10 and 30 feet runs the length of the Town of Nags Head on the Ocean side.

At the northwest end of Nags Head lies a former sand dune system now stabilized and vegetated with various evergreen and deciduous trees. The topography underneath the wooded section, as would be expected, consists of alternating high and low areas created by the former sand dunes. Elevations in this section of Nags Head range from 10 feet above sea level to over 60 feet in some places. This area is also marked with numerous fresh water ponds caused by the collection of rainwater in the depressions between the former dunes.

With the exception of the large wooded area along Roanoke Sound in north Nags Head, most vegetation consists of grasses and a few shrubs. Jockey's Ridge, a "live" sand dune system in north Nags Head, is completely barren on its larger slopes. This sand dune system is the largest and highest of its kind in the eastern United States and in this respect it is truly unique.

Very little is known about the various soils in Nags Head, particularly in terms of their capability of supporting different urban land uses. It is obvious, though, that certain areas of Nags Head, notably the previously referred to Jockey's Ridge sand dune system and the lower areas where there is virtually no drainage, are at this time unsuitable for almost any type of urban development.

## NAGS HEAD POPULATION

The size, nature, and structure of Nags Head's population is extremely important in planning to provide an optimum environment for the people in the future. Population characteristics are an important element in the determination of the number of jobs that the local economy must provide, the educational and institutional facilities which might be needed, the services which must be provided and the amount of land which must be set aside for various activities.

The traditional source of information on population characteristics has been the population statistics which are published every decade by the U. S. Census Bureau. It should be emphasized, however, that these statistics are based upon a concept of a "resident population." People are counted in the localities where they maintain their usual place of residence, meaning the place where they live and sleep most of the time. This type of counting is recognized to cause problems in cities which receive a large influx of people daily, consuming its services, but which are not counted in its official population.

This phenomenon occurs in the Nags Head area which receives a large influx of recreationists during the summer months. The census information does not reflect these peak population figures. However, since population figures are often the basis for state and federal aid allocation and for most comprehensive planning, the implications of sole reliance on resident population counts are serious and far reaching. Therefore, non-resident population projections will be considered and analyzed in the population forecast section of this plan.

## RESIDENT POPULATION CHARACTERISTICS

### AGE

Age structure is an important variable in estimating requirements for facilities and services such as schools, health care, housing and recreation. Sex and age characteristics are the basic causative elements in birth rates, mortality and migration trends.

The median age is a statistical measure of age composition which may be defined as the age dividing the population into two equal size groups, one older and one younger than the median age. Those counties or towns with medians under twenty may be described as "young" while those with medians of thirty and over are described as "old." Nags Head's median age could not precisely be determined since individual ages are not available for incorporated towns of less than 1,000 persons. However, it was determined that the median age was 35 years and could possibly be as high as forty-one. The statistic is highly significant when compared with the median age of the population of surrounding counties. Table 1 shows that the median age of Nags Head's population is much higher.

The high median age can be the result of many factors such as lowered birth rates, lowered death rates, out-migration of younger age groups, and in-migration of older age groups. In Nags Head, it seems safe to assume that the high median age can be attributed to the in-migration of older people.

The high median age of the Nags Head population has resulted in a family size which is smaller than that of Dare County or the neighboring counties. Table 1 illustrates that the average family size of 2.59 in Nags Head is significantly lower than even Dare County's.

TABLE 1

## GENERAL POPULATION CHARACTERISTICS

COUNTY	MEDIAN AGE	FAMILY SIZE
Beaufort	29.0	3.31
Camden	27.7	2.40
Currituck	31.0	3.17
Dare	33.6	2.80
Hyde	29.8	3.42
Pasquotank	25.9	3.55
Tyrrell	31.8	3.36
Nags Head	35.0+	2.59

SOURCE: U. S. Bureau of Census, General Population Characteristics, 1970, and General Social and Economic Characteristics, 1970.

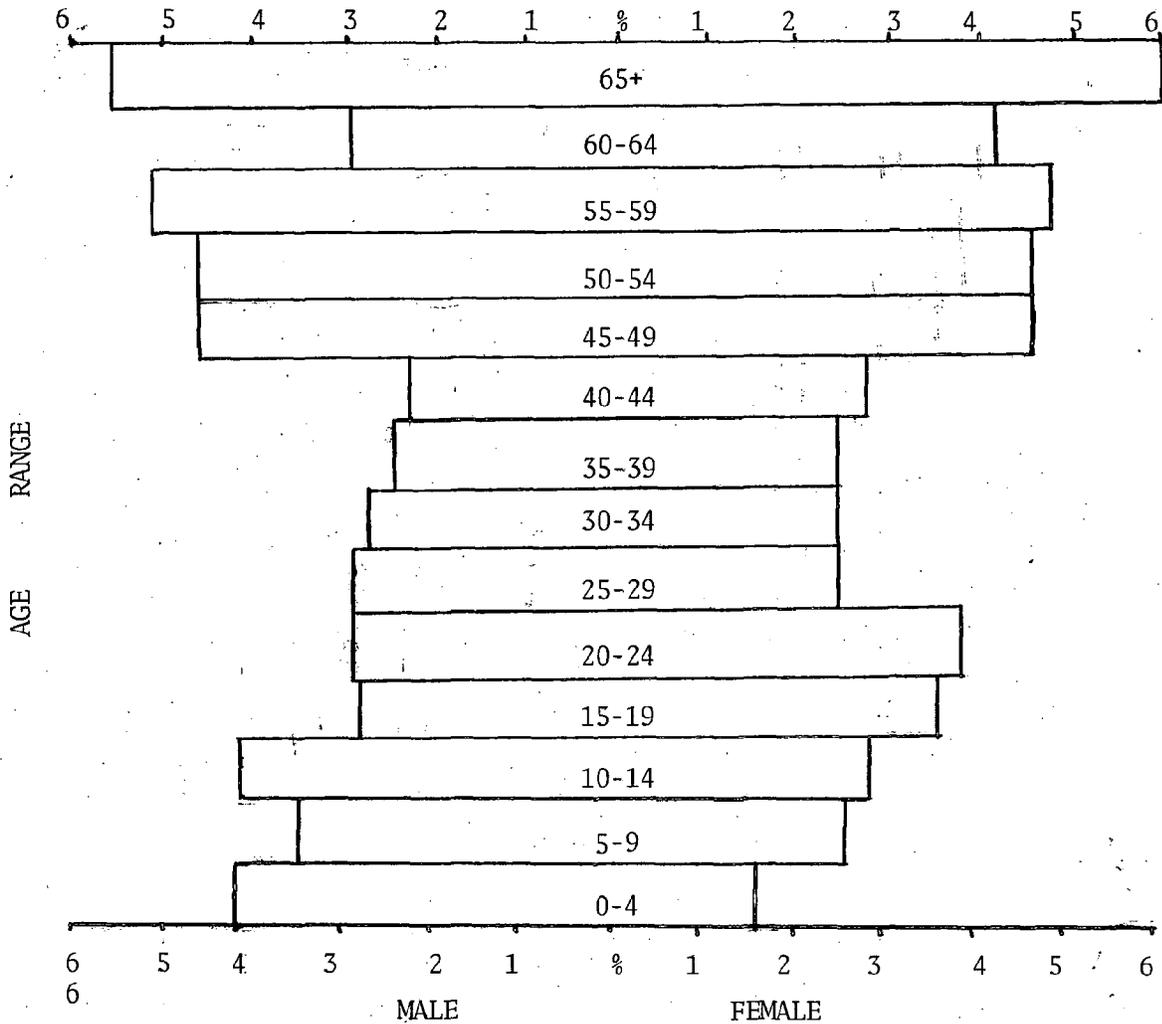
By examining the basic shape of the Nags Head population pyramid (Fig. 1) it is possible to identify the population's combined age-sex characteristics:

- (1) The middle section is concave--this indicates a relatively small proportion of the Town's population is 30 to 45 years old. A vestige of out-migration from the area during the 1950's. This section constitutes the majority of the labor force. However, since the median age of the Town is apparently increasing, this age group should become proportionately smaller and the economy will have to support a greater concentration of older people unless economic growth provides job opportunities to attract and hold younger groups.
- (2) The base curves inward; a result of the reduction of birth rates as well as a product of in-migration of older families.
- (3) The bulge at the top represents an in-migration of older people. The aging trend in Nags Head has two major implications for the planning program:
  - (a) It will produce specialized demands on services and facilities, particularly in the area of health care delivery systems and recreation since older persons require more medical care and more specialized recreation programs than the rest of the population.
  - (b) With a larger number of families receiving fixed incomes, fluctuations in the national economy will have a greater impact on the county.
- (4) An excess of females occurs in the older age groups. The investigation into the balance of the sexes provides information on the special rates and employment patterns within the community.

The fact that the excess of females occurs in the older age groups lessens to some degree the need for specialized employment opportunities for women, however, consideration must be given to providing more job opportunities appropriate for the Town's long-range economic development goals. Also, emphasis should be placed in providing for cultural and recreational programs designed for older women.

FIGURE 1

AGE/SEX PROFILE NAGS HEAD, 1970



## EDUCATION

Educational levels attained by Nags Head residents were not available in the 1970 census data, therefore the educational levels of Dare County residents will be briefly considered here. Residents of Dare County educational achievements have consistently paralleled those of all North Carolina residents. (See Table 2).

In 1950, the median school years completed by persons 25 years of age or older was 7.9. This means that half of Dare County's residents had received a less than eight years of formal education. This level equaled that of North Carolina and was higher than the neighboring counties of Currituck and Tyrrell. However, both the state and Dare County were considerably lower than the median United States achievement of 9.3 years of education.

By 1970, this level had increased by 2.6 years so that fifty percent of Dare County residents had completed over 10.5 years of school. This increase is comparable to the statewide increase of 2.7 years but is slightly behind the United States 20 year change of 2.8 years which climbed to a national median of 12.1 school years completed. While the educational level of Dare County residents has increased over the past 20 years to remain on a par with statewide levels, it has increased more rapidly than other counties in the immediate region. There has been a steady increase in the percentage of people with 4 years or more of high school as well as in college graduates. While Dare County has a higher percentage of residents in this category than either Currituck or Tyrrell Counties, it still remains below the levels of North Carolina and the United States. The migration of retired persons to Nags Head and Dare County has probably raised the educational level. Some of the more educated people have left Tyrrell County since migration tends to occur more frequently among more highly educated people.

TABLE 2  
 MEDIAN NUMBER OF SCHOOL YEARS COMPLETED  
 BY PERSONS 25 YEARS AND OLDER

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>Change 1950-1970</u>
Dare	7.9	8.9	10.5	2.6
Currituck	7.3	8.4	9.6	2.3
Tyrrell	7.2	7.8	8.4	1.4
North Carolina	7.9	8.9	10.6	2.7
United States	9.3	10.5	12.1	2.8

Source: U. S. Bureau of Census.

#### POPULATION TRENDS

An analysis of Nags Head's growth trends are an indicator of the pressure on the Town's land resources and its public services and facilities. If the pressure is great, without proper management, it is possible that the town will begin to lose control of the land development process and be unable to keep pace with the demand for public services. Also, analysis of historic growth trends provides a basis for forecasts of the Town's future population levels.

The 1970 population of Nags Head was 414. Unfortunately, official Census Bureau population counts for the Town prior to the 1970 census are unavailable since the Town incorporated in 1962. However, population estimates were made for the Dare Beaches area by the Dare Beaches Water and Sewer Authority in the publication "Dare Beaches Sketch Development Plan." The Dare Beaches are located in the northern half of the Outer Banks of North Carolina extending southward from the Currituck County line to Oregon Inlet, a distance of approximately 33 miles. The area contains the incorporated towns of Kill Devil Hills and Nags Head.

Considering the past 60 years, the growth rate for the past two decades represents a great quickening in population increase for Dare County. If the 691 temporary workers present for the 1940 Census are excluded from the figures, a steady but small rate of growth occurs, ranging from an adjusted 1.0 percent rate for the period 1940-1950 to a 5.6 percent increase from 1910 to 1920. Between 1950 and 1960 Dare experienced a 10 percent increase. In the following decade (1960-1970) the upward trend continued with an 18 percent increase. While Dare ranked twenty-fifth out of North Carolina's 100 counties in rate of population growth in 1950-1960, the most recent decade (1960-1970) saw that rank improve to seventeenth.

For the past twenty years, according to Stephens and Associates, the growth of Nags Head has surpassed that of the County, registering ten-year increases of 22 percent (1950-1960) and 28 percent (1960-1970). The population of Nags Head and the Dare Beaches has reflected an increasing attractiveness of this area over the rest of Dare County. (See Table 3). In 1950 approximately 17 percent of all county residents lived on the beaches but by 1970 this figure had increased to over 22 percent.

Since the 1950 and 1960 figures for the Dare Beaches and Nags Head are estimates, the increasing attraction of the Beaches can be further documented by a look at historical data for the County broken down to the township level. (See Table 4).

Atlantic and Nags Head Townships include the Dare Beaches area, as well as Roanoke Island. Over the 40-year period 1930-1970, the share of Dare County population living in these two townships has increased from 48.9 percent in 1930 to almost 64 percent in 1970. At the same time, the population of Manteo, which comprises a large percentage of the non-beach population of these townships, has decreased by almost 14 percent since 1950. Hatteras Township has

increased in population by 17.8 percent over four decades and has held a relatively stable share of county population, while the other three townships have all declined both in absolute numbers and in shares of total population.

Over this era (1930-1970), Dare County's population increase of almost 35 percent is greatly exceeded by the 76 percent increase in the total Atlantic-Nags Head Townships area. This all points to a significant and steady shift of Dare County population to the Dare Beaches area, indicating that the Beaches will continue to receive an increasing share of Dare County growth. Specifically, according to population forecasts made by the North Carolina Department of Human Resources, Nags Head's population as of July, 1974 was 530. This represents a 22 percent increase since the 1970 census.

TABLE 3  
COMPARATIVE GROWTH RATES: 1950-1960 and 1960-1970

	<u>1950-1960</u>	<u>1960-1970</u>
Nags Head	22.0*	28.0*
Dare Beaches	27.6*	32.4*
Dare County	9.8	17.9
Currituck County	6.4	5.7
Tyrrell County	-10.4	-15.8
North Carolina	12.2	11.5
South Carolina	12.5	8.7
Virginia Beach, Va.	101.6	102.0
Virginia	19.5	16.6
Ocean City, Md.	-27.6	67.2
Cape May, J. J.	N. A.	1.9
Rehoboth Beach, Del.	-16.0	N. A.
South Atlantic	22.6	18.1
United States	18.5	13.3

\*Estimated

N.A. - Not Available

Source: U. S. Census of Population, 1950, 1960, 1970.

TABLE 4. DARE COUNTY POPULATION DISTRIBUTION BY TOWNSHIP,  
1930 - 1970

Township	1930		1940		1950		1960		1970	
	# of Persons	Percent of Co. Total	# of Persons	% Change, 1930-40	# of Persons	% Change, 1940-50	# of Persons	% Change, 1950-60	# of Persons	% Change, 1960-70
Atlantic	556	10.7	504	-9.4	665	31.9	864	29.9	1141	32.1
Kill Devil Hills	Not Incorporated						268		357	33.2
Nags Head	1988	38.2	2547	28.1	2422	-4.9	2760	14.0	3328	20.6
Nags Head	Not Incorporated						414		540	5.9
Croatan	574	11.0	734	27.9	575	-21.7	545	-5.2	540	-.9
East Lake	289	5.6	249	013.8	121	-51.4	115	-5.0	88	-23.5
Hatteras	1132	21.8	1201	6.1	1046	-12.9	1217	16.3	1333	9.5
Kennekeet	663	12.7	806	21.6	576	-28.5	434	-24.6	565	30.2
Dare Co.	5202	100.0	6041	16.1	5405	-10.5	5935	9.8	6995	17.9
						100.0		100.0		100.0

SOURCE: U. S. Census of Population, 1930, 1940, 1950, 1960, and 1970.

### Comparative Trends

The rapid growth of Dare County and specifically Nags Head is not typical of Northeast North Carolina counties and towns. For example, neighboring counties Currituck, Hyde, and Tyrrell all declined in population over the past twenty-year period (see Table 5). The economies of most neighboring counties are predominantly agricultural with a prominent out-migration of people as opposed to the recreation-based economy of Nags Head and Dare County. Compared to North Carolina, the South Atlantic region, and the United States, the Dare Beaches area had the highest growth rates over the past twenty years.

### Components of Population Change

In studying population change, it is important to look at its causes. The two basic factors are natural increase (the excess of live births over deaths in the period) and net migration (those moving into or out of an area under consideration.)

In the decade 1950-1960, natural increase accounted for all of Dare County's 9.8 percent growth as the county experienced a net out-migration of 23 percent of its 1950 population. The out-migration of younger males in the working age group, especially among Blacks, is a well documented trend in 1950 through 1960 in Dare and the rural South.

TABLE 5  
COMPONENTS OF DARE COUNTY POPULATION CHANGE: 1950-1960 & 1960-1970

	<u>1950-1960</u>	<u>1960-1970</u>
Beginning Population	5404	5935
Change: Births	1245	1260
Deaths	591	819
Natural Increase	654	441
Net Migration	-124	+619
	530	
Ending Population	5935	6995
* % Migration	-2.3	+10.4

\*Rates are expressed as percentage of beginning population.

In the decade 1960-1970, the rate of natural increase dropped from 12.1 percent to 7.4 percent. During the decade, Dare experienced an 18 percent overall growth rate which is largely attributable to a ten-year net migration of 10.4 percent of the 1960 population. The population growth patterns within the county indicates that a large number of the in-migrants are locating in the beach areas.

TABLE 6  
NET MIGRATION RATES: 1950-1960 & 1960-1970

	<u>1950-1960</u>	<u>1960-1970</u>
Dare	-2.3%	10.4%
Currituck	-7.0	1.8
Tyrrell	-24.0	-20.3
North Carolina	-8.1	-1.6

\*Rates expressed as a percentage of population at the beginning of each decade.

Source: William Clifford. 1971, Population Change for N.C. 1950-1960 and 1960-1970, MCSU, Raleigh.

Net migration of the 1950-1960 period was lower in Dare than in other counties shown in Table 6 or the State. In 1960-1970 Dare showed sharpest gains in in-migration while Currituck also showed a significant turnaround. In 1970, Dare ranked ninth in state net migration and attracted this large in-migration at a time when out-migration rates for the region were increasing.

From 1950 to 1970, Dare's rate of natural increase was significantly lower than that of North Carolina. (Table 7) Although figures on natural increase are not available for Nags Head, it is probable that the rate of natural increase in the Town should be lower than county rates due to the very high median age which is a characteristic of the Nags Head population.

TABLE 7

## COMPARATIVE NATURAL INCREASE 1950-1960 and 1960-1970

	<u>1950-1960</u>	<u>% of 1950 Population</u>	<u>1960-1970</u>	<u>% of 1970 Population</u>
Dare	654	21.1	441	7.4
Currituck	831	13.4	257	3.9
Tyrrell	686	13.6	203	4.5
North Carolina	822,223	20.2	1,011,772	22.2

Source: Wm. Clifford. 1971. Population Change for N. C. 1950-1960 and 1960-1970. NCSU, Raleigh, N.C.

Summary of Population Growth

With an estimated increase of 116 residents since the last census, the recent growth of Nags Head has been even more rapid than county growth. In general the County's eastern townships have been growing and the mainland townships have been losing population. This re-orientation of settlement patterns toward the beach areas has accompanied the development of the recreation industry. The changing settlement patterns indicate increased demand for public services and the need for careful land management in Nags Head.

Age characteristics of the in-migrating population have had a major impact on the county's birth rate. In effect, this net in-migration in the older age groups in the 1960's has produced an aging population which has resulted in a reduction of the county's birth rate, and a slight increase in the death rate. This is particularly true for Nags Head, since an analysis of the 1970 census data revealed that the median age in Nags Head is significantly higher than the county's median age. All factors point to an increasingly older population for the Town.

## INCOME CHARACTERISTICS

Individual income data are not available for Nags Head at the present time. Generalized data are available, however, from the 1970 Census of Population and Housing Fifth Count Information (Table 8).

Mean and median family income available for Dare County will be compared to approximated income for Nags Head based on the data in Table 8.

TABLE 8  
COUNT OF FAMILIES BY INCOME

<u>Income</u>	<u>Family</u>	<u>Unrelated Ind.</u>	<u>Income</u>	<u>Family</u>	<u>Unrelated Ind.</u>
Under \$1,000	0	0	\$8,000-8,999	0	0
1,000-1,999	0	10	9,000-9,999	6	0
2,000-2,999	0	6	10,000-11,999	14	0
3,000-3,999	13	0	12,000-14,999	7	0
4,000-4,999	0	0	15,000-24,999	13	0
5,000-5,999	12	6	25,000-49,999	32	0
6,000-6,999	0	0	50,000 & over	0	0
7,000-7,999	26	0			

Source: U. S. Bureau of Census, 1970.

### Average Income

Typically, the mean and median are the "average" measures used in the analysis of income characteristics, but it is important to make a distinction between the two measures. Most people when speaking of the "average" are actually referring to the arithmetic mean, and in the case of incomes, the mean is simply the sum of all family incomes divided by the number of families. Since this measure does not account in any way for the distribution of income, it may be considered a summary average which reflects the total income available in the area.

The median, as a measure of average income, is the income level at which half the families make more, and half make less. Median income is a measure of income distribution and, as such, it might be considered a typical average which gives a rough idea of the typical income of families in an area. Thus, in an area where there exists a considerable disparity between the number of families in the lower income groups and those in the upper income groups, the median income may be considerably below the mean income. However, only in the case of a perfectly even income distribution will they be equal.

### Income Distribution

In 1970 the median family income in Dare County was \$6,482 and its mean family income was \$8,246. This disparity between mean income and median income represents an important income characteristic. In an even income distribution the mean and median are equal. Therefore, with a median effective buying income substantially smaller than the mean, the area has a disproportionately large number of families in the lower income groups.

The distribution of income for households in Dare at the county level is found in Table 9. Approximately 35 percent of the households in the county have annual incomes less than \$5,000 and 70 percent make less than \$10,000 per year.

TABLE 9  
HOUSEHOLD EFFECTIVE BUYING INCOME DISTRIBUTION - DARE COUNTY

Income Group	Percentage of Households
0 - \$2,999	20.1
\$ 3,000 - 4,999	15.3
\$ 5,000 - 7,999	23.3
8,000 - 9,999	11.3
10,000 - 14,999	17.1
15,000+	12.9
	35.4
	34.6
	30.0

Source: Sales Management. "Survey of Buying Power," 1973.

While there exists a disparity between the Town of Nags Head's median family income of approximately \$7,000 and the mean family income of approximately \$14,500; this disparity is related to the fact that there is an unusually high percentage of households in the Town making in excess of \$10,000 per year. The distribution of income for households in Nags Head is found in Table 10. Approximately 20 percent of the Town's households have annual incomes less than \$5,000, however, 46 percent make in excess of \$10,000 per year.

TABLE 10

HOUSEHOLD EFFECTIVE BUYING INCOME DISTRIBUTION - NAGS HEAD

Income Group	Percentage of Households
0 - \$2,999	11 = 20
\$ 3,000 - 4,999	9
5,000 - 7,999	30 = 34
8,000 - 9,999	4
10,000 - 14,999	14 = 46
15,000+	32

Source: U. S. Bureau of Census, 1970.

This analysis of Nags Head's and Dare's income characteristics indicate that while higher income levels are an obvious target for the county's economic development program the situation in Nags Head is not as critical as the rest of the county.

## ECONOMIC CHARACTERISTICS

An understanding of the structure and function of the economy of Nags Head is a fundamental element of the Town's planning and management program, providing economic information essential for decisions concerning the future. Detailed economic statistics relating specifically to the Town of Nags Head are not available at the present time. This information is available, however, for all of Dare County and in certain cases for the Dare Beaches area which can be expected to apply generally to Nags Head.

### Economic History\*

The early history of Nags Head is not known in great detail but is thought that perhaps the first settlements along the Outer Banks may have been made by shipwrecked or weary sailors.\*\* Many tales have been told about the first settlers of the Outer Banks with the story about how the name "Nags Head" was established being among the more interesting. Bill Sharpe, in A New Geography of North Carolina writes that "...Residents of the coast once stripped wrecked vessels of their cargo, and some say Bankers even tried to lure ships to their doom. This accomplished by hanging a lighted lantern around the neck of a horse and leading the nag along the beach, the bobbing light persuading mariners offshore to believe it came from a boat riding at safe anchorage..." As the author later pointed out, there is some doubt as to the credibility of this story, yet, no one seems to know the true origin of the name "Nags Head".

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\*Unless otherwise indicated the information in this subsection pertaining to the historical development of Nags Head was obtained from the previously published Population and Economic Function - Land Development Plan for Nags Head, 1964, which was based on the book The Outer Banks of North Carolina 1584-1958, by David Stick, (University of North Carolina Press, 1958).

\*\*Bill Sharpe, A New Geography of North Carolina, Vol. I; Raleigh, N.C. published by the State Magazine, 1954), p. 74.

In the early 1800's Nags Head began to develop as a summer resort community. In the early 1830's a Perquimans County planter in seeking a refuge for his family from the dreaded "chills and fever" (Malaria), which was common on the mainland, purchased a large tract of land just above where the old "Roanoke Inlet" had once been and constructed a summer home on it.

Several of the planter's friends and relatives would visit during the summer season and it was not long before other summer homes were being built in the area. The resort community continued to grow and by 1838 it was decided that there was a definite need in the area for a public house to provide entertainment and lodging for visitors to the Banks. It was at this time that the first hotel was constructed in Nags Head. The hotel, which had accommodations for 200 guests, was built among the larger dunes halfway between Roanoke Sound and the Atlantic in the same vicinity of the earlier summer homes.

Although the only practical means of travel to and from Nags Head was by boat, the community continued to grow as a resort. By the mid 1800's Nags Head, with its big hotel, featured "name" bands and was frequented by notable visitors. This period of growth was soon to end, however, with the coming of the Civil War.

In early 1862, the Confederate Army moved into Nags Head taking over the hotel as command headquarters. When Nags Head fell, the hotel was set ablaze by the retreating confederates so as to render it useless to the enemy. After the War, a new hotel was built and it appeared that Nags Head was once again to become a popular family resort. This brief period of revival succumbed to the post-war reconstruction and depression, however, and by 1890 there were hardly any remains of the once flourishing resort.

It is somewhat ironic that the isolation which had made Nags Head attractive as a resort eventually became the major factor which slowed further

development. In the early 1900's there were still no bridges to connect the Banks with the mainland. Tourists had to travel by water which often resulted in lengthy delays.

By the turn of the century "Old Nags Head" had been replaced by a new community on the ocean side. The dwellings which were not destroyed by fire in "Old Nags Head" were eventually consumed by the massive shifting sand dunes of Jockey's Ridge.

One of the major sources of income for Bankers during the late 1800's and early 1900's was service with the government. At one time there were fifteen coast guard stations along the Dare County coast. Commercial fishing was also an important source of income for many residents of the Banks.

The effects of World War I and the Great Depression of the late 1920's was severely felt among Dare County residents. There were fewer tourists than ever and the outlook for the future did not hold any better promises. Washington Baum, who became chairman of the Dare County Board of Commissioners in 1934, saw matters in a different light. Encouraged by Bankers and other Dare County citizens, Baum set out to convince the State Highway Commission of the need for bridges and roads connecting the Banks with the mainland. Although his efforts with the Highway Commission were to no avail, he later pushed through the issuance of long-term county bonds for the construction of a bridge between Roanoke Island and Nags Head. Total cost was approximately \$140,000 and in 1928 the new bridge connecting the Island with the Banks was in general use.

At about this same time, a group of Elizabeth City businessmen formed the Wright Memorial Bridge Company and constructed a bridge across Currituck Sound from a point just north of Kitty Hawk. The Wright Memorial Bridge was completed in 1931 and shortly afterwards the State Highway Commission constructed an 18-mile long sand-asphalt highway along the beach connecting the two bridges.

During this period, other improvements were being made which brightened the outlook of the area. In 1931 construction was begun on the Wright Memorial at Kill Devil Hills and regular ferrys were operating between Roanoke Island and Mann's Harbor and across Oregon Inlet. But, paralleling these progressive developments were other problems for the Bankers, nationwide depression had arrived and unemployment had reached a high point on the Banks. In addition, many areas of the beach were badly eroded, and at Cape Hatteras the Shore had been cut so badly that the lighthouse was threatened by the sea.

However, as reported by David Stick:

"At the height of these bad times there came a heartening note in the Elizabeth City Independent for July 21, 1933, under the headlines: 'A Coastal Park for North Carolina.' In this and subsequent articles by Banker Frank Stick, the details of a proposal for a vast rehabilitation program for the Outer Banks were unfolded. The first step would be the reclamation of the areas which have been denuded of vegetation, an organized erosion control and sand fixation project designed to reclaim the bald beaches and rebuild the eroded dunes, which would at the same time provide work and income to help the residents of eastern North Carolina survive the depression. This would be followed by the establishment of a National Seashore Park to preserve most of the Banks from Oregon Inlet to Cape Lookout in a natural state. Finally, a modern coastal highway would be constructed from Nags Head to Beaufort to enable outsiders to visit the reclaimed Banks in this national seashore park."

Later, improvements to the Wright Memorial, restoration of the "Cittie of Raleigh" and mosquito control work were added to the program.

Work and additional planning soon followed on; each of these projects and by the summer of 1941 new hotels and tourist cottages at Nags Head were doing a big business, lot sales showed a marked increase, and attendance at "The Lost Colony" pageant and the Wright Memorial were at an all-time high.

In addition, the first National Seashore Recreation Area had been authorized for the Banks, and considerable land, including Cape Hatteras, had been acquired for the park.

That was in 1941; in December, the Japanese attacked Pearl Harbor and the world again went to war. With the war, Nags Head returned to economic inactivity.

The beach development potential, made possible with the opening of the bridges and other facilities, had been held up first by depression and then by war. But, the end of the war was like a starting signal. By the summer of 1946, and with the resumption of "The Lost Colony", new hotels, motels, restaurants, stores and cottages were open for business at Nags Head, and many more were being planned. Land prices rose steadily as new real estate developments were opened, and tourists poured across the bridges.

Although many persons by this time assumed that the Cape Hatteras Seashore Recreational Area project was dead, an anonymous donor, later identified as two foundations established by the children of Andrew W. Mellon, offered in June of 1952, to give \$618,000 for the purchase of park lands if the State of North Carolina would provide matching funds. Four days later the State appropriated the funds and the park became assured.

With the development of the Cape Hatteras National Seashore, Nags Head continued to develop since the Park made the town a more attractive vacation center and since the major tourist services--food, lodging, and auto service--for the Outer Banks area were in Nags Head. The Park and other Banks' attractions also caused tourists to demand easier access into the area, and in quick succession a bridge was constructed across Croatan Sound to replace ferries from Mann's Harbor to Roanoke Island in 1957, across the Alligator River in 1961 and across Oregon Inlet in 1963. Completion of the Oregon Inlet Bridge made nearly the entire length of the National Seashore easily accessible by motor vehicle without having to meet ferry schedules.

Development of the National Seashore and subsequent construction of bridges across the Alligator River, Croatan Sound and Oregon Inlet have had a tremendous impact on the economy of Nags Head. Building has steadily increased and the

number of visitors to Nags Head has increased. Many of the visits to Nags Head are tied directly to National Seashore visits. Some idea of the increase in these related visits can be obtained from the increase in the number of visits to the National Seashore which rose from 578,000 in 1961 to a record of 1,783,737 in 1972, an increase of nearly 200 percent.

There was a phenomenal surge in both residential and commercial construction in Nags Head until 1972. In 1970 construction in Nags Head amounted to \$983,690 with 104 building permits being issued. In 1971 there were 273 building permits issued for a total of \$1,671,810 and in 1972, 387 permits were issued at a value of \$5,905,629. This trend abated in the period 1972-1974, decreasing to 184 permits issued at a total valuation of \$1,741,063 in 1974. However, figures through August of 1975 indicate that construction is again beginning to increase.

### Labor Force Characteristics

Characteristics of the labor force are a major factor in the economic development of the county and Nags Head. Utilizing factors such as labor, seasonal unemployment, and commutation patterns, it is possible to define manpower problems within the county and Town and to identify resources which become the focus of long-range economic development programs.

### Labor Force Participation

The age-sex specific activity rate is the most useful measure of labor force participation. These rates are calculated for each sex in the active (age 16-65) age group and they are a device for relating the economically active population in a particular age group to the total population of that group (Table 11).

TABLE 11  
AGE-SEX-SPECIFIC ACTIVITY RATES - 1970

	Age-Specific Population		Age-Specific Employment		Activity Rate	
	Male	Female	Male	Female	Male	Female
Nags Head	160	131	83	65	51.9	49.6
Dare County	2,040	2,100	1,496	837	73.3	39.8
Currituck- Albemarle-Pamlico Economic Region	24,754	26,810	19,880	11,698	80.3	43.6

SOURCE: U. S. Census; Stephens Associates

The most obvious point in the comparison is that the male activity rate for Nags Head is well below the rate of the county and the economic region.

These low rates possibly reflect the following facts:

- (1) An unusually large percentage of retirees reside in Nags Head in comparison to the economic region and the County as a whole. An examination of Table 12, reveals the possibility that a number of these retirees are within the age-specific limits of 16 to 64.
- (2) Nags Head is more dependent upon the tourist industry than either the economic region or the County. Seasonal employment possibly accounts for the low activity rates.
- (3) There is a lack of diverse economic opportunities in Nags Head, making expanded job opportunities an important consideration in the economic development program.

TABLE 12

COUNT OF PERSONS 14 AND OLDER BY SEX, AND LABOR FORCE IN NAGS HEAD, 1970

	MALE	FEMALE
Armed Forces	0	0
Employed	83	65
Unemployed	0	8
Inmate of Institution	0	0
Others Not in Labor Force;		
Under 65	33	39
65+	19	15

SOURCE: 1970 Census of Population and Housing

Unemployment

Unemployment statistics are important economic indicators which permit assessment of the overall strength and vitality of an economy and, perhaps more importantly, identification of the magnitude of the economy's seasonal fluctuations. The most current unemployment statistics are reported by the North Carolina Employment Security Commission.

Unemployment is defined as all persons who did not work at all during the reporting period but were able, available, and looking for work. The rate of unemployment is simply the number of unemployed as a percent of the total work force. Given today's highly mobile work force, for all practical purposes it is impossible to achieve a "zero" rate of unemployment. In fact, economists at the national level consider a 4 percent unemployment rate as "full employment."

Table 13 provides a comparison of the 1974 unemployment rates of Dare County and monthly unemployment figures. The Dare County annual rate is slightly higher than that of the state; however, an examination of the county's monthly unemployment rate reveals marked seasonal fluctuations. In February, the county's unemployment was at 20.6 percent, it declined steadily to 0.7 percent

in August, and rose again to 9.3 in December.

TABLE 13

Unemployment Rates	Dare County	North Carolina
1974 Total	6.0*	4.5
1974 Monthly		
January	15.2	4.8
February	20.6	4.0
March	16.9	3.8
April	9.2	3.3
May	4.1	3.1
June	1.9	3.8
July	1.0	4.5
August	0.7	3.4
September	.9	4.0
October	1.8	4.6
November	4.4	6.6
December	9.3	4.6

SOURCE: N. C. Employment Security Commission, 1975.

\*All figures are preliminary and subject to change.

Seasonal fluctuations are a long-recognized characteristic of economies based primarily on the recreation industry. These fluctuations are the result of changing demand which can be traced to three factors:

1. The product of the recreation industry--recreational experiences--must be consumed within the county by the purchasers, leading to highly seasonal demand because the consumer may choose the time to travel to the county;
2. The demand for recreation has a high income--elasticity, meaning that vacations are one of the first expenditures to be cut when a family's disposal income drops and that the industry is highly susceptible to fluctuations in the national economy;
3. Recreation demand is subject to changes in the weather.

Employment trends in the County should also reflect employment trends in Nags Head. Table 13 (which does not give seasonal fluctuations) reveals that there were eight unemployed persons in Nags Head out of an age specific group of 291 in 1970. This represents an unemployment rate of only 2.7 percent. However, this figure is misleading primarily because of the large number of retirees under 65 years of age who fall in the age-specific group.

While it is unrealistic to suggest that the fluctuations in employment could be dampened to the extent that it would resemble trends of more conventional economies, it is possible, through innovative economic programming, to capitalize on apparent off-season labor resources and thereby reduce the high off-season unemployment.

#### Commuting Patterns

According to 1970 Census statistics shown in Table 14, approximately 18 percent of Dare's labor force commutes into the county for employment. The commuters are from Currituck, Pasquotank, Tyrrell, and Hyde Counties. By contrast, in 1970 only 4% of the labor force commuted out of the county for employment.

These commutation patterns illustrate two important factors relating to the county's economy"

1. They show the tremendous increase in economic opportunities within the county.
2. They show that Dare County's recreation industry is becoming an economic resource for surrounding areas as well as the residents of the county.

In addition to job opportunities, commuting patterns are a function of residential preferences and are difficult to modify to any great extent. However, considering that 18 percent of the county's workers live outside the county and spend most of their incomes in these other areas, the economic development program should attempt to attract these commuting workers into the county. Such

programs should include concentrated efforts to provide suitable housing in appropriate price ranges, year-round recreational and cultural facilities, medical services, and a lengthened work season.

TABLE 14  
DARE COMMUTING PATTERNS

Area	Out-Commuting	In-Commuting
Currituck	15	216
Tyrrell	21	43
Norfolk-Portsmouth	42	0
Hyde	0	33
Beaufort	0	7
Washington	0	8
Camden	0	6
Pasquotank	0	63
Elsewhere	<u>19</u>	<u>51</u>
TOTALS	97	427
Net Commuting	+330 Workers	

SOURCE: U. S. Census, 1970.

Total Employment

In 1972, the Dare Beaches Water and Sewer Authority took a survey of employers on the Dare Beaches, Roanoke Island, and Currituck County, obtaining economic data. This survey provides the most up-to-date and only area-specific data available. Stephens and Associates rearranged the employment categories of the survey to be comparable with various census categories in their Economic Study of the Dare Beaches. Much of the following discussion on total employment will be drawn primarily from the Economic Study of Dare Beaches with specific reference made to Nags Head where relevant statistics are available.

Between 1960 and 1970, the Dare economy became dominated by the recreation industry. Employment in the natural resource based industries--agriculture, forestry, and fisheries declined greatly. In response to recreation demand, food stores, restaurants, motels and hotels, became the leading employers of the economy (Table 15). Service related industries employ the greatest number of persons throughout the county.

TABLE 15  
EMPLOYMENT SUMMARY BY MAJOR INDUSTRY GROUPS

Industry Groups	Total Employment					
	1950	%	1960	%	1970	%
Agriculture, Forestry, and Fisheries	395	28.2	280	15.8	181	7.8
Construction	239	17.0	234	13.2	316	13.5
Manufacturing	64	4.6	99	5.6	132	5.7
Transportation, Communication and Utilities	117	8.3	172	9.7	158	6.8
Wholesale Trade	44	3.1	28	1.6	78	3.3
Retail Trade	233	16.6	288	16.3	598	25.6
Services	172	12.3	411	23.2	647	27.7
Government	96	6.8	166	9.4	233	9.6
Not Reported	43	3.1	94	5.3	0	0
TOTALS	1,403	100.0	1,772	100.0	2,333	100.0

SOURCE: U. S. Census

TABLE 16

COUNT OF EMPLOYED PERSONS 14 AND OLDER BY INDUSTRY, NAGS HEAD, 1970

<u>Industry Group</u>	<u>Employment</u>	
	<u>1970</u>	<u>%</u>
Construction	12	8.3
Retail Trade	80	54.4
Services	18	12.2
Other Industries	<u>37</u>	<u>25.1</u>
TOTALS	147	100.0

SOURCE: U. S. Census of Housing and Population, 1970.

A comparison of the above two tables again serves to illustrate the dependence of Nags Head and Dare County and recreation-oriented activities. Retail trade and services account for approximately half of the county's total employment and nearly two-thirds of the total employment in Nags Head.

#### The Tourist Industry

Recreation is a big business in the United States. Nags Head relies heavily on tourism as the main source of outside income. Studies have shown that over half of tourist expenditures are for food and lodging, meaning that the trade and services sectors lead the industry. These sectors are characterized by small businesses with low productivity. Also, skills and wages in these sectors are generally low; often there are more jobs for women than men. In attempting to determine summer visitor population on the Dare Beaches, Stephens & Assoc. estimated that should all possible housing accommodations in 1971 be filled to capacity, approximately 30,000 overnight visitors could stay on the Dare Beaches. This would be in addition to the year-round residents, as well as employees who commute to work on the Beaches. There are also a large number of day-visitors who are

staying on Roanoke Island, are passing through the area to other lodging places, or who have driven to the Beaches from surrounding areas such as Norfolk or Elizabeth City for the day. One estimate for 1971 had a peak weekend population of 35,000 for the Dare Beaches. National Park Service records reveal that a total of 1,525,228 persons visited the Park in 1974.

All these figures indicate the enormous impact summer visitors have on the resort area. This impact is felt both physically and economically. Travel spending in Dare County in 1974 amounted to \$57.5 million, making the county the fifth highest in the state according to figures published by the North Carolina Travel Survey. This figure represents an increase of 14% over 1973. The trend is continuing in 1975 as figures of July 30, 1975 indicate that vacation travel to the Dare Coast is ahead of the first six months of 1974. This increase is occurring in spite of the general showing of the national economy.

It is obvious that proximity and total population contribute to the market area of North Carolina's coastal region (see Table 17). The great majority of visitors to Dare Beaches are from the eastern seaboard with Virginia having 24% of that total. North Carolina has 17% of these visitors mostly from the large population centers in the Piedmont. Pennsylvania and Maryland combine for 20% of the total visitors. These four states are the residence for 62% of all visitors to the Dare Beaches.

The primary market area extends approximately 350 miles to the north, including most of the New York City Metropolitan area. It approximates the configuration of the "Megalopolis Corridor" extending somewhat more to the west in Philadelphia and Virginia. In North Carolina, it extends only 100 miles to the southeast due to the effects of other coastal resorts outside this area. In 1970, the market area had a population of 30,897,072 people or roughly 15% of the total population of the United States.

TABLE 17

## ORIGIN OF VISITORS TO THE DARE BEACHES AND VIRGINIA BEACH, VIRGINIA

State	Percent of Total Visitors			Virginia Beach 1971 Overnight visitors Registration
	Dare Beaches		1972	
	1970 Study	1972 Survey	1972 Hotel Guests	
Virginia	24	24	19	24.2
North Carolina	17	17	9	2.0
Pennsylvania	12	12	14	13.1
Maryland	9	9	14	10.1
Ohio	6	6	8	8.7
New York	5	5	7	14.4
New Jersey	4	4	6	7.3
West Virginia	2	2	3	1.9
South Carolina	2	2	--	.1
District of Columbia	2	1	3	2.1
Delaware	--	1	2	.6
Others	17	17	15	15.5
TOTAL	100	100	100	100.0

Source: 1970 Greater Nags Head Chamber of Commerce Visitors Study; Tourist Survey by North Carolina Office of Travel and Promotion; 1972: Survey of Labor Day Visitors to Sea Oatel and Carolinian, 1972; Tourist Development Division, City of Virginia Beach, Registration Data, 1971.

Analysis of Nags Head's economic base substantiates its reliance on recreation as its primary source of outside income and emphasizes the short-term as well as the long-term problems inherent in a narrowly-based recreation economy:

1. Dare County's major product is recreational experiences; however, their consumption is seasonally oriented leading to extreme fluctuations in demand and under-utilization of labor and resources.
2. Employment in recreation does not compare favorably with other resource-based industries since wages are characteristically very low.

3. The recreation industry is extremely sensitive to fluctuations in the national economy. Under adverse economic conditions, recreation is one of the first items removed from the family budget.
4. The recreation resource is extremely sensitive to public policy. Poor land management policies can severely damage the economic potential of recreation resources.

On the positive side, the recreation industry is favored by a growing population, increases in disposable income, and increased leisure.

#### Retail Sales

Retail sales are another indicator of Dare County's economic growth. With recent population growth, rising incomes, development of the recreation industry, and inflation, the level of retail sales is expected to increase; however, the rate of increase is dependent primarily on the county's economic activity. As shown in Table 18, retail sales have increased over 400% since 1960, reflecting mainly the rapid expansion of the county's recreation-oriented industries.

The significant factors in Dare's retail sales growth are increasing income, higher standards of living, and population growth. The growth of Dare's retail trade industries, as measured by sales has been very strong over the past 15 years. Even under adverse national economic conditions during the 1967-69 period, the county's retail sales increased by almost 25 percent. Retail sales trends in Dare also verify the development of the recreation industry which was identified by the analysis of the county's employment.

TABLE 18  
DARE COUNTY  
RETAIL SALES -- 1960-1975

<u>Fiscal Year</u> <u>Fiscal Year</u>	<u>Retail Sales</u> <u>Current Dollars</u>	<u>Percent Increase</u>
1960-61	8,921,844	---
1961-62	10,021,531	12.3
1962-63	10,798,805	7.8
1963-64	12,156,285	12.6
1964-65	13,291,380	9.3
1965-66	14,920,985	12.3
1966-67	16,692,708	11.9
1967-68	17,577,479	5.3
1968-69	20,783,047	18.2
1969-70	23,490,677	13.0
1970-71	28,290,561	20.4
1971-72	32,222,254	13.9
1972-73	37,881,600	17.6
1973-74	44,676,070	17.9
1974-75	48,731,661	9.1

SOURCE: N. C. Department of Revenue; Stephens Associates.

## TRANSPORTATION

The character of local and regional transportation systems is one of the dominant factors controlling an area's growth and development. The history of isolation and slow growth on the Outer Banks serves to illustrate this relationship. An area in which a major portion of the economy is tied directly to recreation is even more heavily dependent upon access for economic development. Three major factors which determine the success of a recreation area are:

1. Travel time from geographic centers of population to the recreation area;
2. The comfort or discomfort of travel conditions; and
3. Total cost per visit.

### Regional Access

Transportation systems serving the county are composed of many elements; including highways, air, water, and rail. Highways are the most important element providing access to Nags Head at the present time. However, increasing disposable income and leisure time, as well as advances in transportation technology, make it impossible to discount the importance of air and water transportation in the future development of the area.

### Highways

For all practical purposes, regional access to Nags Head is limited to U.S. Highway 158 from the North and U.S. Highway 64-264 from the west. Highway 158 enters the county from lower Currituck County via the Wright Memorial Bridge over Currituck Sound. The Highway is two lanes and was constructed in 1931. Highway 64-264 is two lanes crossing the Alligator River, the Croatan and Roanoke Sounds. Route N.C. 12 carries traffic south from Nags Head to the Cape Hatteras National Seashore.

### Traffic Volumes

Average daily traffic (ADT) is defined as the average 24-hour traffic volume for a given period of time. Highways are designed to accommodate a certain peak ADT. The North Carolina State Highway Commission has collected volume data (64) at the Alligator River Bridge and Highway 158 at the Wright Memorial Bridge. These data in ADT form are presented in Table 19 for each month of the year.

It is estimated that approximately 75% of the traffic on U.S. 64 is composed of passenger cars and that the remainder is commercial vehicles. Although traffic composition counts were not made on U.S. 158, commercial usage would be approximately the same as that on U.S. 64.

### Highway Capacities

The Highway Research Board of the National Academy of Sciences - National Research Council has published standards for judging traffic volume capacity of various types of highways. These capacities are based primarily on the width of the pavement.

Routes U.S. 64-264 and U.S. 158 are both two lane highways with a pavement width of approximately 24 feet. Under the standards developed by the Highway Research Board, these highways can accommodate a maximum of 7,300 vehicles per day.

The data on average daily traffic presented in Table 19 indicates that the U.S. 64-264 facility entering the county from the west will be adequate well into the future. Route 158 entering the Dare Beaches from the north is already dangerously close to capacity during the peak summer months of July and August. Average daily traffic on Route 158 for the month of July increased about 22 percent per year from 1970 to 1973, reaching a 1973 peak of 7256. The ADT decreased slightly in 1974 but an increase is again expected which should be reflected in the 1975 figures.

Table 19

Dare Beaches Monthly Traffic Volume  
AVERAGE DAILY TRAFFIC

MONTH	HIGHWAY 64				HIGHWAY 158				Mean	
	1970	1971	1972	1973	1974	1971	1972	1973		1974
January	290	382	441	542	525	1327	1718	2119	1809	1641
February	348	427	448	578	432	1691	1821	2417	1694	1822
March	481	503	601	680	518	1812	2509	2571	2232	2235
April	526	890	864	1031	883	3271	3435	4173	3861	3440
May	775	1046	998	1225	1246	4037	4064	4290	4818	5015
June	1078	1442	1536	1649	1634	5227	5516	5955	5610	5430
July	1194	1687	1790	1917	1848	6332	6741	7152	6853	6558
August	1491	1522	1883	1901	1918	6169	6782	7256	7096	6639
September	993	1060	1267	1375	1284	4257	4472	4973	4618	4421
October	871	856	1088	1219	1314	2632	3150	3995	2794	3236
November	687	715	837	885	985	2084	2567	3045	3009	2639
December	409	507	534	516	580	1583	2054	1968	2060	1910
MEAN	767	920	1024	1120	1100	3422	3465	4200	3970	3701

SOURCE: N. C. State Highway Commission

Prior to the construction of the bridges and highways, access was a major factor inhibiting the growth of the area. Similarly, current trends seem to indicate that highway congestion may again limit access to Nags Head, placing a major constraint on development.

#### Air Transportation

Air travel, which had its birth in the Nags Head area, cannot be discounted in the future development of the area. At this time, however, the future of air travel and its impact on the county is not clear. Past trends in the advance of air transportation technology and the increase in the number of people utilizing air transport leads to the general conclusion that air travel will be a major mode of transportation in the future and should be considered in land use plans.

Currently, the only localities providing regular commercial air service are Norfolk, Virginia, a distance of about 70 miles and Elizabeth City, about 60 miles distance. Within a 60 mile radius of the county, there are other airports capable of handling private air traffic. These airports are located at Edenton, Kill Devil Hills, Hatteras, and Manteo. The airport at Kill Devil Hills is located on the site of the Wright Memorial and is operated by the National Park Service. Although this airport offers no facilities other than the runway, it appears to be the logical site for the development of private and light commercial air facilities to serve the Dare Beaches area.

#### Water Travel

Water travel will never again be as important to the growth and development of the county as it was in the period prior to the construction of the bridge systems. It should, however, be viewed as an important recreational

experience. Consideration should be given to improving space for land uses, such as marinas which are related to water travel.

#### Local Transportation System

Internal vehicular circulation in the beach is dependent primarily on corridors, route 158 Business and 158 Bypass running in a north-south direction between Kitty Hawk and Whalebone Junction. The area south of Whalebone is served by route 12. The Southern Shores and Duck communities north of Kitty Hawk are served by State route 1200.

Due to the linearity of the beach area, efficient internal movement of people and goods is difficult to achieve. This problem is destined to become more difficult if current development practices continue. Route 158 Business, which is located on the ocean side of the beach area, is heavily developed with commercial, commercial-residential, and residential uses, each having individual access on the two-lane highway. During the peak summer season, congestion resulting from large numbers of automobiles entering and leaving the highway makes rapid movement impossible.

Route 158 Bypass is located on the soundside of the Dare Beaches area and is intended to route through traffic around congested 158 Business area. The scattered location of business uses on the By-pass threatens this vital function.

## TOWN OF NAGS HEAD

### EXISTING LAND USE

There are approximately 4627 acres of land in Nags Head of which only about 17 percent (approximately 900 acres) is developed for urban purposes, excluding streets and highways.

In order to obtain a comprehensive view of the existing development in Nags Head a field survey was conducted in November of 1975, to determine how all the land was being used. Each use was located and recorded on a large map at a scale of 1" = 400', according to one of the following categories:

- (1) Commercial - includes all retail and minor wholesale operations, commercial recreation facilities, and commercial services and businesses, i.e., laundromats, barber shops, realty offices, motels, hotels, rental cottages and all other commercial;
- (2) Residential - includes all residential uses;
- (3) Government and Institutional, Cultural, Entertainment, and Recreation - Government and Institutional, and other uses generally available to the public at large.
- (4) Industrial - manufacturing and processing uses.
- (5) Transportation, Communication, & Utilities
- (6) Undeveloped Land
- (7) Agriculture
- (8) Forestland
- (9) Water
- (10) Wetland
- (11) Barren - including beaches, surface extraction and cleared transitional land..

This information is displayed on the existing land use map which accompanies this report.

### Commercial

Much of the commercial development in Nags Head is tourist oriented with restaurants, gift shops, entertainment facilities and gasoline service stations. Other commercial uses consist primarily of grocery stores, fishing piers (with bait and tackle shops) and commercial services such as realty offices, laundromats, and similar uses.

The existing pattern of commercial land uses in Nags Head is scattered along the major traffic corridors with seldom more than two or three business establishments in any one general location. Consequently, there are no identifiable "business districts" as such in the Town of Nags Head.

### Motels, Hotels and Cottage Courts

Approximately 7 percent of all developed land in Nags Head is occupied by motels, hotels, and other commercial residential land uses of this nature. With the exception of some scattered rental cottages west of U. S. 158 Bypass and a small number of cottage courts in south Nags Head, most of the land uses in this category are located between the 158 Bypass and the ocean beach extending from the town limits on the north, southward to approximately one-half mile south of Whalebone Junction.

### Residential

It was difficult in many instances to distinguish between permanent residences and the seasonal, rental cottages. The results of the "night survey" conducted in 1972 showed that south Nags Head contained a proportionately larger number of year-round or permanent residences. Other areas containing concentrations of year-round or permanent type dwellings were: 1) along Danube Street and Hesperides Street between the Highway 158 Bypass and Roanoke Sound; and, 2) along Sound Side Road between the Bypass and the Sound. Locations of other single family resort and year-round residences were somewhat scattered

throughout the developed sections of Nags Head. There is an indication of the predominant mix of seasonal and permanent housing from rental signs located on otherwise single family residential property and from the large numbers of automobiles parked at single residences during the season. The response of permanent residents to the survey also indicated potential conflicts in this mixture of use.

Although overall housing conditions in Nags Head are good, several unsound structures still remain. According to information obtained from "Social Indicators-Census Data Service" of the University of North Carolina in 1970, there were 637 housing units in Nags Head. Of this total, approximately 45 houses are found to be substandard while 592 are standard. Most of the substandard houses exist as single units among other better constructed and maintained dwellings. There should be no problem in eliminating the few dilapidated houses which are still standing.

HOUSING CONDITIONS, NAGS HEAD		
Total Housing Units	Substandard Housing	% of Total Housing
637	45	7.0

GOVERNMENTAL AND INSTITUTIONAL, CULTURAL, ENTERTAINMENT, AND RECREATION

The land uses in this category located in Nags Head include: Jockey's Ridge State Park, three churches, post office, Outer Banks Health Center, water treatment plant, street maintenance facilities and water tank, State Highway Patrol Office, Town Hall and fire station, and the fire station in south Nags Head. The addition of Jockey's Ridge State Park since the 1972 Land Development Plan was published has increased the use of land in this category considerably. The impact this will have on future allocation of land use must be carefully considered as well as potential uses for the large amount of vacant town owned property in the vicinity of the Fresh Pond.

### Industrial

There is about one-half acre of land in Nags Head used for industrial purposes, which is concrete manufacturing and accessory uses.

The industrial operation is located near the middle of a large tract, undeveloped, except for the Town Hall and water tower behind the plant and residential development directly across from the cement plant. The noise and dust from the plant and other aspects of the industrial operation conflict with the other nearby uses of the land.

### Summary and Conclusions

The general pattern of land use in Nags Head has not changes since 1972. Commercially oriented residential uses, motels, hotels & cottage courts, exceed other land uses in Nags Head. Most uses of this type are located in the northern half of Nags Head east of the Highway 158 Bypass. South Nags Head and the areas west of the 158 Bypass, contain a proportionately larger number of single family dwellings which are occupied on primarily a year-round basis or used as family resort homes.

### Significant Land Use Compatibility Problems

Commercial land uses are scattered and are most frequently mixed with other land uses. Although some areas of Nags Head contain more commercial establishments than others, a solid nucleus of business and commercial uses has not developed from which a business district can grow and expand.

Beuase of mixed land uses, some residents are not afforded adequate privacy and protection from the offensive characteristics of the more intensive commercial and industrial operations. This is particularly true of the more developed areas in Nags Head.

### Major Problems From Unplanned Development With Implications for The Future

Overzoning. Although many of the scattered commercial establishments in Nags Head existed prior to the adoption of zoning, overzoning for commercial use has encouraged the continuation of this pattern of development.

Scattered commercial development ususally results in unnecessary traffic hazards, inefficient use of land, undesirable mixtures of land uses, inconveniences for customers and an overall weakening of customer drawing power.

By centralizing or concentrating commercial development in a few larger areas, one or two points of access can serve a large number of business establishments and reduce the hazards of traffic pulling onto and off of the highway at many different locations.

Customers find this type of development more convenient in many ways. One stop, for instance, may take the place of several short trips. This saves time and money and is much safer.

Centralized commercial development also facilitates better and more successful merchandising and strengthens customer drawing power. A resident or tourist who sets out to purchase a roll of film at the drugstore may discover the ideal portrait for the den in the shop next door, or find the perfect beach hat in the shop a few doors down.

Strip Commercial Zoning. Both sides of the 158 Bypass are presently zoned for commercial use along its entire length in Nags Head. Strip commercial zoning tends to discourage development of centralized commercial facilities, and when developed, it causes unnecessary traffic hazards from cars pulling onto and off of the highway at so many different locations. If left to develop as it is now zoned, the Bypass will soon become choked with local, turning traffic and much less useful for its intended purpose.

Another problem with strip commercial zoning exists along the causeway between Nags Head and Roanoke Island. Eight commercial operations have now been established along the causeway adding congestion and traffic hazards to an already overcrowded highway during the tourist season. If commercial development is permitted to continue within the narrow strips of land along the highway the "bottleneck" situation will only worsen.

There are no other feasible locations to connect Nags Head with Roanoke Island. Consequently, to alleviate traffic problems here, it will probably be necessary to eventually widen the existing highway. It stands to reason that more commercial development along the causeway will only hasten the need to make corrective improvements (probably by widening the highway), and at the same time make the purchasing of additional rights-of-way more expensive. Steps should be taken to prevent additional development along the causeway except where adequate setback of buildings is possible.

Mixed Land Uses. Perhaps the most widespread problem in the existing development of Nags Head is that of mixed land uses. In some instances business establishments, motels, rental cottages and permanent residences are located side by side in the same block. In the highly developed sections of Nags Head it would, in fact, be difficult to identify any one section or area as being either residential or business.

Such an arrangement of land uses is unsatisfactory in several ways. Residential uses are not afforded adequate privacy and protection from the offensive characteristics of commercial operations, i.e., offending odors, unloading of heavy trucks, lights, traffic and noise associated with night time operations, etc. And, most likely, the business owner or operator would be constantly aggravated and possibly hampered in this operation by complaints from neighbors.

Conflicting Industrial-Residential Land Uses. The industrial operation located adjacent to residential land uses is another example of incompatible land use. Residents across from the concrete mixing plant are subjected almost daily to the noise, fumes and dust which are produced in its operation. Not only does this result in an unsatisfactory living environment, but property values are depreciated for residential and tourist oriented uses.

The present location of the concrete plant is unsatisfactory for the industry as well since under the existing zoning ordinance for Nags Head, the industrial operation is considered a "non-conforming land use." This means that expansion of the existing operation is not permitted either in size or intensity. It appears that the present site is already too small with evidence that part of the operation is spilling over onto the adjacent road right-of-way. This would seem to indicate that expansion is already necessary, yet is not permitted.

While this plant provides a vital product for the development of Nags Head and the county, a more suitable location for this and similar uses should be found.

In providing for the relocation of the existing industry, consideration should also be given to other potential industrial needs such as wholesaling, warehousing, commercial laundry etc. that are or will be needed in Nags Head and the other tourist oriented communities.

Subdivision Regulations. Until December of 1971, the Town of Nags Head did not have regulations governing the subdivision of land. The only requirement was that a plat of the subdivided property be recorded with the Dare County Register of Deeds. As a result of not having subdivision regulations, many poorly planned and deficient subdivisions have been created.

The following is a list of the more common defects found in the subdivisions which were recorded prior to the adoption of subdivision regulations in Nags Head:

- 1) Inadequate or badly designed street system--i.e., no provisions for access to adjacent areas which will likely be developed in the future; streets too narrow (width of less than 10' in some cases); no publicly dedicated streets (access by private easement only); excessively long dead-end streets, etc.

- 2) Street construction below minimum standards, i.e., unstable street beds, street surface too thin, faulty or no curbing etc.
- 3) Topography of land unsuitable for building purposes, i.e., barren, unstabilized sand dunes, inadequate drainage, etc.
- 4) Lack of utility and drainage easements, i.e., easements should be provided on all side and rear property lines of up to 10 feet so that later construction and development of improved services will not be hindered.

When subdivisions are defective in one or more ways, residents are not afforded satisfactory living conditions and usually an unnecessary financial burden is placed on the community in that the cost of street and utility maintenance is excessive. In addition, expensive corrective improvements are often required in later years to alleviate the problems associated with poorly designed and developed subdivisions.

An example of an otherwise unnecessary expense is when a street is constructed with a base or bed which is too shallow and wearing surface which is too thin. It may look alright and last for a year or two but invariably the street will begin to break up after only a few years resulting in the need to patch or possibly replace the whole street. Not only does this give a bad appearance but usually the whole community is forced to pay (through taxes) for the benefit of a few.

The need for strict enforcement of subdivision regulations has been demonstrated.

#### Areas Likely to Experience Major Changes in Predominant Land Use

The overall pattern of land use within Nags Head is not expected to change significantly over the next ten years. Two major factors will influence this projection however. The town is participating in the regional wastewater

facilities study which will culminate in a plan for sewage treatment for Roanoke Island and Bodie Island. If the current timetable is accurate, construction of the facilities recommended by that study will be around ten years in the future. The expansion of the present water system is scheduled for completion toward the end of 1976.

The primary constraints on development other than the availability of capital have been the inadequate water system and the land area required for septic tank and package sewage disposal systems. The removal of these two constraints will require strict adherence to development policies and standards to insure that the resulting development maintains the quality and character which the citizens of Nags Head have indicated they want to preserve.

## CURRENT PLANS, POLICIES AND REGULATIONS

1. The following plans are currently in effect:

### Nags Head Land Development Plan (1972)

The Land Development Plan designates future probable land use areas for low, medium and high density residential use, for motels and hotels, for general commercial use and for public and industrial land uses. The Plan was prepared by the Nags Head Planning Board with technical assistance from the N. C. Department of Natural and Economic Resources, Division of Community Services.

### Nags Head-Kill Devil Hills Thoroughfare Plan (1972)

The Thoroughfare Plan outlines a coordinated system of major streets and highways to serve as a basis for the future development of Nags Head and Kill Devil Hills. It was prepared by the N. C. Department of Transportation.

2. The following plans are work in progress:

### Master Drainage Plan

The U. S. Department of Agriculture Soil Conservation Service and N. C. Department of Human Resources are designing a drainage plan for the entire Town to eliminate storm drainage problems and to lessen flood hazard.

### Waste Water Facilities Plan (201)

Henry Von Oesen Associates are preparing a plan for sanitary sewage facilities for Nags Head, Kill Devil Hills, Roanoke Island and the North Dare Beaches Area.

### Community Facilities Plan and Public Improvements Program

The Nags Head Planning Board is undertaking this study of the facilities required to support desired growth in the Town, the costs and funding sources, with technical assistance from the N. C. Department of Natural and Economic Resources, Division of Community Assistance.

3. The following Land Use Policies and Regulations are in effect:

Zoning Ordinance (1962)

The Zoning Ordinance with subsequent amendments establishes zoning districts for appropriate uses within the Town and sets controls on the location, height, bulk and uses of structures. The Planning Board is working on a complete revision of the ordinance at this time.

Subdivision Ordinance (1971)

Establishes procedures and minimum standards for subdividing land in Nags Head and requires developers to install streets, utilities and preserve frontal dunes in ocean front subdivisions.

Soil Erosion and Sedimentation Control Ordinance (1975)

Requires an erosion control plan for land disturbing activities in Nags Head.

Dune Protection Ordinance (1971)

Nags Head enforces the Dare County Dune Protection Ordinance within the corporate limits. It requires a permit before altering any dune or vegetation thereon and requires structures to be set back at least 150 feet from mean high water of the Atlantic Ocean.

N. C. Building Code

Nags Head requires building permits for construction or modification of structures in accordance with the N. C. Building Code.

Flood Hazard Ordinance (1975)

Nags Head is in the permanent flood hazard program of the Federal Insurance Administration. The ordinance establishes flood hazard boundaries and sets development standards for structures in the various hazard zones.

Improvements (Septic Tank) Permits

Inspection and evaluation of each lot is required prior to construction which is dependent on septic tanks. Under-sized lots or lots with unsuitable soil characteristics cannot be developed with septic tanks.

The Dare County Health Department enforces the ordinance and makes the evaluation.

4. Enforcement Procedures

Nags Head employs a full-time Building Inspector who is responsible to the Town Manager for the enforcement of all land use controls except for the improvements permits which are administered by the Dare County Health Department.

SECTION II  
PUBLIC PARTICIPATION ACTIVITIES

ALTERNATIVES CONSIDERED IN THE DEVELOPMENT OF OBJECTIVES,  
POLICIES AND STANDARDS

The Coastal Area Management Act of 1974 requires that land use plans be adopted for each of the twenty coastal counties named in the Act and certain coastal towns. If any locality fails to develop its own plan, it is to be done for them by the State. The Nags Head Commissioners notified the State that they intended to develop their own plan. Immediately, Nags Head residents became aware that they were going to be required to face the future squarely by planning not only for the very near future but for generations to come.

A questionnaire was used as a basis to offer planning alternatives as to how Nags Head should grow and develop, identify issues which were seen as problems by citizens, and determine objectives of the Land Use Plan.

Citizens were asked to indicate the degree of encouragement or discouragement which they felt should be given to the following topics: agriculture; fishing industry; tourism; forestry; construction; research/development industry; light industry (warehousing assembly; etc.); heavy industry; residential development; single family residences; high rise residences; low rise multi-family residences; preservation of open space; new and improved cultural facilities (libraries, art galleries, theaters etc.); increased accessibility to Dare County; improved tourist facilities (convention centers, etc.); urban growth; protection of residential areas from encroachment by commercial or industrial enterprise; preservation of wildlife habitat; regulation of dunes and shoreline; and soil conservation.

In responding to the questionnaire, citizens were asked to indicate their degree of concern with such problem areas as water supply, traffic congestion, sewage disposal, solid waste disposal, high rise construction, lack of medical services, limitations on building height, pollution of oceans and sounds, over-

population, commercialization, small lots, lack of open space, lack of recreational facilities, destruction of dunes and beaches, lack of job diversification, lack of comforts and conveniences, lack of drainage, erosion by wind and water, lack of economic development, lack of industry, lack of planning, infringement upon individual rights, lack of county services, controlled growth, and control of natural resources.

The interests and concerns expressed by the citizens of the town during this process became the basis for the goals and policies which will guide future growth in Nags Head. Appendix A contains a copy of the citizen survey questionnaire and a summary of the results.

## IDENTIFICATION OF MAJOR LAND USE ISSUES

The public participation process resulted in the identification of the major land use issues and problems as perceived by the citizens of Nags Head and the development of long-range goals and policies to guide future growth which reflect the concerns expressed by them.

### A. Population and Economic Trends

The permanent population of Nags Head is estimated to have increased over 20% in the five years since the last census. The statistical profile of Nags Head residents indicates an increasingly older population with an average family size of only 2.6 which is significantly smaller than other communities in the region. The attraction of Nags Head for retirees is evident in this trend.

The implications of an increasingly older population in Nags Head are that specialized demands will be placed on health care and other community services and that the buying power of persons on fixed incomes will more immediately reflect fluctuations in the national economy.

The economic and physical impact of seasonal visitors to Nags Head must be carefully measured and taken into account for planning municipal facilities and services. Summer visitors in 1975 had the effect of increasing the population of the town by more than 1,500 percent almost overnight. In spite of a general slowing of the economy of the entire nation, visitation to this area actually increased in 1975.

The needs and desires of permanent residents seeking a retirement haven and the requirements of the tourist oriented economy of the town must be balanced in the future development of Nags Head. It is also important to try to achieve stabilization of the highly seasonal economy through programs designed to extend the tourist season and to increase local participation in the supply and service industries.

## B. Housing and Community Services

The most urgent problem identified by the residents of Nags Head was the lack of readily available medical and health care services. This problem will become even more critical as the population increases.

The inadequacy of the present municipal water supply is recognized as an urgent problem by the residents. This problem is emphasized when the peak demand is placed on the system by seasonal visitors at the time when fresh water recharge through rainfall is at its lowest. Septic tanks are no longer a satisfactory solution to the problem of sewage disposal when population densities begin to increase as they have in Nags Head. A modern sewage disposal system has become necessary to prevent the pollution of the highly productive sounds as well as to prevent potential pollution of the water-table aquifer which is the source of water for many domestic and commercial wells.

Disposal of increasing amounts of trash and garbage is recognized as an important concern in Nags Head. The solid waste problem is compounded by the fact that suitable sites for disposal are also areas which have the greatest potential for development.

While there are some recreation attractions for tourists, the recreation needs of permanent residents have not been recognized. As the community develops, expanded cultural and recreational facilities will be required to meet the increasing demand. Other community services including police and fire protection, education and social services must take into account the dual and seasonal nature of the populace of Nags Head.

Unplanned location of commercial and industrial land uses near residential neighborhoods has created some incompatible situations in the town. The residents of Nags Head see this as a problem along with the over-commercialization of the beach which could destroy the "family beach" atmosphere that is the major attraction for many visitors. Overcrowded development on small lots and structures which are out of scale with the low profile of vegetation and land features also threatens the style of living valued by Nags Head residents.

C. Productive Natural Resources

Nags Head is located at the edge of some of the world's most productive breeding grounds for shellfish and finfish. Commercial fisheries have long been a mainstay of the local economy. In recent years sport and recreational fishing and related tourism has over-shadowed commercial fishing as the basis for economic well being. The use of land as a base for the varied recreational experiences available here is part of the natural wealth of the area.

The interdependence of these two most valuable of productive resources, the water and the land, make it imperative that their use be carefully managed to conserve their productivity. Soil erosion by wind and water and pollution of the sounds and ocean are problems which threaten to destroy the very things which make Nags Head attractive.

D. Important Natural Environments

Nags Head is the site of two areas which have been designated as National Landmarks. Jockey's Ridge, which has been acquired as a State Park,

is recognized as the highest natural sand dune on the East Coast of the United States. Nags Head Woods is a unique example of maritime forest which covers ancient dunes with frequent fresh water ponds and bogs.

Their conservation is necessary to insure that future generations of coastal residents and visitors have the opportunity to participate in an important part of the coastal experience.

#### E. Cultural and Historic Resources

Jockeys Ridge and Nags Head Woods are only two of many cultural and historic resources of this area. The vicinity also includes the site of the first English settlement in America and the site of man's first powered flight. This rich, natural, cultural, and historic heritage constitutes one of the greatest assets of the area and one which is important to preserve so that it continues to attract visitors to the Outer Banks.

The first residents of the Nags Head area selected their home sites with care. They worked on the beaches and in the sounds, but they built their homes in sheltered, stable locations well protected from the winds and storms. This proven example of how to live in a fragile and sometimes hostile environment is part of the cultural heritage of Nags Head which should serve as a guide for future development.

DEVELOPMENT OBJECTIVES, POLICIES AND STANDARDS

A. The citizens of Nags Head have indicated their concern with the qualities of living in Nags Head which are most important to them and which seem most in danger of being lost if present trends continue. These qualities are:

1. The slow pace of life in Nags Head.
2. Freedom from pollution and the pressures of urban populations.
3. The natural environment of the Outer Banks and the recreational activities associated with it.
4. The inaccessibility of Nags Head and the privacy available here.

The overall goal of the Nags Head Land Use Plan will be to preserve and enhance these qualities which are unique to Nags Head so that the town will continue to be a pleasant place to live for permanent residents and remain attractive to the visitors who are vital to the economic well-being of the town.

B. The citizens of Nags Head indicated general agreement with the Goals of the 1972 Land Development Plan but suggested some alternative objectives and policies for achieving those goals. The concepts which most people agreed upon are the assumptions on which the development policies and standards will be based.

1. Effective planning can minimize the potential conflicts between the sound economic development of Nags Head and the natural environment which is the major attraction of the area.
2. Nags Head should give a high priority to improving community services and utilities to accomplish the objectives of the Land Use Plan.

3. Any industries or other large scale development should provide local officials with an assessment of the primary and secondary impact that such development will have upon the natural and cultural environment of Nags Head.
4. The natural resources of the area must be conserved to maintain their attractiveness and protective functions.
5. The growth of Nags Head should be controlled in accordance with plans for the provision of the necessary services to accommodate that growth.

#### Goal

Provide for the development and expansion of the tourist industry as the major industry of Nags Head.

#### Objectives

1. The "Family Beach" atmosphere is the attraction which brings most visitors back to Nags Head. This image should be reinforced and encouraged.
2. The seasonal fluctuations of the tourist oriented economy should be stabilized by extending the season to make more economical use of facilities and services.
3. Public access to the beach should be provided for land-locked property owners.
4. The development of a commercial services park for the location of wholesale warehousing and distribution activities would help to retain a larger share of the recreation income in Nags Head as well as provide a wider range of job diversification.
5. The construction of vacation homes will be encouraged to increase private investment in Nags Head and to help extend the tourist season.

### Goal

Coordinate the future growth and development of the Town of Nags Head with adjacent municipalities and with Dare County.

### Objectives

1. This plan, under the guidelines of the Coastal Area Management Act, represents a joint effort between the Planning Boards of Nags Head, Dare County, Kill Devil Hills and Manteo. Further cooperative planning efforts should be encouraged for the periodic review and revision of policies affecting all of the local governments.
2. The development of an adequate water and sewer system to serve the needs of this growing community is imperative. Coordination of each unit of government involved is required for the successful achievement of this objective.
3. The joint Thoroughfare Plan prepared for the Towns of Nags Head and Kill Devil Hills by the N. C. Department of Transportation should be adopted as part of the overall planning program along with the specific recommendations for implementation included in it.

### Goal

Conserve air, water, and land resources and preserve the natural environment to the extent possible.

### Objectives

1. Proposed development should not destroy or irretrievably alter:
  - A. Wetlands
  - B. Frontal Dunes
  - C. Beaches

- D. Estuarine or Impounded Surface Waters
  - E. Prime Wildlife Habitat
  - F. Unique natural areas, historic or archeological sites
2. Proposed development should not encroach upon or be endangered by:
- A. Areas of special flood hazard
  - B. Ocean front erosive areas
  - C. Inlets and areas within range of their migration
  - D. Estuarine erosive areas
3. Proposed development should not significantly affect the quality or reduce the value of:
- A. Public or privately owned forest, park, game lands, sanctuaries or other non-intensive recreation areas.
  - B. Aquifers, or aquifer recharge areas, or public water supply watersheds or water supply areas.

### Goal

Provide for the orderly growth and development of Nags Head as a community for year-round family living as well as a family ocean resort community.

### Objectives

The development of land and water areas within Nags Head should be undertaken in accordance with sound resource management principles in order to make the most economic use of public funds invested in services and to enhance private investment in the long term future of the Town. The following standards will guide the location of development in appropriate areas and identify certain measures necessary to insure safety and convenience for residents of and visitors to Nags Head.

A. General Standards -

1. Development should be located on stable, well-drained soils with a relatively low water table.
2. Structures should be located on the development site to avoid the destruction of existing vegetation wherever possible.
3. Structures should be located on site to avoid the alteration of the natural land form wherever possible.
4. Development should be located to minimize interference with established patterns of surrounding land use and to prevent conflict between incompatible uses of land and water.
5. Development should be located to avoid the destruction or irretrievable alteration of fragile or valuable natural or cultural resources.
6. Development should not occur in areas where there is a demonstrated danger of the loss of life or property due to natural or man-made processes.
7. Development in areas subject to coastal flooding should be designed and located to minimize the damage caused by such flooding.
8. Development should be located and timed to make the most efficient and economical use of existing or proposed public services including water, sewer, police, fire protection, schools, libraries and other services.

B. Residential Standards -

1. Permanent neighborhoods should be located in sheltered areas protected from encroachment by major transportation routes and incompatible commercial and industrial development.

2. Permanent neighborhoods should maintain low density levels and large amounts of useable open space to preserve the privacy and aesthetic appeal which characterize the traditional settlements of the Outer Banks.
3. Seasonal and vacation residences should be located with convenient access to transportation routes and recreational activities.
4. Residential development which requires septic tanks for sewage disposal should follow current health requirements as to soil type, height of water table and area to prevent pollution of ground water supply, aquifer recharge areas or estuarine waters.
5. Development which results in residential densities over 3 families per acre should be served by public or community sewage disposal systems.

C. Commercial Standards

1. General commercial activities, business and tourist services require locations adjacent to major thoroughfares. The uncontrolled development of commercial sites at scattered locations along highways does not promote good business, is inconvenient for shoppers (especially tourists unfamiliar with the area), promotes inefficient use of valuable developable land, creates dangerous traffic conflicts at each driveway entrance, and seriously impairs the capacity and function of the highway. Therefore, commercial development should be concentrated in groups of complementary uses where possible.
2. Small commercial enterprises of less than one acre are encouraged to locate where suitable sites exist among existing commercial uses in order to take advantage of combined drawing power and to increase customer convenience.

3. Large scale commercial developments involving one acre or more are encouraged to concentrate complementary uses on sites large enough to provide ample parking, controlled access to highways, and suitable buffering for adjacent residential use.
4. Convenience retail facilities designed and limited to serve neighborhood level trade areas only may be appropriate adjacent to some residential neighborhoods if properly buffered to minimize impact on adjacent residences.
5. Since the natural beauty of the area is one of its greatest attractions to tourists and permanent residents, advertising signs should be located only where they do not obscure or detract from that natural beauty.
6. Water related commercial activity such as marinas and piers should be located in naturally protected areas as near deep water as possible where the least amount of alteration of vital marsh and estuarine bottom is required.

D. Industrial Standards -

1. Industries will be required to provide an assessment of the impact of primary and secondary development caused by the industry and should use the best available technology to avoid pollution of the water or air during construction and in production.
2. Industries which are not entirely dependent upon waterfront locations should be located elsewhere.

## PROCESS USED TO DETERMINE PUBLIC PARTICIPATION

The Town of Nags Head has maintained an active planning program since its incorporation in 1961. Over the years, it has adopted and periodically updated a Land Development Plan to guide the growth of the town in an orderly manner.

Ordinances have been passed to enforce the standards set by the plan which has been implemented by the Planning Board and Commissioners to achieve many of the goals stated in it.

In 1974, the North Carolina General Assembly passed the Coastal Area Management Act requiring coastal communities to adopt land use plans which reflect the desires and needs of coastal residents and insure the protection, preservation, orderly development, and management of the Coastal Area. The Town Commissioners designated the Nags Head Planning Board as the responsible agency for assuring that the Nags Head Land Use Plan was in compliance with the Act.

To insure the maximum amount of public participation in the planning process and to assist them in necessary revisions of the existing land use plan, the Planning Board appointed a Citizens Advisory Committee on Land Use Planning. The responsibilities of the Citizens Advisory Committee were:

- (1) To advise the Board of Commissioners and Planning Board during the preparation of the Land Use Plan required by the Coastal Area Management Act of 1974.
- (2) To secure the views of a wide cross section of citizens, representing not only different geographical areas of the Town, but the varying economic, social, and cultural interests as well, on the goals and policies for the Land Use Plan.

- (3) To make sure that individuals in the community understand the problems and procedures involved in land use planning and to get individuals to take an active part in evaluating present land use and planning for the future development of the town.

The Planning Board and the Citizens Advisory Committee held public meetings for the north, central, and southern areas of the Town to inform the citizens of the requirements of the Coastal Area Management Act and to receive their input for the preparation of this Statement of Objectives and Policies which will become the basis for guiding the future development of the Town.

Members of the Nags Head Planning Board participated in the development of a Questionnaire which was used to elicit public response and to help define the objectives and concerns of the citizens of Nags Head.

Personal door-to-door and face-to-face contact of residents by members of the Planning Board and Advisory Committee was responsible for getting large numbers of local citizens involved in the Planning Process. Local newspaper articles and radio interviews were also used to increase awareness of the program.

Over 30% of the permanent population responded to the questionnaire and over 27% of questionnaires mailed to non-residents property owners were returned.

The large number of additional written comments on the questionnaires indicated a real concern with the direction the town was taking. The response of the participants at the community meeting was well thought out and generated some meaningful direction for revisions in the existing Nags Head Land Use Plan.

SECTION III  
CONSTRAINTS ON DEVELOPMENT

CONSTRAINTS ON DEVELOPMENT  
TOWN OF NAGS HEAD

The majority of literature on coastal features and processes used to document this report applies generally to the area of Nags Head but very little information is available which treats Nags Head specifically. For that reason, the information which was gathered for Dare County in its entirety is presented here. Those items which apply specifically to Nags Head are listed below:

I. Physical Limitations for Development

A. Hazard Areas

- (1) Ocean Erodible Areas
- (2) Estuarine Erodible Areas

B. Areas with Soil Limitations

C. Sources of Water Supply

II. Fragile Areas

A. Coastal Wetlands

B. Sand Dunes Along the Outer Banks

C. Jockey's Ridge

D. Ocean Beaches and Shorelines

E. Estuarine Waters

F. Public Trust Waters

G. Complex Natural Areas  
Nags Head Woods

H. Areas That Contain Remnant Species  
Nags Head Woods

I. Registered Natural Landmarks  
Jockey's Ridge  
Nags Head Woods

J. Historic Areas  
First Colony House  
Beach Cottage Row  
Fearing House

III. Areas With Resource Potential  
Jockey's Ridge State Park

## DARE COUNTY CONSTRAINTS ON DEVELOPMENT

The following outline and discussion identify the areas within Dare County which could be recognized as constraints on undeveloped land as required in the State Guidelines under the Coastal Area Management Act of 1974.

- I. Physical Limitations for Development
  - A. Hazard Areas
    1. Man-made
    2. Natural
      - a. Ocean Erodible Areas
        1. Location and Extent of Dare County Beaches
        2. Shoreline Changes
        3. Littoral Drift
        4. Inlet Changes
        5. Storm Recessi-n Forecasts
      - b. Estuarine Erodible Areas
  - B. Areas with Soil Limitations
    1. Soil Associations in Dare County
    2. County Soil Map and Soil Interpretation Chart
  - C. Sources of Water Supply
    1. Groundwater
    2. Surface Water
  - D. Areas With Steep Slopes
- II. Fragile Areas
  - A. Coastal Wetlands
  - B. Sand Dunes Along the Outer Banks
  - C. Ocean Beaches and Shorelines
  - D. Estuarine Waters
  - E. Public Trust Waters
  - F. Complex Natural Areas
    1. Natural Areas Designations in "Potential for Outdoor Recreation in Dare County, N.C."
    2. Maritime Forests and Fresh Water Ponds
      - a. Nags Head Woods
        1. Flora
        2. Fauna
    3. Durant Island
    4. Dare County Pocosin
  - G. Areas that Sustain Remnant Species
    1. Rare and Endangered Animals
    2. Rare and Unique Plant Species
  - H. Registered Natural Landmarks
  - I. Historic Areas
- III. Areas With Resource Potential
  - A. Productive Agricultural Lands
  - B. Potentially Valuable Mineral Sites
  - C. Publicly Owned Parks
  - D. Wildlife Sanctuaries

## I. PHYSICAL LIMITATIONS ON DEVELOPMENT

Physical Limitations on Development are areas likely to have conditions making development costly or causing undesirable consequences if developed. As seen in the preceding outline, a discussion on physical limitations should include Hazard Areas, Areas with Soil Limitations, and Sources of Water Supply.

- A. Both Man-made and Natural Hazard Areas should be considered. Man-made hazard areas within Dare County include the airport located in Manteo, the airstrips located in Kill Devil Hills and Hatteras, as well as the bombing range located on the mainland. Natural hazard areas include Ocean Erodible Areas and Estuarine Erodible Areas which are discussed in the following paragraphs.

### Ocean Erodible Areas

These areas are defined in the State Guidelines as the area above mean high water where excessive erosion has a high probability of occurring. Ocean erodible areas are extremely dynamic lands highly susceptible to becoming completely displaced by water.

The active beach area consists of the beach and the outer barrier dune. During normal wind and tide conditions, the beach front absorbs the energy of the waves, and it is regularly undated by tides. During extreme weather conditions, the outer barrier dune serves as the island's first line of defense against the sea.

Two important processes occur in the active beach area--one is the normal process of deposition and erosion of sand by winds and waves, and the other is the occasional breaching of the barrier dune and the resulting overwash caused by storms. Studies have shown that the combination of erosion and overwash produce a slow westward movement of the island. Under natural conditions, the beach is eroding inland, and the soundside shore is extending into the sound at approximately the same rate.

An article on the Outer Banks by Collier Cobb of UNC in the National Geographic Magazine stated that at one time the area was thickly forested up to the water's edge. After the Civil War, Bodie and Hatteras Islands were deforested for ship timbers, hence, initiating the erosion that has affected the area up to the present.

Alteration through improper development in the active beach area appears to produce an acceleration of the natural processes. Development in the active beach area must be considered from the standpoint of high potential loss of life and property, the destruction of the natural landscape, and destruction of the island's barrier against the forces of the sea. Both forms of destruction will have major economic consequences.

## Location and Extent of the Dare County Beaches

Bodie Island - The island is lined on the ocean side with a 33-mile stretch of beach from Dare-Currituck County line to Oregon Inlet. The island varies in width from about one-half to two miles. The area from the southern boundary of Nags Head to Oregon Inlet is under the care of the Cape Hatteras National Seashore Recreation Area and the National Park Service. The principal communities in the island are Nags Head, Kill Devil Hills and Kitty Hawk.

Hatteras Island - The shoreline west of Cape Hatteras is a 13-mile stretch which is rather straight towards to the west to Hatteras Inlet with a small concave portion close to the Cape. To the north of the Cape is a 39-mile stretch of coastline consisting mainly of two straight sections and a convex section towards the Atlantic Ocean in the vicinity of Rodanthe. The island is very narrow except in the area near the Cape.

The principal towns or communities are Rodanthe, Waves, Salvo, Avon, and Buxton north of Cape Hatteras, and Frisco and Hatteras in the western segment. The resident population live within the limits of these communities; the remainder of the island in the Cape Hatteras National Seashore Recreational Area is practically uninhabited except for the Coast Guard Stations located therein.

## Shoreline Changes\*

Two changes in the ocean shoreline of the area have been determined by comparing surveys made by the U.S. Coast and Geodetic Survey until 1860, aerial photographs of the area, and a survey made by the Corps of Engineers in 1958. Findings gathered by Langfelder et. al. (1968) and Whals (1973) on the coastal erosion of the N. C. Coastline were also employed.

Athearn and Ronne (1963) in their study of shoreline changes in the vicinity of Cape Hatteras, pointed out that erosion of the south beach at the Cape was quite impressive. At the southwest section, the loss between 1945 and 1953 amounted to 1,500 feet measured roughly along the high water line. The orientation of the beach changed substantially. The former trend was west-northwest to east-southeast; since 1953, the trend has been west to east. Most of the erosion was said to be confined to a pie-shaped wedge near the point, apparently with little change occurring farther west. Another 300 feet was lost between 1953 and 1958; however, the dune stabilization program of the National Park Service somewhat stabilized with some accretion observed.

House Document No. 763, 80th Congress (1948) reported from data gathered between 1848 and 1934 an average annual accretion of 0.8 foot over the 56 miles of shoreline from the Virginia State line southward. The area of erosion was noted at a section where the coast changes direction between 50 and 80 miles from the Virginia State line. Between Cape Hatteras to Ocrocoke Inlet, an average erosion of 2.2 feet per year was observed. At Cape Hatteras itself, a progressive erosion has been experienced from 1848 to 1934 with the eastern

\*From Coastal Erosion by Jerry Machemehl.

face averaging 21 feet per year. The southwestern face of the Cape has accreted at an average of 24.2 feet per year. The net change indicated a loss of 127 acres for the immediate vicinity of the Cape.

The study made in 1947 by the Corps of Engineers of shoreline changes in the Nags Head area from 32 to 66 miles from the Virginia State line showed a mixed pattern of erosion and accretion. Erosion occurred at most stations prior to 1935. From 1935 to 1937 accretion prevailed. Likewise, from 1937 to 1939 more sections experienced accretion than erosion. However, the net result for all the area except for that close to inlets was erosion. of from 5 to 95 feet, or a maximum rate of nearly 12 feet per year. From 1931 to 1939, there was a recession of 1,020 feet at the area near the north side of Oregon Inlet, but an accretion of 165 feet at the south side. The area north of New Inlet accreted 35 feet during the same period. An examination of figures 1 and 2 reveals the amount of erosion or accretion which has occurred during the period 1949-1971 along the Dare County barrier chain.

#### Littoral Drift

The predominant littoral drift was as expected in the shoreline north of Cape Hatteras, would be southward. Wave action accounts mostly for the marked predominance of the southward drift. The predominance of the southward drift has been further confirmed by southward migration of inlets and southward trailing of underwater spits at Cape Hatteras. The closure of most of the breaches through the barrier beach early in their development could also explain the fact that the volume of littoral material being moved is quite large.

The direction of the littoral drift is easterly from Hatteras Inlet to Cape Hatteras per the findings of Langfelder et. al. (1968). This accounts for the considerable accretion of material around Cape Hatteras where this easterly drift meets the southerly drift coming from the north of the Cape. The amount of accretion in this portion ranges from 80,000 to 400,000 cubic yards, increasing in the direction of the Cape.

#### Inlet Changes

The north tip of Ocracoke Island receded southwesterly covering a distance of 8,100 feet, an average annual rate of about 80 feet. The south tip of Hatteras Island advanced southwesterly about 3,200 feet, an average annual rate of 30 feet. The width of Hatteras Inlet increased from 3,500 feet in 1852 to about 8,400 feet in 1958. Welch (1885) did some research work on the account of the cutting through of Hatteras Inlet where he found that there is substantial evidence from many reliable sources that this inlet was opened during a great gale on September 7, 1846.

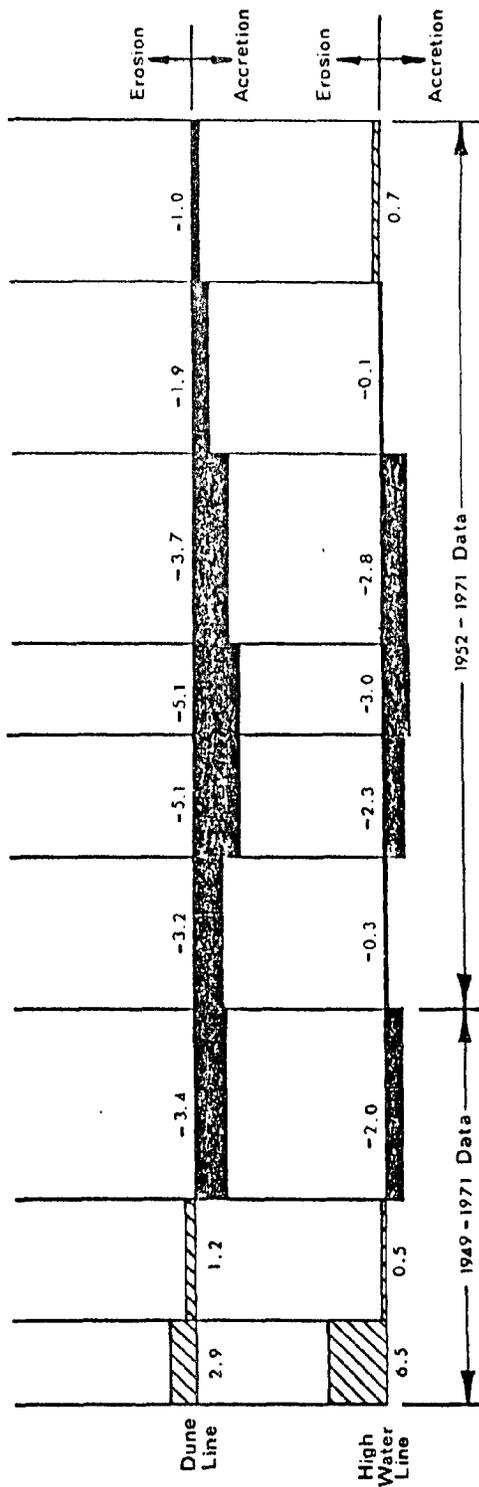
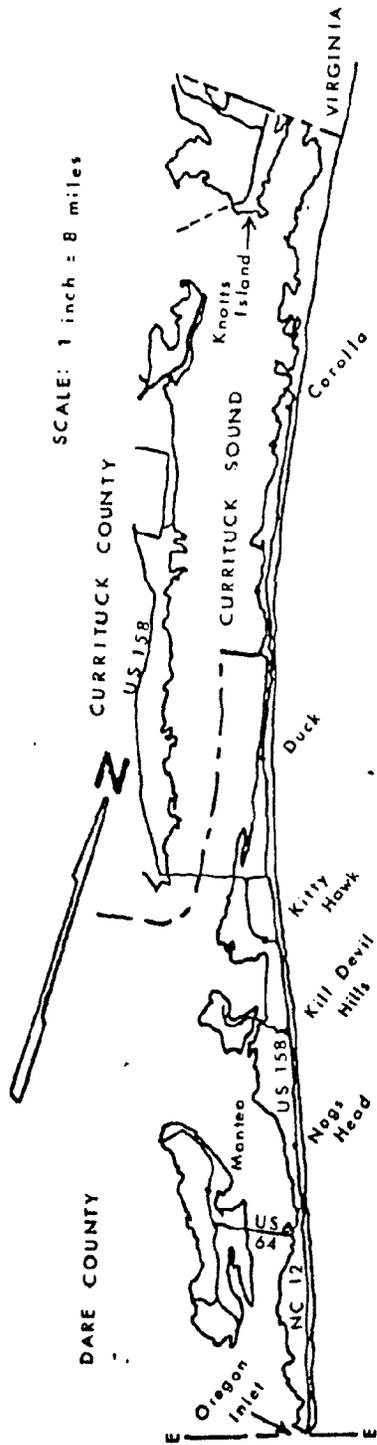


FIGURE 1  
COMPOSITE MEAN ANNUAL RATES OF CHANGE  
(FEET PER YEAR) FOR DUKE LINE AND  
HIGH WATER LINE IN CURRITUCK AND  
NORTHERN DARE COS. FOR 1949-1971



From available records, Oregon Inlet is the other inlet besides Ocracoke and Hatteras that has remained open at all times in the area. Numerous other inlets along the coast have closed, or opened and closed during this time. New Inlet was artificially opened in 1924, closed and then opened alternately and finally closed again in 1947 joining up Pea Island with Hatteras Island. Oregon Inlet is an opening in the barrier beach 40 miles north of Cape Hatteras and 80 miles by ocean from Ocracoke Inlet.

Records have shown that the width of Oregon Inlet was 2,770 feet at the baseline sometime in 1931. It had widened to 4,300 feet in 1935 and varied in width from 4,000 feet in 1936, 4,300 feet in 1937, and 4,350 feet in 1939. The increase in width was nearly equal on both sides of the inlet during the period, so it was concluded it has no tendency to migrate except for its previous history, that it moved southward about 1-1/2 miles in 65 years prior to this period.

The existence and histories of inlets in the area were determined from maps, surveys, charts and reports previously made. The oldest reliable record is a map of the coastal section from the Virginia State line to Cape Fear entitled "Chart of his Majesty's Province of North Carolina," signed by James Wimble in 1738. It has been shown that since that time both Ocracoke and Hatteras Inlets migrated in a southwesterly direction.

#### Storm Recession Forecasts

Storm erosion of beaches and dunes of the Dare County coast has always occurred, but it has not been a serious economic problem until recently when increased development of beachfront property has taken place. In some locations, structures have been built seaward of the beach storm recession line and have sustained considerable damage. In 1973, Knowles et. al, presented the results of a study to determine the expected storm induced beach erosion for storm occurrence of one in twenty-five, one in fifty, and one in a hundred year frequencies. This erosion study provides preliminary information needed for coastal land management. The calculated storm recessions for each of the piers analyzed in Dare County are presented in Table .

The storm induced recession prediction presented here is considered to be useful for determining the distance from the toe of the primary dune in which any structures might be considered to be in danger. However, if a building setback line is to be established, additional factors such as long time erosion, continuity of the dunes, size and shape of the dunes, potential for overwash and other existing features should be considered.

RESULTS OF BEACH RECESSION STUDY FOR NORTH CAROLINA COASTLINE

County and Pier Name	Dune Height (ft. above MSL)	Toe of Dune Height(ft) from MSL	Dist. from MHW(ft)	Recession from toe of dune (ft) for three storms with specific return frequencies in years
				1/25      1/50      1/100
Dare County				
Kitty Hawk	19.6	12.1	215	11      34      54
Avalon	18.5	9.3	150	40      70      94
Nags Head	22.9	7.6	112	94      107      126
Outer Banks*	30.0	4.1	75	69      73      78
Hatteras Island	21.7	2.2	102	99      104      108
Cape Hatteras*	24.0	8.8	61	57      66      74

SOURCE: "A Preliminary Study of Storm Induced Beach Erosion for N. C."

### Estuarine, Sound Erodible Areas

These areas are defined as the area above ordinary high water where excessive erosion has a high probability of occurring. The estuarine and sound and river erodible areas are natural hazard areas especially vulnerable to erosion. Development within this type land is subjected to the damaging process of erosion unless special development standards and preventive measures are employed.

In determining the landward extent of this area, 25 and 100 year recession figures are projected for certain reaches of the Dare County mainland. This inventory was undertaken by the State Soil Conservation Service and is available at the present time only for the Dare mainlands.

The reaches identified on Page 75, Fig. 3 represent segments of shore which have similar erosive characteristics. The average width loss to erosion was established by observing aerial photos over a twenty-two year period. This figure represents the total loss to erosion during that time. Estuarine recession figures for Roanoke Island and the west portions of the barrier islands will be available when further information is supplied by the State Geologist.

#### ESTUARINE, SOUND AND RIVER EROSION IN DARE COUNTY

Reach No. 1	
Average width lost to erosion	44.4 feet
Total length of shoreline	3.3 miles
Average width lost to erosion per year	2.0 feet
25-year shore recession forecast	50 feet
100-year shore recession forecast	200 feet
Reach No. 2	
Average width lost to erosion	44.0 feet
Total length of shoreline	4.1 miles
Average width lost to erosion per year	2.0 feet
25-year shore recession forecast	50 feet
100-year shore recession forecast	200 feet
Reach No. 3	
Average width lost to erosion	44.0 feet
Total length of shoreline	22.6 miles
Average width lost to erosion per year	2.0 feet
25-year shore recession forecast	50 feet
100-year shore recession forecast	200 feet

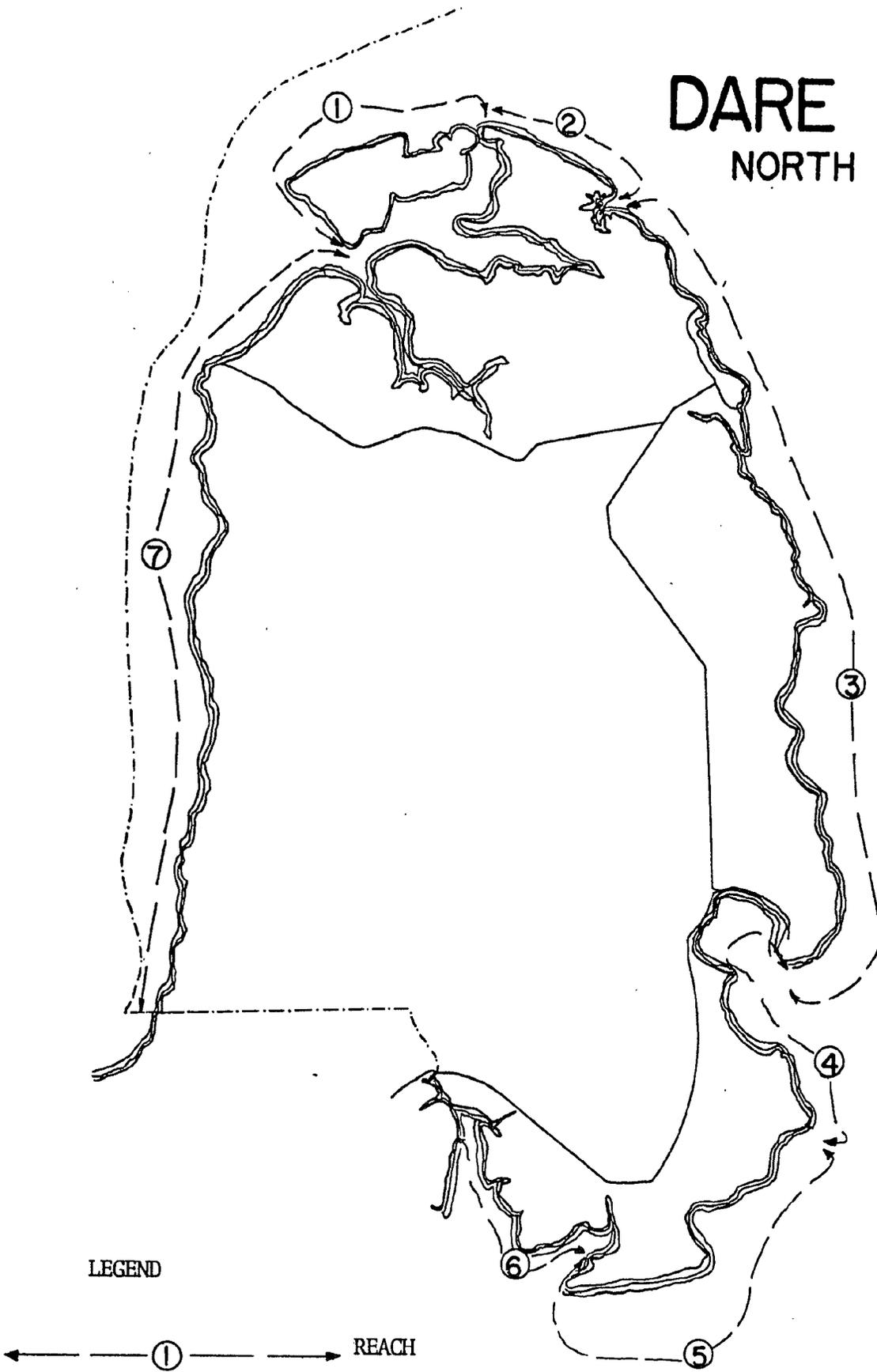
Reach No. 4	
Average width lost to erosion	44.0 feet
Total length of shoreline	10.8 miles
Average width lost to erosion per year	2.0 feet
25-year shore recession forecast	50 feet
100-year shore recession forecast	200 feet

Reach No. 5	
Average width lost to erosion	44.0 feet
Total length of shoreline	8.7 miles
Average width lost to erosion per year	2.0 feet
25-year shore recession forecast	50 feet
100-year shore recession forecast	200 feet

Reach No. 6	
Average width lost to erosion	44.0 feet
Total length of shoreline	9.3 miles
Average width lost to erosion per year	2.0 feet
25-year shore recession forecast	50 feet
100-year shore recession forecast	200 feet

Reach No. 7	
Average width lost to erosion	44.0 feet
Total length of shoreline	23.2 miles
Average width lost to erosion per year	2.0 feet
25-year shore recession forecast	50.0 feet
100-year shore recession forecast	200.0 feet

# DARE COUNTY NORTH CAROLINA



ESTUARINE EROSION FOR DARE COUNTY

## B. Areas with Soil Limitations\*

Areas with soil limitations are also considered as physical limitations on development. Soils which occur together in a characteristic and repeating pattern on the landscape constitute a general soil area or a Soil Association. Soil Associations are named for two or more of the most extensive soil types found on a particular landscape. The less extensive soil types may not be included in the Association name.

A generalized soils map showing the locations and extent of six associations in Dare County has been prepared. This map, along with the accompanying text and interpretations, provides the general soils data necessary for planning and efficient use and orderly development of the county's land resources. This map will be useful to those who are interested in the location and extent of soil types in the county, as well as to those who seek the locations of areas suitable for agricultural, industrial, or other broad land use potentials within the county.

It should be emphasized that this general soils map has been prepared for broad planning purposes only. It does not accurately depict specific soil types on individual tracts of land and is not suitable for detailed planning of such tracts. A more detailed soil survey is necessary for detailed planning.

The accompanying soil interpretations table gives limitations of the main soil types for dwellings, recreational areas, light industries, and highway development, as well as suitability for general agriculture, woodland, and pasture development.

The six soil associations in Dare County are discussed in the following pages. (The accompanying maps, legends and tables were prepared by the Soil Conservation Service assisting the Pamlico Soil and Water Conservation District.)

### 1. PACTOLUS-WAKULA-WAGRAM ASSOCIATION:

Moderately well and well drained soils with gray to dark gray loamy sand surface layers and loamy sand to sandy clay loam subsoils.

This association comprises about one percent (1%) of the county's total area. It occurs as a small isolated area around Mann's Harbor on the mainland and as larger acreages on Roanoke Island around Wanchese and Manteo. Large acreages of the association are also located on the northern end of the Outer Banks around Kitty Hawk, Sound Landing, and Collington.

The majority of the acreage in this association is devoted to recreational enterprises and urbanization. Agriculture is limited to small acreages and, generally, is devoted to small garden plots.

\*From "Soil Map and Interpretations, Dare County, N. C."

## 2. NEWHAN-COROLLA-DUCK ASSOCIATION:

Excessively drained moderately well and poorly drained gray sandy soils that contain marine shells.

This association comprises about thirteen percent (13%) of the county's total acreage. Soils of the association are found exclusively on the Outer Banks and primarily on the eastern side of the chain from the Currituck line to Hatteras in the South.

Soils of this association are unsuited for agriculture or forestry. They generally have severe limitations for most potential uses and should be considered as "high risk" areas for housing and industrial development. This rating is based on soil characteristics as well as on their close proximity to the ocean and susceptibility to wind and water damage resulting from storms and hurricanes.

## 3. DARE-PUNGO-PONZER ASSOCIATION:

Very poorly drained soils with thick to moderately thick organic surface over mineral subsurface layers ranging from sand to clays.

Soils of this association, along with other closely related organic and mineral soils, comprise approximately seventy percent (70%) of the county's total area. This association represents even a larger percentage of the total acreage of the Dare County mainland.

Organic soils, as differentiated from mineral soils, are those in which 16 inches or more of the surface layer is composed predominantly of organic materials. In Dare County these organic soils represent a large cross-section of surface and subsurface conditions. Along with the unique nature of these organic soils comes a large variety of associated and complex management problems.

The soils of this association are extremely wet year around, are extremely acid unless limed, have large amounts of wood throughout the profile, contain high percentages of unstable organic materials and are extremely susceptible to fire when dry. The characteristics for organic soils of this association indicate a limited potential for agriculture and forestry and essentially no potential for industrial development. Agricultural development is taking place on these soils but sound management practices and large capital investments are required. Although corn, soybeans and small grains are potential crops for these soils, indications are that these acreages may be best utilized for pasture or forage crop production.

## 4. WASDA-BLADEN ASSOCIATION:

Very poorly and poorly drained soils with thin organic loam to silt loam surface layers over firm clay loam or clay subsurface layers.

This association comprises approximately ten percent (10%) of the county's total acreage. It occurs as two large fairly homogenous areas on the mainland of Dare County. One large area is located in the west-central portion of the county and the other area extends from East Lake community along Highway 64 and runs in a northeast-southeast band to highway 264.

Only a very small percentage of this association is now under cultivation; this acreage is located in the East Lake Community. However, plans for development of tremendous acreages of this association are in progress. These soils respond well to application of lime and fertilizer but a complete drainage system must be installed and maintained in order to off-set the high water table and periodic flooding. Potential uses of soils in this association are, therefore, limited to agriculture and forestry.

#### 5. CAPERS ASSOCIATION:

Very poorly drained soils with dark gray silty clay loam surface layers over silty clay subsoils.

This association comprises about five percent (5%) of the county's total acreage. Capers soils make up approximately ninety percent (90%) of the association. The Capers soils are associated almost exclusively with level tidal flats and estuaries bordering the Pamlico, Croatan, Currituck, and Albemarle Sounds. These soils are flooded by saline or brackish water at least once per month and in many areas, twice daily. Elevations for these soils range from sea level to approximately three feet above sea level. Their chief use is that of a natural habitat for shore and water birds and animals. They are also chief nutrient source for shellfish and other important estuary marine life. Vegetation consists chiefly of smooth cordgrass, black rush, glass wort, sea-shore saltgrass, sea-oxeye, and other marsh related grass and shrub species.

#### 6. DUNE SAND ASSOCIATION:

Unstabilized and partially stabilized sand dunes.

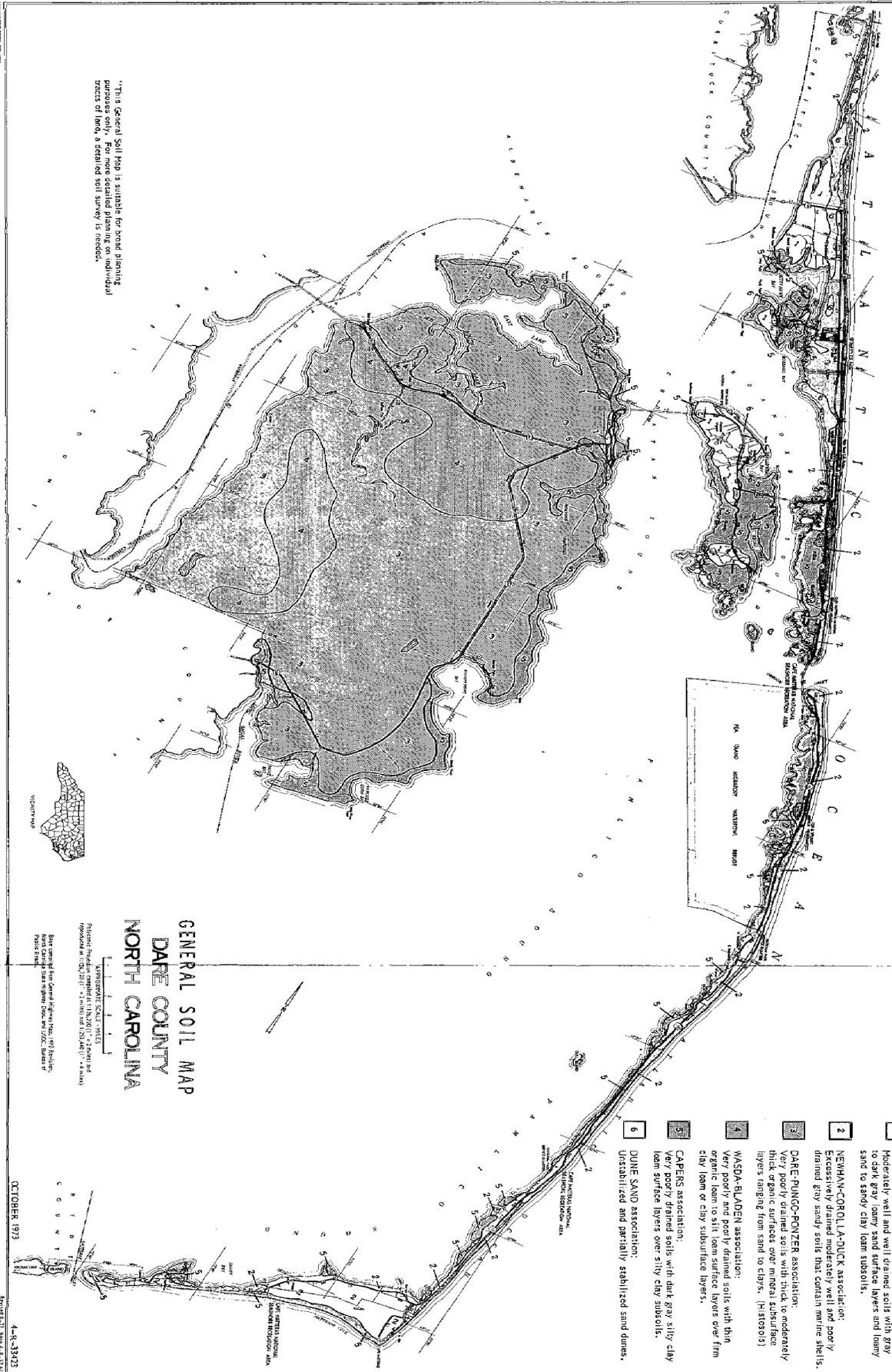
This association comprises about one percent of the county's total acreage and is found exclusively on Roanoke Island and the Outer Banks from Nags Head to the Currituck County line. Jockey's Ridge is included in the association.

The Duneland areas are highly susceptible to wind erosion and in their natural state are continually being shifted generally in a westward direction. Because of the unstable character of these dunes, they generally support little or no vegetation. Occasional clumps of bitter panicgrass and bayberry may be found on the lower slopes. Slopes generally range from 8 to 35 percent.

(Tentative - Soil Names Subject to Change)

L E G E N D

- 1 PACTOLUS-WAKULA-WAGRAM association:  
Moderately well and well drained soils with gray to dark gray, lamy sand surface layers and loamy sand to sandy clay loam subsoils.
- 2 KENNAH-COROLLA-DUCK association:  
Excessive(ly) drained moderate(ly) well and poorly drained gray sandy soils that contain marine shells.
- 3 DARE-PUNGO-PONZER association:  
Very poorly drained soils with moderately thick organic surfaces over mineral subsurface layers ranging from sand to clays. (Hst05015)
- 4 WASDA-BLADEEN association:  
Very poorly and poorly drained soils with thin organic loam to silt loam surface layers over firm clay loam or clay subsurface layers.
- 5 CAPERS association:  
Very poorly drained soils with dark gray silty clay loam surface layers over stony clay subsoils.
- 6 DUINE SAND association:  
Unstabilized and partially stabilized sand dunes.



"This General Soil Map is suitable for broad planning purposes only. A detailed soil survey is needed to provide more specific information on soil types and their characteristics."

GENERAL SOIL MAP  
DARE COUNTY  
NORTH CAROLINA

PROPORTIONATE SCALE: 1:50,000  
Reference: Publication 11-11820-1 (1-2-70) and 11-11820-2 (1-2-70) and 11-11820-3 (1-2-70)  
Base source of map: General Highway Map, 1967 Edition, State of North Carolina, Raleigh, N.C., and U.S. Geological Survey, Washington, D.C.

OCTOBER 1973  
4-85-33103  
Revised 11/73

SOIL INTERPRETATIONS  
GENERAL SOIL MAP  
DARE COUNTY, NORTH CAROLINA

SOIL ASSOCIATIONS	% OF ASSOC.	LIMITATIONS FOR						SUITABILITY FOR			
		DWELLINGS WITH SEPTIC TANK FILTER FIELDS	RECREATION			LIGHT INDUSTRIES	ROADS AND STREETS	GENERAL AGRICULTURE	WOODS	PASTURE	
			CAMP SITES	PICNIC AREAS	INTENSIVE PLAY AREAS						
FACTOLUS-WAKULLA-WAGRAH 17 Factolus Wakulla Wagram	35%	Sev. Fl. Wt. LFC	Mod. Wt. Text.	Mod. Wt. Text.	1/	2/	1/	4/			
	30%	Slt. to Mod. LFC	Sev. Text.	Sev. Text.	Sev. Fl. Wt.	Mod. Fl.	Good	Good	Good		
	20%	Slight to Mod.	Mod. Text.	Mod. Text.	Moderate	Slight	Fair	Fair	Fair		
NEWHAN-COROLLA-DUCK 137 Newhan Corolla Duck	35%	Slight LFC Slope	Sev. Text.	Sev. Text.	Sev. Text. Fl.	Sev. Text. Fl.	Poor	Poor	Poor		
	25%	Sev. LFC Wt.	Sev. Text.	Sev. Text. Wt. Fl.	Sev. Text. Fl.	Sev. Text. Fl.	Poor	Poor	Poor		
	25%	Sev. LFC Wt. Fl.	Sev. Fl. Wt.	Sev. Wt. Fl.	Sev. Wt. Fl.	Sev. Wt. Fl.	Poor	Poor	Poor		
DARE-PUNGO-PONZER 707 Dare Pungo Ponzer	40%	Sev. Fl.	Sev. Fl.	Sev. Fl.	Sev. Fl. BS	Sev. Fl. TSC	Poor	Fair	Poor		
	25%	Sev. Fl.	Sev. Fl.	Sev. Fl.	Sev. Fl. BS	Sev. Fl. TSC	Poor	Fair	Poor		
	20%	Sev. Fl.	Sev. Fl.	Sev. Fl.	Sev. Fl. BS	Sev. Fl. TSC	Poor	Good	Good		
WASDA-BLADEN 107 Wasda Bladen	65%	Sev. Fl. Wt.	Sev. Fl.	Sev. Fl.	Sev. Fl. Wt.	Sev. Fl. Wt.	Good	Good	Good		
	20%	Sev. Fl. Wt. Perm	Sev. Fl.	Sev. Fl. Wt.	Sev. Fl. Cor.	Sev. Fl. Wt.	Good	Good	Good		
	90%	Sev. Fl. Wt.	Sev. Fl.	Sev. Fl.	Sev. Fl. BS	Sev. Fl. BS	Poor	Poor	Poor		
DUNE SAND 17 Dune Sand	90%	Sev. LFC Slope	Sev. Text.	Sev. Text.	Sev. Slope	Sev. Text.	Poor	Poor	Poor		

DEFINITIONS OF SOIL LIMITATIONS

NONE TO - Soils have properties favorable for the rated use. Limitations are so minor that they can be easily overcome. Good performance and low maintenance can be expected from these soils.

MODERATE - Soils have properties moderately favorable for the rated use. Limitations can be overcome or modified with planning, design, or special maintenance.

SEVERE - Soils have one or more properties unfavorable for the rated use. Limitations are difficult and costly to modify or overcome requiring major soil reclamation, special design, or intense maintenance.

ABBREVIATIONS FOR LIMITING FACTORS:

Fl - Flood Hazard  
Wt - Water Table  
Sh-Sw - Shrink-Swell Potential  
Perm - Permeability  
Text - Texture  
LFC - Low Filter Capacity  
Cor - Corrosion Potential  
TSC - Traffic Supporting Capacity  
BS - Bearing Strength

Sev. - Severe  
Mod. - Moderate  
Slt. - Slight

1/ Structures whose footings are in subsoil.

2/ Refers to roads and streets that have subsoil for base.

3/ Tobacco, peanuts and truck.

4/ Corn, soybeans and small grain.

### C. Sources of Water Supply\*

Areas which contain the sources of water supply for the County could be considered as physical limitations on development. The following discussion is concerned with the County's groundwater and surface water supplies.

#### Groundwater

Information on the subsurface geology of Dare County is primarily limited to the study of well cutting made throughout the area. It is generally accepted that the area was submerged during the Tertiary and Pleistocene periods. Generally sandy materials of the Pleistocene-Pliocene Periods are encountered to varying depths of approximately 180 feet. The materials are underlain by sediments from the Miocene Period to depths of about 1600 feet.

Water bearing formations are found in both the surficial sands and deeper units such as the Yorktown formation found in the upper miocene sediments. This non-artesian aquifer is the principal source of water supply in Dare County. Most wells on the mainland yield water from this aquifer. Test data indicate that the area south of Mann's Harbor is ideal for the development of large water supplies. This area includes or is adjacent to the center of recharge and also the greatest thickness of the aquifer.

The principal aquifer extends beneath all of Roanoke Island and has been the source of water supplies for many years. Test wells show the southern half of the island to be very favorable for the development of relatively large water supplies.

All fresh groundwater in the Dare Beaches area at least to the depth penetrated by test wells, is derived from precipitation falling on the area. According to data collected by the U. S. Geological Survey, aquifers that crop out on the mainland to the west and extend beneath the Outer Banks contain saline water. Present groundwater supplies on the "Banks" are obtained from shallow wells, most of which are less than 40 feet deep.

#### Surface Water

The obvious surface water features in the County are the Alligator River and the tidal waters of Roanoke Sound, Croatan, Albemarle and Pamlico Sound at the Atlantic Ocean, which is close enough to have a definite salt spray effect on the front line beach vegetation, and obviously affects weather conditions. The numerous but peculiar freshwater ponds have a significant if not total effect on the water supply in the Nags Head and Kill Devil Hills area. These lakes occur in the Nags Head Woods area and are water-table lakes believed to be the product of wind-scooped depressions in this ancient dune section.

The lakes have large storage capacities. The volume of the largest lake (Fresh Water Lake) was measured at a time when the lake surface was at 9.4 feet above mean sea level and the average maximum depth of the lake was 15 feet. At that time, Fresh Water Lake contained approximately 90 million gallons of water and its surface covered approximately 35 acres. The other unnamed fresh water lakes in this area are smaller than Fresh Water Lake but their aggregate water volume would be sizeable. The lakes are recharged by rainfall and by inflow from the upper aquifer.

\*From Van Oesen Regional Water System

#### D. Areas Which Exceed 12% Slope

The incidence of areas which exceed 12% slope comprise a very small percentage of total acreage within the county. With the exception of the live dune areas of Jockey's Ridge and certain sectors of the frontal dune system, the steep slopes within the county are stabilized with natural vegetation. Areas which exceed 12% slope within the County are:

- (1) The relict dune system facing Roanoke Sound on the Northeast section of Roanoke Island. The dunes are stabilized with vegetation. This area is subdivided and most of the land is in residential use;
- (2) The Jockey's Ridge live dune system;
- (3) The maritime forest areas of Buxton Woods and Nags Head Woods;
- (4) The Wright Memorial at Kill Devil Hills;
- (5) A small area of inland dunes south of Frisco; and
- (6) The frontal dune system within the County.

Previously, it was emphasized that the soils map and text found in this Land Use Plan were prepared for broad planning purposes only and of the need for a more detailed soil survey for more detailed planning. This detailed survey is presently being prepared by the Soil Conservation Service. The Service has evaluated soil characteristics and related grading slope features of property for development potentials in Dare County.

The texture of all soils types in areas which exceed 12% slope is sand. There are two major distinguishing features of these sandy beach soils which relate directly to their potential for quality urban development. These two features are degree of wetness and degree of stabilization. Duneland, Newham Fine Sand, and Fripp are the soil types found in steeply sloping areas within the County.

Duneland is defined as areas of well drained, sparsely vegetated (less than 15%) and rapidly shifting sands. Therefore, the major consideration of this soil is the lack of stabilizing vegetation. The high potential of shifting sand can undermine or cover up structures and roads.

Newham Fine Sand are deep, well drained and excessively drained sands. The permanent water table or seasonal high water table is well below 36 inches and is generally greater than six feet. These soils are considered to be fairly well stabilized as they have more than 40% of the surface vegetated. The soil has good potential for development and a graded angle can be steeper than on Duneland due to natural vegetation.

Fripp soils are found in areas of 25 to 60% slopes on undulating to rolling dunes commonly adjoining beaches and waterways along the coast. Most sites are 5 feet to 50 feet above mean sea level. Flooding is rare and only on the lower slopes. This soil is excessively drained with rapid permeability. Native vegetation for this soil consists of wax myrtle, live oak, slash pine, loblolly and longleaf pine, sand pine, sea oats, sea coast bluestem and beach grass. In Dare County, this soil type is found in the Nags Head Woods area, with steep slopes up to 60%, but covered with what appears to be virgin timber.

## II. FRAGILE AREAS

Fragile areas are those areas which could easily be destroyed by inappropriate or poorly planned development. The following discussion involves areas which could be considered as fragile within Dare County.

### A. Coastal Wetlands

Coastal wetlands are defined as any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (not to include hurricane or tropical storm tides). Salt marshland or other marsh shall be those areas upon which grow some, but not necessarily all of the following salt marsh and marsh plant species: Smooth or salt water Cordgrass (*Spartina alterniflora*); Black Needlerush (*Juncus roemerianus*); Glasswort (*Salicornia* spp.); Salt grass (*Distichlis spicata*); Sea Lavender (*Limonium* spp.); Bulrush (*Scirpus* spp.); Saw Grass (*Cladium Jamaicense*); Cat-Tail (*Typha* spp.); Salt-Meadow Grass (*Spartina patens*); and Salt-keed Grass (*Spartina cynosuroides*).

South of Chesapeake Bay salt marshes typical of those along the entire South Atlantic and Gulf Coasts occur. These represent, in general, the best development of salt marshes in the United States. In the southeastern states, salt marshes are formed primarily in estuaries where major rivers, draining large expanses of upland, deposit heavy salt burdens. They also form behind barrier beaches (as along the North Carolina coast north of Cape Lookout), and up bays and tributary rivers as far as there is an influence of salt water.

In Dare County, the sounds offshore are generally covered by marshgrass. The importance of these productive marsh areas has been emphasized and re-emphasized over the past several years. Many species of fish and wildlife which are an intricate part of the Dare economy are tied to these soundside marsh areas for at least a part of their life cycles. Within the County there are approximately 15,500 acres of irregularly flooded salt marshes and 500 acres of regularly flooded marshes.

Development on land contiguous with marsh areas also presents problems. Presently the only means of treatment is septic tanks. Seepage of wastewater into the marsh areas could endanger the continued support of many fish and wildlife species.

## B. Sand Dunes Along the Outer Banks\*

Sand dunes along the Outer Banks are considered fragile areas and defined as sand deposits of windblown (eolian) origin, whether partly or wholly vegetated with grasses, herbs, vines or woody plants.

The dunes comprise a major portion of the Outer Banks and represent a protective barrier for the sounds, estuaries, and the mainland. These sand deposits represent a dynamic system that does not afford long term protection for incompatible development. Development with inadequate design or construction may be subject to substantial damage due to the adverse effects of wind and water.

The stabilizing factor in the beach environment is vegetation. The grasses, shrubs and trees common the Outer Banks area tend to capture the moving sand, while the roots of these plants tend to hold the sand in place, preserving the protective dune system.

There is a zonal distribution of vegetation on the barrier islands, owing to variations in wind exposure, water supply, soil salinity and soil nutrients. The primary dune system is covered by hardy dune grasses which are able to survive the typically harsh conditions of the active beach area. The presence of these dune grasses is essential to maintenance of the primary dune system and its protective function. It is significant to note that these dune grasses are able to withstand adverse wind and salt conditions, but like many plants, they are unable to withstand trampling.

The secondary or inland dune system, is covered with mixed grasses and trees with the backdune area primarily in forest cover. Like the dune grasses, the vegetation on the secondary dune is highly important to the beaches. First, the vegetation covering this dune system is responsible for its stability. Second, although the relationship between the vegetation and the secondary dune system and the groundwater supply has not been quantified, it is clear that the two are interrelated.

The forests of the Outer Banks utilize a significant quantity of water, but they prevent a much greater loss of water through evaporation from the bare sand. Also, depletion of the groundwater supply through withdrawal or diversion would have the effect of destroying the forests by robbing them of water. Thus, the vegetated secondary dunes of the Dare beaches are a fragile and important resource for the continued development of the area.

\* From the Dare Beaches Sketch Development Plan and Chapter 10, Coastal Erosion.

On the Bodie Island sector of the Dare County Outer Banks, the area from the southern boundary of Nags Head to Oregon Inlet is under the care of the Cape Hatteras National Seashore Recreation Area and the National Park Service where extensive sand dune stabilization projects with the use of sand fences and beachgrass planting programs are in progress. Dunes 15 to 20 feet in height are continually built up the seashore under this program which tends to make the area somewhat stable in spite of the continuous action by natural erosion processes. Extensive commercial and residential developments are found in the area north of what are outside the park area. Continuous dunes about 15 to 20 feet high protect this area northward up to Nags Head. Natural dunes are not existing in the vicinity of Nags Head, Kill Devil Hills, and Kitty Hawk. These were probably leveled by erosion or in course of the development of the area. Many structures were built close to the shoreline with no apparent protection from encroachment of the ocean in the event of storms or inclement conditions. Further north in the vicinity of Duck, little beach development exists. The beach is bounded by continuous dunes about 15 feet high, up to the Dare-Curry tuck County line. The area is rather low with the road showing evidence of being flooded at times making it difficult to travel. All these areas are sparsely developed with isolated areas of residential developments.

The shoreline from Oregon Inlet to the area north of the Cape Hatteras lighthouse is relatively uniform with fairly wide beaches and artificial dunes built with the aid of sand fences. The dunes are continuous, about eleven feet high. Changes in the shoreline have occurred in the area north of the lighthouse where heavy erosion is continuing in spite of protective measures. Dunes were overtopped and eroded while damaging floods were experienced behind the dune line. The beach at the southwest end of the island is wide with adequate dunes back from the ocean about 8 to 12 feet high and covered with vegetation. The beaches become more narrow toward the Cape with dunes closer to the ocean.

Beach dunes north of Duck and the Jockey Ridge sand dunes are of statewide significance. The Duck dunes contain a variety of salt spray grasses including several species at their southern limit. These dunes are threatened by commercial-residential development. Jockey Ridge was designated a National Landmark in 1974.

C. Ocean Beaches and Shorelines (see Ocean Erodible Areas, p. 76)

#### D. ESTUARINE WATERS\*

The State of North Carolina, in its Dredge and Fill Law of 1970 (G. S. 113-229 (n) (2)), defined estuarine waters as "all waters of the bays, sounds, rivers, and tributaries thereto seaward of the dividing line between coastal fishing waters and inland waters, as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Conservation and Development filed with the Secretary of State, entitled 'Boundary Lines, North Carolina Commercial Fishing-Inland Fishing Waters, revised March 1, 1965'." In other words, estuaries are semi-enclosed coastal water bodies having free connection with the open sea and within which seawater is measurably diluted with fresh water drained from the adjacent land.

According to the National Estuarine Pollution Study, there are 10 distinct estuarine regions of the United States which contain 884 separate estuarine systems encompassing 29.3 million surface acres of water (Chapman 1973). The South Atlantic Estuarine Region, stretching approximately 800 miles from Cape Hatteras to Fort Lauderdale, contains 83 separate estuarine systems (9% of the total) and 4 million surface acres (14% of the total). Of this North Carolina has an estuarine area of roughly 2.2 million acres or approximately 55% of that in the South Atlantic Estuarine Region (Shalowitz 1964); and in size it is exceeded only by the systems of Alaska and Louisiana.

Estuaries have developed and evolved over geological time, and the plant and animal communities dependent upon these systems have evolved to high levels of productivity and diversity in response to the relatively large changes in the natural environment. Man is a newcomer, geologically, to estuaries, and since our country was first settled the Nation's estuaries have served him well. Man has placed a multiplicity of demands upon estuarine and coastal environment as producers of food, as avenues of transportation, as receptacles of wastes, as living space, and as sources of recreational or esthetic pleasure.

Because of the multiplicity of demands made by both man and the organisms dependent upon these systems, it is imperative that we evaluate properly the respective roles of the various parts of the system so that we can manage this environment wisely and derive the maximum user benefits from each of the component parts.

In the state of North Carolina the 1973 commercial fishery harvest brought a dockside value to fishermen of about \$16 million. Since less than one-half of the dockside landings were processed in the State, the economic value was about \$50 million while the potential was over \$100 million.

Recreational activities in and around estuarine areas also provide a significant revenue to coastal regions. For example, in 1968 an estimated 112 million people spent approximately \$14 billion seeking recreation in the coastal strand. In 1975 it has been projected that approximately \$5.4 billion will be spent on sport fishing alone. About 16 million people will engage in sport fishing in 1975 and this number is growing at a rate of one-half million per year (Teal, Jameson and Bader 1972).

\*From "The Estuary - An Area of Environmental Concern" by Thayer.

Seasonal visitors to the estuarine zone also include waterfowl hunters and vacationers; those who come for boating, canoeing, water skiing, and swimming. Many business enterprises, large and small, cater to all of these recreational seekers, such as hotels, beach cottages, restaurants, sporting goods shops, marinas, bait and tackle dealers, and others. And, many seasonal visitors, entranced with the beauty and loneliness of the estuarine area, buy property there and build upon it.

What makes these estuaries so important? The most important biological characteristic of estuaries, which forms a basis for much of our economy, is the high productivity. High plant production has resulted in a very diverse estuarine animal assemblage. The plants and animals die and during their decomposition nutrient elements and dead tissue fragments are liberated into the water. Tidal action and currents spread the nutrients which in turn are utilized by the plants. Other organisms feed upon the plants and dead debris and in turn are consumed by still larger species. This is a self-sustaining process but one which is very susceptible to intervention by man.

Thus, our estuaries and their associated transition zones-salt marshes, sounds, intertidal areas, etc. form a valuable natural resource. These estuaries, which play an important life-support function have lost more than 7% of their fish and wildlife habitat to commercial and housing development over the past few decades (Tinansky and Meade 1974), and are being lost for fishery production at a rate of about 1% per year. Because these estuaries are located between the oceans and the land and because a high percentage of our population lives near the coast, a majority of the estuarine destruction is a direct result of man's activities. Pollution, land-fill and dredging, building, draining of marshes, and increasing use of fresh water have all taken their toll of estuarine areas.

Estuarine waters located in Dare County are the Roanoke, Croatan, Currituck, Albemarle and Pamlico Sounds.

#### E. Public Trust Waters

Public trust waters are described as all waters of the Atlantic Ocean from the mean high water mark to the seaward limit of state jurisdiction; all coastal waters subject to the ebb and flow of lunar tides shoreward to their mean high water mark; all navigable rivers, lakes and streams, sounds, and artificially created water bodies to their ordinary high water mark provided that any artificially created navigable water bodies must have navigable connections to navigable natural water bodies or must have public areas or must be publicly owned. The public has rights in these waters including navigation, fishing and recreation. The protection and maintenance of the area is necessary in order to preserve the public rights therein. (see list of surface waters in Dare County)

INVENTORY OF SURFACE WATERS, DARE CO.

Identity of Area	Type of Area	Location		Description of Area
		Township (Name)	Highway No. and Miles or Other Landmark	
Atlantic Ocean	Scenic (Water and Shores)	Not Applicable	Eastern and Southeastern boundary of county	Ocean side of Outer Banks (barrier islands). Present use, recreation, swimming, fishing, bathing. Southern section of Bodie Island and Hatteras Island are in the Cape Hatteras National Seashore Area.
Albemarle, Croatan, Currituck, Pamlico and Roanoke Sounds	Scenic (Water and Shores)	Not Applicable	Northern, Eastern, and Southern sections of county.	Coastal waters and shores protected from Atlantic Ocean by the Outer Banks (barrier islands).

INVENTORY OF SURFACE WATERS, DARE CO.

Name	Location	Description
Long Shoal River	From U.S. 264 to the Pamlico Sound.	1.3 miles long to .3 miles wide, 3' deep. Brackish waters. Excellent fishing, trout, mullet bluefish, flounder. Fair duck hunting. Good boating.
Deep Creek	11.2 miles south of Lake Worth. Opening into Long Shoal River.	1.2 miles long to .1 mile wide 6' deep. Surrounded by marsh. Good fishing, some hunting.
Pains Bay	4.7 miles south of Stumpy Point. Opening into Pamlico Sound.	4.6 miles long, to 1.2 miles wide, 6' deep. Surrounded by marsh. Good fishing. Good access.
Parched Corn Bay	East of Long Shoal River	Small bay. Good fishing, trout bluefish, mullet. Excellent boating. Limited hunting.
Whipping Creek Lake	4 miles southeast of Stumpy Point. Off Alligator River.	1.3 miles long. Surrounded by marsh. Shallow waters. Limited access.
Back Lake	1 mile west of Stumpy Point.	1 mile long, .3 miles wide, surrounded by marsh. Limited fishing. Good duck hunting.

INVENTORY OF SURFACE WATER, DARE CO.

Name	Location	Description
Stumpy Point Bay	South of Stumpy Point. Opening Pamlico Sound. East of Lake Worth.	2 miles long and 2 miles wide. 7' deep. Good fishing, shad, rock, trout, perch, bass. Good boating. Great potential for development.
Sawyer Lake	East of Buffalo City site. Off Milltail Creek.	1 mile long, to 300' wide. Surrounded by marsh. Limited fishing. Ideal hunting, bear and deer. Limited access.
Callaghan Creek	3 miles south of Manns Harbor. Opening into Spencer's Creek.	3.3 miles long, to 100' wide. Marshy areas. Excellent fishing, white perch, rock, and bass. Some duck hunting.
Spencer Creek	1.3 miles south of Manns Harbor	3 miles long, to 300' wide. Good fishing, rock, bass and perch. Some duck hunting.
Long Wretch Creek	5 miles south of Manns Harbor. Bordering Croatan Sound.	.5 mile long, 4.1 miles wide. Surrounded by marsh. Good fishing, bass, bream, perch. Good crabbing. Limited access.
South Lake	Southern branch of East Lake	4.5 miles long, to 8' deep. Good fishing, bass, rock and perch. Good hunting, ducks, bear, deer.

INVENTORY OF SURFACE WATER, DARE CO.

Name	Location	Description
East Lake	Northern point of Dare County peninsula. Between Alligator River and Albemarle Sound.	7.7 miles long, to 10' deep. Surrounded by marsh. Excellent fishing, bass, rock and perch. Good hunting, bear, deer, duck.
Tom Mann Cr��ek	Bay on North side of Durant Island. Opens into Albemarle Sound.	.4 miles long, 1.9 miles wide, to 4' deep. Surrounded by marsh. Good fishing, rock, bass, perch. Some duck hunting.
Peter Mashoes Creek	2.1 miles north of Manns Harbor bridge. Junction Albemarle and Croatan sounds.	1.9 miles long, .4 mile wide and to 5' deep. Good fishing, bass, rock, and perch. Private boat ramp.
Billy's Ditch	From highway 64 to South Lake	1.5 miles long. Surrounded by marsh. Limited fishing. Good hunting, deer, bear. Access for outboards to South Lake.
Hidden Lake	1/2 mile east of Alligator River. 1 mile south of East Lake Landing.	500' wide, 1500' long. Surrounded by marsh. Limited fishing. Limited access.
Spence Creek	Part of Peter Mashoes Creek	1.8 miles long, to 300' wide. Surrounded by marsh. Good fishing.
Milltail Creek	1.8 miles south of Bay Point off Alligator River	15 miles long, deep water for large boats for 12 miles. Limited fishing bream and jacks. Limited access.
Shallowbag Bay	East of Manteo	Good fishing, boating. Channel and harbor. Limited duck hunting. Good potential for development.

INVENTORY OF SURFACE WATERS, DARE CO.

Name	Location	Description
Broad Creek	2.6 miles south of Manteo. Opening to Roanoke Sound.	2.2 miles long, .3 mile wide, 4' deep. Good fishing, crabbing, boating. Limited duck hunting.
Mill Creek	South of Manchese. Off Roanoke Sound.	.5 mile long, 200' wide. Deep waters to accommodate fishing trawlers. Good fishing, boating, access to Mill Landing Docks.
Baum Creek	.3 mile west of Baumtown. Off Croatan Sound.	.2 mile long, 50' wide. Limited fishing and crabbing. Good boating, duck and goose hunting. Great potential for development.
Oyster Creek	.5 mile west of Manchese. Off Croatan Sound.	.3 mile long, 50' wide. Surrounded by marsh. Good fishing, trout bass, perch. Some duck and goose hunting.
Cedar Bush Bay	.5 mile southwest of Manchese. Off Croatan Sound.	.5 mile wide, .8 mile long. Marshy area. Good fishing, bass, perch, trout, croakers.
Kitty Hawk Bay	North of Collington Island, and Wright Memorial Bridge.	Excellent Bass fishing. Good duck hunting. Marina, boat ramp. Large residential development.
Collington Creek	From Kill Devil Hills Bridge to Buzzard Bay.	.4 mile long, .2 wide. Good fishing, duck hunting.
Lighthouse Bay	.2 mile south of Bodie Island Lighthouse.	.4 mile long, .2 wide. Good fishing. Excellent hunting.

INVENTORY OF SURFACE WATERS, DARE CO.

Name	Location	Description
Motts Creek	South end of Bodie Island. West side of Bonner Bridge.	.2 mile long, .1 wide. Good fishing. Excellent boating. Boat landing, Oregon Inlet Marina.
Eagle Nest Bay	North of Pea Island in National Seashore Park.	.7 mile long. .5 mile wide. Surrounded by swamp and shifting sand dunes. Good boating and fishing.
Goat Island Bay	North of Pea Island, in National Seashore Park	.3 mile long, to .3 wide. Good fishing of all types. Good boating.
The Trench	In Pea Island Refuge, off Pamlico Sound	.3 mile long, to .4 wide. Good boating and fishing.
Pea Island Bay	In Pea Island Refuge, off Pamlico Sound.	.5 mile long, to .2 wide. Good boating and fishing.
Terrapin Creek Bay	1.2 mile northwest of Pea Island Coast Guard Station.	.4 mile long, to 1.4 wide. Good fishing and boating.
Beach Slue	.9 mile southwest of Pea Island Coast Guard Station.	.8 mile long, to .4 wide. Good boating and fishing.
Wreck Creek	1.5 miles southwest of Pea Island Coast Guard Station	.6 mile long, to .1 wide. Surrounded by marsh. Good fishing and boating.
Brooks Creek	4 miles southwest of Buxton, in Pamlico Sound.	.8 mile long, to .2 wide. Good fishing, boating, and crabbing. Good duck and goose hunting.

INVENTORY OF SURFACE WATERS, DARE CO.

Name	Location	Description
Joe Saur Creek	3 miles north of Hatteras Village. Off Pamlico Sound	.5 mile long, .3 wide. Limited fishing. Good boating. Fair development potential.
Sandy Bay	Northwest of Hatteras Village. Off Pamlico Sound	.3 mile long, 1 mile wide. Brackish water. Good fishing, bass, flounder, trout.
Duck Pond	.5 mile south of Hatteras Village.	.4 mile long, 200' wide, 2' deep. Limited fishing, boating. Good development potential.
Isaac Pond	South of Duck Pond	.2 mile long, 200' wide, 2' deep. Good development potential.
Clubhouse Creek	South of Isaac Pond	.3 mile long, 10' to 800' wide. Limited fishing, good boating, Good area for development.
Hatteras Inlet	Inlet between Dare County and Hyde County on the southern end of the Outer Banks	3 miles long, .8 mile wide. Excellent fishing. Opens to Atlantic. Accommodates large boats.

## F. Complex Natural Areas

Complex natural areas are defined as lands that support native plant and animal communities and provide habitat conditions or characteristics that have remained essentially unchanged by human activity. Such areas are surrounded by landscapes that have been modified but do not drastically alter the conditions within the natural areas of their scientific or educational value.

Complex natural areas provide the few remaining examples of conditions that existed within the coastal area prior to settlement by Western man. Often these natural areas provide habitat conditions suitable for rare or endangered species or they support plant and animal communities representative of presettlement conditions.

(1) The following areas in Dare County were suggested as natural areas in "Potential for Outdoor Recreation in Dare County, N. C., 1974." (see following list, pages 97 & 98)

Additional Dare County areas which may be considered as complex natural areas:\*

### (2) Maritime Forest and Fresh Water Ponds

Forests develop where there is elevation for protection from flooding salt waters and where distance from the surf reduces wind-blown salt spray. Scattered, small wooded areas occur sporadically along the Outer Banks, usually on the soundside of the islands in the vicinity of villages, but the Nags Head Woods contains approximately 50 acres and is located near Kill Devil Hills west of Rt. 158. The Nags Head Woods-Jockey's Ridge area is a characteristic system of active and inactive dunes in various stages of migration and plant succession. By far the most prominent feature or features are the twin sand dunes, reputed to be the highest in the eastern United States, which are referred to collectively as Jockey's Ridge. These high piles of sand, reaching heights up to 140' are active and considered to be live dunes, yet their physical appearance and location has not changed drastically since 1949 (based on aerial photographic interpretation). This is not to say that a state of equilibrium has been reached as the peaks themselves shift their position on the main body of the dunes in response to wind variations. This apparent stability is in direct contrast with other active (live) dunes which gradually migrate southward.

This section receives heavy use from the public, who have not been denied access as they continuously climb up and over the dunes. The moving sands nightly erase the thousands of daily footprints.

\*From "Environmental Assessment - Jockey's Ridge State Park"

INVENTORY OF NATURAL AREAS

Identity of Area	Name	Type of Area	Location		Description of Area
			Township (Name)	Highway No. and Miles or Other Landmark	
Alligator River Swamp		Natural (Swamp)	East Lake	Western section of county, adjacent to Alligator River	1/2 to 1 mi. wide and 20 miles long. River swamp of Southern baldcypress, tupelo gum, pond pine and other wet-site species. Present use, woodland, hunting.
East Lake		Natural (Water and Swamp)	East Lake	Northwestern section of county, adjacent to Alligator River.	100' to 1 1/2 mi. wide and 6 miles long. Open fresh coastal water with Southern baldcypress, Atlantic whitecedar, tupelo gum, pond pine growing along shores. Present use, fishing, hunting.
Lake Worth (Black Lake)		Natural (Water and Bog)	Stumpy Point	Southeastern section of county 3.5 miles west of Stumpy Point, N. C.	1 mi. long, 1/8 mi. wide. Inland fresh water lake with pond pine, Southern baldcypress, switchcane wax myrtle, and other bog vegetation. Present use, fishing and wildlife sanctuary.
Pamlico Sound Marsh		Natural (Marsh)	Stumpy Point	Western shore of Pamlico Sound.	5 mi. long, 100' to 1/2 mi. wide; Irregularly flooded salt marsh. Vegetation-black needlerush, salt meadow cordgrass and sawgrass. Present use, waterfowl habitat.

INVENTORY OF NATURAL AREAS

<u>Identify of Area</u>		<u>Location</u>		<u>Description of Area</u>
<u>Name</u>	<u>Type of Area</u>	<u>Township (Name)</u>	<u>Highway No. and Miles or Other Landmark</u>	
Roanoke Marshes	Natural (Marshes)	Manns Harbor	Northeastern section of county. Western shore of Croatan Sound.	7 mi. long, 100' to 2-1/2 mi. wide. Irregularly flooded, salt marsh. Vegetation-black needlerush, salt meadow cordgrass and sawgrass. Present use, wildlife habitat.
South Lake	Natural (Water and Swamp)	East Lake	Northwestern section of county, S. of Albemarle Sound.	6 mi. long 100' to 1/2 mi. wide. Coastal open fresh water with Southern baldcypress. Atlantic whitecedar, tupelo gum, and pond pine growing along shores. Present use, fishing and wildlife habitat.
Whipping Creek Lake	Natural (Lake and Swamp)	East Lake	Southwestern section of county about 2 mi. E. of Alligator River.	3/4 mi. long 100' to 1/4 mi. wide. Inland fresh water lake with Southern baldcypress, tupelo gum and Atlantic whitecedar growing along shores. Present use, fishing and wildlife habitat.
Milltail Lake	Natural (Lake and Swamp)	Manns Harbor	About 10 miles Southwest of Manns Harbor	7 mi. long. 20' to 400' wide. Fresh water lake with Southern baldcypress, tupelo gum and pond pine growing along shores. Present use fishing and wildlife habitat.

Nags Head Woods is a prime example of relict dunes which have been stabilized by forest cover. This cover forms a peculiar type of forest which appears to be a combination of maritime and mixed hardwood-pine inland forest. The forest type of loblolly pine, sweet gum, hickory, sour gum, beech, oak, and holly is not represented in the present public lands of the National Seashore. Within them occur many plants which are very near their northern limits including live oak, Spanish moss, resurrection fern, and wild olive, to name a few.

As would be expected, the topography within the woods is undulating with elevations ranging from 10' to 60' above sea level. The depressions in this area contain dozens of unique freshwater ponds which were possibly created by rainwater collecting in non-porous, wind scoured basins. These ponds are of varying productivity and chemical composition and are the subject of much ongoing scientific investigation and research. The smaller dune east of the woods, and the large active dune at the northern end (near the Wright Brothers Memorial) are slowly and persistently marching toward the remnant woods, and in some sections have overrun the forest and are beginning to slough off into the Roanoke Sound, creating interesting sand bluffs.

This area presents an interesting and fairly uncommon admixture of saltwater ocean, tidal water sound, and freshwater pond. Add to the water and atmospheric mix, the peculiar dune establishment and you have a truly unique site.

The botanical results of this association or mixture are apparent in a wide range of plant communities such as;

- (1) salt-spray tolerant dune grasses and herbs;
- (2) tangles of salt-spray tolerant shrubs, vines, and small trees;
- (3) a peculiar maritime forest of magnificent loblolly pine, sweet gum, hickory, sour gum, beech, oak and holly;
- (4) a peculiar aquatic population within the many freshwater ponds, and
- (5) tidal marshlands.

Many plants found here are very near their northern limits. Among these are live oak, Spanish moss, resurrection fern, and wild olive.

The abundance of plant species indicates diverse habitat which should house a diverse fauna. No research has been uncovered regarding animal populations but there is plenty of evidence to indicate large populations. Song birds should be plentiful in the woods and thickets, while great numbers of water fowl and wading birds can be seen along the sound. Kingfishers, hawks, owls and possibly ospreys could find nesting agreeable in and around the vast Nags Head Woods. While few animals were seen, it is probable that there are large populations of small and medium sized rodents (mice and squirrels), rabbits, opossum, racoon, and possibly that a fox or bobcat is roaming around the woods. No evidence was seen of any large mammals such as deer. The reptilian and amphibian populations should also have good representation due to the abundance of ponds and shoreline. It is a known fact that there is some good fishing for bass and bream in many of the ponds.

A large stand of forest trees on the Dare County barrier islands occur in the Buston Woods. The woods covers about 3,000 acres, 1,000 of which is within the boundaries of Cape Hatteras National Seashore. It covers the slopes and crests of old dunes that rise to nearly 60 feet in several places. Narrow interdunal areas are occupied by swampy woods, vine jungles, shrub thickets and blackwater ponds. Wider interdunal areas are fresh marshes with ponds included. These are discussed with the forest habitat because of their close association. Dominant tree species include Loblolly pine, live oaks, laurel oaks, hollies, dogwood, hornbeam and red bay. Common shrubs comprise youpon was myrtle, blueberry, American beautyberry, southern prickly ash, Devil's walking stick and palmettos. The latter may be the northernmost wild palms in the eastern United States. Near them grow the northernmost Carolina laurel-cherries. The woods have been drastically exploited by man; lumbering pasturage and wild fires have taken their toll; as have storms with their blistering salt winds.

Animals are abundant but hard to see in dense cover. The woods contribute greatly to the variety of the fauna. Five animals, about two dozen birds (mostly songbirds) and about a dozen reptiles and amphibians are known in the park only from Buston Woods and vicinity. The opossum, once believed extinct on Hatteras Island, appears to be returning. The gray fox may have already invaded by crossing Oregon Inlet Bridge. The eastern mole, deer mouse and cotton mouse might continue if the forest were largely removed, but the gray squirrel and white-tailed deer will depend on preservation of the park forest for survival.

Ospreys have recently been declining rapidly throughout the eastern states, but several still nest each year in the Buston Woods. Cottonmouths are abundant in much of Buston Woods and environs; canebrake rattlers are much more scarce and local.

### (3) Durant Island

Durant Island is a 3500-acre island at the mouth of the Alligator River. Located in the area is an extensive fresh-water marsh and cypress swamp. No development exists on the island except for a hunting club lodge on the north-east point of Tom Mann Creek. Access is limited to boat. The isolation of the island would possibly lend itself to natural area protection.

### (4) Dare County Pocosin

Dare County Pocosin is a vast bog-like area of stunted pines, wax myrtle, evergreen shrubs, pitcher plants and numerous grasses which grow on a floating mass of peatmoss. It has been suggested that several thousand acres should be set aside. The Pocosin occupies the area lying west and northwest of U.S. 264 from the Dare County line to Mann's Harbor.

#### G. Areas That Sustain Remnant Species

Areas that sustain remnant species are those places that support native plants or animals, rare or endangered, within the coastal area. Such places provide habitat conditions necessary for the survival of existing populations or communities of rare or endangered species within the county. The continued survival of certain native plant and animals cannot be assured unless the relatively few well-defined areas providing necessary habitat conditions are protected from development or land uses that might alter these conditions.

#### Rare and Endangered Species\*

Endangered species which occur include the bald eagle, peregrine falcon, and American alligator. The red-cockaded woodpecker and the Atlantic Sturgeon could occur but current records do not substantiate this assumption. Similarly, more definite information is needed concerning occurrence and nesting of the loggerhead turtle which is known to occur in coastal waters in the Oregon Inlet area. The endangered Outer Banks king snake is reported to occur on Hatteras Island.

Rare plant species were referred to in the Nags Head Woods and Buston Woods discussion.

#### H. Registered Natural Landmarks

Registered natural landmarks are so designated by the Secretary of Interior. They are true, accurate, essentially unspoiled examples of natural areas which possess exceptional value or quality in illustrating or interpreting the natural heritage of our nation. Examples in Dare County are Jockey's Ridge and Nags Head Woods which have previously been discussed.

\*From Wildlife and Land Use Planning with Particular Reference to Coastal Counties.

## I. Historic Sites\*

As authorized by the General Assembly, historic sites are among the categories of fragile properties which the Coastal Resources Commission could designate as interim areas of environmental concern. In defining the categories of historic sites, three already established programs were used: the National Register of Historic Places; National Historic Landmarks; and the state historic site and grant-in-aid programs.

The National Historic Preservation Act of 1966 established the National Register of Historic Places. The National Register is the official list of the nation's irreplaceable cultural resources. It is maintained by the National Park Service, Department of the Interior. Following is a listing of the historic properties located in Dare County.

\*From "Historic Sites" by Seapker.

HISTORIC SITES  
DARE COUNTY

Historic places that are listed (NR), or have been approved for listing by the North Carolina Historical Commission (ANR) in the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966.

Historical, archaeological, and other places and properties owned, managed or assisted by the State of North Carolina pursuant to G.S. Chapter 121;

Properties or areas that are or may be designated by the Sec. of the Interior as Registered Natural Landmarks (NL) or as National Historic Landmarks (NHL):

Name	Location	Category	Ownership
Wright Brothers National Memorial	Kitty Hawk	*NR	Federal
Nags Head Woods	Between Nags Head and Kill Devil Hills	***N L	Unknown
Fort Raleigh National Historic Site	4 miles N. of Manteo on U. S. 158	*NR	Federal
Jockey's Ridge	On W. side of U.S. 158 by-pass at 12.5 mi. post, Nags Head	***N L	State
Caffey's Inlet Life Saving Station	Duck vicinity	***ANR	
Kitty Hawk Life Saving Station	Kitty Hawk	***ANR	
Kill Devil Hills Life Saving Station	Kill Devil Hills	***ANR	
Chicamacomico Life Saving Station	Rodanthe	***ANR	
Creeds Hill Life Saving Station	Frisco vicinity	***ANR	

HISTORIC SITES (Continued)

Name	Location	Category	Ownership
Durants Life Saving Station Drinkwater's folly	Hatteras vicinity Manteo vicinity	***ANR ***ANR	
Fearing House Beach Cottage Row	Nags Head Nags Head	***ANR ***ANR	
First Colony House	Nags Head	***ANR	

### III. AREAS WITH RESOURCE POTENTIAL

#### (A) Productive Agricultural Lands

Some productive agricultural soils are being identified on the Dare County Mainland by First Colony Farms, Inc. Most of these soils require extensive drainage and clearing to make them productive, however, so they are presently more valuable for the timber and pulpwood they support.

#### (B) Potentially Valuable Mineral Sites

Dare County contains some commercially valuable deposits of sand, clay and marl. However, mineral resources are not at this time a significant factor in the economy of the County. There have been numerous exploratory attempts to locate oil and gas resources within the county in the past but these have yielded no positive results.

There are trace amounts of potentially valuable minerals present in well cores from the Dare County Area but none have been identified as being available in economically feasible quantities with currently available technology.

#### (C) Publicly Owned Parks

Cape Hatteras National Seashore Recreation Area is one of the 181 acres in the country administered by the National Park Service under the Department of the Interior, which comprise outstanding scenic, scientific and historical areas of the United States. Cape Hatteras was the first National Seashore Park in the National Park System. Extending from Whalebone Junction at the southern boundary of Nags Head about 70 miles southward through Ocracoke Island, the National Seashore preserves 45 square miles of beach land. It is divided into three sections: Bodie Island, Hatteras Island and Ocracoke Island. It covers the entire area of the Outer Banks, except for the eight unincorporated towns and villages. The park area is included in the National Park Plan known as "Mission 66" Museums have been established at Cape Hatteras and Bodie Island. The National Park has constructed various recreational and community improvements in the area in addition to the extensive erosion and sand dune rehabilitation projects.

- (D) Pea Island Wildlife Refuge is a part of Cape Hatteras National Seashore on the Outer Banks. The refuge was established in 1938 as a refuge and breeding ground for migratory birds and other wildlife. It is located on the northern most 13.5 miles of Hatteras Island. Refuge lands also include several small islands immediately off the main part of the refuge in Pamlico Sound.

We need to consider wildlife in land use planning because:

- (1) wildlife serves as an "environmental barometer" and constitutes an early warning system against environmental contamination hazardous to human health;

- (2) the observation of wildlife and its pursuit through hunting and fishing constitute a form of highly therapeutic outdoor recreation for a substantial portion of our population;
- (3) the recreational pursuit of fish and game generates expenditures that contribute in a substantial way to local and state economies;
- (4) the study of wildlife in its natural setting provides insight on man's place in the natural order and valuable clues to analysis of human behavior and social organization, as well as derivation of medical and industrial products of value to human welfare; and

Deer occur throughout the county in moderate numbers. Most of the county is considered to be occupied range for the black bear, however, fewer than 100 are thought to exist. Their numbers are considerably reduced from the population of two decades ago. Bear hunting is prohibited by law. All small game species occur; however, due to limited agricultural operations, populations of certain species are considered below average for the Coastal Plains area. Marsh rabbits, woodcock, raccoon and wildcat are plentiful; cottontail rabbits, opossum, foxes, snipe and rails occur in moderate numbers; quail, dove and squirrel are uncommon. Furbearers, including muskrat, mink, raccoon, otter and nutria, are in plentiful supply. Waterfowl, including most species which occur in the State, are present in ample numbers. The coastal marshlands, and the shallow coastal waters of Currituck, Roanoke, Croatan and Pamlico sounds provide great diversity of habitat to support tipping, diving and sea ducks; mergansers; Canada and greater snow geese; whistling swan and American brant.

## CAPACITY OF COMMUNITY FACILITIES

Information in this section is based on previously published engineering reports by Henry Von Oeson and Associates, Inc. and interviews with municipal and county officials.

### I. WATER AND SEWER SERVICE AREAS

A. The Towns of Nags Head and Kill Devil Hills both constructed and began operation of their water systems in 1964. The Nags Head system began operation with approximately 555 customers and currently has around 850 customers. The Kill Devil Hills system went into operation with about 500 customers and currently serves slightly over 1000 customers. This total of approximately 1850 customers represents service to slightly less than fifty percent of the potential customers in the service area, not including another 1100 or more trailer park and campground sites that are not being served.

The source of supply for these systems is a fresh water lake which is located on the boundary between the towns about 3200 feet westward to the ocean and which is surrounded on the southwest and north by vacant lands owned by the municipalities. This lake is recharged by rainfall in the area and has provided ample supply until 1969 when an apparent drop in the lake water level indicated the rate of withdrawal was greater than the area's recharge capacity. Since that time a growing demand for water has caused greater water level drops and increasing concern. Some shallow wells have been installed to supplement the lake supply. They have increased the supply by about 110,000 gallons per day. A second group of wells was recommended and is now being contemplated that would increase this augmentation supply to 300,000 gpd. The lake was dredged in the spring of 1975 to increase its storage capacity. Peak demand on

these systems comes during the tourist season when rainfall is least. The peak service day for Kill Devil Hills in 1975 was on July 5 when 833,000 gallons were pumped. For Nags Head the 1975 peak day was July 6 with 866,000 gallons pumped.

In the spring of 1975 the citizens of Nags Head and Dare County approved a \$5.5 million bond referendum for the construction of a central water system to serve all of Roanoke Island and the Dare Beaches Complex from Oregon Inlet North to Duck. This system is in the design phase at the present time but it should be sufficient to serve the expected growth of the service area for a fifteen to twenty year period.

A sewage treatment facilities plan under the Environmental Protection Agency 201 Planning Program is underway for the same service area. The resulting system should serve the needs of the area adequately for the same time period.

#### B. OTHER SEWAGE TREATMENT PLANTS

The Villas - operates a 0.08 mgd extended aeration type waste treatment facility that discharges to Buzzard's Bay, a class "SC" waters. This facility is being properly operated and maintained. Assimilative capacity calculations indicate that if this facility maintains the minimum requirements for secondary type treatment, as defined by EPA, it should protect water quality in the receiving waters.

## II. SCHOOLS

The Dare County Board of Education operates all public schools within the county. All facilities are in excellent condition and all sites are adequate for necessary expansion with the exception of the Manteo High School site. It is anticipated that within 10-15 years a new Junior

High School site must be located somewhere on Roanoke Island to accommodate grades 7 through 9.

The Manteo Elementary School was built in 1965 on a 10 acre site and serves 540 pupils K-6 from the Nags Head area, Roanoke Island and the Mainland communities. Manteo High School was originally constructed in 1960 with additional classrooms added in 1965. It serves 600 students in grades 7 through 12 from Roanoke Island, the Mainland and from Oregon Inlet, North.

### III. PRIMARY ROADS

Nags Head is not included in the statewide seven year Highway Improvement Program. The only project within Dare County included in the program is the widening and straightening of U.S. 64 from the Alligator River Bridge to Manns Harbor.

1975 peak traffic counts indicate a deterioration of the capacity and design speed of the U.S. 158 bypass in the Nags Head and Kill Devil Hills area and on N. C. 12 toward Hatteras from Whalebone Junction. The State Department of Transportation uses average annual daily traffic counts as a basis for design and improvement requirements which cannot take into account the tremendous load put on the system by tourist traffic from June through September. The most recent peak figures for these highways indicate that they are sometimes dangerously overloaded.

N.C. 12 especially, carried the majority of an estimated 1,525,000 visitors to Cape Hatteras National Seashore through September of 1975. This highway is in need of widening to a standard width of 24 feet and resurfacing.

#### IV. SOLID WASTE COLLECTION

Nags Head uses the county sanitary landfill for disposal of solid waste. The town makes door-to-door pickup from residences and businesses daily during the tourist season and twice weekly during the winter. They have a 1974 27 cubic foot packer and a 1974 23 cubic foot truck. Additional personnel are added on a part-time basis to handle the seasonal load.

#### V. FIRE PROTECTION

The Nags Head Volunteer Fire Department is composed of 39 certified volunteers who operate from two stations. One station is located near the center of town and the other is in South Nags Head. The town also owns a lot near Whilebone Junction for construction of an additional station when this becomes necessary. The department has a 1974 Ford 1,000 GPM pumper and three 1962 Ford 500 GPM pumpers. The town has an excellent fire rating of 8.

#### VI. LAW ENFORCEMENT

Nags Head maintains a 24-hour police radio dispatcher who is tied to the Dare County dispatch system. The Police Department consists of seven full-time officers and four dispatchers who are supplemented by two additional personnel for beach patrol duty during the summer months. The department has seven automobiles and two four wheel drive vehicles.

SECTION IV  
ESTIMATED DEMAND

## ECONOMIC FORECASTS

Forecast of Nags Head's future economic growth and ultimately its population growth, are an important derivative of the study of its economic base and employment projections. Since economic factors are closely related to population growth, economic forecasts are widely accepted as the most accurate basis for making population projections. By making appropriate employment/population ratio assumptions, employment projections can be converted to forecasts of total population.

### Economic Growth Factors

A broad range of techniques are available for forecasting employment growth. The simplest of these involve projections based upon historic growth trends. However, these techniques are most applicable in very stable growth situations where past trends will likely mirror the future, not in very dynamic areas like Nags Head where recent growth has been rapid and where future growth is more directly related to external demand factors. Therefore, the key to forecasting the Town's future economy is to determine those external factors which are relevant to future basic employment levels.

Since the majority of Nags Head's basic employment is in recreationally-oriented industries, visitors are the most important factor in the growth of the Town's employment sector. However, techniques for forecasting growth in visitation are poorly developed.

Envirotek Incorporated, in their publication, Dare County Planning Program, identified certain national trends which will have an impact on Dare's and Nags Head's future economy:

- (1) Increasing Affluence. By 1980, the experts expect median family income to increase to \$10,400 and per capita disposable income to increase to \$3,600.
- (2) Economic Stabilization. It is predicted that the economy will stabilize and that unemployment will fluctuate in a narrow range between 3 and 4.5 percent.
- (3) Changing Attitudes Toward Work and Leisure. Total leisure will increase. The four-day week will become the norm indicating a dramatic increase in the demand for recreational activities.

Stephens and Associates, in their 1974 publication, Dare County Economic Development Plan, forecasted increases in Dare County's basic employment. These forecasts were made by assuming that increased visitation in Dare is a function of population and income growth in the recreation market area. These same techniques and assumptions are employed in forecasting employment increases for the Town of Nags Head.

#### Recreation Market Area Growth Rates

As previously discussed on page 36, the Town's recreational market area extends approximately 350 miles to the north, including most of the New York Metropolitan area, conforming roughly to the eastern "Megalopolic Corridor", extending to the west in Pennsylvania and Virginia and to the south in North Carolina. This market area comprises 15% of the total population of the United States or approximately 35,000,000 people. Sophisticated population and income projections from the Bureau of Economic Analysis in the Department of Commerce permit development of projections for Nags Head's market area. The BEA projections are based on functional economic areas which have been defined for the entire United States. The market area for Nags Head includes the following seven economic areas:

- New York
- Philadelphia
- Baltimore
- Washington
- Richmond
- Norfolk-Portsmouth
- Raleigh

A detailed explanation of the BEA projection techniques would be quite lengthy; however, in concept, they utilize a "stepdown" technique to determine each economic area's share of projected national economic growth. The "stepdown" projection is widely recognized as one of the most accurate forecasting methodologies.

#### Composite Growth Factor

Stephens Associates derived a composite growth factor for Dare County from the market area's population and income growth rates for each decade between 1970 and 2000; a similar growth factor has been derived for the Town of Nags Head. The basic assumption is that growth in employment in Nags Head is a function of the growth of population and income in its market area and that income is a more important determinant than population.

The composite is actually a weighted average of the two growth rates. In calculating the growth factor, a weight of 3.0 is assigned to the market area's income growth and a weight of 1.0 to its population growth rate.

Table 20 NAGS HEAD EMPLOYMENT GROWTH FACTORS 1970-2000

Decade	Market Income Growth	Market Population Growth	Growth Factor
1970-1980	58.7%	15.8%	.480
1980-1990	46.0%	14.2%	.381
1990-2000	49.5%	13.0%	.404

Source: Stephens Associates

Employment Forecasts

The composite growth factors for the market area were used to forecast the growth of employment in Nags Head. The estimates of the Town's future employment are found in Table 21.

Table 21 NAGS HEAD AVERAGE ANNUAL EMPLOYMENT FORECASTS<sup>a</sup>

Year	Growth Factor	Total Annual Average Employment
1970 <sup>b</sup>	.480	176
1980	.381	261
1990	.404	360
2000	-	505

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<sup>a</sup>Source: Stephens Associates

<sup>b</sup>1970 Census employment figures corrected upward to reflect average annual employment.

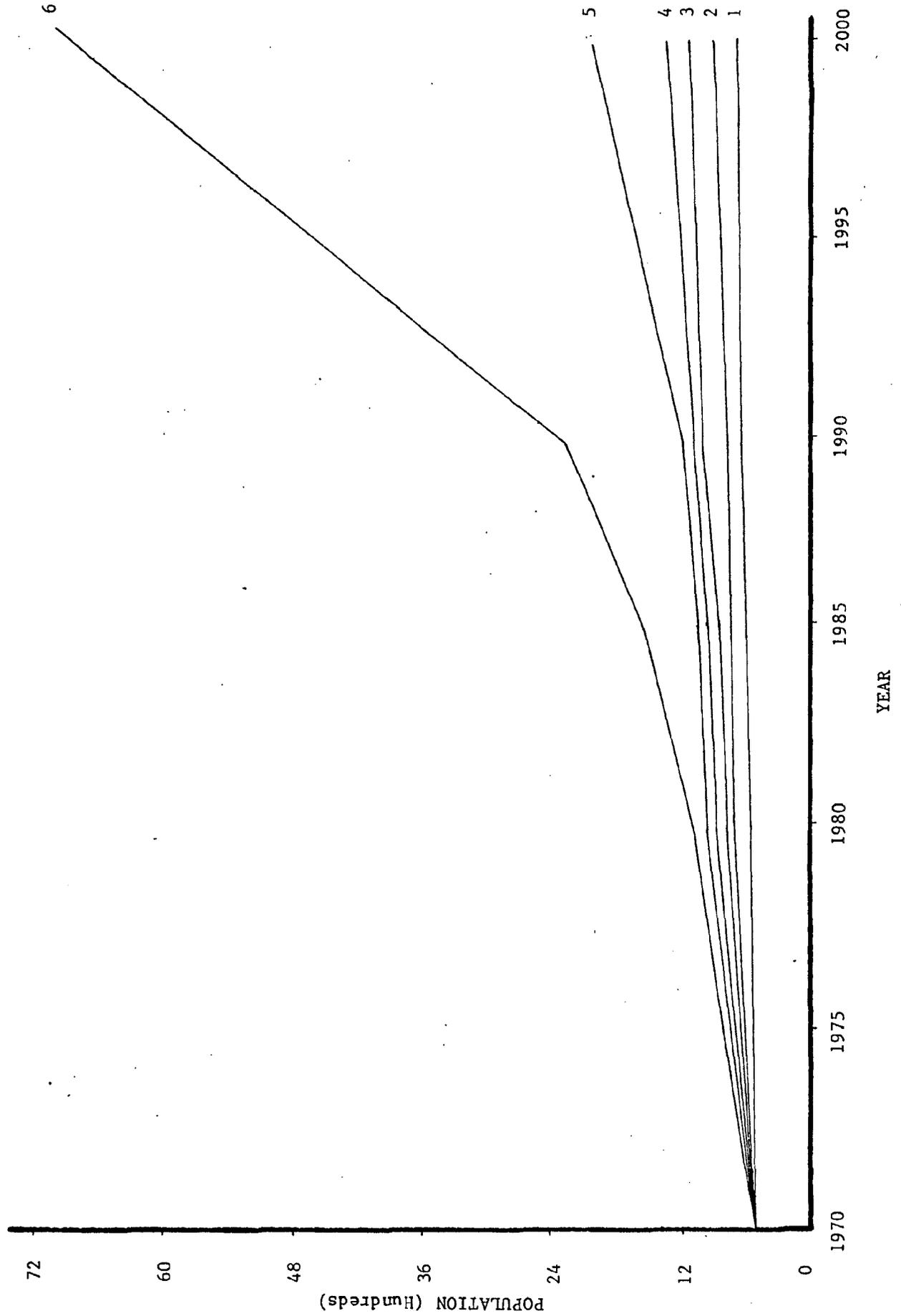
## POPULATION FORECASTS

Many sophisticated techniques have been devised for population studies. None of these, however, are particularly suited for small, dynamic areas such as Nags Head. Forecasting the population of a resort area is quite different from working with other areas. The main source of population increase in Nags Head is migration, which is less predictable than the natural increase factor. Also, the employment is based on tourism, one of the least predictable industries.

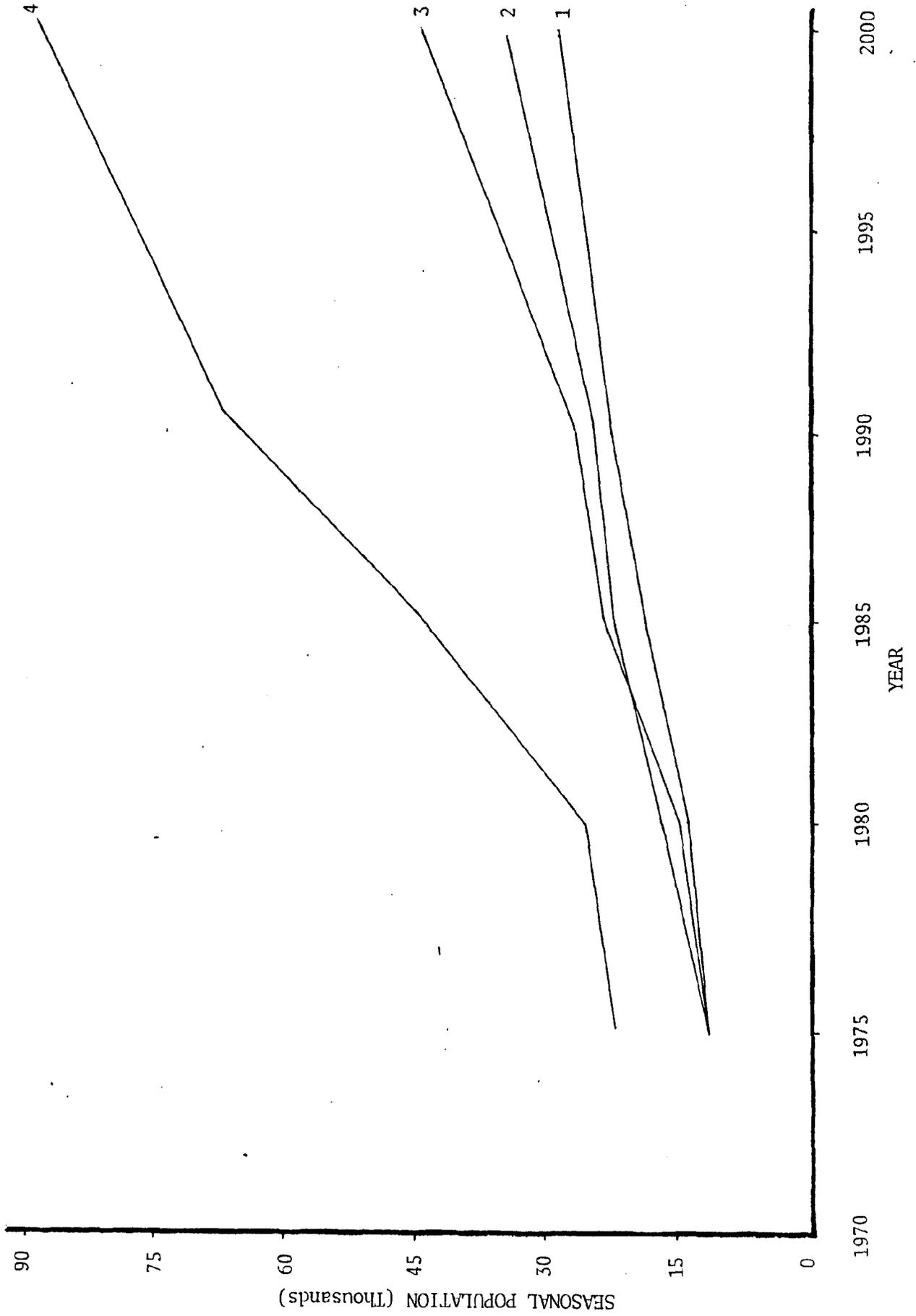
An examination of charts A & B reveals recent population projections for Nags Head. These population figures were either projected specifically for Nags Head or for the Dare Beaches Planning Area and then applied to the Town. The tremendous ranges between the high and low projections magnify the problem of realistically forecasting both resident and non-resident population figures which should take into account certain variables such as Nags Head's recent, dynamic growth trend; local economic trends and projections; and economic and population growth trends in the market area. Also the Town's physical constraints on development and the desires and needs of the citizens as they relate to population growth must be carefully considered.

A detailed explanation concerning the methodology of each projection is not within the scope of this Land Use Plan. However, it is felt that the resident projection (Forecast #3) accurately reflects all the factors discussed in the previous paragraph. The resident forecast for Nags Head is based upon the County projections found in Stephens and Associates' Dare County Economic Development Plan.

NAGS HEAD RESIDENT POPULATION PROJECTION-Chart A



NAGS HEAD SEASONAL POPULATION PROJECTION-Chart B



### Resident Population Forecasts

Nags Head's total employment forecasts provide the basis for further estimates of the Town's resident population. The estimation technique using employment forecasts is simple. It assumes that the relationship between employment and total population in a base year will remain fairly stable throughout the forecast period and that, therefore, the ratio of employment to population can be used to relate employment forecasts to population.

In 1970 the ratio of Nags Head's average annual employment to total resident population was 0.425. National and State trends, however, show this ratio increasing. In North Carolina, for example, the employment/population ratio increased from 0.32 in 1940 to 0.39 in 1970. To account for a probable increase in labor force participation, the Town's employment/population ratio has been increased .005 per decade. Table 22 contains estimates of Nags Head's resident population for 1975-2000.

TABLE 22 ESTIMATED RESIDENT POPULATION FOR NAGS HEAD: 1970-2000

Year	Average Annual Employment	Employment/Population Ratio	Total Resident Population
1970	176	.425	414
1975	219	.4275	512
1980	261	.430	607
1985	310	.4325	717
1990	360	.4350	828
2000	505	.440	1148

### Non-Resident Forecasts

The year-round population is not the most relevant figure in a tourist economy. Nags Head's seasonal visitors are an important aspect of the county's total population because they place demands on the county services and resources similar to those of the resident population. Therefore, forecasts of Nags Head's future population levels must include estimates of the magnitude of the non-resident seasonal population.

Based on water consumption figures, the total peak population in 1975 for Nags Head was approximately 12,000 persons. The composite growth factor for the Town's market area has been used to forecast total population in 5 year intervals to 1990 and for the year 2000. These projected figures are found in Table 23 (also see Chart B, forecast #2):

Year	Growth Factor	Total Peak Population
1975		12,000
1980	.240	14,880
1985	.190	17,710
1990	.191	21,092
2000	.404	29,625
2025	.236	36,616

## FUTURE LAND NEEDS

It is estimated that approximately 2,500 acres or 56% of the 4,627 total acreage in the Town of Nags Head is available and suitable for development. This land, along with about 900 acres already developed, has been classified in the Transitional Category on the Land Classification Map which accompanies this report. Over 25% of the total land area of the Town is in the Conservation Classification.

The desired population, if allocated to suitable vacant land in the Town, should result in a peak seasonal and permanent population density of around 5 people per acre by 1985. This figure is within the limits of development which can be supported with properly installed septic tanks. The density of development will be governed by the Nags Head Zoning Ordinance and the Dare County Septic Tank Regulations. The vacant land in Nags Head contains some previously platted lots which are smaller than present regulations would permit. The Dare County Septic Tank Regulations prohibit the development of those lots too small for a septic tank to be safely installed. The Nags Head Zoning Ordinance requires that non-conforming lots be combined for development if they have continuous frontage in single ownership. Many such lots in developed areas of the Town have been combined, either to conform with ordinances, or to create more desirable property for development. The development of non-conforming lots may become possible when a sewage treatment system is made available unless they are condemned by local, state or federal government through due process. If it were possible to develop all of the existing sub-standard lots in Nags Head the potential gross density would be increased from about 5 persons per acre to around 8 persons per acre. The rate of growth to that density level would not change, however, since the economic determinants

of the major market area in the central Atlantic states would not be effected.

Within the Transitional Land Classification more detailed allocation of land uses will be made through the Nags Head Zoning Ordinance which will be based on the Objectives, Policies and Standards expressed in this Plan. It is estimated that roughly 570 acres of residential land and around 290 acres of commercial land will be developed in the 10 year period.

## COMMUNITY FACILITY DEMAND

The Nags Head Planning Board is currently engaged in studies to determine the cost of major utility systems and other services which will be necessary to support the desired population growth which is projected by this Land Use Plan. The details and cost estimates of those requirements will be published as a Community Facilities Plan and Public Improvements Program which will become an integral part of the Nags Head Comprehensive Plan. Without that kind of systematic examination of desires, needs and resources, it is impossible to give a meaningful estimate of the cost of growth or to evaluate potential methods of paying the cost.

The voters of Nags Head and Dare County approved a 5 million dollar bond referendum for a water supply which could accommodate a larger population than is forecast by this study. The engineering study for a sewage treatment system for Nags Head and the surrounding area is in progress. A central sewage treatment system is required to support the goals of conservation and protection of Wetlands, Estuarine and Surface Waters and Ground Water. That system could cost in excess of 11 million dollars according to the estimates. This type of system normally cannot be constructed without funding assistance from the State and Federal government. Due to the changing guidelines and the unpredictable availability of those funds it is considered presumptive to rely upon such assistance until the funds are committed.

Developers are required to bear the cost of installation of services required by new subdivisions. This Town Policy now includes streets, water lines, street lighting and drainage but will also include sewage collection lines when a treatment system is available.

The preparation of a Capital Improvements Budget for Nags Head will be the fiscal implementation tool for the Land Use Plan. The Capital Budget is a means through which the Town can most economically relate public expenditures to its long-range plan for necessary and desirable public improvements while making the most effective use of the fiscal resources available to it, whether from Local, State, or Federal sources.

Other facilities in addition to water and sewer systems which will require attention during the ten year period are:

- A. U. S. Highway 158 Bypass
- B. Solid Waste Collection Vehicles and Personnel
- C. Possible Addition of Police Vehicles and Personnel
- D. Replacement of Fire Truck Before 1982.

SECTION V  
PLAN DESCRIPTION

## Land Classification

The land area of Dare County is divided into five categories for the purposes of guiding development into the most appropriate areas.

### A. Developed Land

#### Description -

Developed lands, delineated in rust color on the Land Classification Map, range from incorporated larger communities that contain sizeable permanent, seasonal, and transient populations with a diversity of residential, commercial, tourist and light industrial development and a high level of public services and facilities, to smaller, less varied communities with a lesser intensity and diversity of development and a lower level of public services and facilities.

#### Function and Standards -

Developed lands will provide the service and growth centers for Dare County. They are intended to accommodate the greater portion of the necessary and natural expansion of residential, commercial, and industrial activities. The needs of Dare County's permanent, seasonal and transient population for housing, recreation, commercial activity, social and professional services will be met in these areas. The building intensity in the developed areas will allow the economic feasibility of a high level of public and institutional services. These areas will discourage the dispersion of development in the conservation areas of the County because they are concentrated in character and are located in areas where existing development patterns indicate the demand for and viability of growth centers.

B. Transition Land

Description -

Transition lands, delineated in hatched rust color on the Land Classification Map, are those areas of Dare County where the capability of the natural resources and the anticipated need for future development indicate that relatively intense development of primarily residential character is suitable. The areas are located near or adjacent to developed lands, along highways or in areas where the soils and accessibility of services indicate a high development potential.

Function and Standards -

Transition lands will provide for moderate intensity development in areas where development will not significantly harm relatively tolerant natural resources. These areas are designed to provide for residential expansion and growth and to accommodate uses related to and compatible with residential uses in the vicinity of developed lands where utilities and community services can be most economically and readily provided. Development and the required services and utilities will be at a generally less intense level than in developed lands.

C. Community Land

Description -

Community lands, delineated in cross hatched rust color on the Development Guide Map, are those areas of Dare County characterized by existing clusters of one or more different land uses in readily accessible locations within reasonable proximity to a developed area where the natural resources are fairly tolerant to development at a low intensity.

Function and Standards -

The community lands will provide for low intensity development opportunities at levels that will protect the natural resources of Dare County and still allow orderly growth and development. These areas will primarily provide residential opportunities for permanent residents as well as seasonal residents. Public services and utilities will not be available in these areas at as high a level as in the developed and transitional areas.

#### D. Rural Land

##### Description

Rural lands, delineated in white on the Land Classification Map, are those areas of Dare County with little or no urban development in relatively remote locations where there are natural resources intolerant to intensive development. These areas are characterized by forested or open, low-lying lands which would be suited for carefully managed resource utilization programs such as forestry, agriculture or passive recreation.

##### Function and Standards

Rural lands will provide areas for the long term management of productive resources within the county which will help to stabilize the seasonal fluctuations of the economy. The potential economic importance of these areas and their general unsuitability to support intensive development makes the protection of these lands essential to the county. Building construction, residential and related supporting development should occur only on large lots in relatively small clusters on carefully selected sites. Public services and utilities in these areas will be limited to support only those uses which are compatible with the concept of conservative resource utilization. The rural classification will also provide large open areas within the county to serve as a buffer against incompatible uses of land and to serve future land needs which cannot be anticipated.

E. Conservation Land

Description -

Conservation lands are delineated in dotted green on the Land Classification Map. These are land areas within Dare County where development must be restricted because of an inherent incapability of the land to support development because of fragility or hazardous conditions or because the natural resources represent a greater value than the value of development.

Function and Standards -

There is sufficient land suitable for development in Dare County to accommodate projected and desirable growth without infringing upon areas which are unsuited for development. The classification of conservation lands will direct development away from areas which cannot support intensive development, where public services are not and should not be made available, and direct it instead to more tolerant areas where services can be supplied more economically. These areas are also designated to identify characteristics which represent a potential hazard to development such as flood and erosion. These hazard factors increase the public and private cost required to support development. If considered against the useful life of the private investment and against the less apparent public cost through provision of services and potential disaster assistance, the return for development in these areas would be marginal. Management of forestry and agricultural resources is a permitted use within Conservation Areas where suitable soils are found.

Conservation lands will protect areas identified as potential sources for public water supply on the Outer Banks or as recharge areas for principal aquifers on Roanoke Island and the mainland.

Privately owned wildlife refuges, wilderness areas and passive recreation areas will be classified as Conservation Land.

Large publically owned or controlled tracts will be included in the conservation classification to further identify and protect historic, cultural and natural resource areas. Development or alteration of land is appropriate within conservation areas where it can be shown that:

- (1) The proposed development will not destroy or irretrievably alter:
  - A. Wetlands
  - B. Frontal Dunes
  - C. Beaches
  - D. Estuarine or Impounded Surface Waters
  - E. Prime Wildlife Habitat
  - F. Unique natural areas, historic or archeological sites
- (2) The proposed development will not encroach upon or be endangered by:
  - A. Areas of special flood hazard
  - B. Ocean front erosive areas
  - C. Inlets and areas within range of their migration
  - D. Estuarine erosive areas
- (3) The proposed development will not significantly affect the quality or reduce the value of:
  - A. Public or privately owned forest, park, game lands, sanctuaries or other non-intensive recreation areas.
  - B. Aquifers, or aquifer recharge areas, or public water supply watersheds or water supply areas.
- (4) The proposed development will not require an increase in public utilities or services beyond that provided by the developer.

The Town of Nags Head has been designated as a growth area as part of the Dare County Land Use Plan. The County Development Plan has placed Nags Head in the Transitional Classification with the exception of those portions of the town that fit various categories of conservation classification.

More detailed allocation of land uses within this growth area is the function of this plan. Since Nags Head is limited to its present total size by the municipal limits of Kill Devil Hills to the north, the Atlantic Ocean to the east, and Roanoke Sound and National Park Service lands to the west, the use categories must be carefully assigned to allow for the orderly development of a well balanced community which preserves the unique characteristics of the town to the greatest extent possible.

#### A. Residential

The Land Development Plan for Nags Head includes three ranges of residential density. Low density residential with approximately one to four dwelling units per acre, medium density residential with approximately four to six dwelling units per acre, and high density residential with six to ten dwelling units per acre.

The low density residential areas are designed to accommodate single family homes for predominantly permanent residents. They should be located generally west of U.S. 158 by-pass and of the area south of Whalebone Junction away from the major traffic arteries or suitably buffered from them. The medium density residential areas should be located in close proximity to U.S. 158 by-pass with sufficient depth of property to permit adequate buffering including reverse frontage lots if necessary. The medium density areas are designed for single and two-family residences with some mix of permanent and seasonal residents.

The high density residential areas are designed to accommodate single family and multi-family structures and would be more appropriate for seasonal residents. These areas should be located with convenient access to either the U.S. 158 by-pass or business route within reasonable proximity to the Ocean Beach.

B. Commercial Residential

The areas designated as commercial residential are intended to accommodate motel, hotel and restaurant development as well as some limited commercial uses in conjunction with motels or hotels. Planned residential development at densities approaching those of motels and hotels would also be appropriate in these areas under carefully regulated conditions. The primary location of these areas should be on or near the ocean front and along U.S. 158 business.

C. Commercial

The commercial areas are intended to accommodate the wide range of retail shopping facilities and services required by permanent residents and tourists. For the convenience of the shopper and to improve the drawing power of individual commercial facilities, these commercial areas should be fairly compact and contain sufficient off-street parking to accommodate anticipated growth. The present tendency of commercial uses to locate in a strip along the highways will be discouraged.

D. Public and Semi-Public

These areas include governmental, institutional and cultural facilities and uses which are generally available to the public at large. They encompass over one fifth of the total land area of the town and include such uses as Jockey's Ridge State Park, the public water supply impoundment area around the Fresh Pond and all town owned property.

## POTENTIAL AREAS OF ENVIRONMENTAL CONCERN

There is sufficient land suitable for development in Nags Head to accommodate projected and desirable future growth without infringing upon areas unsuited for development. In addition to those areas included in the conservation classification, there are some areas which, because of their over-riding importance, their fragility, or the hazard they represent, should either be protected from development or developed only with special precautions. Within Nags Head those areas which could be designated as AEC's are:

### A. Coastland Wetlands:

#### 1. Description

The marsh areas along the causeway and in scattered locations on the shoreline of Roanoke Sound.

#### 2. Permissible Uses

Erosion Control, fishing piers, docks, bulkheads (on upland side), utility easements, limited dredging for access to navigable waters and such other development requiring water access which do not significantly alter the natural function of the marsh.

### B. Estuarine Waters:

#### 1. Description

Those Roanoke Sound waters which are classified S-A for the taking of shellfish or S-C

#### 2. Permissible Uses

Propagation of marine life, navigation, fishing, swimming, water skiing, boating, fishing piers and docks.

C. Resource Areas - Watersheds or Aquifers:

1. Description

The water impoundment and immediate area around the Fresh Pond.

2. Permissible Uses

Public water supply, recreation, and other development only when provided with public waste water disposal system.

D. Fragile, Historic or Natural Resource Areas:

1. Jockey's Ridge State Park, Nags Head Woods and the Cape Hatteras National Seashore to the west and south of town.

2. Permissible Uses

On publicly owned land only those uses consistent with the objectives for which the area was established. On privately owned land only such limited development as would preserve areas susceptible to environmental damage from more intensive development. Such development should be undertaken only after approval of a complete development plan which shows that the proposed development will not destroy or significantly alter the natural topography, vegetation, surface waters or other unique natural features.

E. Areas Subject to Public Rights:

1. Description

The waters of the Atlantic Ocean and Roanoke Sound under the jurisdiction of the Corps of Engineers.

2. Permissible Uses

Propagation of marine life, navigation, fishing, swimming, boating, fishing piers, docks, bulkheads for erosion control.

F. Natural Hazard Areas:

1. Description

The ocean front and barrier dunes within one hundred and fifty feet (150') of the mean high water mark of the Atlantic Ocean, the portions of the Roanoke Sound shoreline with a recent history of erosion problems and those areas of the town that have an identified special flood hazard with velocity (V5 zone) as designated by the Department of Housing and Urban Development Flood Insurance Administration.

2. Permissible Uses

(a) Ocean front and barrier dunes;

Erosion and storm protection, beach and ocean access.

(b) Erodible areas of Roanoke Sound Shoreline;

erosion prevention devices, piers, docks, bulkheads.

(c) Flood hazard areas;

residential, commercial, industrial, public and semi-public uses which are developed according to the standards of the Federal Insurance Administration.

SECTION VI  
SUMMARY AND MAJOR CONCLUSIONS

## DATA ASSEMBLY AND ANALYSIS

The assembly of data for the preparation of the Nags Head Land Use Plan was initiated upon the completion of a comprehensive bibliography for the town specifically and the coastal plain area of North Carolina in general. The completed bibliography included all previously published reports and studies involving such subjects as water and sewer, economy, demography, tourism, geology and groundwater, natural and historic areas, indigenous flora and fauna, erosion, climate, fishing, soils, legal restraints, aerial photo interpretation, coastal wetlands, recreation and planning to name but a few. (see list of references.)

Data was assembled and subsequently organized into general topics as required in the State Planning Guidelines which includes: population and economy; current plans policies and regulations; physical limitations; fragile areas, areas with resources potential, community facility capacities; population and economic projections; future land needs; and future community facility demands. The required data was then analyzed and, in conjunction with results obtained from the citizen survey questionnaires, was utilized in formulating the Nags Head Land Use Plan. The following discussion and summary represents major conclusions which were derived from the Land Use Plan.

## NAGS HEAD LAND USE PLAN

### I. HOW AND WHY THE LONG RANGE GOALS WERE DEVELOPED

The Town of Nags Head has maintained an active planning program since its incorporation in 1961. Over the years, it has adopted and periodically updated a Land Development Plan to guide the growth of the town in an orderly manner.

Ordinances have been passed to enforce the standards set by the plan which has been implemented by the Planning Board and Commissioners to achieve many of the goals stated in it.

In 1974, the North Carolina General Assembly passed the Coastal Area Management Act requiring coastal communities to adopt land use plans which reflect the desires and needs of coastal residents and insure the protection, preservation, orderly development, and management of the Coastal Area. The Town Commissioners designated the Nags Head Planning Board as the responsible agency for assuring that the Nags Head Land Use Plan was in compliance with the Act.

To insure the maximum amount of public participation in the planning process and to assist them in necessary revisions of the existing land use plan, the Planning Board appointed a Citizens Advisory Committee on Land Use Planning. The responsibilities of the Citizens Advisory Committee were:

- (1) To advise the Board of Commissioners and Planning Board during the preparation of the Land Use Plan required by the Coastal Area Management Act of 1974.

(2) To secure the views of a wide cross section of citizens, representing not only different geographical areas of the Town, but the varying economic, social, and cultural interests as well, on the goals and policies for the Land Use Plan.

(3) To make sure that individuals in the community understand the problems and procedures involved in land use planning and to get individuals to take an active part in evaluating present land use and planning for the future development of the town.

The Planning Board and the Citizens Advisory Committee held public meetings for the northern, central, and southern areas of the Town to inform the citizens of the requirements of the Coastal Area Management Act and to receive their input for the preparation of this Statement of Objectives and Policies which will become the basis for guiding the future development of the Town.

Members of the Nags Head Planning Board participated in the development of a questionnaire which was used to elicit public response and to help define the objectives and concerns of the citizens of Nags Head.

Personal door-to-door and face-to-face contact of residents by members of the Planning Board and Advisory Committee was responsible for getting large numbers of local citizens involved in the Planning Process. Local newspaper articles and radio interviews were also used to increase awareness of the program. Over 30% of the permanent population responded to the questionnaire and over 27% of the questionnaires mailed to non-residents property owners were returned. The large number of additional written comments on the questionnaires indicated a real concern with the direction the town was taking. The response of the participants at the community

meeting was well thought out and generated some meaningful direction for revisions in the existing Nags Head Land Use Plan.

This process resulted in the identification of the major land use issues and problems as perceived by the citizens of Nags Head and the development of long range goals and policies to guide future growth which reflect the concerns expressed by them.

## II. MAJOR LAND USE ISSUES AND PROBLEMS WITH EXISTING CONDITIONS AND TRENDS

### A. Population and Economic Trends

The permanent population of Nags Head is estimated to have increased over 20% in the five years since the last census. The statistical profile of Nags Head residents indicates an increasingly older population with an average family size of only 2.6 which is significantly smaller than other communities in the region. The attraction of Nags Head for retirees is evident in this trend.

The implications of an increasingly older population in Nags Head are that specialized demands will be placed on health care and other community services and that the buying power of persons on fixed incomes will more immediately reflect fluctuations in the national economy.

The economic and physical impact of seasonal visitors to Nags Head must be carefully measured and taken into account for planning municipal facilities and services. Summer visitors in 1975 had the effect of increasing the population of the town by more than 1,500 percent almost overnight. In spite of a general slowing of the economy of the entire nation, visitation to this area actually increased in 1975.

The needs and desires of permanent residents seeking a retirement haven and the requirements of the tourist oriented economy of the town must be balanced in the future development of Nags Head. It is also important to try to achieve stabilization of the highly seasonal economy through programs designed to extend the tourist season and to increase local participation in the supply and services industries.

B. Housing and Community Services

The most urgent problem identified by the residents of Nags Head was the lack of readily available medical and health care services. This problem will become even more critical as the population increases.

The inadequacy of the present municipal water supply is recognized as an urgent problem by the residents. This problem is emphasized when the peak demand is placed on the system by seasonal visitors at the time when fresh water recharge through rainfall is at its lowest. Septic tanks are no longer a satisfactory solution to the problem of sewage disposal when population densities begin to increase as they have in Nags Head. A modern sewage disposal system has become necessary to prevent the pollution of the highly productive sounds as well as to prevent potential pollution of the water-table aquifer which is the source of water for many domestic and commercial wells.

Disposal of increasing amounts of trash and garbage is recognized as an important concern in Nags Head. The solid waste problem is compounded by the fact that suitable sites for disposal are also areas which have the greatest potential for development.

While there are some recreation attractions for tourists, the recreation needs of permanent residents have not been recognized. As the community develops, expanded cultural and recreational facilities will be required to meet the increasing demand. Other community services including police and fire protection, education and social services must take into account the dual and seasonal nature of the populace of Nags Head.

Unplanned location of commercial and industrial land uses near residential neighborhoods has created some incompatible situations in the town. The residents of Nags Head see this as a problem along with the over-commercialization of the beach which could destroy the "family beach" atmosphere that is a major attraction for many visitors. Overcrowded development on small lots and structures which are out of scale with the low profile of vegetation and land features also threatens the style of living valued by Nags Head residents.

C. Productive Natural Resources

Nags Head is located at the edge of some of the world's most productive breeding grounds for shellfish and finfish. Commercial fisheries have long been a mainstay of the local economy. In recent years sport and recreational fishing and related tourism have overshadowed commercial fishing as the basis for economic well being. The use of land as a base for the varied recreational experiences available here is part of the natural wealth of the area.

The interdependence of these two most valuable of productive resources, the water and the land, makes it imperative that their

use be carefully managed to conserve their productivity. Soil erosion by wind and water and pollution of the sounds and ocean are problems which threaten to destroy the very things which make Nags Head attractive.

D. Important Natural Environments

Nags Head is the site of two areas which have been designated as Registered Natural Landmarks. Jockey's Ridge which has been acquired as a State Park is recognized as the highest natural sand dune on the East Coast of the United States. Nags Head Woods is a unique example of maritime forest which covers ancient dunes with frequent fresh water ponds and bogs.

Their conservation is necessary to insure that future generations of coastal residents and visitors have the opportunity to participate in an important part of the coastal experience.

E. Cultural and Historic Resources

Jockey's Ridge and Nags Head are only two of many cultural and historic resources of this area. The vicinity also includes the site of the first English settlement in America and the site of man's first powered flight. This rich natural, cultural, and historic heritage constitutes one of the greatest assets of the area and one which is important to preserve so that it continues to attract visitors to the Outer Banks.

The first residents of the Nags Head area selected their home sites with care. They worked on the beaches and in the sounds but they built their homes in sheltered, stable locations well protected from the winds and storms. This proven example of how to live in a

fragile and sometimes hostile environment is part of the cultural heritage of Nags Head which should serve as a guide for future development.

### III. LAND USE GOALS AND OBJECTIVES

- A. The citizens of Nags Head have indicated their concern with the qualities of living in Nags Head which are most important to them and which seem most in danger of being lost if present trends continue. These qualities are:
1. The slow pace of life in Nags Head.
  2. Freedom from pollution and the pressures of urban populations.
  3. The natural environment of the Outer Banks and the recreational activities associated with it.
  4. The inaccessibility of Nags Head and the privacy available here.

The overall goal of the Nags Head Land Use Plan will be to preserve and enhance these qualities which are unique to Nags Head so that the town will continue to be a pleasant place to live for permanent residents and remain attractive to the visitors who are vital to the economic well-being of the town.

- B. The citizens of Nags Head indicated general agreement with the Goals of the 1972 Land Development Plan but suggested some alternative objectives and policies for achieving those goals. The concepts which most people agreed upon are the assumptions on which the development policies and standards will be based.

1. Effective planning can minimize the potential conflicts between the sound economic development of Nags Head and the natural environment which is the major attraction of the area.
2. Nags Head should give a high priority to improving community services and utilities to accomplish the objectives of the Land Use Plan.
3. Industry or other large scale development should provide local officials with an assessment of the primary and secondary impact that such development will have upon the natural and cultural environment of Nags Head.
4. The natural resources of the area must be conserved to maintain their attractiveness and protective functions.
5. The growth of Nags Head should be controlled in accordance with plans for the provision of the necessary services to accommodate that growth.

#### Goal

Provide for the development and expansion of the tourist industry as the major industry of Nags Head.

#### Objectives

1. The "Family Beach" atmosphere is the attraction which brings most visitors back to Nags Head. This image should be reinforced and encouraged.
2. The seasonal fluctuations of the tourist oriented economy should be stabilized by extending the season to make more economical use of facilities and services.

3. Public access to the beach should be provided for land-locked property owners.
4. The development of a commercial services park for the location of wholesale warehousing and distribution activities would help to retain a larger share of the recreation income in Nags Head as well as provide a wider range of job diversification.
5. The construction of vacation homes will be encouraged to increase private investment in Nags Head and to help extend the tourist season.

#### Goal

Coordinate the future growth and development of the Town of Nags Head with adjacent municipalities and with Dare County.

#### Objectives

1. This plan, under the guidelines of the Coastal Area Management Act, represents a joint effort between the Planning Boards of Nags Head, Dare County, Kill Devil Hills and Manteo. Further cooperative planning efforts should be encouraged for the periodic review and revision of policies affecting all of the local governments.
2. The development of an adequate water and sewer system to serve the needs of this growing community is imperative. Coordination of each unit of government involved is required for the successful achievement of this objective.
3. The joint Thoroughfare Plan prepared for the Town of Nags Head and Kill Devil Hills by the N. C. Department of Transportation should be adopted as part of the overall planning program along with the specific recommendations for implementation included in it.

Goal

Conserve air, water, and land resources and preserve the natural environment to the extent possible.

Objectives

1. Proposed development should not destroy or irretrievably alter:
  - A. Wetlands
  - B. Frontal Dunes
  - C. Beaches
  - D. Estuarine or Impounded Surface Waters
  - E. Prime Wildlife Habitat
  - F. Unique natural areas, historic or archeological sites
2. Proposed development should not encroach upon or be endangered by:
  - A. Areas of special flood hazard
  - B. Ocean front erosive areas
  - C. Inlets and areas within range of their migration
  - D. Estuarine erosive areas
3. Proposed development should not significantly affect the quality or reduce the value of:
  - A. Public or privately owned forest, park, game lands, sanctuaries or other non-intensive recreation areas.
  - B. Aquifers, or aquifer recharge areas, or public water supply watersheds or water supply areas.

Goal

Provide for the orderly growth and development of Nags Head as a community for year-round family living as well as a family ocean resort community

### Objectives

The development of land and water areas within Nags Head should be undertaken in accordance with sound resource management principles in order to make the most economic use of public funds invested in services and to enhance private investment in the long term future of the Town. The standards expressed in development codes will guide the location of development in appropriate areas and identify certain measures necessary to insure safety and convenience for residents of and visitors to Nags Head.

#### IV. LAND CLASSIFICATION

The Coastal Resources Commission has adopted a five category classification system to identify the general use of land, to direct population densities in areas which can best be served by necessary utilities and to conserve natural resources by guiding growth.

The Town of Nags Head has been designated as a growth area as part of the Dare County Land Use Plan. The County Development Plan has placed Nags Head in the transitional classification with the exception of those portions of the town that fit various categories of conservation classification.

More detailed allocation of land uses within this growth area is the function of town development codes. Since Nags Head is limited to its present total size by the municipal limits of Kill Devil Hills to the north, the Atlantic Ocean to the east, and Roanoke Sound and National Park Service lands to the west, the use of land must be carefully coordinated to allow for the orderly development of a well balanced community which preserves the unique characteristics of the town to the greatest extent possible.

The five categories are:

Developed lands: Which can range from small communities to large incorporated cities, where population density is moderate to high and where there are a variety of land uses which have the necessary public services and utilities.

Transition lands: Which comprise areas suitable for moderately intensive development and expansion of predominantly residential character. These areas are also capable of accommodating other uses compatible with such development. The level of public services and utilities in these areas is less intense than in developed lands.

Community lands: Which include areas capable of low intensity residential development. Public services and utilities in these areas will be available at a lower level than in the developed and transition lands.

Rural lands: Which comprise areas with little or no urban development. They are characterized by low-lying lands suited primarily for carefully managed programs such as forestry, agriculture or passive recreation. The lands used for these purposes will help stabilize the seasonal fluctuations of the County's economy. Public services and utilities in these areas will be limited. Rural lands could also provide open spaces to serve as buffer zones or to be held in reserve for future uses as yet unanticipated.

Conservation lands: Which are areas where development must be restricted. These lands are incapable of supporting urban development because of their fragility or hazardous nature or because the natural, agricultural or forestry resources hold a higher value than their value for development. Conservation lands will protect areas representing potential sources of public water supply or as water supply recharge areas.

Privately owned wildlife refuges, wilderness areas and passive recreation areas are classified conservation lands. In addition, large publicly owned or controlled tracts are classified as conservation lands to protect historic, cultural and natural resources.

## V. ESTIMATED DEMAND

The following table depicts the desired population changes for Nags Head based on the stated objectives of orderly growth and development:

Year	Permanent Population	Seasonal Population	Total Peak Population
1975	512	11,488	12,000
1980	607	14,273	14,880
1985	717	16,993	17,710
1990	828	20,264	21,092
2000	1148	28,477	29,625
2025	1419	35,197	36,616

Since the present water supply for Nags Head is inadequate, the voters of Nags Head and Dare County have taken the first step to accommodate this growth by passing a bond referendum to provide a dependable water supply. With that supply, the growth which is expected to occur during the next ten year period can be accommodated in the Transitional areas established by this Plan. That area comprises around 75% of the total land area of the town.

Over 25% of the total land area of Nags Head is in the conservation category which is preserved from urban development.

Within the area of Nags Head that has been classified Transitional there will be individual sites which cannot be developed due to the constraints mentioned in this Synopsis.

Growth will of necessity be at a low density because it will be governed by the Dare County Septic Tank Regulations to prevent pollution of estuarine waters and to prevent contamination of the ground water supply. The desired growth for Nags Head will yield a gross population density of around five people per acre in the Transitional land classification on that peak tourist weekend in July or August of 1985 when all the visitor accommodations are full.

The effect of previously platted sub-standard lots on the population growth desired for Nags Head will be minimized by the Zoning Ordinance and by the Dare County Septic Tank Regulations which prohibit the development of such lots until an approved community water supply or sewage disposal system is available. The Nags Head Subdivision Regulations require developers to install the necessary utilities and streets so that the cost of these additional services should not increase the general tax burden within the growth period.

To achieve the goals of protecting the vital shellfish waters and shallow ground water supply of Nags Head, a central sewage collection and treatment system is required. Nags Head, Dare County and the other municipalities have joined together to examine this problem and to propose a solution to it. The cost of the system which results from that study will again require a Bond Referendum and a commitment from the voters. Engineering studies indicate that such a system might cost in excess of \$11 million. Due to the fact that it is impossible to accurately predict future changes in Federal and State guidelines regarding loan and grant programs for sewage systems it would be unwise to anticipate State or Federal assistance for such a project. Any available assistance would, of course, reduce the cost of the facilities to the local governments. The expenditures for treatment plants, pumping stations and major collection lines may be covered by Bond Referendum and such additional funding that may be available. But collection lines to serve existing individual homes and businesses in Nags Head must be justified by the need and willingness to finance such service by the users.

The intent of this Plan and the regulatory ordinances based on it is to control the growth of Nags Head to a level acceptable to its citizens and within the limits of their willingness to support it.

This means that the tremendous population increases experienced by other resort communities will not be felt by Nags Head because of the restrictions the town has placed on development with individual septic tanks and eventually with central sewage treatment. The population densities are keyed to the availability of a central sewage treatment system and will remain relatively low even when such a system is available.

The continued development of the town will be carefully monitored to insure that the standards and policies of this Plan are maintained and that the most economic use is made of public funds to supply the required services.

## VI STEPS REQUIRED FOR IMPLEMENTATION

### A. Land Use Policy

The very publication of a document such as the Nags Head Land Use Plan can have an influence on the way the community develops in the future provided that it is well publicized and understood by the citizens. For the Plan to have a real impact on development, however, it must be recognized as a formally adopted statement of public policy--a public commitment to the goals which are considered to be the most desirable goals for the future of Nags Head.

The Land Use Plan must become a factor in the decisions made by the Town Board. It must influence choices between alternative courses of action which occur daily in the government of the Town. The Land Use Plan must also generate other programs which will be necessary in order to achieve the goals outlined in it.

### B. Regulatory Ordinances

Probably the most commonly used and most familiar of the regulatory methods of implementing the Land Use Plan is the zoning ordinance. In the legislation passed by the N. C. General Assembly to enable towns to enact zoning ordinances (N.C.G.S. 160A-383) is the requirement that "such regulations shall be made in accordance with a comprehensive plan...". Thus it is mandatory that the zoning ordinance and the Land Use Plan be in harmony and lead to the achievement of the stated goals for community development. Interpretations of the zoning ordinance by the building inspector and Boards of Adjustment should also reflect the influence of the Land Use Plan as the ultimate statement of public policy on land use.

While the zoning ordinance is a control for development that has already taken place in most cases, the regulation of subdivisions provides an opportunity to insure that new development taking place within the jurisdiction of the municipalities occurs in an orderly manner in accordance with the goals of the Land Use Plan. The provisions for review of subdivision plats by the Planning Board should insure that such development is coordinated with the appropriate utility and thoroughfare systems and that the development is of a quality and at a density that will further the goals of the Land Use Plan.

The North Carolina Building Code, the Dare County Dune Protection Ordinance and the Flood Hazard Ordinance are important regulatory tools to implement the Land Use Plan. Nags Head intends to act as a permit-letting agency for minor developments as authorized by the Coastal Area Management Act.

C. Public Investment

The most direct means of implementing the Land Use Plan is through the preparation of a Public Improvements Program and Capital Budget. This process is a commitment of public resources and facilities to the goals of the Land Use Plan which will ultimately effect the private sector of development and encourage growth and development of the type and in the direction indicated by the plan. A thorough examination of each municipal department is necessary to determine the projects and facilities which will be required over the twenty year planning period to accomplish the stated objectives. Careful consideration of needs as related to objectives should result in a

priority listing of the major items of expense. Then, with a review of the fiscal resources available through general revenue, bonding capacity, taxation, and possible state and federal assistance, a specific budget for a six year program of public expenditure may be prepared.

The capital budget process is intended to provide a vehicle through which the community can most economically relate public expenditures to the Land Use Plan in order to make those necessary and desirable public improvements with the most effective utilization of the available fiscal resources.

#### VII. RELATIONSHIP BETWEEN TOWNS AND THE COUNTY

The preparation of this plan represents a cooperative effort between the Nags Head Planning Board, the Planning Boards of Dare County, Kill Devil Hills and Manteo. It includes the representative ideas and opinions of the entire citizenry of Nags Head. The Nags Head Planning Board will continue this process of cooperation to provide for periodic review and revision of these policies in the light of changes in the life-style of the area, changes in the environment and economic pressures. Nags Head will control development within its jurisdiction according to the policies and standards of this plan.

#### VIII. POTENTIAL AREAS OF ENVIRONMENTAL CONCERN

There is sufficient land suitable for development in Nags Head to accommodate projected and desirable future growth without infringing upon areas unsuited for development. In addition to those areas included in the conservation classification, there are some areas which,

because of their overriding importance, their fragility, or the hazard they represent, should either be protected from development or developed only with special precautions.

Within Nags Head those areas which could be designated as AEC's are:

A. Coastal Wetlands:

1. Description

The marsh areas along the causeway and in scattered locations on the shoreline of Roanoke Sound.

2. Permissible Uses

Erosion Control, fishing piers, docks, bulkheads (on upland side), utility easements, limited dredging for access to navigable waters and such other development requiring water access which do not significantly alter the natural function of the marsh.

B. Estuarine Waters:

1. Description

Those Roanoke Sound waters which are classified S-A for the taking of shellfish.

2. Permissible Uses

Propagation of marine life, navigation, fishing, swimming, water skiing, boating, fishing piers and docks.

C. Resource Areas - Watersheds or Aquifers:

1. Description

The water impoundment and immediate area around the Fresh Pond.

2. Permissible Uses

Public water supply, recreation, and other development only when provided with public waste water disposal system.

D. Fragile, Historic or Natural Areas:

1. Jockey's Ridge State Park, Nags Head Woods and the Cape Hatteras National Seashore to the west and south of town.

2. Permissible Uses

On publicly owned land only those uses consistent with the objectives for which the area was established. On privately owned land only such limited development as would preserve areas susceptible to environmental damage from more intensive development. Such development should be undertaken only after approval of a complete development plan which shows that the proposed development will not destroy or significantly alter the natural topography, vegetation, surface waters or other unique natural features.

E. Areas Subject to Public Rights:

1. Description

The waters of the Atlantic Ocean and Roanoke Sound under the jurisdiction of the Corps of Engineers.

2. Permissible Uses

Propagation of marine life, navigation, fishing, swimming, boating, fishing piers, docks, bulkheads for erosion control.

F. Natural Hazard Areas:

1. Description

The ocean front and barrier dunes within one hundred and fifty feet (150') of the high water mark of the Atlantic Ocean, the portions of the Roanoke Sound shoreline with a recent history of erosion problems and those areas of the town that have an identified special flood hazard with velocity (V5) as designated by the Department of Housing and Urban Development Flood Insurance Administration.

2. Permissible Uses

(a) Ocean front and barrier dunes;

Erosion and storm protection, beach and ocean access.

(b) Erodible areas of Roanoke Sound Shoreline; erosion prevention devices, piers, docks, bulkheads.

(c) Flood hazard areas;

residential, commercial, industrial, public and semi-public uses which are developed according to the standards of the Federal Insurance Administration.

## IMPLEMENTATION TECHNIQUES REQUIRING STATE LEGISLATION

The North Carolina General Statutes permit local governments to adopt ordinances to regulate development in a variety of ways through ordinances and utility extension policies. These methods are mostly negative in their effect in that development is either prohibited or restricted in certain areas.

Other states<sup>1</sup> are using incentives programs such as preferential tax structure for land remaining undeveloped, scenic easements for critical property, and transfer of development rights which allows suitable property to be more intensely developed while preserving valuable or fragile natural resources.

These techniques make use of the economic leverage that determines the mythological "highest and best use" for land to accomplish the same goal of the restrictive ordinances. They have the added advantage of requiring no additional permit system or enforcement agency and are much less expensive than outright acquisition.

North Carolina has taken a step in this direction with N.C.G.S. 105-277 which provides for preferential tax assessment for farm land. This program should be more widely publicized and perhaps expanded to include other types of land. The other incentive techniques should be examined by the Coastal Resources Commission for their applicability in North Carolina.

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<sup>1</sup>State of Maine Title 33 Chapter 667.  
State of New Hampshire H. B. 747 Chapter 391

SECTION VII  
REFERENCES AND APPENDICES

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APPENDIX A

The Coastal Area Management Act of 1974 requires that a Land Use Plan be adopted for each of the 20 coastal counties named in the Act.

If any county fails to develop a plan it will be done for that county by an agency of the State.

The Dare County Commissioners have notified the State that the citizens of Dare County intend to develop our own plan. This will give us the greatest voice possible in the future of Dare County.

Doubtless you would like to see the county plan reflect your views of how Dare County should grow and develop. Your voice will have the greatest impact during the early stages of developing the plan. That time is now.

This questionnaire is one way to be heard. Please answer the questions carefully since your answers will serve as an important foundation for the writing of the plan.

Please remember that a Land Use Plan is not a zoning ordinance but a broad statement of our goals for growth and development and broad allocation of our land resources to meet those goals. The Land Use Plan will furnish guidelines for development and will serve as the basis for future detailed planning.

This questionnaire will be divided into three areas:

- (1) Personal profile questions asked for statistical purposes.
- (2) Questions related to Dare County today.
- (3) Questions related to Dare County tomorrow.

SECTION I: PERSONAL PROFILE

1. Check the area primarily through which you are associated with Dare County (normally the area of residence or of property holdings if non-resident. If strong association with more than one area makes it impossible to choose, check each and describe association to right of each area checked.)

       Duck & North

       Hatteras (Oregon Inlet South)

       Kill Devil Hills

       Kitty Hawk (Includes area outside limits  
of Kill Devil Hills and  
North to Duck)

       Manns Harbor, Stumpy Point,  
East Lake & Other Mainland  
areas.

       Manteo (City)

       Nags Head

       Manteo (Outside city limits)

       Wanchese

       North End Roanoke Island

2. Your age group. Circle one letter.

A. Below 18

B. 18-24

C. 25-34

D. 35-44

E. 45-54

F. 55-64

G. 65 or Over

SECTION I: PERSONAL PROFILE (Cont'd)

3. Are you a Dare County resident (includes communities located within Dare County)?

Circle one letter.

- A. Yes, and I own or am purchasing a home.
- B. Yes, and I rent my home.
- C. I am a nonresident who owns or is purchasing property in Dare County.
- D. I am a nonresident who does not hold property in Dare County.

4. What is your primary economic relationship with Dare County (circle one letter)?

- A. No income derived from Dare County.
- B. Agriculture and related business or service.
- C. Fishing and related business or service.
- D. Tourism and related business or service.
- E. Forestry and related business or service.
- F. Construction and related business or service.
- G. Business or service used by general public and not specifically related to any of above.
- H. Retirement income (if from one of above, indicate which \_\_\_\_\_).
- I. Other (Please Specify) \_\_\_\_\_

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SECTION II - DARE COUNTY TODAY

5. If you were born in Dare County, check here \_\_\_\_\_.

If not born in Dare County, check here \_\_\_\_\_.

If you were born in Dare County, which of the following keep you here, or if you were not born in Dare County which of the following attracted you (select three most important to you and number then in order of importance).

- \_\_\_ A. Slow pace of living.
- \_\_\_ B. Privacy (inaccessibility)
- \_\_\_ C. Freedom from pollution and population pressures.
- \_\_\_ D. The natural environment and associated recreational activities.
- \_\_\_ E. My job or business or property holdings.
- \_\_\_ F. Belief that there will be future economic expansion which will provide great personal opportunity.
- \_\_\_ G. Family
- \_\_\_ H. Other (Please Specify) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Of those things which attracted you to or keep you in Dare County, which do you believe we are most likely to lose?

\_\_\_\_\_ Most Likely

\_\_\_\_\_ Next most likely

COMMENTS:

SECTION II - DARE COUNTY TODAY (Cont'd)

7. Indicate your degree of concern with the following which have been cited as problems or potential problems in Dare County:

PROBLEM	Most Urgent Concern	Urgent Concern	Not A Problem
A. An adequate water supply			
B. Traffic congestion			
C. Sewage disposal			
D. Trash & Garbage disposal (not collection)			
E. High rise construction			
F. Lack of medical services			
G. Limitation on building height			
H. Pollution of ocean & sounds			
I. Over population			
J. Commercialization			
K. Lack of access to beaches, sounds, inlets and ocean			
L. Unattractive buildings			
M. Small lots and crowded developments			
N. Lack of reserved open space			
O. Lack of community recreational facilities			
P. Destruction of dunes and beaches			
Q. Lack of job diversification			
R. Lack of usable land to accommodate growth			
S. Lack of comforts or conveniences available in more urban areas (such as TV & radio, supermarkets, shopping centers, etc.)			
T. Lack of surface & subsurface drainage			
U. Erosion by wind and water			
V. Other (Please Specify)			

SECTION III - DARE COUNTY TOMORROW

8. Have you previously heard of the Coastal Zone Management Act of 1974?

(Circle letter beside all that apply)

- A. No
- B. Yes, through newspaper
- C. Yes, through radio
- D. Yes, through TV
- E. Yes, by word of mouth
- F. Yes, by other means (Please Specify) \_\_\_\_\_

9. Indicate the degree of encouragement or discouragement you believe should be given the following, assuming that any change will affect the existing balance (that is, encouraging one probably will discourage at least one of the others). Check only one column beside each item.

DARE COUNTY AS A PLACE TO WORK	Encourage Strongly	Encourage Moderately	No Change	Discourage Moderately	Discourage Strongly
A. Agriculture & Related					
B. Fishing Industry & Related					
C. Tourism & Related					
D. Forestry & Related					
E. Construction & Related					
F. Research/Development Industry					
G. Light Industry (warehousing, assembly, etc.)					
H. Heavy Industry (conversion of raw materials)					

SECTION III - DARE COUNTY TOMORROW (9 Cont'd)

DARE COUNTY AS A PLACE TO LIVE OR VISIT	Encourage Strongly	Encourage Moderately	No Changes	Discourage Moderately	Discourage Strongly
I. Residential Development					
J. Single family residences					
K. High rise residences					
L. Low rise multi-family residences					
M. Preservation of open space					
N. New & improved cultural facilities (libraries, art galleries, theatres, etc.)					
O. Increased accessibility to Dare County					
P. Improved tourist facilities (convention centers, etc.)					
Q. Urban growth					
R. Protection of residential areas from encroachment by commercial or industrial enterprise					
S. Preservation of wildlife habitat					
T. Regulation of dunes & shoreline					
U. Soil conservation					
V. Other (Please Specify)					

SECTION III - DARE COUNTY TOMORROW (Cont'd)

10. Please check the degree of agreement or disagreement with each of the following statements.

	Agree Strongly	Agree	Neutral	Disagree	Disagree Strongly
A. There is enough economic development underway in Dare County.					
B. Industry in Dare County would improve the quality of life.					
C. New industry locating in Dare County should be required to file an environmental impact statement.					
D. A person should be able to do anything he wants with his land.					
E. Planning can minimize conflict between economic development and environmental protection.					
F. We have enough people living in Dare County now.					
G. We should try to attract more permanent residents.					
H. We should give high priority to improved community or county services (central or area water systems, sewage disposal, etc.)					
I. We must control growth to allow services to keep pace with the need.					
J. We must control natural resources to keep Dare County a tourist attraction.					
K. Other (Please Specify).					

SECTION III - DARE COUNTY TOMORROW (Cont'd)

11. Are you pleased with the direction Dare County development is taking? \_\_\_ Yes, \_\_\_ No. Please use this space to write the reasons you are pleased or to indicate the changes you would like to see and your reasons for them.

APPENDIX B

SUMMARY OF QUESTIONNAIRE - NAGS HEAD RESIDENTS

- #1 A total of 147 Nags Head resident surveys were returned.
- #2 68% of the Nags Head residents are 45+
- #3 All are residents
- #4 Approximately 34% of those surveyed receive NO income from Dare County or receive retirement income. 31% receive income from tourism and related services. 15% are associated with business or services used by the general public.
- #5 82% of the Nags Head residents surveyed were not born in Dare County. The qualities which attracted them to Dare County are:
- (1) Slow pace of living
  - (2) Freedom from pollution and population pressures
  - (3) The natural environment
- #6 Of those qualities which attracted them, the two which they believe they are most likely to lose are:
- (1) Freedom from pollution and population pressures
  - (2) The natural environment
- #7 The major problem areas cited are:
- (1) Lack of medical services
  - (2) An adequate water supply
  - (3) Erosion by wind and water
  - (4) Pollution of oceans and sounds
  - (5) Sewage disposal
  - (6) Limitation on building height
  - (7) High rise construction
  - (8) Destruction of dunes and beaches
  - (9) Small lots and crowded developments
  - (10) Commercialization
- Factors which present no problem are:
- (1) Lack of comforts or conveniences
  - (2) Lack of usable land to accommodate growth
  - (3) Lack of job diversification
  - (4) Over population
  - (5) Trash and garbage disposal
  - (6) Lack of community recreational facilities
- #8 90% of the Nags Head residents had previously heard of CAMA - the majority through the newspapers.

#9

The major factors which the Nags Head residents feel should be strongly encouraged are:

- (1) Single-family residences
- (2) Protection from encroachment
- (3) Preservation of open space
- (4) Fishing industry
- (5) Preservation of wildlife habitat
- (6) Regulation of dunes and shoreline
- (7) Residential development
- (8) Soil conservation
- (9) New and improved cultural facilities
- (10) Improved tourist facilities

Factors which are strongly discouraged are:

- (1) High rise residences
- (2) Heavy industry
- (3) Low rise multi-family residences

#10

Nags Head residents strongly agree with the following statements:

- (1) Planning can minimize conflict
- (2) We should give high priority to improved county or community services.
- (3) New industry should file an EIS
- (4) We must control growth to allow services to keep pace with the need
- (5) We must control natural resources to keep Dare County a tourist attraction

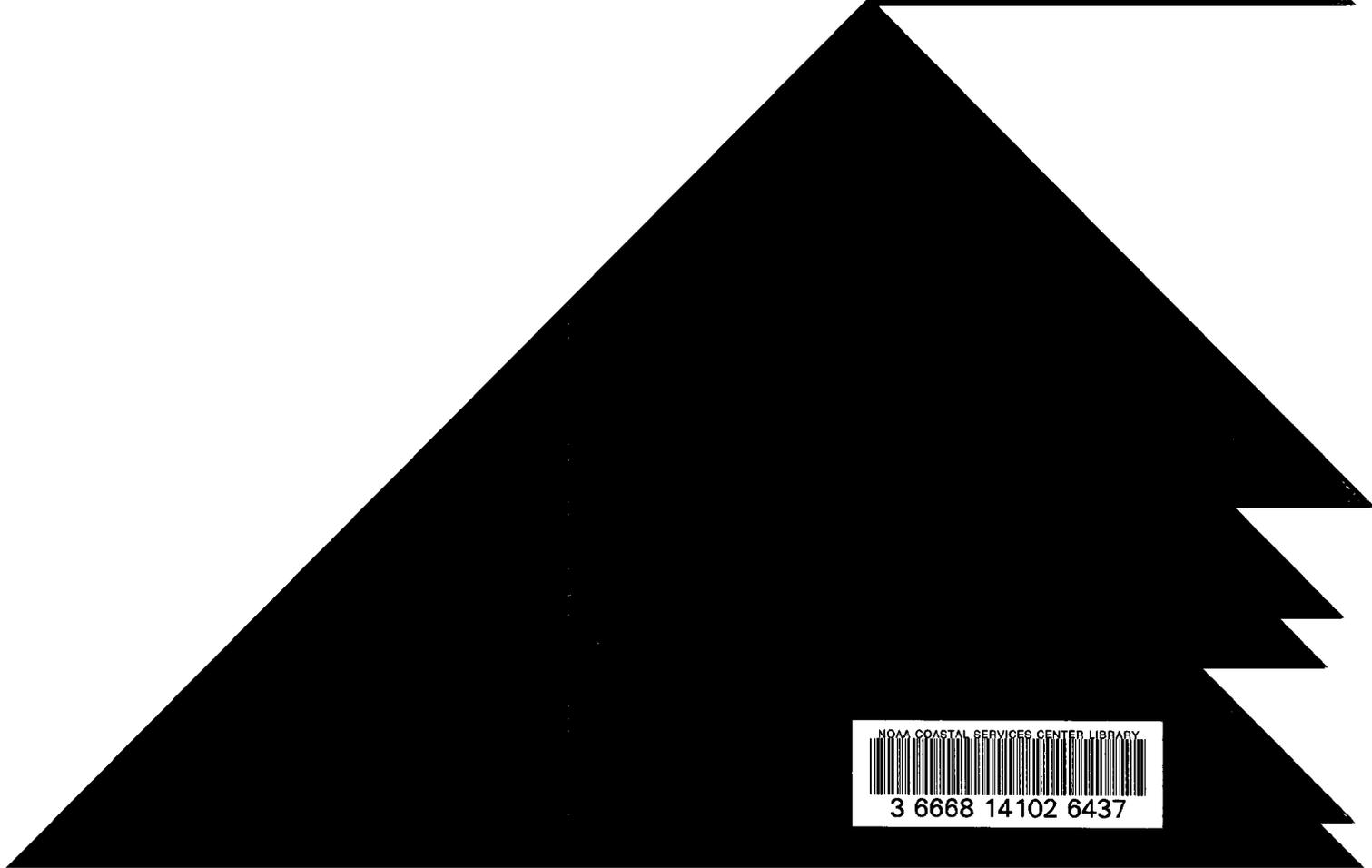
They disagree with the following:

- (1) A person should be able to do anything he wants with his land.

#11

52.4% of those surveyed are not pleased with the direction Dare County development is taking.

This report was financed in part by the National Oceanic and Atmospheric Administration and the State of North Carolina, and meets the requirements of the North Carolina Coastal Area Management Act of 1974.



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