North Carolina Coastal Zone Management Program
HD211.N8T977 1986

TYRRELL COUNTY, N.C.
CAMA LAND USE PLAN

1985 UPDATE

JUL 1989

[redacted]

PREPARED BY

TALBERT, COX & ASSOCIATES

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TYRRELL COUNTY, NORTH CAROLINA
LAND USE PLAN: 1985 UPDATE

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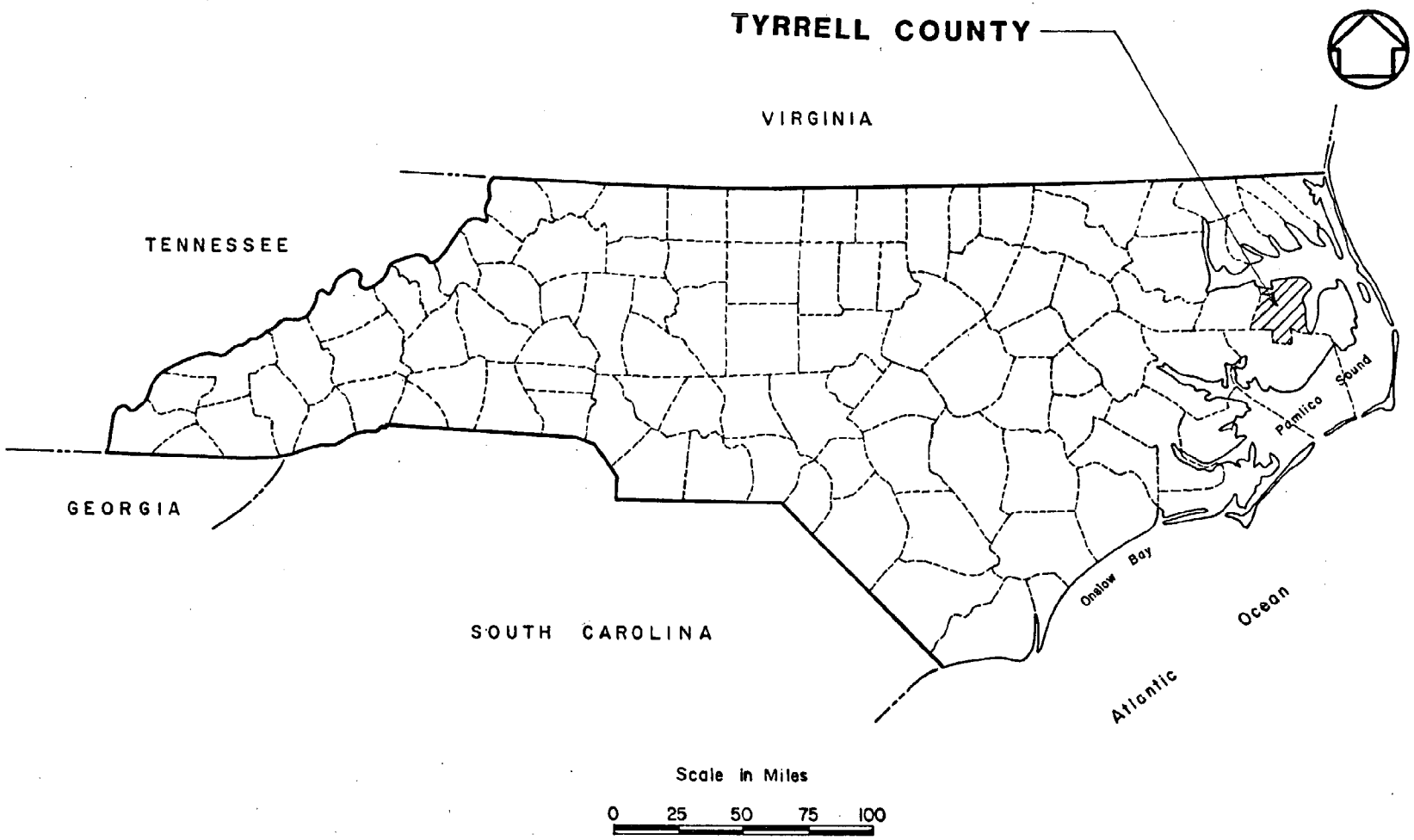

MAP 1
Location Map

TYRRELL COUNTY, NORTH CAROLINA
LAND USE PLAN: 1985 UPDATE

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SECTION I :
Analysis of Existing Conditions
and
Projected Demand

TYRRELL COUNTY LAND USE PLAN

A. Establishment of Information Base

This 1985 Land Use Plan Update for Tyrrell County has been prepared in accordance with requirements of the North Carolina Coastal Area Management Act (CAMA). Specifically, this document complies with Subchapter 7B, "Land Use Planning Guidelines," of the North Carolina Administrative Code, as amended, July 9, 1984.

The initial Land Use Plan was prepared for Tyrrell County in 1976, and the first update in 1980. According to the "Land Use Planning Guidelines," the major purpose of periodic updating of local land use plans is to identify and analyze newly emerging community issues and problems. An additional element which was not required in either the 1976 Plan or the 1980 Update is a "Storm Hazard Mitigation, Post-Disaster Recovery, and Hurricane Evacuation Plan," and is required to be included in the 1985 Update. This element is designed to help local governments coordinate effective policies and actions relating to the impact of hurricanes or other severe storms.

The guidelines further give the following objectives the update should meet:

- -- to further define and refine local policies and issues;
- -- to further examine and refine the land classification system and the land classification map;
- -- to assess the effectiveness of the existing land use plan and its implementation;
- -- to further explore implementation procedures, and;
- -- to promote a better understanding of the land use planning process.

Both the 1976 Land Use Plan and the 1980 Update provided much of the needed information base for this most recent update. However, in many cases, new information had to be developed. A number of data sources were tapped during the preparation of this plan in order to prepare updated analyses of population, housing, economics (including agriculture, fisheries, and forestry), and existing land uses. Most of the data came from primary and secondary sources in the form of direct contacts with representatives of various state and federal agencies and/or previously published documents or reports. Also, "windshield" surveys were conducted to obtain data on existing land use patterns. Interviews were conducted with various County officials. Efforts were made to obtain data that was as up-to-date and accurate as possible.

The data analysis showed that in most cases, the changes since 1980 (the last update year) have not been dramatic, while in

other cases, some trends appear to be emerging. Some major conclusions of the updated land use plan are:

1. Tyrrell County's population grew between 1970 and 1980, reversing a three-decade-old trend of population losses. Population growth is projected to continue through 1995, with some notable shifts in age and sex ratios. The Columbia and Scuppernong Townships are projected to receive most of this growth.

2. The economic importance of agriculture is firmly established and will remain dominant in the County throughout the next 10 years. The mining of peat still has the potential to become significant during the next 10 years.

3. The overall land development pattern, being one with a predominantly rural, scattered character, will likely continue. The rapid rate of clearing forest land for conversion into agricultural use, highlighted as a major issue in 1976 and 1980, has leveled to a slower pace.

4. With a growing population and expanding labor force, it will be necessary perhaps to pursue economic expansion in the form of industrial development.

Some of the data sources utilized in preparing this document include:

1. U. S. Census of Population and Housing, 1980, U. S. Department of Commerce.

2. N. C. Office of State Budget and Management, Demographic Section.

3. 1976 Tyrrell County CAMA Land Use Plan.

4. 1981 Tyrrell County Land Use Plan.

5. "A Survey of Natural Areas in Tyrrell County, North Carolina," for N. C. Natural Heritage Program, Coastal Area Inventory Project, by Drs. Andrew N. Ash and Charles B. McDonald, E.C.U., January, 1981.

6. "Tyrrell County Statistical Report," FY 84-85.

7. Before the Storm: Managing Development To Reduce Hurricane Damages, McElyea, Brower, & Godschalk, 1982.

B. Present Conditions

1. Population:

Tyrrell County, located in rural Northeast North Carolina on the north side of the Pamlimarle peninsula, has the smallest county population of all of the State's 100 counties. This distinction has been held by the County for quite some time. Notice Table 1, below, which shows the decennial population of Tyrrell County from 1900 to 1980, with projections for 1985, 1990, and 1995.

TABLE 1: Tyrrell County Population: 1900-1980, With Projections to 1995

Year	Population	Num. Change	Pct. Change
1900	4,980	-	-
1910	5,219	+239	+ 4.8
1920	4,844	-375	- 7.2
1930	5,164	+320	+ 6.6
1940	5,556	+392	+ 7.6
1950	5,048	-508	- 9.1
1960	4,520	-528	-10.5
1970	3,806	-714	-15.8
1980	3,975	+169	+ 4.4
*1985	4,134	+159	+ 4.0
*1990	4,249	+115	+ 2.8
*1995	4,398	+149	+ 3.5

Source: U. S. Census (Provided by Albemarle Commission)

* Projections by the N. C. Office of State Budget & Management

The population trends in Tyrrell County have been erratic since the turn of the century. As Table 1 shows, population increased from between the years 1900 to 1910, but fell sharply between 1910 and 1920, rising again during the '20s and '30s, and peaking in 1940 with 5,556 persons. However, from 1940 to 1970, the County lost population rather dramatically, having a total decline of 1,750 persons or 31.5% over the 30-year period. The most severe population decrease occurred between 1960 and 1970, with a total decline of nearly 16%. However, beginning with the 1980 Census, the County appears to be in a gradual growth pattern. This pattern of increased population within Tyrrell County is supported by recent projections made by the North Carolina Office of State Budget and Management. Growth, though small, continued from 1980 to 1985, and is projected to continue through 1995.

a. Composition

Table 2: Historical & Projected Racial Composition
Tyrrell County

	White		Total (%)	Non-White		Total (%)
Year	M	F		M	F	
1960	1,259	1,285	2,544 (56%)	995	981	1,976 (44%)
1970	1,034	1,119	2,153 (57%)	804	849	1,653 (43%)
1980	1,167	1,251	2,418 (61%)	706	851	1,557 (39%)
*1985	1,258	1,321	2,579 (62%)	702	853	1,555 (38%)
*1990	1,343	1,383	2,726 (64%)	682	841	1,523 (36%)
*1995	1,431	1,471	2,902 (66%)	661	835	1,496 (34%)

Sources: U. S. Census; N. C. Office of State Budget & Management

*Projections by Office of State Budget & Management

The racial composition of Tyrrell County's population has been shifting gradually since 1960. Blacks, who comprise almost all of the non-whites in Tyrrell, have been steadily declining in both numbers and percent of the total population. This decrease is attributable, to a large extent, to a constant out-migration of younger people who seek employment and educational opportunities outside of Tyrrell County. This is likely to continue through the 1995 planning period, as the projections in Table 2 show. On the other hand, the white population, except for a decline between 1960 and 1970 has increased and is projected to continue this trend throughout the forecast period.

The following Tables 3 and 4, which depict the projected population of Tyrrell County for both 1985 and 1990 by age, race and sex, show that females outnumber males in the County, and will likely continue to do so through the planning period (through 1995). This is partially due to the somewhat longer average life-span for females than males, resulting in more widows. These tables show also that the overall age groups in Tyrrell County are not projected to change significantly percentage-wise. However, it is quite interesting to note that the number and percent of white females in the age range from 20 to 54 is projected to increase from about 44% of the total white female population in 1985, to about 51% by 1990. During the same time period, there will be a decrease in the percent of white females in the 55 and over age ranges, although the number will remain about the same. In general, the trend appears that Tyrrell County's older population (55 and over) is gradually declining as a percent of the total population, while the middle and perhaps more productive age groups of from 20 to 54, will increase their percentages.

Table 3

TYRRELL

PROJECTED POPULATION, JULY 1, 1985, BY AGE, RACE, AND SEX

AGE	TOTAL	WHITE			OTHER		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
TOTAL	4134	2579	1258	1321	1555	702	853
0-4	342	190	102	88	152	65	87
5-9	347	196	105	91	151	64	87
10-14	313	189	101	88	124	51	73
15-19	259	154	71	83	105	42	63
20-24	312	165	70	95	147	68	79
25-29	335	192	101	91	143	68	75
30-34	321	207	98	109	114	53	61
35-39	244	169	83	86	75	42	33
40-44	204	138	76	62	66	29	37
45-49	191	124	59	65	67	33	34
50-54	192	124	57	67	68	34	34
55-59	208	131	66	65	77	41	36
60-64	222	158	64	94	64	26	38
65-69	221	145	68	77	76	38	38
70-74	183	121	62	59	62	27	35
75-79	125	88	38	50	37	12	25
80-84	79	61	23	38	18	6	12
85&UP	36	27	14	13	9	3	6
			PERCENT OF COLUMN TOTAL				
0-4	8.27	7.37	8.11	6.66	9.77	9.26	10.20
5-9	8.39	7.60	8.35	6.89	9.71	9.12	10.20
10-14	7.57	7.33	8.03	6.66	7.97	7.26	8.56
15-19	6.27	5.97	5.64	6.28	6.75	5.98	7.39
20-24	7.55	6.40	5.56	7.19	9.45	9.69	9.26
25-29	8.10	7.44	8.03	6.89	9.20	9.69	8.79
30-34	7.76	8.03	7.79	8.25	7.33	7.55	7.15
35-39	5.90	6.55	6.60	6.51	4.82	5.98	3.87
40-44	4.93	5.35	6.04	4.69	4.24	4.13	4.34
45-49	4.62	4.81	4.69	4.92	4.31	4.70	3.99
50-54	4.64	4.81	4.53	5.07	4.37	4.84	3.99
55-59	5.03	5.08	5.25	4.92	4.95	5.84	4.22
60-64	5.37	6.13	5.09	7.12	4.12	3.70	4.45
65-69	5.35	5.62	5.41	5.83	4.89	5.41	4.45
70-74	4.43	4.69	4.93	4.47	3.99	3.85	4.10
75-79	3.02	3.41	3.02	3.79	2.38	1.71	2.93
80-84	1.91	2.37	1.83	2.88	1.16	0.85	1.41
85&UP	0.87	1.05	1.11	0.98	0.58	0.43	0.70

SOURCE - NORTH CAROLINA OFFICE OF STATE BUDGET & MANAGEMENT

BASED ON 70-80 CENSUS DATA
PREPARED MAY 13, 1983

Table 4

PROJECTED POPULATION, APRIL 1, 1990, BY AGE, RACE, AND SEX

AGE	TOTAL	WHITE			OTHER		
		TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Total	4249	2726	1343	1383	1523	682	841
0-4	346	201	108	93	145	62	83
5-9	321	187	100	87	134	57	77
10-14	359	212	115	97	147	60	87
15-19	305	199	106	93	106	42	64
20-24	217	137	61	76	80	28	52
25-29	273	163	66	97	110	52	58
30-34	333	200	105	95	133	70	63
35-39	373	255	122	133	118	54	64
40-44	249	175	87	88	74	43	31
45-49	219	141	78	63	78	32	46
50-54	196	127	61	66	69	37	32
55-59	194	130	57	73	64	31	33
60-64	214	139	71	68	75	41	34
65-69	195	142	54	88	53	19	34
70-74	203	135	67	68	68	32	36
75-79	140	99	52	47	41	17	24
80-84	79	60	21	39	19	3	16
85&UP	33	24	12	12	9	2	7

PERCENT OF COLUMN TOTAL

0-4	8.14	7.37	8.04	6.72	9.52	9.09	9.87
5-9	7.55	6.86	7.45	6.29	8.80	8.36	9.16
10-14	8.45	7.78	8.56	7.01	9.65	8.80	10.34
15-19	7.18	7.30	7.89	6.72	6.96	6.16	7.61
20-24	5.11	5.03	4.54	5.50	5.25	4.11	6.18
25.29	6.43	5.98	4.91	7.01	7.22	7.62	6.90
30-34	7.84	7.34	7.82	6.87	8.73	10.26	7.49
35-39	8.78	9.35	9.08	9.62	7.75	7.92	7.61
40-44	5.86	6.42	6.48	6.36	4.86	6.30	3.69
45-49	5.15	5.17	5.81	4.56	5.12	4.69	5.47
50-54	4.61	4.66	4.54	4.77	4.53	5.43	3.80
55-59	4.57	4.77	4.24	5.28	4.20	4.55	3.92
60-64	5.04	5.10	5.29	4.92	4.92	6.01	4.04
65-69	4.59	5.21	4.02	6.36	3.48	2.79	4.04
70-74	4.78	4.95	4.99	4.92	4.46	4.69	4.28
75-79	3.29	3.63	3.87	3.40	2.69	2.49	2.85
80-84	1.86	2.20	1.56	2.82	1.25	0.44	1.90
85&UP	0.78	0.88	0.89	0.87	0.59	0.29	0.83

DECADE	ESTIMATED RATE OF NET MIGRATION (IN PERCENT)						
80-90	3.21	12.27	16.08	8.81	-9.83	-10.73	-9.08

SOURCE NORTH CAROLINA OFFICE OF STATE BUDGET & MANAGEMENT

BASED ON 70-80 CENSUS DATA PREPARED MAY, 1983

It is also interesting to note that from 1985 to 1990, the school-age population in the County (from 5-19) is projected to increase only by 1.4% per year, for a total of only 66 potential students. The Office of State Budget and Management's projections by age, race and sex for 1995 are not shown in this report. However, the patterns identified in the projections from 1985 to 1990 are likely indicative of trends through 1995.

b. Dispersal

There are five (5) Townships in Tyrrell County, as Map 2, page 8 shows. The County's population is dispersed throughout the Townships, with the largest concentrations being in the Columbia and Scuppernong Townships. Most of the rest of the population is "pocketed" in rural communities along the two major highways (U.S.64 or N.C.94) or paved secondary routes in areas such as Gum Neck, Alligator, Travis, Goat Neck, and Kilkenny. Table 5, below, shows the population within each township from 1960 to 1980.

Table 5: Tyrrell County Township Population: 1960-80

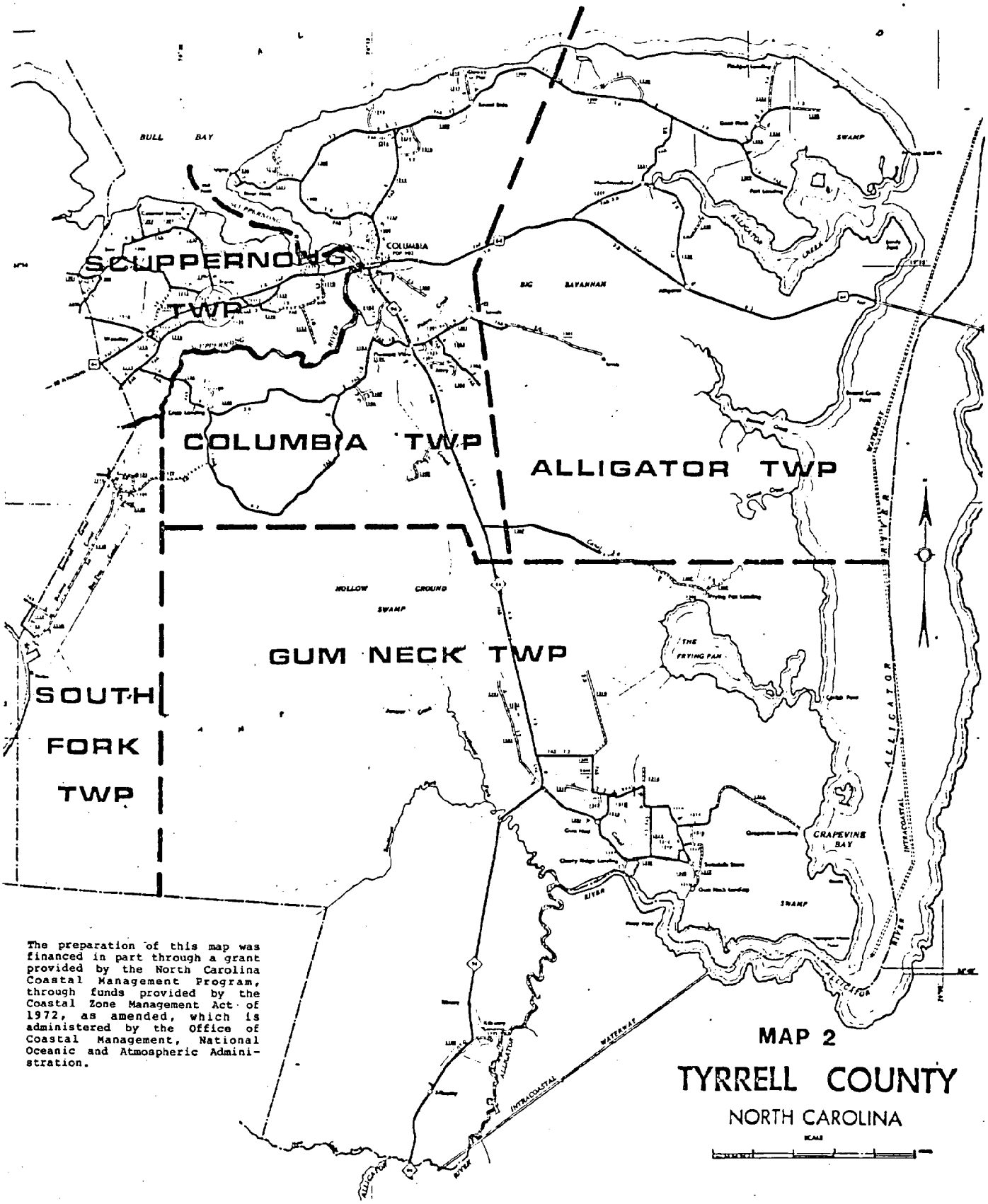
Township	1960	1970	1980	Pct./Num.Change 70/80
Alligator	613	482	477	- 5 (-1.0%)
Columbia	2,212	1,910	2,098	+188 (+9.8%)
- Columbia Town	(1,099)	(902)	(758)	-144 (-16.0%)
Gum Neck	732	523	474	- 49 (-9.4%)
Scuppernong	901	838	864	+ 26 (+3.1%)
South Fork	62	53	62	+ 9 (+17.0%)

Sources: U. S. Census; N. C. Office of State Budget & Management

Columbia Township, which includes the Town of Columbia, gained 188 persons between 1970 and 1980. Ironically, the Town of Columbia lost 144 persons during the period. This is perhaps indicative of new residences being developed near, but outside of the Town limits of Columbia, as well as net out-migration from the Town. It appears that the growth trend of the Columbia Township will likely continue. Both the Scuppernong and South Fork Townships also experienced population gains during the 1970-80 decennial period, while Alligator and Gum Neck Townships both lost population.

c. Seasonal Population

Although there are a growing number of second homes being developed along the Albemarle Sound, seasonal population changes are not dramatic in Tyrrell County. In the absence of a strong tourism element in the economy, there are no major fluctuations in the population which would exert undue pressures on the provision of public facilities or services.



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

MAP 2

TYRRELL COUNTY

NORTH CAROLINA

TOWNSHIPS

d. Population Summary

The analysis of existing and projected population in Tyrrell County suggests the following trends:

1. A three-decade-old trend of population losses ended in 1980 and has been replaced by a gradual growth trend, projected through 1995. The non-white population is projected to decline, while the white population in the County will continue to increase. Also, females will continue to outnumber males throughout the planning period.

2. Overall, the older segment of the population (55 and over), is projected to decline as a percent of the total population, while the middle-age ranges (from 20-54) will increase through 1995. The largest age shift appears to be in the 35-39 age group -- particularly among white females. The increased size of the young adult to middle age groups suggests additional household formations and a need for jobs and adult education or job training opportunities. Although the elderly population is not projected to increase substantially, there is still suggested a need for elderly care facilities.

3. There should be no major shifts in the school-age population throughout the planning period. Therefore, it is suggested that there will be no need for expanded educational facilities on the basis of increased population.

2. Economic Analysis

a. General

The economic picture for Tyrrell County has steadily been improving, as was noted in the 1980 Land Use Plan Update (pp. 6-10). The County's economic base continues to be overwhelmingly agricultural. Other significant elements of Tyrrell County's economy include commercial forestry, commercial fishing, and manufacturing. Existing economic conditions are discussed in more detail, below.

b. Agricultural

Farm income has steadily increased since the 1980 Land Use Plan Update, as Table 6, page 11, shows. From 1980 to 1983, regular farm income increased at an annual average rate of more than 1.2 million dollars. When government payments, particularly the Payment-in-Kind (PIK) program, which was a one-year program in 1983, are taken into account, total farm income increased by nearly 2.0 million dollars per year. Field crops, most notably soybeans, corn, Irish potatoes, and wheat, produce the most farm

income. Livestock production, mostly hogs, accounts for the majority of the rest of farm income. Income from hog production grew by 73% from 1980 to 1983, or at an annual average rate of 24.5%, while income from beef production declined during the same period.

As noted in the 1980 Land Use Plan Update, during the mid-1970s, large tracts of previously forested land were cleared for agricultural production, with most of this activity being conducted by large corporate farms. The 1978 U. S. Census of Agriculture noted that Tyrrell County then had 38,492 acres of harvested cropland. However, the estimated harvested cropland in 1982, according to the U. S. Census of Agriculture, 1982, was 50,859 acres, an increase of 32% in four years.

Table 6: Tyrrell County Agricultural Income: 1980-83

Agricultural Income (000's)

Field Crops	1983	1982	1981	1980
1. Corn (for grain)	4,151.0	4,928.1	6,111.8	4,920.0
2. Soybeans	6,571.1	4,597.7	4,562.0	5,792.2
3. Irish Potatoes	2,264.0	1,988.2	2,834.7	1,595.3
4. Wheat	556.5	711.3	600.0	697.8
5. Peanuts	39.3	39.3	108.0	44.7
6. Other Grains (oats, rye, barley, grain sorghum)	14.4	65.6	60.8	25.0
7. Vegetables, Fruits & Berries (incl. sweet potatoes)	227.5	77.5	158.6	** 1,042.0
Sub-Total	13,823.8	12,407.7	14,435.1	14,120.0
Livestock and Other				
1. Hogs	10,375.2	12,253.1	8,230.4	5,983.0
2. Cattle	155.0	197.3	214.6	401.4
3. Sheep and Lambs	9.0	6.4	5.4	5.4
4. Wool	.7	.5	.4	.4
5. Honey	55.7	53.7	61.7	83.7
Sub-Total	10,595.6	12,511.0	8,512.5	6,474.0
Regular Income Sub-Total	24,419.4	24,918.7	22,947.6	20,594.0
Government Payments	*1,844.6	82.9	61.0	33.5
Total	26,264.0	25,001.6	23,008.6	20,627.5

Source: N. C. Agricultural Extension Service - Annual Estimate of Cash Farm Income

* Includes Payment-in-Kind (PIK) Program Income
**Exceptional Year for Cucumbers, Leafy Greens, Tomatoes & Peppers

During the same period, the number of farms actually decreased, while the average size of farms increased substantially, somewhat reflective of the large corporate ownership. Notice Table 7, below:

Table 7: Farmland Summary in Tyrrell County: 1978-82

	1978	1982	Number/ Pct. Change
Land in Farms (ac.)	56,492	68,370	11,878/ 21%
Number of Farms	173	141	-32/-18%
Avg. Size of Farms	327	485	158/ 48%
Total Croplands	43,350	55,064	11,714/ 27%
- Harvested Cropland	38,492	50,859	12,367/ 32%
- Cropland Used Only for Pasture or Grazing	2,275	204	-2,071/-91%
- Other Cropland	2,583	4,001	1,418/ 55%
Woodland on Farms	10,727	9,688	-1,039/-9.7%

Source: U. S. Census of Agriculture, 1978 - 1982

Although land clearing was quite significant from the mid 70's through around 1982, indications are now that the rate of clearing new farmland has dropped substantially. This trend is expected to continue. (Additional discussions on land use changes are included in Part C of this section, which addresses existing land use and land use trends). Table 8 also gives an indication of the growth of the size of farms in Tyrrell County from 1978 to 1982.

Table 8: Tyrrell County: Size of Farms with Harvested Acres 1978-82

Size Range (Acres)	No. Farms 1978	No. Farms 1982
1 - 9	11	11
10 - 19	23	5
20 - 29	18	12
30 - 49	20	19
50 - 99	25	15
100 - 199	16	14
200 - 499	16	27
500 - 999	14	15
1,000 +	12	14

Source: U. S. Census of Agriculture, 1982

c. Commercial Forestry

Forestry income continues to be significant in Tyrrell County, as Table 9, below, indicates.

Table 9: Tyrrell County Forestry Income, 1980 - 1983

	1980	1981	1982	1983
Pulpwood	$ 25,200	$ 110,143	$ 162,809	$ 178,135
Lumber	2,193,750	1,281,560	1,479,296	1,459,757
Total	$2,218,950	$1,391,703	$1,642,105	$1,637,892

Source: N. C. Agricultural Extension Service, Annual Estimates of Cash Farm Income

Overall forestry income in the County declined between 1980 and 1983, with all of the decline coming from net losses in lumber income. Of the County's 254,360 land acreage (excluding water acres), approximately 183,790 acres are in forestlands. This is about 72% of the total land acreage. Nearly all of the commercial forestlands in the County are owned by large, corporate landholders. The most significant among these are First Colony Farms, Inc., Weyerhauser, and Butler Lumber Company.

d. Commercial Fishing

Most of the commercial fishing occurs in the Albemarle Sound and the Alligator Rivers. According to the North Carolina Division of Marine Fisheries, the commercial catches steadily increased from 1980 through 1983. Notice Table 10, below:

Table 10: Tyrrell County Commercial Fishery Income, 1980-1983

	1980		1981		1982		1983		% Value Change
Species	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	80 - 83
Total Fish	319,876	116,796	614,010	174,423	478,357	160,075	520,803	228,751	+ 96%
Total Shellfish	656,246	111,057	852,173	153,532	1,057,401	201,284	1,116,299	226,720	+104%
	976,122	228,303	1,466,183	327,955	1,535,758	361,359	1,637,102	455,470	+99.5%

Source: N. C. Division of Marine Fisheries

e. Other Commercial Income

Other commercial income for Tyrrell County includes income from manufacturing as well as from commercial wholesale and retail

trade. According to the U. S. Bureau of the Census' County Business Patterns, 1982, the annual business payroll dropped slightly from 1980 to 1982. Notice Table 11, below:

Table 11: Tyrrell County: Establishments & Payroll, 1980-82

	1981	1982
No. Establishments	67	66
Annual Payroll	3,858,000	3,298,000

Source: County Business Patterns, 1982, U. S. Bureau of the Census

The County has very little industrial development with only one major manufacturing concern, located on U. S. 264 on the eastern outskirts of the Town of Columbia. There is also a small crab-pot manufacturer in the County. Additional industrial/manufacturing development could greatly aid the growth of income in Tyrrell County as well as reduce unemployment.

f. Peat Mining

The economic potential for the commercial mining of peat was discussed extensively in the 1980 Land Use Plan Update. However, the proposed development of peat mining operations failed to materialize because of various factors. Peat mining has not had an economic impact upon the County to date. However, this material, which lies in vast reserves under large portions of the County, still holds much promise for commercial development within the next 10 years (See Appendix A, attached to this Plan).

g. Tourism

Income from tourism historically has not had a substantial impact upon Tyrrell County's economy. However, motorists on their way to or from the beaches of Dare County occasionally stop for gasoline or other small purchases. Perhaps the County can encourage the development of businesses which can capitalize on this substantial summer traffic.

h. Employment and Income

1. Employment

Overall employment in Tyrrell County has been declining since 1979, even in the face of a slightly expanding labor force. Notice Table 12, below, which shows the general employment pattern from 1979 through 1983.

Table 12: Tyrrell County Unemployment Rate, 1979-83

	1979	1980	1981	1982	1983
Civil. Labor Force	1,440	1,450	1,450	1,460	1,470
No. Employed	1,280	1,250	1,260	1,170	1,180
No. Unemployed	160	200	190	290	290
Unemployment Rate	11.1	13.8	13.1	19.9	19.7
N. C. Unemp. Rate	4.8	6.5	6.4	9.0	8.9

Source: N. C. Employment Security Commission

As the data in Table 12 shows, Tyrrell County's average annual unemployment rate substantially exceeded the rate for North Carolina. From 1979 to 1983, the County's labor force increased by only a net of 30 persons, or by 2%. However, during the same period, the number of unemployed increased from 160 to 290 persons. In 1983 (the latest year for annual statistics), Tyrrell County had one of the highest County unemployment rates in North Carolina. However, statistics for 1984 are expected to show marked improvement in the local employment picture.

In 1980, the largest occupational categories of the civilian labor force, according to the N. C. Employment Security Commission, Bureau of Labor Market Research, were service occupations (299), farming, forestry, and fishing occupations (296), and operators and fabricators (287). Other major employment categories included: managerial and professional specialty occupations (164), precision production, craft, and repair occupations (151), handlers, equipment cleaners, helpers and laborers (130).

2. Income

Although the income picture in Tyrrell County has been improving, there are still a substantial number of families and individuals below the poverty income level. As the 1980 Land Use Plan Update reported, the 1970 U. S. Census data showed that 355 (or 37.9%) of the County's 936 families (enumerated in 1969) had below poverty incomes. This percentage more than doubled the 1970 census poverty percentage for the State (16.3%). By the 1980 census (enumerated in 1979), although the number of "families" increased, the number of families with incomes below poverty decreased from 355 in 1970 to 219 in 1980. Notice Table 13, below:

Table 13: Tyrrell County: Families Below Poverty Level, 1969-79

	1969		1979	
	No.	Percent	No.	Percent
Tyrrell County	355	37.9	219	20.2
N. C.	-	16.3	-	11.6

Source: U. S. Census, 1970, 1980

According to the 1980 Census, Tyrrell County's percentage of families with below poverty incomes was no longer double that of the State's percentage. Likewise, this improvement was true for individuals with incomes below the poverty level, as noted in Table 14, below:

Table 14: Tyrrell County: Persons With Incomes Below Poverty Level, 1969-79

	1969		1979	
	No.	Percent	No.	Percent
Tyrrell County	1,702	44.8	1,001	25.2
N. C.	-	20.3	-	14.8

Source: U. S. Census, 1970, 1980

Percentage-wise, the improvement in Tyrrell County was greater than for the State as a whole. This was also true for the growth in per capita money income between the 1970 and 1980 Census periods. Notice Table 15, below:

Table 15: Tyrrell County: Per Capita Money Income, 1969-79

	1969	1979	Percent Change
Tyrrell County	$1,562	$4,139	165.0
N. C.	2,492	6,133	146.0
% Tyrrell of N. C.	63%	67%	-

Source: N. C. Statistical Abstract, 1984

Despite gains, per capita income in Tyrrell County is still only about two-thirds the per capita rate of the State as a whole. This is indicative of a need for economic development in the County.

g. Economic Summary

The analysis of current economic conditions indicates the following trends:

1. Agriculture will still dominate the County's economic base, with all other income sources rating distant seconds. Although the rate of land clearing appears to have slowed down, there is still a pattern of fewer but larger farms which will likely continue.

2. Additional economic development potential appears to be in commercial forestry, commercial fishing, and perhaps, industrial development. Peat mining, heralded in the 1980 Land Use Plan for its potential economic contribution to the County, was not developed, but still has potential to be developed over the next 10 years.

3. Overall, income increased in Tyrrell between 1970 and 1980 with agricultural income accounting for the "lion's share" of this gain, again pointing to the importance of farming to the County. Nevertheless, it appears that some additional economic activity will be needed during the next 10 years if previous income gains are to be maintained.

3. Housing

Major issues concerning housing in Tyrrell County were covered thoroughly in the 1980 Land Use Plan Update in two separate appendices (Appendices C and D, pages 91-110). The issues discussed concerned the tax revenue impact that the housing mix, i.e., "stick-built" units versus mobile homes, would have on the County. However, 1980 Census information on housing was not then available. Notice the summary below in Table 16:

Table 16: 1980 Census Tyrrell County Housing Summary

Item	No
Total Units	1,766
Vacant, Seasonal, Migratory	164
Year-Round Units	1,602
Vacant Year-Round Units	221
Occupied Year-Round Units	1,381
Persons in Occupied Units	3,975
Average Household Size	2.88

Source; U. S. Census, 1980.

The average household size declined significantly from 4.0 persons in 1970 to 2.88 according to the 1980 Census. It should

be noted that the 1980 Census data did not report on the recently developed low-income public housing project in Columbia, Secota Village. This project, which consists of 17 structures and 35 dwelling units, was developed by the Mid-East Regional Housing Authority after Tyrrell County became part of the Authority's service area in 1980. These units are completely occupied and began occupancy in 1983. Additional information from the 1980 Census, some of which gives an indication of housing conditions, are shown in the following Table 17:

Table 17: Selected Housing Conditions Summary, 1980 Census: Tyrrell County

Item	No.
Units with Public Water	664
Units with Public Sewer	327
With Complete Kitchen Facilities	1,314
With Central Heat	496
With Air Conditioning	656
One or More Complete Bathrooms	1,110
Built Before 1939	538

Source: 1980 U. S. Census

During land use surveys conducted in late 1984, it was noted that there was a significant number of units which appeared to be substandard scattered around the County. However, concentrations of substandard dwellings were noted in the Goat Neck and Fort Landing areas, with lesser concentrations in the communities of Alligator and Gum Neck. Most new construction appears to be taking place in the Scuppernong Township and in the Columbia Township -- particularly in the Rider's Creek area.

Another notable housing trend is the continuing growth of mobile homes, as noted in the 1980 Plan. Notice Table 18, below. As the Table shows, mobile home placement has increased since 1975, with the greatest gains being in the Columbia and Scuppernong Townships. This trend, although leveling since 1980, will likely continue somewhat, as mobile homes become more and more a viable standard housing alternative for Tyrrell County citizens.

Table 18: Mobile Home Placement by Township
Tyrrell County 1975-1984

Year	Allig.	Col.	Gum Neck	Scup.	*S.F.	Totals	Num. Change
1975	32	176	29	68	4	309	-
1976	35	185	36	76	5	337	+28
1977	34	193	39	76	6	348	+11
1980	40	239	48	81	8	416	+68
1981	47	238	45	86	7	423	+ 7
1982	49	238	48	87	9	431	+ 8
1983	47	263	45	79	10	444	+13
1984	42	274	45	85	10	456	+12

Source: Tyrrell County Statistical Report: FY 84-85
* Double wides

C. Existing Land Use Analysis

1. Current Conditions: General Patterns

The general land use pattern in Tyrrell County has changed very little since the 1980 Land Use Plan Update -- or even since the initial CAMA Land Use Plan in 1976. The County's land area, exclusive of the substantial water acreage, is overwhelmingly forestland. Although the most significant land use changes during the past decade have been the conversion of forest lands into agricultural lands, the overall pattern has varied little. The County is very sparsely populated, with Columbia its only municipality, being the only "urban-built-up" area. In fact, according to the 1980 U. S. Census, Tyrrell County is 99th in population density of all of North Carolina's 100 counties with an average density of 10 persons per square mile. Hyde County, Tyrrell's neighbor to the south, has nine persons per acre and is ranked 100 in population density. Nearby Washington County has a density of 45 persons, and Dare County has a density of 34 persons per square mile. The pronounced rural nature of the County's development pattern is reflected in the fact that outside of Columbia, residential development is scattered along paved secondary routes with few concentrations. As noted in the 1980 Land Use Plan Update, subdivisions have begun to develop along the Albemarle Sound (in the northwest sector of the County), mainly in the Scuppernong Township. Other concentrations occur in the rural communities of Travis, Goat Neck, Alligator, Gum Neck, and Kilkenny. (See existing Land Use Map, attached to this Plan Update as Map 3).

Large farms and timber tracts still account for the majority of the land acreage in Tyrrell County. The largest concentration of commercial land uses is located within the Town of Columbia, with small country stores located in some of the rural communities. Industrial land uses are almost exclusively near Columbia. Recreational land uses, as was pointed out in the 1980 Land Use Plan Update (p.14), includes Gum Neck Landing boat ramp, Columbia boat ramp, Norman Smith Memorial Beach, Pettigrew State Park, Sawyers Marina, Scuppernong Community Center, and Travis Playground.

A general summary of the major land uses in Tyrrell County are listed below in Table 19:

Table 19: *Major Land Use Categories in Tyrrell County

Major Category	Acres	% of Total
Water	109,224	30.0
Land	254,360	70.0
- Forestland	183,790	-50.5
- Farms	68,370	-19.0
- Urban & Built Up	2,200	.6
TOTAL	363,584	

*Estimated, based on assessment of various sources, including the U. S. Census of Agriculture, 1982; the N. C. Statistical Abstract, 1984, and the Tyrrell County Statistical Report, FY 84-85.

It should be noted here that one additional major land use change that will have some effect on usage within the planning period (1985-1995) is the recently designated Alligator River National Wildlife Refuge. In March of 1984, Prudential Insurance Company donated approximately 120,000 acres of land bordering the Alligator River in both Tyrrell and Dare Counties to the U. S. Department of the Interior. Nearly all (94%) of the area is in Dare County, with only 7,500 acres in Tyrrell. The Tyrrell County portion of the Wildlife Refuge consists of three separate parcels, all located north of and bordering The Frying Pan. Most of the land consists of wooded swamps and pocosins, some of which has been and will continue to be commercially timbered, because of previous contractual obligations. An office, with a park ranger and staff, will be opened in Manteo, beginning January, 1985. However, it will take several years to develop a Master Plan for the refuge which would have detailed proposals for land use and restrictions (See Map 3).

2. Significant Land Compatibility Problems

In the conventional application of the concept, there are no significant land compatibility problems in Tyrrell County. A land compatibility problem is generally identified when two or more land use types are adjacent to each other and one is somehow restricted from expansion because of adverse conditions, thus discouraging additional investment. This situation simply has not been a major problem in Tyrrell County. Although the high presence of mobile homes adjacent to conventional dwellings was mentioned in the 1980 Land Use Plan Update, very little concern over incompatible uses is apparent. Because of the aged housing stock and high degree of substandard housing, mobile homes have become accepted as a viable housing alternative in the County. The only significant land compatibility problem noted in the 1980 Plan was

the operation of large-scale hog operations, which produce strong unpleasant odors in the rural environs. In some areas of the County, this is still a nuisance.

3. Major Problems From Unplanned Development

Prior to the adoption of a subdivision ordinance by the County in 1973, the major problem from unplanned development was the propagation of uncoordinated, poorly designed subdivisions along the Albemarle Sound. Some of the problems associated with poor subdivision design included lack of adequate potable water supply, inadequate sanitary sewer disposal due to septic tank placement limitations, and lack of public access to waterfront areas. The County-wide water system has removed concerns over potable water supply and lot size requirements, combined with enforcement of health regulations, have helped decrease incidences of septic tanks being placed in unsuitable soils. As was noted in the 1980 Plan Update, many septic tank problems in subdivisions were caused by small lots (prior to adoption of subdivision regulations). However, the issue of providing general public access to the waterfront in subdivided areas is still a concern. Continued residential development along the Scuppernong River and the Albemarle Sound, which appears to be a steady trend, may lead to further public inaccessibility to waterfront areas unless planning policies, or some regulatory devices are developed and implemented.

4. Areas Experiencing or Likely to Experience Major Land Use Changes

In the 1980 Land Use Plan Update, the main projected land use change involved the anticipated mining of peat resources in Tyrrell County and the possible resultant impacts upon water transportation facilities near Columbia. However, as stated previously, the projected peat mining developments did not materialize, but may hold some promise during this current planning period. The peat reserves are located primarily in the southern half of the County, from the Alligator River westward to Washington County. If peat mining becomes a reality, portions of this area could undergo some significant changes (See Appendix A, attached to this Plan). Another anticipated major land use change in the 1980 Plan Update was the continued massive clearance of forestlands to be converted into farmlands. While woodland clearance is still ongoing in the County, it appears that since 1981 the rate of such clearance has greatly declined. Several factors have been involved in this deceleration. According to the Associate Agricultural Extension Agent, a major reason is that lands which are more feasible or easiest to convert into farm usage have already been cleared. Economic factors have also been important. For example, the cost of clearing new cropland can be very expensive (about $1,000 per acre in 1984, according to the Extension Agent), particularly for smaller operators, who do not own their equipment. Proper drainage is also expensive. The Extension

Agent theorizes that the potential croplands, which are the most economical to drain, have already been developed. Another important factor reducing the rate of land clearing in the County has been the active enforcement by the U. S. Army Corps of Engineers of the 404 permit process concerning any "development" in designated "wetland" areas. Also, since January, 1984, the impact of any proposed development on "Prime Agricultural and Forest Lands" was incorporated into the State Clearinghouse project coordination review process as a result of Executive Order 96 by the Governor of North Carolina. This review process requires local Soil and Water Conservation District representatives to review development proposals in their areas from the standpoint of assessing the impact upon prime agricultural and forest lands. This review process reduces the rate of land to be cleared.

Residential development will likely continue in the two "growth" townships of Columbia and Scuppernong. (See Table 1, page 3, and Table 5, page 7). However, the current overall pattern will likely not be altered significantly.

The final area likely to experience major land use changes will be the three sites designated as part of the Alligator River National Wildlife Refuge. Portions of the combined total of 7,516 acres contains lands which have been and will be timbered through 1995. A small tract of experimental cropland is also located on one of the parcels (See Map 3, attached). However, when a Master Plan is developed by the U. S. Fish and Wildlife Service, it is likely that no agricultural or commercial forestry operations will be allowed on these lands, particularly after the expiration of the current timbering contract.

5. Identification of Areas of Environmental Concern (AECs)

Of the two broad categories of statutorily defined Areas of Environmental Concern (AECs) for Coastal North Carolina, i.e. Estuarine System AECs and Ocean Hazards AECs, only the Estuarine System is applicable to Tyrrell County. All of the AECs in Tyrrell County's estuarine system were listed in the 1980 Land Use Plan Update. Although these AECs have not changed, it may be useful to define these important areas prior to listing them again in this Update.

a. Coastal Wetlands

Coastal wetlands or marshlands are defined as any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial watercourses), provided this shall not include hurricane or tropical storm tides.

Coastal marshlands also contain some, but not necessarily all, of specific marsh plant species. There are no coastal wetlands or salt marshes in Tyrrell County of any significance. However, the general term "wetlands" can be used to describe most of the low-lying "wooded swamp" areas in the County. The "wooded swamp" areas are located primarily along the low-lying land near the Alligator and Scuppernong Rivers, and minor occurrences along the Albemarle Sound.

b. Estuarine Waters and Estuarine Shorelines

Estuarine waters are defined in G. S. 113A-113(b)(2) as "all the water of the Atlantic Ocean within the boundary of North Carolina and all the waters of the bays, sounds, rivers, and tributaries thereto seaward of the dividing line between coastal fishing waters and inland fishing waters, as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Natural Resources and Community Development filed with the Secretary of State, entitled "Boundary Lines, North Carolina Commercial Fishing -- Inland Fishing Waters," revised to March 1, 1965."

Estuarine shorelines are those non-ocean shorelines which are especially vulnerable to erosion, flooding, or other adverse effects of wind and water and are intimately connected to the estuary. These shorelines can be wetlands as well as dry land. This area extends from the mean high water level or normal water level along the estuaries, sounds, bays, and brackish waters as set forth in an agreement adopted by the Wildlife Resources Commission and the Department of Natural Resources and Community Development, for a distance of 75 feet landward. It should be noted, however, that estuarine shorelines are only located adjacent to coastal or joint waters, and not inland waters.

As an AEC, estuarine shorelines, although characterized as dry land, are considered a component of the estuarine system because of the close association with the adjacent estuarine waters. Estuarine waters and adjacent estuarine shorelines make up the most significant components of the estuarine system in Tyrrell County. The significance of the estuarine system is that it is one of the most productive natural environments of North Carolina. It not only supports valuable commercial and sports fisheries, but is also utilized for commercial navigation, recreation and aesthetic purposes. Species dependent upon estuaries include menhaden shrimp, flounder, oysters and crabs. These species make up over 90 percent of the total value of North Carolina's commercial catch. These species must spend all or part of their life cycle in the estuary. The preservation and protection of these areas are vitally important. The estuarine waters and adjacent estuarine shorelines are vast in Tyrrell County, as noted in the 1980 Plan Update, and include the following:

-- The Albemarle Sound from the County boundary near Bull's Bay to Long Shoal Point

-- Scuppernong River to Riders Creek, 1 mile south of Columbia

-- Frying Pan Creek to Lyons Point

-- Alligator River to Cherry Ridge Landing

-- The Frying Pan

c. Public Trust Waters

Public trust waters are partially defined as all waters of the Atlantic Ocean and the lands thereunder from the mean high water mark to the seaward limit of state jurisdiction; all natural bodies of water subject to measurable lunar tides and lands thereunder to the mean high mark; all navigable natural bodies of water and lands thereunder to the mean high water level or mean water level, as the case may be. In other words, public trust areas are waters and adjacent lands, the use of which, benefits and belongs to the public.

-- In Tyrrell County, all of the waters listed as Estuarine Waters and Lake Phelps, as well as inland waters, are considered public trust waters.

Currently, all development and development-related activities within the designated AECs in Tyrrell County are regulated by the CAMA permit process and are guided by local policy (Regulations allow a local government to develop its own use standards for AECs if they are more restrictive than the State's).

D. Review of Current Plans, Policies, Regulations

1. Local Plans, Studies and Regulations

No additional plans or regulations have been developed or adopted by Tyrrell County since the preparation of the 1980 Land Use Plan Update. However, in September, 1982, the County was presented with the Preliminary Engineering Report for Phase II of the Tyrrell County Water System. This report contained details, cost estimates, and projected funding sources for completion of the County water system to serve an additional 80 users. Other local plans and regulations are listed below:

a. Tyrrell County Land Use Plan, 1976.

Prepared by DNRCD under CAMA, the Plan provides a description of present condition of population, economy, and land use constraints to development. It discusses fragile and hazard areas, areas of environmental concern, areas with resource potential, and community facilities. It estimates future needs and sets out policies and objectives related to implementing those needs.

b. Tyrrell County Land Use Plan Update, 1980.

This was the first 5-year update of the initial CAMA Plan (1976) and contains a re-assessment of existing conditions and projections of population, land use and economic conditions. Updated policy statements on various development issues and implementation strategies are also in the Plan Update.

c. Comprehensive Water and Sewer Study, Tyrrell County, 1971.

Prepared by Rivers and Associates, analysis of water and sewer needs and possibilities.

d. 201 Facility Study, 1977.

Prepared by Von Oesen and Associates, determined that a regional sewer facility to serve a broad area surrounding Columbia was not feasible.

e. Subdivision Regulations, 1973.

The Tyrrell County Planning Board was organized in 1973 to undertake comprehensive planning. The subdivision ordinance is administered by the Board which reviews development proposals against standards set out therein.

f. Federal Flood Insurance Program

The Federal Flood Insurance Program, now in the Emergency Phase and scheduled to move into the Regular Phase in 1985, is in effect throughout the County.

g. State Building Code

The County has adopted the State Building Code. The services of an inspection officer and a regular inspection program began in 1985.

h. Septic Tank Regulations

Septic tank regulations are administered by the Health Department.

2. State Agency Plans

a. Transportation Improvement Program, 1980-1986.

This plan, prepared by the N. C. Department of Transportation, is a statewide schedule of highway improvements to be undertaken during the seven-year period 1980-1986. The only project included for completion in Tyrrell County was minor improvements along State Road 1209.

b. North Carolina Airport System Plan, 1979.

Recommended that Tyrrell County construct a minimum airport facility to implement State policy of having an airport within a 30-minute drive of 95% of State's population. However, because of severe military-imposed airspace restrictions, this has not been feasible in Tyrrell County.

c. North Carolina Water Resources Framework Study, 1977.

This study, completed by N. C. Department of Natural Resources and Economic Development in 1977, identified water resource needs for River Basins in the State. Needs identified with Tyrrell County are as follows: (1) designate a floodway for Columbia; (2) develop regional water and sewer; (3) designate conservation of Scuppernong River corridor, Alligator River south to Gum Neck, wooded swamp along Albemarle Sound, Lake Phelps; (4) designate fishing use of the Little Alligator; and (5) designate scenic use of Second Creek.

d. Statewide Comprehensive Outdoor Recreation Plan, SCORP.

The purpose of the SCORP is to compile and analyze the existing supply of and demand for recreation facilities in the

State. The SCORP analysis is by regions and has no specific analysis for each County. Tyrrell County is in Region R.

3. Local Regulations

In addition to the regulations listed under Local Plans (subdivision regulations, State Building Code, and septic tank regulations), the CAMA major and minor permit processes are also enforced in the County. However, Tyrrell County does not have and does not enforce other ordinances such as zoning, historic districts, nuisance, sedimentation and erosion control, or on local environmental impacts. The County also does not enforce a local mobile home park ordinance.

4. Federal and State Regulations

In addition to the local ordinances and regulations discussed above, there are also various State and local regulations which could also affect land development in Tyrrell County.

E. Constraints: Land Suitability

This section of the Tyrrell County Land Use Plan proposes to identify features of the land or landscape of the County which are or could pose serious constraints to development. Under land suitability, these constraints are generally considered under the broad categories of 1) physical limitations, i.e. hazardous (man-made or natural) areas, areas with soil limitations, hazardous slopes, etc., 2) fragile areas, i.e. AECs, complex natural areas, or areas with cultural (architectural or archaeological) significance, and 3) areas with resource potential, i.e. productive or prime agricultural or forest lands, or potentially valuable mineral sites (peat, for example). Some of these elements were discussed in the 1980 Land Use Plan Update, but because of the implications for updating certain policies, additional discussion will be presented below.

1. Physical Limitations

a. Man-Made Hazards

The most significant man-made hazard in Tyrrell County is a United States Air force bombing range located in the Albemarle Sound near the Dewey's pier (SR-1208). Another actively used bombing range is located outside of Tyrrell County in the southern portion of Dare County. However, the approach to the Dare County range is directly over Tyrrell County. Because of these bombing ranges, nearly all of Tyrrell County, except for a 10-mile-wide corridor in the northern portion of the County, is "restricted airspace." Currently, the military has plans to expand the air space restrictions over the entirety of Tyrrell County, to become effective in 1985. The continual presence of low-flying military planes on subsonic training missions, has been the source of many complaints by Tyrrell citizens -- particularly from farmers. There have been reports of actual structural damage to roofs, shattered glass doors and windows, and even broken dishes due to the vibration from these planes. The County's perception of the military restricted airspace, is that it inhibits agricultural growth and development because of restrictions placed on crop dusting. It is also felt that potential industrial development, as well as development of an airport, is also hindered by the airspace restrictions.

The other man-made hazards in Tyrrell County are all storage facilities. Two of these are located in the Town of Columbia and one is located in the Scuppernong community.

b. Natural Hazard Area

1. Flood Hazard Area

When the 1980 Land Use Plan Update was developed, a detailed Flood Insurance Study showing elevations and flood hazard areas,

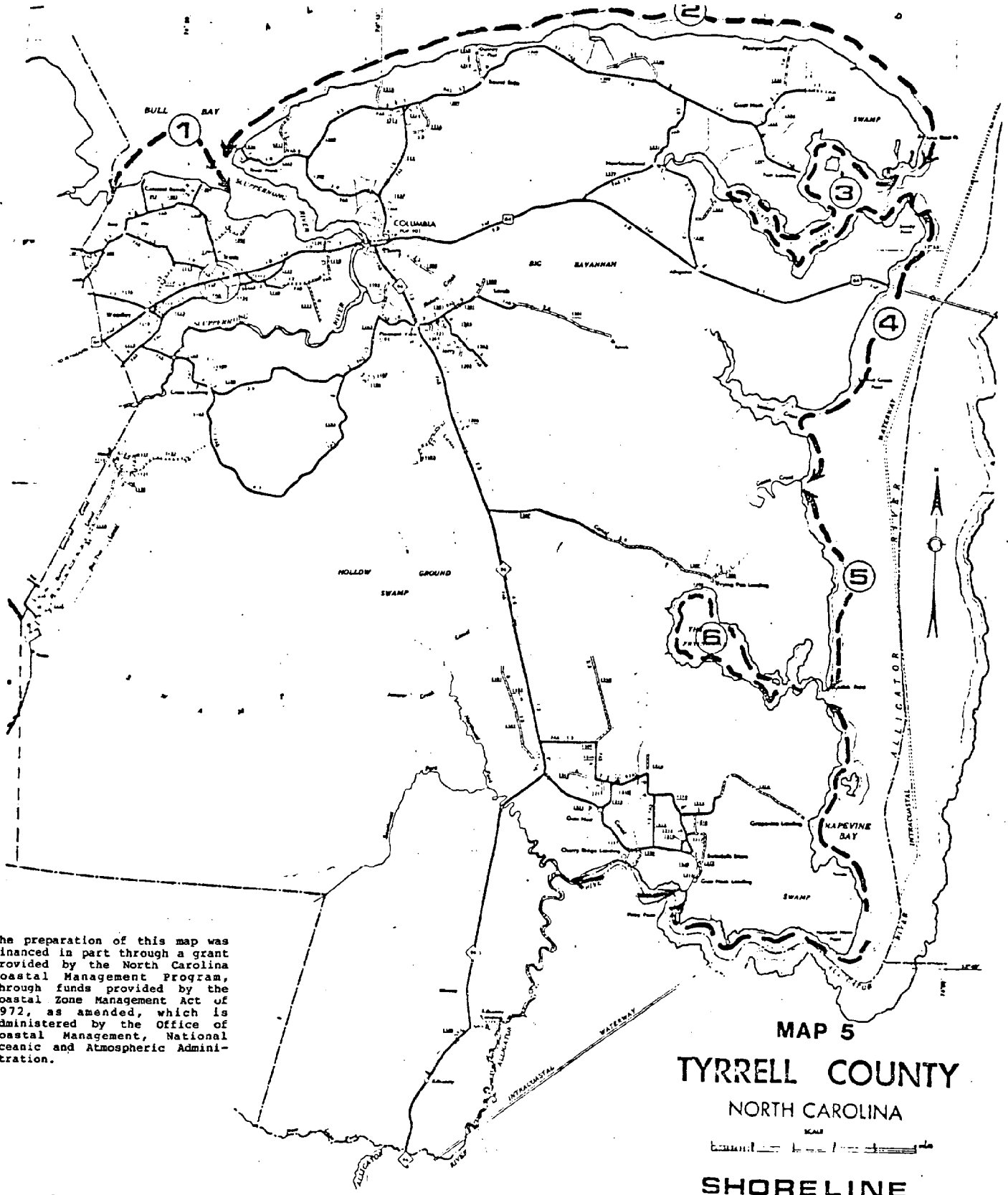
had not been prepared for Tyrrell County. However, the Federal Emergency Management Agency (FEMA) initiated a detailed study in 1982, with the preliminary results being published in July, 1984. The study, which consists of a report and a series of maps of all of the unincorporated area of the County (the Town of Columbia has a separate study) shows the areas which are subject to inundation by the 100-year flood (zone "A"s) along with elevations, as distinguished from areas subject to minimal flooding dangers (Zone "C"). Not surprisingly, the detailed study shows that most of Tyrrell County is subject to the 100-year flood; however, there are significant amounts of areas included in the "Zone C" classification, i.e. in the 500-year flood area and subject to minimal flooding. These areas are mostly found in "pockets" on land between the lower end of the Scuppernong River and Bull Bay-Albemarle Sound. Other pockets of relatively "high ground" are found a few miles north and/or a few miles east of Columbia. There are also pockets scattered in the central portion of the County. However, the largest and most significant area of "Zone C" is located in the southwest portion of the County, from the Washington County border, eastward and southward to the Hyde County border near the southernmost tip of Tyrrell County. (See Map 4, attached). The rest of the County is located within the 100-year, or "high hazard" flood area. The existing land uses within the high hazard flood area, consist mostly of residential, agricultural and forestry uses. The average elevation in the high hazard areas is about four feet above mean sea level (4 msl).

2. Estuarine Erosion Area

As discussed under identification of Areas of Environmental Concern (AECs), Tyrrell County has a substantial area of estuarine waters and estuarine shorelines. Erosion of the estuarine shoreline can pose possible hazards for certain waterfront developments, particularly residential. Estuarine erosion areas have been determined by the Soil Conservation Service for 121 points along the Albemarle Sound and Alligator River. Average annual erosion rates which were identified in the 1976 Plan by "reach" areas (P. 29) are as follows:

1. Shoreline in Scuppernong Township, 3.1 feet
2. Other shoreline along Albemarle, 2.1 feet
3. Little Alligator shoreline, 2.2 feet
4. Little Alligator to Second Creek on Alligator, 3.3 feet
5. Alligator to Gum Neck to Kilkenny, 1.5 feet
6. Alligator River, Gum Neck to Kilkenny, 1.5 feet

The overall average erosion rate is about 2.3 feet per year for Tyrrell County's estuarine shorelines, or about 23 feet every 10 years. This rate of loss could be greatly intensified in the event of major storms. Shoreline stabilization in developed areas is an important consideration for Tyrrell County. (See Map 5, next page).



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

MAP 5

TYRRELL COUNTY

NORTH CAROLINA

SCALE

SHORELINE EROSION

(8) REACH

c. Areas with Soils Limitations

Detailed mapping of various soil types and respective properties were not available for Tyrrell County during the development of the 1980 Land Use Plan Update. However, a "Special Soil Survey Report, October, 1982," was completed and published in preliminary form for Tyrrell County. The report was prepared by the USDA Soil Conservation Service in cooperation with the Tyrrell County Board of Commissioners. The report includes detailed descriptions of the soil types and properties for Tyrrell County with discussion of the suitability for various uses, such as croplands, urban development, and recreation. The most important feature or property of soils to consider in Tyrrell County is its drainage capability, since well-drained, stable soils can be used for a variety of "development" purposes, i.e. croplands or residential (septic tank suitability).

In general, the soils in Tyrrell County have limitations for many uses because of wetness, too rapid permeability, too slow permeability, or low strength. Of the 21 soils classifications contained in the Special Soil Survey Report, all except two were characterized as being poorly drained with limitations for urban development uses. Most of the soil types, however, are suitable for various agricultural uses if the proper drainage is provided. Large acreages of the surface area of Tyrrell County soils consists of highly decomposed organic matter. These peat-type soils are poorly suited for agricultural use because of the high percent of stumps and roots in the soil profile and the depth of organic matter, which limit their use for cultivation.

With the recently established trend of population growth, as well as the absence of centralized sewer facilities, a very important consideration is the extent of soils suitable for urban development, i.e. septic tank placement. As stated previously, only two (2) soil types were classified as well-drained and clearly suited for urban development and uses. These types are: Conetoe Loamy Sand and State Sandy Loam. These soils are found mostly in the northern half of the County along ridges, particularly in the Scuppernong Township area along the Albemarle Sound. Two other soils, Altavista loamy fine sand and Tomotley fine loamy sand have development potential with proper drainage. These soils are also located mostly in the northern half of the County. (See Map 6, attached, which shows the general locations of soil types most suitable for urban-type uses).

d. Sources and Estimated Quantity of Water Supply

1. Groundwater

"The Yorktown aquifer is the principal source of water supply in Tyrrell County. This aquifer consists chiefly of beds of marl, sand and consolidated coquina that are generally separated by beds

of clay or sandy clay. Yields of 5 to 20 gpm are common in most small diameter wells in the Yorktown aquifer. Yields of 75 to 100 gpm may possibly be obtained from carefully constructed wells of large diameter. The aquifer is recharged directly in the area of outcrop and indirectly by seepage of water through overlying surficial sand. The chemical quality of water from the Yorktown aquifer varies with the lithology. The water is commonly moderately hard to hard.

"Surficial sediments of Pleistocene and Recent Age comprise the non-artesian or water table aquifer... This aquifer is recharged directly by precipitation and surface storage and, where it immediately overlies artesian aquifers, acts as a source of recharge to them. The water table is usually within 2 to 3 feet of the land surface except in the swamp, where it is at the surface. Water from this shallow aquifer is characteristically soft, irony and corrosive." (1980 Land Use Plan Update, p. 26-27).

The Tyrrell County water system is tied onto the Town of Columbia's water system. The Town's system, which was built in 1964, uses two wells. Raw water from these wells is treated at the rate of 300 gpm and stored in a 200,000 gallon elevated storage tank. Tyrrell County has a water purchase contract with Columbia to serve users in various unincoprorated areas of the County. Phase I of the Tyrrell County water system consisted of two 250 gpm deep wells, one 250 gpm treatment facility, and a 250,000 gallon elevated storage tank and limited distribution lines. Phase II of the County water system, which was completed in late 1985, expanded the distribution system to serve some of the areas not served by Phase I of the water system. However, Alligator Township, located in the northeast portion of the County, cannot be economically served by the water system. There are also several dwellings in the Frying Pan area which cannot be economically served. Problems from individual wells, i.e. for users not connected to the County water system was cited in the Preliminary Engineering Report: Tyrrell County Water System, Phase II, Revised September, 1982:

> "Water for homes outside of the County Water System service area is presently obtained from individual wells. Most of the existing wells are inadequate as far as capacity is concerned and are not protected from surface contamination. Additional contamination is caused by flooding after excessive rainfall. Some of the homes in the proposed service area have outdoor privies and no water supply."
>
> "Most existing wells, few of which are deeper than 48 feet, yield from 5 to 15 gallons per minute from the surficial sands and gravels, and near-surface sands of the water-table aquifer. A few wells obtain water from sands, coquinas (a soft whitish limestone formed of broken shells and corals)

and hardened shell marls of the Yorktown upper aquifer. Wells in this aquifer range from 47 to 122 feet deep," p. 7-8).

The report also pointed out that most private wells pumped from the shallow, water-table aquifer, which yields typically hard iron water. To make the water more suitable for domestic uses (including drinking) users often must install rather expensive water filters or softening units. Even with these mechanical devices, the water quality is still often undesirable. (Preliminary Engineering Report, p. 8).

2. Surface Water

Generally, the surface water quality in Tyrrell County is good and not subject to acute long-term pollution. There has been concern in recent years over the impact of freshwater intrusion into the saline-concentrated estuarine waters, mainly from surface runoff due to land clearings. However, no definitive studies have been produced detailing such impacts in Tyrrell County. (Discussions with N. C. Division of Environmental Management and Division of Marine Fisheries).

e. Slopes in Excess of 12%

The elevations in all of Tyrrell County are all very low and there are no steep slopes in excess of 12% anywhere in the County.

2. Fragile Areas

These are areas which could easily be damaged or destroyed by inappropriate or poorly planned development. There are several fragile areas in Tyrrell County including those areas previously identified and discussed as Areas of Environmental Concern (AECs). These included coastal wetlands (or marshlands); estuarine waters, public trust areas, and estuarine shorelines (See pages 23 through 25, this section). However, there are other fragile areas in the County which are not classified as Areas of Environmental Concern, but nevertheless, due to either natural or cultural significance, are environmentally sensitive. An example are the so-called "404" wetlands, as designated by the U.S. Army Corps of Engineers. These areas are extensive in Tyrrell County and function similarly to AECs. However, the 404 areas are regulated by the Corps and not by the State. Additional areas will be identified and discussed below as either "Natural Resource Fragile Areas," or "Cultural Resource Fragile Areas."

a. Natural Resource Fragile Areas

Natural resource fragile areas are generally recognized to be of educational, scientific, or cultural value because of the natural features of the particular site. Features in these areas serve to distinguish them from the vast majority of the landscape.

These areas include: complex natural areas, areas that sustain remnant species, unique geologic formations, pocosins, wooded swamps, prime wildlife habitats, or registered natural landmarks. With the exception of unique geologic formations and registered natural landmarks, the above-listed natural resource fragile areas tend to overlap in Tyrrell County. As noted in the 1980 Plan Update, much of Tyrrell County could be considered as a "complex natural area," p. 33-34). These 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." These areas are to be determined to be rare within the County or to be of particular scientific or educational value. Complex natural areas are often surrounded by landscapes that have been modified but still do not drastically alter the conditions within the natural areas or their scientific or educational value. The complex natural area in Tyrrell County could also include areas that sustain remnant species, pocosins, wooded swamps and wildlife habitats. (See 1980 Plan, pp. 29-34). Also, the newly designated Alligator River National Wildlife Refuge could also fit in these overlapping categories. There are no registered natural landmarks or unique geologic formations in Tyrrell County.

b. Cultural Resource Fragile Areas

Fragile areas may be particularly important to a locale either in an aesthetic or cultural sense. Fragile coastal cultural resource areas are generally recognized to be of educational, associative, scientific, aesthetic, or cultural value because of their special importance to our understanding of past human settlement of and interaction with the coastal zone. Their importance serves to distinguish the designated areas as significant among the historic architectural or archaelogical remains in the coastal zone, and therein establish their value.

Although there has been no comprehensive archaeological or architectural investigation of Tyrrell County, the State Division of Archives and History has recorded several sites in the County. One site, the Spruill House near Colonial Beach, has been investigated for inclusion in the National Register of Historic Places. The Tyrrell County Courthouse is the only historic place in Tyrrell County which has been placed on the National Register of Historic Places.

Although several sites have been identified as having the potential for inclusion on the "study list" for possible recommendation to the National Register of Historic Places, none have actually been placed on the list.

3. Areas With Resource Potential

a. Agricultural and Forest Lands

The primary areas with resource potential to be considered in this 1985 update of the Tyrrell County Land Use Plan are agricultural and forest lands. As discussed under existing economic conditions (pages 9 through 17), agriculture and commercial forestry are the largest income producers for Tyrrell County and therefore cannot be under-estimated in value. In August, 1983, the Governor of North Carolina issued a formal policy declaration (Executive Order 96) concerning the State's desire to promote the "Conservation of Prime Agricultural and Forest Lands" in support of and to assist with compliance of the Federal Farmland Protection Policy Act of 1980. The declaration of Executive Order 96 recognized the fact that in many areas of the State, prime agricultural and forest lands are being converted to other uses at such a significant rate that these irreversible uses may ultimately reduce the capacity of food and fiber production. Prime agricultural and forest lands were defined as those lands "... which possess the best combination of physical and chemical characteristics for producing food, feed, fiber (including forest products), forage, oilseed, and other agricultural products (including livestock), without intolerable soil erosion."

The Governor directed the Secretary of the State Department of Natural Resources and Community Development to assume the responsibility of carrying out the Order. The program proposed in the Executive Order involved the identification of and mapping of prime agricultural and forest lands by the Soil and Water Conservation Commission through the assistance of local Soil and Water Conservation Districts. Also, by means of the existing State Clearinghouse review process, the impact of any development proposed on prime agricultural or forest lands would have to be assessed beginning January 1, 1984.

However, as of the writing of this report, prime agricultural or forest lands have not been identified or mapped in accordance with Executive Order 96, in Tyrrell County. With appropriate drainage facilities, most of the soil types in Tyrrell County yield very productive farmland. The majority of the productive farmland is located in the northern portions of the County, with forest lands dominating most of the rest of the County's landscape. (See Existing Land Use Map, attached as Map 3).

b. Productive Water Bodies

Because of the significance of commercial and recreational fishing in Tyrrell County, the primary fishing areas should also

be considered as an area with resource potential. As noted in the 1980 Plan Update (p. 11), fisheries are varied in Tyrrell County and include pound net activity, gill net, crabbing, and eeling. Most fishing is done in the Albemarle Sound, the Alligator River, and the Scuppernong River. Croaker, bass and perch are primarily caught in the Sound, while herring is mostly caught in the Scuppernong River.

c. Mining Lands

As discussed elsewhere in this report and extensively in the 1980 Land Use Update, Tyrrell County has a substantial peat reserve capable of being mined for commercial or industrial purposes. An estimate made by First Colony Farms several years ago projected that there were approximately 45,000 acres of peat reserves in Tyrrell County (1980 Land Use Plan, p. 36). Detailed maps of the locations of peat reserves are not currently available. However, review of detailed soils classifications maps prepared by the U.S.D.A. Soil Conservation Service, indicates that soil types with highly decomposed organic matter as surface layers and underlayed by decayed logs, etc., may signify the presence of peat. These types of soils can be found nearly all over the County in various pockets. However, the broadest concentrations appear to be in the south, south-central, and eastern portion of the County. A substantial portion of the potential peat lands are currently forested.

d. Outdoor Recreation Lands

Lands used for hunting, fishing, boating, hiking, camping, and other outdoor recreational uses are also important resources to consider in the development of land use policies. In Tyrrell County, because of many productive water bodies, and expansive woodlands, recreational fishing and hunting opportunities, within the appropriate seasons, abound. Also, Pettigrew State Park, located around Lake Phelps (mostly in Washington County), is partially located near the southwest corner of Tyrrell and is increasing in significance as a State recreational area. Lake Phelps contains camping sites, hiking trails, and facilities for water sports such as boating. (1980 Land Use Plan, p. 37).

F. Constraints: Capacity of Community Facilities

1. Water

The capacity of the combined Columbia-Tyrrell County water system has not changed since the preparation of the 1980 Land Use Plan. However, improvements to the County's distribution system were completed in early 1985. With the expanded distribution lines, the only major area not served by the County water system is the Alligator Township. This area is too sparsely populated to make the extension of water service economically feasible. Also, there are several families in the Frying Pan area not economically feasible to serve. There are no plans to serve these unserved areas in the the near future because of the economics.

The capacities of the combined water systems are summarized in Table 20 below:

Table 20: Columbia-Tyrrell Water Systems Capacity, 1984

	Columbia	Tyrrell Co.	Total
*Daily Pumping Capacity	150,000 gpd	**168,000 gpd	318,000
Treatment Capacity	150,000 gpd	168,000 gpd	318,000
Elevated Storage	200,000 gpd	+300,000 gpd	500,000
Avg. Daily Consumption	75,000 gpd	84,000 gpd	159,000
Excess Capacity	75,000 gpd	84,000 gpd	159,000
Per Capita Consumption	94 gpd	38 gpd	66 gpd (avg.)

*10 hr day: **14 hr day: +Includes 50,000 gal. detention storage on ground
Sources: Town of Columbia; Tyrrell County

Both Columbia and Tyrrell County have considerable excess water capacity, with a combined total of 159,000 gpd. At the current combined average per capita consumption rate of approximately 52 gallons per day, this capacity could easily accommodate a population increase within the service area of 3,058 additional persons. The significantly lower per capita consumption rate for Tyrrell County users, compared to Columbia's may be attributable to the fact that many County water users still have their private wells and pumps, which are also used.

2. Sewer

The only centralized sewer system in the County is still the one which serves the Town of Columbia. Past studies, as reported in the 1980 Land Use Plan, have shown that it is not economically feasible to serve a broader area with the system, such as the Townships of Columbia and Scuppernong. Notice Table 21 below:

Table 21: Town of Columbia Sewage Treatment Capacity, 1984

Treatment Capacity	150,000 gpd
Current Daily Effluent Load	80,000 gpd
Excess Treatment Capacity	70,000 gpd
Per Capita Use	100 gpd

Source: Town of Columbia

The Town's sewage treatment is based on an aeration and oxidation system. The Town's sewer system has been extended to serve the Secota Village assisted housing project, which consists of 35 units in 17 buildings. Also, by the Fall of 1985, the system will be extended to serve a small single-family subdivision to be developed within the Town of Columbia (12 units).

If the collection system were economical to expand and/or if growth takes place in Columbia, the excess treatment capacity could accommodate approximately 700 more persons -- an increase of nearly 88% over the estimated 1984 population of 800.

3. Solid Waste

The general elevations of Tyrrell County (18" above mean sea level in some places) make location of a sanitary landfill virtually impossible. Currently Tyrrell County has more than 50 dumpsters located in various places around the County. The County owns and operates two refuse compactor trunks which collect the solid wastes for delivery to a sanitary landfill in Washington County.

4. School Enrollments

The Tyrrell County school system currently operates two schools, an elementary (K-6) and a high school (7-12). Table 22 below compares 1980 enrollments with 1984-85 enrollments.

Table 22: Tyrrell County School Enrollments, 1980 and 1984-85

	1980	1984-85
Elementary	411	441
High School	395	336
Teachers	53	52

Since the preparation of the 1980 Land Use Plan, some major additions and improvements have been made, including a new auditorium, a new band building, and a library for the elementary school. According to the County schools supervisor, "classroom"

availability at both schools are at "capacity." As reported earlier in the discussion of population projection, however, no significant increases of school age children are anticipated. The capacity of the current facilities should be adequate for quite some time.

5. Transportation

There are only two primary roads in Tyrrell County, U. S. Highway 64, which runs east-west and N. C. Highway 94, which runs north-south. N. C. 94 intersects with and dead ends at U. S. 264, giving the County a "T-bone" thoroughfare network. Most of the State-maintained secondary routes are located in the northern portion of Tyrrell County, with the road network being quite undeveloped in the southern areas of the County. Traffic volumes in Tyrrell County are never excessively heavy. The capacities of the paved roads are more than adequate to handle projected traffic volumes. Notice Table 23 below, which compares traffic counts at certain points in 1979 to counts in 1983.

Table 23: Selected Primary Road Traffic Volumes

Location	1979	1983
1. U. S. 64 & U. S. 64 Bypass (west)	4,500	4,100
2. N. C. 94 & U. S. 64 Bypass	4,600	3,400
3. N. C. 94 (south of U. S. 64)	2,600	2,200
4. U. S. 64 Bus. & U. S. 64 Byp. (east)	2,100	2,000

Source: NCDOT, Division of Thoroughfare Planning, Raleigh, N. C.

The capacities of these roads, according to the NCDOT, is in the range of from 7,000 to 10,000 vehicles per day, which are more than adequate for traffic in Tyrrell County. Notice also that from 1979 to 1983, traffic volume declined.

6. Medical Services

Professional medical services have improved significantly since the preparation of the 1980 Land Use Plan (p. 41). Since 1981, the Tyrrell Rural Health Association has received grants for the provision of a full-time physician and staff in Tyrrell County. The physician resides in Columbia, as well as a Nurse Practitioner, staff nurse and X-ray technician. These medical personnel are available for emergency service. There is also a dentist in private practice in Columbia and a pharmacy store.

7. Emergency and Protective Services

As reported in the 1980 Land Use Plan, police services for both the County and Town of Columbia are still centered in the

County Sheriff's Department. The Sheriff's Department still consists of the sheriff, three deputies and four radio dispatchers. The dispatching unit is used to dispatch all emergency vehicles, including ambulance and fire. Two volunteer fire departments serve the County, operating from Columbia and one from Gum Neck. The 1980 Plan reported the possibility of a third voluntary fire department being established in the Newlands-Cross-Landing area. However, this is no longer a consideration. Emergency rescue service is currently provided by the Tyrrell County rescue squad which is dispatched through the Sherriff's Department on a 24-hour basis.

8. Other Facilities

Since the 1980 Land Use Plan, a new library facility has been constructed. The library, which is located on U. S. 64, a short distance from the Tyrrell County Courthouse, also has meeting rooms, one of which is used for the County Board of Commissioners' meetings.

Also, Tyrrell County has recently constructed a senior citizens facility in Columbia which is being used for a variety of activities for the County's elderly population, including a nutrition program (hot meals) site. The facility was funded with local and State funds and was completed in late 1985.

G. Estimated Demand

1. Population and Economy

According to projections in Table 1, Tyrrell County's population in 1995 will be 4,398, an increase of 264 persons over the 1985 estimate of 4,134. (Both estimates were provided by the N. C. Office of State Budget and Management). This growth rate (6.39%) certainly does not imply a "rapid growth" situation which would impose stresses upon existing facilities and services. If current trends continue, the Town of Columbia can expect to gain 51 of the 264 additional persons, leaving 213 residing in the County. (This is based on Columbia's proportion of the County's current population estimate, assuming the proportion holds steady and the Town does not annex. Columbia's population is currently projected at 800, representing an increase since the 1980 Census). Again, on the basis of current trends, most of the 213 additional persons will reside in the Columbia and Scuppernong Townships. Also, since there appears to be a trend toward smaller households (e.g. the average household size in 1970 was 4.0 persons, but only 2.88 in 1980), the average household size in Tyrrell County by 1995 could be 2.5 persons. Thus, assuming an average of 2.5 persons per household in 1995, the increased population by that time will result in 20 additional households for the Town of Columbia, and 85 more households in the unincorporated portions of the County, mostly in the Columbia and Scuppernong Townships.

The 105 additional households will place certain demand upon goods, services, and facilities. However, the most pressing demand will likely be for employment. There is no appreciable seasonal population in Tyrrell County.

2. Future Land Need

According to the current population estimate (4,134), compared to the estimated acreage of "urban and built-up land" (See Table 1), the population density in the developed areas is approximately 1.88 acres per person. Assuming the same proportion for 1995, the 264 additional persons in the County will require approximately 496 additional developed acres. This projected developed acreage would include all urban-type uses, i.e. residential, commercial and industrial. With 183,790 acres currently in forest lands and 68,370 acres in farms (including sizeable amounts of land in the "minimally flooded" and suitable soils areas), land availability will pose no problem for development needs during the planning period.

3. Community Facilities Need

The additional population increase by 1995 of 264 persons will require more water from the Columbia-Tyrrell County water system. However, at the average per capita consumption rate of 66 gallons per day, an additional 17,424 gallons per day will be

needed, only a little more than 10% of the current combined excess capacities. Provision of water supply should not pose a problem during the planning period.

Outside of Columbia, additional residents will have to continue to rely on septic tanks for disposal of sewage. With the availability of suitable, well-drained soils and/or the installation of modified septic systems in certain soil types, septic tank placement should not pose major problems -- except possibly in the Alligator Township which is not connected to the County water system. However, as Table 5, page 7 showed, Alligator Township has been constantly declining in population and is not expected to experience significant population growth during the planning period.

The County's solid waste disposal system will still have to rely on ultimate disposal in the Washington County landfill as the most practical method of waste disposal.

Currently, there are three public boat ramps located in the County providing water access to the public, and nine private boat ramps. As the population increases, there will be a need for additional points of public water access.

Other facilities and services, such as schools, roads, medical, protective and emergency services, are projected to be adequate throughout the planning period.

SECTION II
POLICY STATEMENTS

SECTION II: POLICY STATEMENTS

The formulation of specific policies regarding growth and management objectives is perhaps the most important part of this updated Land Use Plan. Those policies must, in some cases, strike a delicate balance between objectives of the Coastal Resources Commission and the desires and objectives of the citizens of Tyrrell County. Most of the trends identified in the 1980 Plan are still continuing, so in many instances, policies set forth in the 1980 Plan will not require modification. As the analysis of existing conditions showed, these ongoing trends include: a moderately growing population, increased waterfront development, and the continuing potential for the mining of peat.

The Coastal Resources Commission, recognizing the diversities which exist among the Coastal counties and communities, required the County to specify particular development policies under four rather broad topics in 1980. For the 1985 Update, however, the CRC has added a fifth issue, i.e., "Storm Hazard Mitigation." In most cases, policies developed under these topics will cover most of the local development issues, but in some cases, they do not. In the latter case, the locality has the flexibility to address its own locally defined issues. The five required broad topics are:

- -- Resource Protection
- -- Resource Production and Management
- -- Economic and Community Development
- -- Continuing Public Participation
- -- Storm Hazard Mitigation

After an analysis of the existing conditions and trends and input from the County's citizens, the foregoing policies were developed to provide an overall framework for guiding growth and development in Tyrrell County throughout the 10-year planning period (1985-1995).

A. Resource Protection

1. Areas of Environmental Concern: Development Policies. Tyrrell County recognizes the primary concern of the Coastal Resources Commission, in terms of protecting resources, as managing Areas of Environmental Concern (AECs). The County also shares this concern for the protection and sound management of these environmentally sensitive land and waters. The AECs which occur in Tyrrell County were identified in Section I of this Plan on pages 23 through 25. All of these areas are within the Estuarine System. In terms of developing policies, the Estuarine System AECs, which include Coastal Wetlands, Estuarine Waters, Estuarine Shorelines, and Public Trust Areas, will be treated as one uniform grouping since they are so closely interrelated. Another reason for grouping these AECs together is the fact that

the effective use of maps to detail exact on-ground location of a particular area, pose serious limitations.

Tyrrell County's overall policy and management objective for the estuarine system is "to give the highest priority to the protection and coordinated management of these areas, so as to safeguard and perpetuate their biological, social, economic, and aesthetic values and to ensure that development occurring within these AECs is compatible with natural characteristics so as to minimize the likelihood of significant loss of private property and public resources." (15 NCAC 7H. 0203) In accordance with this overall objective, Tyrrell County will permit those land uses which conform to the general use standards of the North Carolina Administrative Code (15 NCAC 7H) for development within the Estuarine System. Generally, only those uses which are water dependent will be permitted. Specifically, each of the AECs within the Estuarine System is discussed below.

a. Coastal Wetlands

By technical definition, there are no "coastal wetlands", i.e., regularly flooded salt marsh areas containing certain plant species, of any significance in Tyrrell County. Most of the "wetlands" in the County consist of freshwater marsh or "wooded swamp" areas in the lowlands near the Alligator and Scuppernong Rivers, with lesser occurrences along the northeastern shorelines of the Albemarle Sound. Also, the more sensitive areas are those closest to the water. The wooded swamps and pocosins in Tyrrell County could also possibly contain areas that sustain remnant species, and wildlife habitats, all of which are important to Tyrrell County. However, the County does not believe that all land uses in these areas should be prohibited. The first priority of uses of land in these areas should be the allowance of uses which promote "conservation" of the sensitive areas, with conservation meaning the lack of imposition of irreversible damage to the wetlands. Generally, uses which require water access and uses such as utility easements, fishing piers and docks, will be allowed, but must adhere to use standards of the Coastal Area Management Act (CAMA: 15 NCAC 7H).

b. Estuarine Waters and Estuarine Shorelines

The importance of the estuarine waters and adjacent estuarine shorelines in Tyrrell County was discussed in Section I of this document on pages 23 - 25 and under "Estuarine Erosion Area," page 29. Tyrrell County is very much aware that protection of the estuarine waters and adjacent estuarine shorelines -- both vital components of the estuarine system -- is of paramount importance to fishing, both commercially and for recreation.

Tyrrell County recognizes that actions within the estuarine shoreline, which is defined as the area extending 75 feet landward

of the mean high waterline of the estuarine waters, could have a substantial effect upon the quality of these waters. This area is subject to erosion and occasional flooding, which could not only affect the quality of the adjacent estuarine life, but also threaten the security of personal property from developments located therein. The estuarine erosion rates cited in Section I of this report points that certain land areas in the County are being lost to erosion at an average rate of 2.3 feet per year. If a waterfront lot were to be located in such an area without stabilization measures, 23 feet of the lot could possibly be lost to erosion over 10 years.

In order to promote the quality of the estuarine waters as well as minimize the likelihood of significant property loss due to erosion or flooding, Tyrrell County will permit only those uses which are compatible with both the dynamic nature of the estuarine shorelines and the values of the estuarine system. Residential, recreational, and commercial uses may be permitted within the estuarine shoreline, provided that:

1. a substantial chance of pollution occurring from the development does not exist;
2. natural barriers to erosion are preserved and not substantially weakened or eliminated;
3. the construction of impervious surfaces and areas not allowing natural drainage is limited only to that necessary for developments;
4. standards of the North Carolina Sedimentation Pollution Control Act 1973 are met;
5. development does not have a significant adverse impact on estuarine resources;
6. development does not significantly interfere with existing public rights or access to, or use of, navigable waters or public resouces;

c. Public Trust Areas

Tyrrell County recognizes that the public has certain established rights to certain land and water areas. (For definitions and geographic locations of public trust areas, see page 25, Section I). These public areas also support valuable commercial and recreational fisheries, waterfowl hunting, and also contain significant aesthetic value. Tyrrell County will promote the conservation and management of public trust areas. Appropriate uses include those which protect public rights for navigation and recreation. Projects which would directly or indirectly block or impair existing navigation channels, increase shoreline erosion, deposit spoils below mean high tide, cause adverse water circulation patterns, violate water quality standards, or cause degradation of shellfish waters, shall generally not be allowed. Allowable uses shall be those which do not cause detriment to the physical or biological functions of public trust areas. Such uses

as navigational channels, drainage ditches, bulkheads to prevent erosion, piers, docks, or marinas, shall be permitted.

d. Policy Alternatives: Development in AECs

Sections a, b, and c of this Part have presented details of Tyrrell County's position on land uses in the statutorily defined Areas of Environmental Concern (AECs). Policy alternatives include:

1. Revising and strengthening the existing Subdivision Ordinance, to impose stricter design standards, particularly in waterfront areas, or areas with water accessibility.
2. Adopt either a County-wide Zoning Ordinance, to establish certain "zones," or districts with specified uses and restrictions, or an ordinance covering just those developing areas of the County.
3. Continue to utilize current system, i.e., existing Subdivision Ordinance (with no modifications), along with Federal and State permit and review processes, i.e., 404, and CAMA.

e. Policy Choices

Tyrrell County will continue to utilize current system, i.e., existing Subdivision Ordinance (with no modifications), along with Federal and State permit and review processes, i.e., 404, and CAMA.

2. Development in Areas with Constraints

The constraints to development in Tyrrell County were discussed in Section I (pages 28-40) and relate to both physical constraints and limitations of community facilities. The physical constraints include man-made hazards such as the USAF bombing ranges, high hazard flood areas, estuarine erosion areas, soils limitations, and natural and cultural resource fragile areas.

Although the County does not favor the continued existence or expansion of the existing air space restrictions imposed by the presence of USAF bombing ranges in the Albemarle Sound and in southern Dare County, there appears to be little which can be done to mitigate these operations. However, in October, 1985, the Tyrrell County Board of Commissioners officially voiced their position on military air operations by adopting a resolution detailing the County's concerns, along with an official request that operations and restrictions be reduced (See Appendix B, attached). The high hazard flood areas, i.e., areas susceptible to the 100-year flood, include the majority of Tyrrell County's land area. As the attached Map 4 indicates, nearly all of Tyrrell County is considered to be in the "Zone A" category, according to maps prepared by the Federal Emergency Management Agency, with

some "pockets" of "Zone C" areas, i.e., minimally flooded areas susceptible to a 500-year flood. The areas with the highest risk appear to be the estuarine erosion areas (particularly along the Alligator River shoreline) and interior lowland swamp areas. Again, since most of the County is flood prone, it is not realistic that all development should be prohibited from these areas.

Estuarine erosion areas, as a physical constraint to development, are closely related to the high hazard flood areas. Soils limitations for development are also nearly a County-wide phenomenon. Most of the soil types have limited permeability or too rapid permeability, making septic tank placement a problem. Also, the excessive spreads of muck or silt-type soils and peat-type soils, cannot support septic tanks nor bear the construction of heavy structures. The best soils for development are located in the northwestern quadrant of the County in ridges along the Albemarle Sound and Scuppernong River areas.

The natural resource fragile areas are closely linked with the previously identified AECs and the cultural resource fragile areas were discussed on page 35). Existing community facilities, i.e., water, solid waste collection, etc., do not pose a serious constraint to development.

a. Policy Alternatives

Possible policy alternatives regarding managing growth and development in areas with identified constraints include:

1. Amend subdivision regulations to include stricter design standards.
2. Develop and adopt additional regulations such as a Zoning Ordinance or Flood Damage Prevention Ordinance to regulate or prohibit all development in areas with identified physical constraints.
3. Permit development in those areas, utilizing current state, federal and local regulatory processes, i.e., CAMA, flood insurance, current subdivision regulations, and Corps of Engineers 404 permits, and where adequate protective measures have been taken.

b. Policy Choices

Tyrrell County adopts the following policies regarding development in areas with constraints.

1. Development will be permitted in some areas subject to erosion, provided proposals comply with provisions outlined for development within the estuarine shorelines (see page 45).

2. Tyrrell County realizes the inevitability of some development occurring in high hazard flood areas, because of the availability of soils suitable for septic tank placement. Therefore, the County will continue to participate in the National Flood Insurance Program and adopt a full-phase Flood Damage Prevention Ordinance and promote enforcement through the new County Building Inspection Program. Proposed developments which are not otherwise damaging to AECs may be permitted, provided protective measures which comply with flood insurance requirements are imposed.

3. Development in areas where soil types have limited bearing capacity will not be encouraged.

4. In areas with possible septic tank limitations, Tyrrell County will remain committed to decisions rendered by the Health Department's Sanitarian.

5. Tyrrell County does not favor the continued existence or expansion of the existing air space restriction imposed by the presence of U.S.A.F. bombing ranges in the Albemarle Sound area near the County (See Appendix B, attached).

b. Implementation Schedule

1. Beginning in 1985, Tyrrell County will initiate a building inspection program employing the services of a building inspector.

2. After the County's entrance into the regular phase of the Flood Insurance Program, the subdivision ordinance will be amended to require the inclusion of elevation above mean sea level, for each lot in a subdivision plat.

3. Hurricane and Flood Evacuation Needs and Plans

An entire section within the Policy Statement discussions is included separately for hurricane and flood evacuation, as well as storm mitigation of post-storm redevelopment policies, beginning on page 66.

4. Other Resource Protection Policy Areas

There are some additional resource protection issues which are required to be addressed by the CAMA planning guidelines and which have lesser definition in Tyrrell County than in some other coastal areas. These areas, along with relevant policy discussion and statements are included below:

a. Protection of Potable Water Supply

As discussed in Section 1, pages 31-32, and 37, Tyrrell County's water distribution system is based on the Town of Columbia's water system. Groundwater, drawn through a total of four wells is the supply source of the system. Two wells are located in the County, about 5 miles south of Columbia off Highway 94, and two are located within the Town of Columbia. Land uses near groundwater sources are regulated by the North Carolina Division of Environmental Management through N.C.A.C. Subchapter 2L and Subchapter 2C. Tyrrell County recognizes the importance of protecting potable water supplies and therefore supports the enforcement of these regulations.

b. Use of Package Treatment Plants

Since, as reported on page 37, the only centralized sewer service in the County is in the Town of Columbia, it may become necessary to develop small package treatment systems in order to accommodate certain types of development in outlying areas of the County. This development may be residential, commercial, or industrial. It shall be the policy of Tyrrell County to allow such package plants if they can be constructed within the overall intent of this plan and meet other federal and state environmental regulations.

c. Stormwater Runoff Associated with Agriculture, Residential Development, Phosphate or Peat Mining, and Its Impact on Coastal Wetlands, Surface Waters, or Other Fragile Areas

Stormwater runoff is basically the same issue as surface drainage in Tyrrell County. Policies on surface drainage are addressed in other areas of this Plan. (See Part B, this section, "Resource Production and Management Policies", for policies relating to agriculture, [B.1], residential development [B.6], and peat mining [B.3], and discussion of related impacts. Phosphate mining is not an issue in Tyrrell County.

d. Marina and Floating Home Development

The development of marinas has significant commercial and recreational potential in Tyrrell County. Therefore, the County supports the development of marinas, in compliance with existing environmental regulations. (Also, see Part C.4, "Redevelopment of Developed Areas", Section II). So-called "floating homes" are not an issue or problem in Tyrrell County.

e. Industrial Impacts on Fragile Areas

Part C.1, "Types and Locations of Desired Industry", contains specific policy statements on industry. (See pages 55-57).

B. Resource Production and Management Policies

Appropriate management of productive resources is very important to any locality. However, in Tyrrell County, the productive resources are intricately tied to the predominant economic sectors of the County which makes the necessity of balanced management policies of paramount importance. The major productive resources to be considered relate to agriculture, commercial forestry, commercial and recreation fisheries, peat mining, and recreational land uses.

1. Agriculture

Agriculture, as discussed under analysis of existing economic conditions, is the unchallenged leader in Tyrrell County's economy. More of the County's income comes from this sector than from all the other major sectors combined. The importance of farming and its supportive activities such as proper land clearing and development of adequate drainage facilities, cannot be overestimated in Tyrrell County. Executive Order 96, "Conservation of Prime Agricultural and Forest Lands", was supposed to have led to the identification of "prime areas," in both agriculture and forestry, by the soil and water conservation districts. However, this identification has not occurred in Tyrrell County. Nevertheless, assuming adequate drainage, the most productive farmlands are located in the northern half of the County and south central on either side of NC Highway 94.

a. Policy Alternatives

1. Do not impose any additional land use controls or restrictions on agricultural practices, so that needed land clearance and drainage activities can continue.

2. Adopt a County-wide zoning ordinance and zone certain lands as "agricultural," with use restrictions and limitations.

3. Support and encourage use of the U. S. Soil Conservation Service's "Best Management Practices" program.

b. Policy Choice

1. Tyrrell County, in recognition of the importance of agriculture to the County's economy, believes that existing federal and state permitting procedures (CAMA and Corps of Engineers) pose enough limitations to the use of farmland in the County. Because of the soil types and topography, the County recognizes that proper drainage is essential and must be allowed to

continue as needed, and as it does not result in irreversible damage to enrironmentally sensitive areas. Therefore, no additional limitation or policies will be adopted. However, the County will support and encourage the identification of "prime" farmland in Tyrrell County and use of the "Best Management Practices" program.

c. Implementation Schedule

1. Leave the existing process as is.

2. Encourage the Regional Soil and Water Conservation District to identify prime agricultural lands by FY 87, so that these areas can be mapped.

3. Continue to support State Clearinghouse review of impact of development on prime agricultural lands.

2. Commercial Forestry

Woodlands and forests cover most of Tyrrell County's landscape. Substantial amounts of income are generated annually from forest products, mainly from saw timber. Some timberlands, however, are located in pocosins or wooded swamps, both of which are environmentally sensitive and need to be protected. "Prime" forest lands, as defined in Executive Order 96, have not as yet been identified for mapping in Tyrrell County. "Productive" forest lands, however, are found in many sections of the County (including a portion of the recently designated Alligator River National Wildlife Refuge).

a. Policy Alternatives

1. The County could, through the adoption and enforcement of local ordinances, impose restrictions on timbering practices and require commercial loggers to replant and reclaim timbered areas.

2. The County could leave current practices as they are without imposing additional restrictions.

b. Policy Choice

1. The County believes that imposing additional restrictions are not necessary at this time nor should be throughout the planning period. However, Tyrrell County will encourage reforestation whenever feasible, as a sound timber management practice.

c. Implementation Schedule

1. Leave the existing process as is.

2. Encourage the Regional Soil and Water Conservation District to identify prime forestlands by FY 87, so that these areas can be mapped.

3. Continue to support State clearinghouse review of the impact of development projects on prime forestlands.

3. Mining Resource Areas

The County still has vast, virtually untapped peat reserves, as noted in the 1980 Land Use Plan. Proposals at that time to develop peat mines did not materialize. However, the potential is very much still there. If peat resources could be mined, the economic impact upon the County could be substantial. The ad valorem tax base could receive a generous boost; greatly needed semi-skilled and unskilled jobs could be created, and, possible "spin-off" support industries and commercial facilities could develop. (See Appendix A, attached to this Plan, which was excerpted from the 1981 Plan, for a detailed discussion of possible environmental impacts of peat mining).

a. Policy Alternatives

1. The County could adopt local ordinances regulating the mining of peat and requiring certain safeguards to be imposed.

2. Not develop any local ordinances at this time, but rely solely on State and Federal regulatory enforcements, i.e., National Environment Protection Act of 1969, along with the Clean Air and Clean Water Acts enforced by the State Division of Environmental Management, the State mining permit provisions, and the 404 wetlands permit process, enforced by the U. S. Army Corps of Engineers.

b. Policy Choice

1. The County supports the eventual mining of peat resources in Tyrrell County and believes that enforcement of State and Federal environmental regulations are sufficient to mitigate possible adverse impacts upon environmentally sensitive areas.

c. Implementation Schedule

1. Continue to rely on State and Federal enforcement provisions and activities.

4. Commercial and Recreational Fisheries

The productive water bodies in and around Tyrrell County have been valuable contributors to the local economy as well as provided many opportunities for recreational fishing. With increasing annual catches over the last several years, it appears that commercial fishing has the potential to expand in Tyrrell County. It is, therefore, very important to protect the water quality of productive fishing areas. In recent years, concern has been raised by commercial fishermen along North Carolina's Coast and the State Division of Marine Fisheries, that freshwater run-off (particularly from agricultural drainage) has been detrimental to estuarine waters by altering the salinity content. Concern also has been raised because of incidences of fecal coliform, coming from septic tank seepage, showing up in primary shell-fishing waters and forcing the "closing" of such waters. Tyrrell County would like to see water quality in all of the productive water bodies maintained.

a. Policy Alternatives

1. Seek to develop impositions, prohibiting the clearing of additional land, and thereby reducing the extent of freshwater run-off.

2. Not impose local restrictions on additional land clearing, but rely on the 404 permit process and enforcement of septic tank placement regulations, particularly in areas with unsuitable soils and high erosion areas.

3. Seek funding assistance to develop artificial reefs in the Albemarle Sound to attract fish, and thereby enhance commercial and recreational opportunities in the County.

b. Policy Choices

1. No definitive study for Tyrrell County has shown the extent of detriment to the estuarine system caused by freshwater run-off. The County does not believe that it is necessary to limit either land clearing or unnecessarily restrict agricultural drainage. The 404 permit process is viewed as being sufficient in limiting the amount of land cleared.

2. The County will support enforcement of septic tank placement regulations by the Health Department and the Soil Conservation Service, to minimize the likelihood of effluent from septic systems in unsuitable soils contaminating fishing waters.

3. Continue to enforce the County's subdivision regulations, requiring larger lot sizes for residences in areas where soils are not as well suited for septic tank placement.

4. Seek to protect the integrity of surface waters by requiring a minimum buffer of 1,320 feet on both sides of estuarine waterways. This area will also be designated "Conservation" in the County's land classification system (See Section IV of this report).

5. The County will apply for funds through the N. C. Division of Marine Fisheries' Reef Development Program in FY 86 in order to develop artificial reefs in selected locations along the Albemarle Sound. The reefs should attract fish and enhance commercial and sports fishing in Tyrrell County.

c. Implementation Schedule

1. Continue to support enforcement of existing regulatory provisions as outlined in b. above.

5. Off-Road Vehicles

The mention of "off-road" vehicles in coastal North Carolina usually conjures ideas of four-wheel drive type vehicles running up and down sandy beaches. However, there are no recreational beaches in Tyrrell County. Nevertheless, off-road vehicles are important in some sections of Tyrrell County because of the necessity for landowners to travel in "bog or swamp areas," as cited in the 1980 Land Use Plan (p.58). As this property is private and not available to the public as public beaches are, the use of these vehicles is acceptable in these cases. No other policy discussion on this issue is deemed necessary.

6. Residential and Commercial Land Development

Tyrrell County, as discussed under sections of this report analyzing existing population and economic trends, is very sparsely populated and has one of the lowest County per capita incomes in North Carolina. Also, just between the census years of 1970 and 1980 did the County end a three-decade old trend of population losses. Tyrrell County is not in a "rapid growth" situation and does not suffer the potentially related pressures resulting from increased residential, commercial, or industrial uses of land. Besides the limitations presented in other policy discussions in this report (particularly those relating to protection of sensitive natural and cultural resources), Tyrrell County views itself as being in a position to accommodate growth and development.

Additional development particularly commercial and industrial development, is regarded as desirable because of the important local revenue and employment generating impacts. The other policy statements regarding resource protection adequately voice the County's concerns regarding these resources. However, land development, whether for residential, commercial, industrial or peat mining uses, and in conformance with existing regulatory controls will be encouraged in Tyrrell County.

A more detailed discussion of the specific types of development along with relevant policy statements are included in the following section, "Economic and Community Development Policies".

C. Economic and Community Development Policies

The analysis of overall existing conditions and trends for this 1985 Update of the Tyrrell County Land Use Plan did not show any alarming trends which would drastically alter general economic and community development policies contained in the 1980 Plan. However, some relevant trends which have been identified include:

- -- Population growth in the County, although nearly exclusively in the Columbia and Scuppernong Townships;
- -- Growth in the County's labor force, in the midst of chronic high unemployment, indicating a need for expanded job opportunities;
- -- Growth and stability of the County's three basic resource extraction economic activities, i.e., farming, fishing, and forestry;
- -- Continuing potential for the mining of peat in Tyrrell County;
- -- Continuing decline of the existing conventional housing stock.

Tyrrell County is very much concerned about the future growth in economic and community development. As the population gradually increases, the economic base will need to expand, more housing will be needed and increased, although relatively minor, pressures will be placed on community facilities. Sound public investment decisions will also have to be made. All of these issues and others are important in the formulation of land use policies. Particular issue areas and policy statements are discussed below.

1. Types and Locations of Desired Industry

Tyrrell County has an intense need for increased job opportunities for many of its unemployed and underemployed citizens. Industrial development could provide these opportunities as well as expand the County's tax base.

Tyrrell County would like to see industry developed which could take advantage of existing natural resources and/or expand upon the current three major industries in the County. Industries such as seafood processing, food canneries, paper and wood manufacture, and marine-related industries would all be considered desirable as long as the integrity of environmentally sensitive areas could be assured of maintenance and stability. Also, other low-pollution, light manufacturing and/or assembly industries would be desirable.

a. Locations and Standards

The County would like to see industry locate, if feasible, in industrial parks which could be developed in suitable locations in the County. However, because of soil and other limitations, individual plant sites may be more feasible. All industrial prospects will be required to comply with general development standards which are designed to protect environmentally sensitive areas, including:

1. Providing an assessment of the impact of the development of the industry and be required to use the best available technology to avoid pollution of air or water during construction or operation.

2. Be located on land having stable, well-drained soils. The sites should be located in areas adequately protected from flooding and be accessible to existing public utilities and transportation routes.

To date, two potential industrial sites in Tyrrell County have been identified and targeted for industrial prospects. These sites are on file with the State Department of Commerce in Raleigh. Some industries such as boat or ship maintenance and repair, may need to be close to water areas, or have adequate water access.

b. Policy Alternatives

Possible policy alternatives concerning industrial development in Tyrrell County include:

1. the development of an active industrial recruiting program within the County;

2. conducting studies to see which industry types may want to locate in the County, and assessing possible environmental impacts; and

3. seeking funding and technical assistance to develop and industrial park or parks within the County.

c. Policy Choices

As Tyrrell County recognizes the need for economic expansion and the fact that industrial development can greatly enhance this expansion, the County hereby adopts the following position.

1. The County will seek to develop an active industrial recruitment program, seeking low-pollution, light manufacturing industries. The County Finance Officer will coordinate this activity.

2. Tyrrell County will seek technical assistance and financial help to develop at least one industrial park, to be located near Columbia.

3. The County believes that all industrial prospects should be given a fair, case-by-case assessment in order to carefully compare possible economic benefits with possibly negative environmental effects. Such reviews will be coordinated by the Tyrrell County Industrial Facilities and Pollution Control Financing Authority.

4. The County and the Town of Columbia will provide, as much as is locationally and economically feasible, basic support services such as water and sewer, if possible, to newly locating industries.

d. Implementation Schedule

The County will establish more active contact with the State's industrial development representative for the region. The County will actively explore funding assistance to develop an industrial park near the Town of Columbia.

2. Local Commitment to Service Provisions

Currently, the major service to development provided by the County is water. The County water system, connected by a purchase agreement to the Town of Columbia's system, serves most concentrated areas of residential development in the County. The Town of Columbia provides both water and sewer to the Town and to areas immediately adjacent to the Town. The Columbia-Tyrrell County water system and the Columbia sewer systems are all currently operating with substantial excess capacities. The excess capacities are more than adequate to meet projected demand based on population growth trends throughout the planning period (through 1995). A county-wide sewer system has been shown to be economically infeasible. The economic infeasibility of serving other areas in the Columbia Township with the Town's sewer system has also been cited.

Both Tyrrell County and the Town of Columbia are committed to providing basic services such as water and, where feasible, sewer to serve increased development in the County, particularly prospective industrial development, in those areas most suited for development.

Other support facilities and services provided by or within the County such as police and fire protection, health services, social services, solid waste collection, and library services, appear to be adequate throughout the planning period. As development occurs and the local tax base expands accordingly, slightly higher levels of county-provided services can be provided.

a. Policy Alternatives

1. Do not encourage the provision of services for new development in an attempt to keep things as they are.

2. Encourage extension and expansion of needed services as much as feasible, to accommodate new residential, commercial, or industrial development.

b. Policy Choice

1. Tyrrell County will remain committed to providing needed services, as economically feasible, to accommodate new residential, commercial, and industrial development in the County.

c. Implementation Schedule

1. The County will work with the Town of Columbia throughout the period to encourage the provision of services where needed, and as feasible, for new development.

3. Desired Urban Growth Patterns

The only "urban" area in Tyrrell County is the Town of Columbia. The rest of the residential development in the County has a pronounced rural pattern, except for some of the small subdivisions near the Albemarle Sound in the Scuppernong Township. Future subdivisions will all have to meet formal orderly development design standards in accord with the County Subdivision Regulations. The rural cluster community pattern, evident in the Alligator, Gum Neck, and Travis communities, for example, is usually built around a church or churches and a community store. Some older established communities, such as Alligator, are in areas with generally unsuitable soils for urban development, or are in high hazard flood areas. In the northern half of the

County, however, most of the developed areas appear to be located in areas where the soils are more suited for development.

Another trend in the County possibly affecting urban growth patterns is the increasing number of mobile homes. Although mostly scattered on individual lots, mobile homes have established themselves as a viable housing alternative for many residents and the County may wish to plan for the eventuality of mobile home parks.

a. Policy Alternatives

1. Tyrrell County could encourage the continuation of existing rural cluster community patterns.

2. The County could discourage a duplication and continuation of the existing development patterns by adopting a Zoning Ordinance which could prohibit areas with identified limitations (soils, or presence of AECs, for example) from developing.

3. Adopt and develop a Mobile Home Park Ordinance to establish design standards for mobile home parks which may eventually be proposed in the County.

b. Policy Choices

1. The existing rural cluster communities are a long established residential pattern in Tyrrell County, and will not be discouraged by the County. However, the County will not encourage "new" developments in areas with identified limitations such as soils or proximity to AECs; specifically, the County will not extend water service to such areas. However, redevelopment, or rehabilitation activities are viewed as being acceptable. Also, water service may be extended to address a severe health problem as in portions of the Alligator Township.

2. The County does not deem it necessary to adopt a Zoning Ordinance at this time, but will consider the development of a draft Mobile Home Park Ordinance to establish design standards for mobile home parks.

c. Implementation Schedule

1. Obtain assistance in developing a draft Mobile Home Park Ordinance in FY 86.

4. Redevelopment of Developed Areas

The County's and the Town of Columbia's position concerning redevelopment of developed areas was discussed thoroughly in the 1980 Land Use Plan (p. 62-64), and mainly related to activities along the Columbia waterfront. A major issue cited was the need for dredging the natural channel at the mouth of the Scuppernong River, and that the U. S. Army Corps of Engineers would be requested to do so. In 1984, the Corps of Engineers surveyed the depths of the River from its mouth to beyond the U. S. 64 bridge. Also, some redevelopment has occurred along the waterfront, notably, the Tyrrell County Veteran's Memorial Park on the west bank and renovated Town Hall facilities for Columbia and a public wharf and docking facility on the east bank. Redevelopment of Columbia's waterfront will continue to be encouraged throughout the planning period. However, an additional redevelopment issue which also needs addressing is the concentrated presence of substandard housing conditions in the Alligator and Goat Neck communities. The County may wish to pursue State and/or Federal funding to establish housing rehabilitation programs in these areas.

a. Policy Alternatives

1. Continue to work with the Town of Columbia in encouraging redevelopment of the Town's waterfront.

2. Encourage private sector development of the waterfront through the Industrial Development Committee's activities in contacting industrial/commercial prospects.

3. Seeking funding through the State-administered Small Cities Community Development Block Grant Program to establish a housing improvements program in either the Alligator or Goat Neck communities.

b. Policy Choices

1. The County will work with the Town of Columbia in requesting needed channel dredging at the mouth of the Scuppernong River and encourage redevelopment of the waterfront area, to the extent possible, by the private sector.

2. Tyrrell County would like to see redevelopment/rehabilitation activities occur in such communities as Goat Neck, Alligator, and Gum Neck, where there are concentrations of substandard housing conditions.

c. Implementation Schedule

1. In FY 86, request that Corps of Engineers or U. S. Coast Guard snag the Scuppernong River.

5. Commitment to State and Federal Programs

Tyrrell County is generally receptive to State and Federal programs, particularly those which provide improvements to the County. The County will continue to fully support such programs. The North Carolina Department of Transportation road and bridge improvement programs are very important to Tyrrell County.

Examples of other State and Federal programs which are important to and supported by Tyrrell County include: drainage planning and erosion control activities carried out by the U.S.D.A. Soil Conservation Service, which is valuable to farmers; dredging and channel maintenance by the U.S. Army Corps of Engineers; and Federal and State projects which provide efficient and safe boat access for sports fishing. However, Tyrrell County does not support expansion of military restricted airspace over the County as currently proposed by the U. S. Department of Defense.

All of these programs and others are important to Tyrrell County, and the County is committed to their continued support.

6. Assistance to Channel Maintenance

Proper maintenance of channels is very important in Tyrrell County, mainly because of the substantial economic impact of commercial fisheries. Commercial fishing is increasing in the County. If silt or other deposits fill in the channels, this could impede efficient docking of the commercial vessels. With adequate channel maintenance, Tyrrell County could begin to make more utilization of its extensive waterways for water transportation purposes. Since there are no railroads in the County, water transportation (particularly along the Intracoastal Waterway - Alligator River) could be useful for bulk shipments in the County. The County is quite aware of this situation. Tyrrell County provides assistance to the Corps and State officials by either helping to obtain or providing spoil sites. The County will remain committed to providing such assistance.

7. Energy Facilities Siting

In Tyrrell County, the siting or location of energy facilities relates almost solely to peat mining, as noted in the 1980 Plan Update. The nature of peat mining is such that there is little choice about particular extraction sites. Peat mining, like strip-coal mining, must be done where the mineral is located. It is always an on-site operation, yet the conversion

or processing of it can occur somewhere else. The County believes that off-site processing should not occur in environmentally sensitive or hazardous areas, or in any area where it is known that major or irreparable environmental damage will result. The 1980 Land Use Plan Update referred to reports by First Colony Farms that sufficient peat reserves existed in Tyrrell, Dare, Hyde, and Washington Counties to support an electric generating plant in that region. Although at the writing of this report, the development of such a power plant does not appear to be a consideration, Tyrrell County, as stated in the 1980 Plan, supports the acquisition of sites in the shoreline areas of the Albemarle Sound or the Alligator and Scuppernong Rivers, if such siting will not have long-term detrimental impacts upon the environment (p. 66, 1980 Plan Update).

8. Tourism and Beach and Waterfront Access

As discussed under the economic analysis section, tourism has not historically had a significant impact upon Tyrrell County's economy. However, throughout the planning period, the impact of tourism may grow. With the recent designation of the Alligator River National Wildlife Refuge area, more visitors may be attracted to the County. Also, more commercial activities may develop to capitalize on the Outer Banks beaches "pass-through" traffic, which is substantial every summer. Tyrrell County does support tourism and is aware of the potential economic benefit of such activity.

"Beach access" is not a major problem in Tyrrell County in the conventional sense of the words. There is no ocean-front shoreline in Tyrrell County and most of the shoreline along the Albemarle Sound is not "beach", while much of the shoreline area along the Scuppernong and Alligator Rivers consists of wooded swamps. There are several State-maintained recreation boating access points for public use located in various places around the County. However, as waterfront residential development continues along the Albemarle Sound and Bull's Bay area, concern has been raised over provision of public access to the waterfront. Section 14 of the Tyrrell County Subdivision Ordinance, "Waterfront Lots" (p. 14), requires provision of water access to lot owners whose lots do not have waterfrontage. These "water access" lots can be either dedicated to the County for maintenance, or deeded to an owners' association for common ownership by lot purchasers. If the County elected to accept the water access lots dedicated, then the property would likely be accessible to the general public. However, if the access property were deeded to the lot owners, it would remain private property, likely limiting access to the general public.

a. Policy Alternatives

1. The County could establish no policies nor take any additional action, and assume that existing boating access points are sufficient for public access.

2. The County could take additional steps, including amending its Subdivision Ordinance, to assure better opportunity for general public waterfront access, even with developing waterfront access.

3. The County could seek funding assistance through the Division of Coastal Management's Beach Access Program to acquire and develop specific public access sites.

4. The County could seek "donation" of sites by private landowners for public access development.

b. Policy Choice

1. Tyrrell County wants to see improved waterfront access opportunities for the general public and will take additional measures to better assure those opportunities.

c. Implementation Schedule

1. In FY 86, Tyrrell County will apply for funds through the Division of Coastal Management's Beach Access Program to develop a sound, practical public access Plan which will analyze the County's public access needs.

2. Also, in FY 86, Tyrrell County will seek financial assistance through such agencies as the Division of Coastal Management, the Division of Marine Fisheries, the N. C. Wildlife Commission, and the Land and Water Conservation Fund, to develop a "port of safe harbor" at a designated site along the Albemarle Sound. This facility would provide emergency docking for recreational boats during storms.

9. Density of Development

Overly dense development is not a problem in Tyrrell County, nor is anticipated to become a problem during the period covered by this plan update. With an anticipated population growth of 264 persons between 1985 and 1995, (an increase of 6.4% over the 1985 estimate), the rate of growth will not push developed densities to unacceptable levels. As presented in other discussions in this report, the most suitable soils for residential development are located in the northern half of the County -- particularly along

ridges near the Albemarle Sound and Scuppernong River. There are also "pockets" of areas classified as "Zone C", i.e., minimally flooded areas according to the Flood Insurance Maps prepared by the Federal Emergency Management Agency (FEMA). (See Maps 4, 6, and 7, attached). Tyrrell County would like to see development continue in areas which are considered as most feasible to accommodate growth and where support services, such as water and sewer (including septic tank placement), are feasible and practical to provide. Also, the County will continue to enforce its Subdivision Ordinance, which has established minimum lot sizes in coordination with sanitary requirements of the County Health Department which will affect development densities. The minimum square footage for lots without access to public water or sewer, is 20,000 S.F., and for lots with access to public water, but not to public sewer, is 15,000 S.F. The average density of development in these areas will range from 2.1 to 2.9 units per acre.

10. Land Use Trends

The overall land use trends, as have been discussed in other sections of this report, include continuing, although at a slower rate, land clearing activities; continued emphasis on agricultural uses of land, and increasing, although not dramatic, waterfront residential development. The projected land use changes are not anticipated to be causes for alarm in Tyrrell County. Continued enforcement and coordination, of existing local, state, and federal land use regulations, i.e., through CAMA, Corps of Engineers, 404 process, sanitary regulations, and the County's Subdivision Ordinance and proposed building inspections program, are adequate to help assure orderly growth and development in the County.

D. Continuing Public Participation Policies

Tyrrell County recognizes that an important element in developing and implementing any local policies or plans regarding the use of land in the County, is involvement of the County's citizenry. From the initial stages of development of this 1985 update of the County's CAMA Land Use Plan, Tyrrell County has sought to provide open opportunities for citizen input. A "Public Participation Plan" was developed for the plan updating process, outlining the methodology for citizen involvement. The plan stated that public involvement was to be generated primarily through the County Planning Board and through "public information" meetings, advertised in local newspapers and open to the general public. The Planning Board meetings also are open to the general public.

Specifically, during the beginning stages of the update process, the Planning Board met with the planning consultant to review and discuss preliminary development issues; afterwards, a

public information meeting was announced in the Coastland-Times newspaper, and public notices of the meeting were posted in conspicuous places in the County. This meeting was held with citizens, the Planning Board, and the planning consultant attending. Citizens provided input and voiced their concerns about land use policies. Also, during the second quarter of the plan preparation, the County Board of Commissioners received a report on the update process, and was presented with the major issues identified by the citizens at the public information meeting. Throughout the plan development process, both the County Planning Board and Board of Commissioners were actively involved. A series of meetings, or "joint-working sessions" were held. All of these meetings were open to the public. Specifically, work sessions and/or meetings were held on the following dates: October 8, 1984; November 5, 1984 (an advertised and posted Public Information Meeting); November 5, 1984 (with County Board of Commissioners); January 15, 1985 (joint work session with both Planning Board and Board of Commissioners); February 18, 1985 (joint session with both Boards); April 25, 1985 (joint work session with both Boards, meeting was announced in the Coastland Times, newspaper, and public was invited to attend); and May 7, 1985 (final joint session with both Boards).

The final draft plan, prior to submission to the CRC, was presented to the County Board of Commissioners on June 18, 1985.

After review and comments by the CRC staff and other agencies, the revised plan was subject to a duly advertised final public hearing for citizens in December, 1985. On January 8, 1986, this plan was adopted by the Tyrrell County Board of Commissioners, for formal submission to the Coastal Resources Commission.

In addition to direct citizens' input through the public meetings, interviews were conducted with representatives of various agencies in the County to solicit input. These included: the Tyrrell County Farm Extension Service; the U.S.D.A. Soil Conservation Service; the Farmers Home Administration; U. S. National Park Service; N. C. Division of Emergency Management; and the Town of Columbia.

In order to continue providing citizens an awareness of the land use planning process, all of the regular meetings of the Planning Board will be announced in local newspapers.

It is the belief of the Tyrrell County Board of Commissioners that all citizens be afforded adequate opportunities to participate in the governmental and planning decisions which affect them. Therefore, citizens' input will continue to be solicited, primarily through the Planning Board with advertised and adequately publicized public meetings held to discuss special land use issues, and to keep citizens informed.

E. Storm Hazard Mitigation, Post-Disaster Recovery, and Evacuation Plans

The entire North Carolina Coastal region, including Tyrrell County, faces strong threats of damage each year from hurricanes, Northeasters, or other major storms. For nearly 20 years, there was a marked "slowdown", or "lull", in hurricane activity along the State's coast. Predictions were that a major storm could strike the State at any time during the hurricane season, since such a storm was "long overdue". And then, in September, 1984, the "waiting" ended. Hurricane Diana, with some of the strongest sustained winds ever recorded, rammed into the Southeast coast near Wilmington. Although damage was extensive, the potential destruction was much greater and the damage would have been greatly escalated had the storm hit land at a slightly different location. This time the State and the Southeast coastal area were relatively fortunate. But what about next time?

Notice the excerpt below from, Before the Storm: Managing Development to Reduce Hurricane Damages, McElyea, Brower, & Godschalk, 1982, concerning development in coastal communities:

> "At the same time, development along the coast has grown by leaps and bounds. Unless this development is wisely located and built to withstand hurricane forces, North Carolina's coastal communities will face massive destruction. Local governments, as the primary protectors of the public health, safety, and general welfare, have a responsibility to reduce the risk of property damages and loss of life attending coastal development. They also have a responsibility to ensure that reconstruction following a major storm can occur quickly and leave the community safer from disaster in the future. These are the goals of hazard mitigation and reconstruction planning." (p.iii)

The purpose of this section of the 1985 CAMA Land Use Plan Update, is to assist Tyrrell County in managing development in potentially hazardous areas through establishing hazard mitigation policies and to reduce the risks associated with future hurricanes by developing post-disaster reconstruction/recovery policies, and reviewing the adequacy of current evacuation plans. The overriding concept of this exercise is simply "planning ahead of time."

> "Hazard mitigation includes any activity which reduces the probability that a disaster will occur or minimizes the damage caused by a disaster. Hazard mitigation includes not only managing devlopment, but also evacuation planning and other measures to reduce losses of life and property. Reconstruction involves the full range of repair activities in the wake of a disaster which seek to return the community to a "normal" level

of operations." (McElyea, Brower, & Godschalk, p. iii).

With this introduction, the following pages will present the storm hazard mitigation and post-disaster recovery policies, and review of the existing evacuation plan along with appropriate discussions and maps.

1. Storm Hazard Mitigation: Discussion

Hazard mitigation, or actions taken to reduce the probability or impact of a disaster could involve a number of activities or policy decisions. The starting point, however, is to identify the types of hazards (including the relative severity and magnitude of risks), and the extent of development (including residential, commercial, etc.) located in storm hazard areas.

Hurricanes are extremely powerful, often unpredictable forces of nature. The two most severe effects are fatalities and property damage, which are usually the result of four causes: high winds, flooding, wave action, and erosion, each of which are discussed briefly below:

a. High Winds

High winds are the major determinants of a hurricane, by definition, i.e., a tropical disturbance with sustained winds of at least 73 miles per hour. Extreme hurricanes can have winds of up to 165 miles per hour, with gusts up to 200 miles per hour. These winds circulate around the center or "eye" of the storm. Although the friction or impact of the winds hitting land from the water causes some dissipation of the full force, there is still a tremendous amount of energy left to cause damage to buildings, overturn mobile homes, fell trees and powerlines, and destroy crops. Also, tornadoes can often be spawned by hurricane wind patterns. Wind stress is an important consideration in storm hazard mitigation planning. Because of a hurricane's size and power, it is likely that all of Tyrrell County would be subject to the same wind velocity in the event of a storm.

b. Flooding

Flooding, on the other hand, may not affect all areas with equal rigor. The excessive amounts of rainfall and the "storm surge" which often accompany hurricanes can cause massive coastal and riverine flooding causing excessive property damage and deaths by drownings. (More deaths are caused by drowning than any other cause in hurricanes.) Flooding is particularly a problem in ocean coastal areas because of the storm surge and low-lying areas. However, flooding can cause extensive damage in inland areas also, since many coastal areas have low elevations and are located in high hazard or "Zone A" flood areas according to the Federal

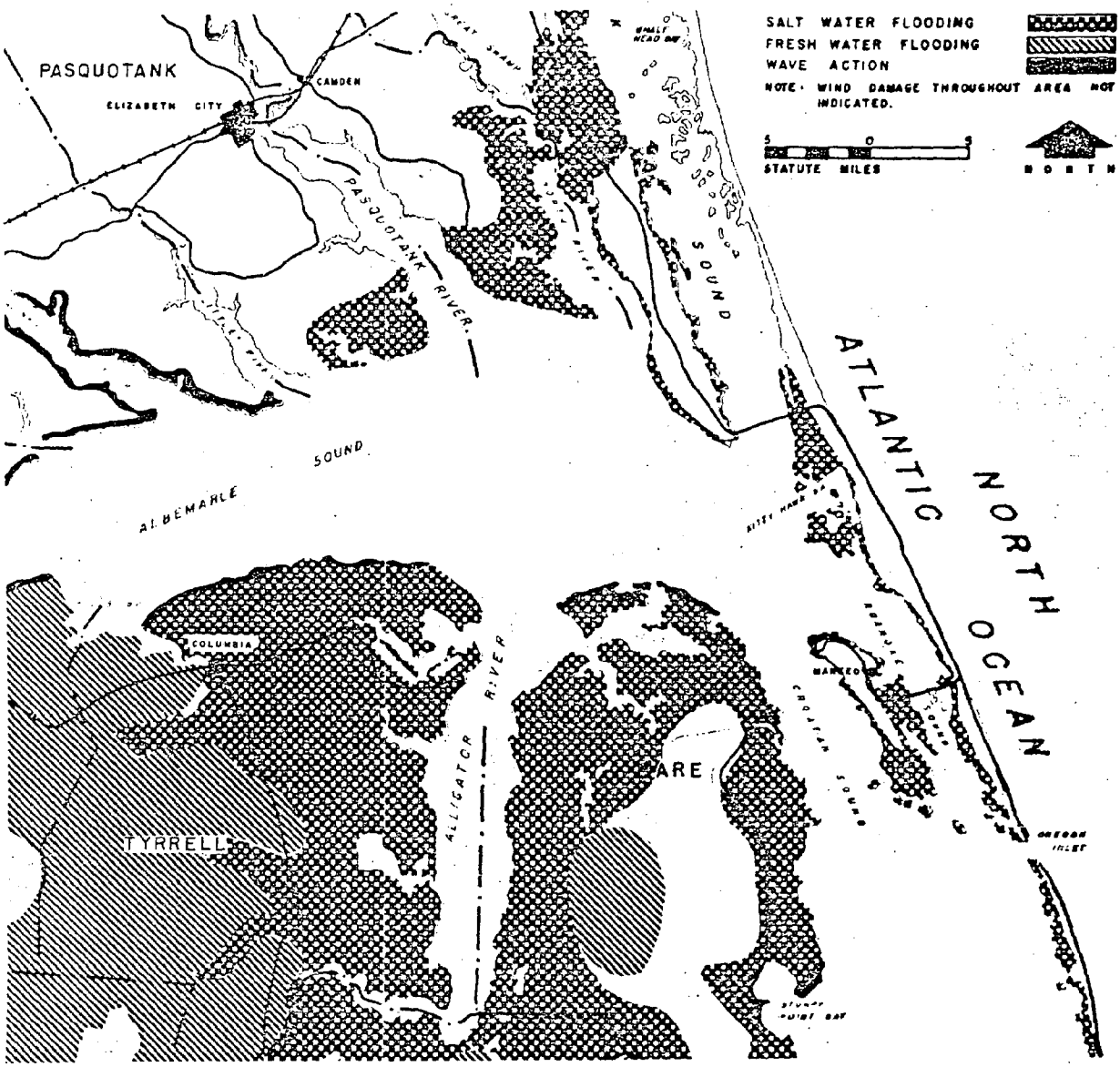
Emergency Management Agency Maps. Based on recent preliminary flood insurance maps prepared for Tyrrell County, nearly all of the County is classified as being in the 100-year "high hazard" flood zone, or Zone A. Because of low elevation, nearly all of the County would be subject to flooding during a severe hurricane. There are, however, "pockets" of areas classified as "Zone C", i.e., in the 500-year "minimally flooded" area. In severe storms, Zone C areas would also likely be flooded, but risks are not as severe as for Zone A areas. (See Map 7, "Composite Hazards Map," attached).

As Map 7 shows, most of the "development" in Tyrrell County is in the high hazard Zone A areas, with the highest concentration of residential development in Zone C areas being in the northwest portion of the County, from Travis westward toward Washington County, and north toward Bull's Bay.

Flooding cannot only cause damage to buildings, but saltwater flooding can cause serious damage to croplands, which is what took place in the Albemarle region, including Tyrrell County in 1954 and 1955 from Hurricanes Hazel, Connie, Dianne, and Ione (McElyea, Brower, & Godschalk, pp. 2-8, 9). Notice Figure 1 on the following page. Consideration of potential flood damage is important to Tyrrell County's efforts to develop storm mitigation policies.

FIGURE 1

Flooding in the Albemarle Sound Region from Hurricanes Hazel, Connie, Diane, and Ione (1954-1955)



Source: N. C. Council of Civil Defense, 1955.

c. Wave Action

Damage from wave action is connected very closely to the storm surge, i.e., wind-driven water with high waves moving to vulnerable shoreline areas. Areas most likely to be affected are ocean erodible areas and estuarine shoreline areas. There are no ocean erodible areas in Tyrrell County, but there are extensive estuarine shoreline areas (75 feet inland from the mean high water mark of estuarine waters) in the County. However, wave action damage would have the most significant impact along the Albemarle Sound shoreline. As the existing land use map (Map 3, attached), and the composite hazards map (Map 7, attached) show, there is a significant amount of residential development in or near the estuarine shoreline area. Wave action can cause erosion as well as push possible flood waters to areas not reached by the storm surge itself. The estuarine shoreline along Tyrrell's riverine shores, i.e., Alligator, Little Alligator, Scuppernong, and the Frying Pan are sufficiently inland from an open coast so that the wave energy is dispersed and diffracted, mainly by the proximity to forested areas. Figure 1, page 67, also shows the pattern of wave action damage in Tyrrell County from the hurricanes of 1954 and 1955.

d. Erosion

The final major consideration in storm hazard mitigation is severe erosion, caused by high winds, high water, and heavy wave action. Again, in Tyrrell County, the area most susceptible to storm-related erosion is the estuarine shoreline AEC along the Albemarle Sound. This is essentially the same area potentially affected by the action of damaging waves and described in part c, above. Shoreline erosion could lead to loss of property through portions of waterfront lots being washed into the Sound or even actual structural damage to buildings. Erosion potential is an important factor to consider in developing storm hazard mitigation policies.

e. Summary: Storm Hazard Mitigation Considerations

In summary, all four of the major damaging forces of a hurricane, i.e., high winds, flooding, wave action, and shoreline erosion could have a potential impact upon Tyrrell County in the event of a major storm. The degree of susceptibility to losses and/or damages was generally alluded to in the previous discussions. However, Table 24, below, provides a better projection of the percent of the County's building structures (residential and commercial, etc.), subject to the potentially devastating effects of a major storm:

Table 24 *Percent of Structures Subject to Storm Damage Factors, Tyrrell County

Storm Impact	Percent Structures Possibly Affected	1985 Tax Value (Millions)
1. High winds	100%	133.9
2. Flooding	80%	107.1
3. Wave Action	5%	6.7
4. Shoreline Erosion	5%	6.7

Based on preliminary projections derived from examination of Existing Land Use Map. Map prepared by Talbert, Cox & Associates. Tax value provided by County Finance Office.

The information in the Table above is preliminary and is not intended to convey the impression that every single structure possibly affected by damaging factors would be affected, only that the potential is there. Knowing that the potential is there forms the basis for setting forth storm hazard mitigation policies, keeping in mind that "mitigate" means actions which may reduce the probability of disaster, or minimize the damage caused by a disaster (McElyea, Brower, & Godschalk, p. iii).

f. Policy Statements: Storm Hazard Mitigation

In order to minimize the damage potentially caused by the effects of a hurricane or other major storm, Tyrrell County proposes the following policies.

1. High Winds

Tyrrell County supports enforcement of the N. C. State Building Code, particularly requirements of construction standards to meet wind-resistive factors, i.e., "design wind velocity". The County will also support provisions in the State Building Code requiring tie-downs for mobile homes, which help resist wind damage.

2. Flooding

Tyrrell County is supportive of the hazard mitigation elements of the National Flood Insurance Program. Currently, Tyrrell County is participating in the emergency phase of the insurance program. However, Preliminary Flood Insurance Rate Maps and a draft Flood Damage Prevention Ordinance have been prepared for the County's move into the Regular Phase insurance program. Tyrrell County also supports continued enforcement of the CAMA and 404 Wetlands development

permit processes in areas potentially susceptible to flooding.

3. Wave Action and Shoreline Erosion

Tyrrell County is supportive of the CAMA development permit process for estuarine shoreline areas and the requisite development standards which encourage both shoreline stabilization and facilitation of proper drainage.

g. Implementation: Storm Hazard Mitigation

1. In FY 85-86, Tyrrell County will establish a County-wide building inspection program, with the services of a building inspector, enforcing provisions of the N. C. State Building Code for new construction. These provisions will include designing for wind resistance and mobile home tie-downs for newly placed mobile homes.

2. Tyrrell County will adopt the Flood Damage Prevention Ordinance for the Regular Phase of the National Flood Insurance Program, in FY 86-87, as of the effective date of the finalized Flood Insurance Rate Maps. This ordinance which will require basic floodproofing for all new construction, including all first floor elevations being at or above the base flood elevations, will be enforced as part of the County's new building inspection program. The base flood elevation, as shown on the flood insurance maps, is the elevation of the 100-year flood.

3. The County will continue to support enforcement of State and Federal programs which aid in mitigation of hurricane hazards, including CAMA and the U. S. Army Corps of Engineers 404 permit process.

2. Post-Disaster Reconstruction Plan

Tyrrell County recognizes that in the event of a major storm, it will be very important to have, at a minimum, a general recovery and reconstruction plan. This section of the Land Use Plan Update will address this issue.

a. Appointment of a "Post Disaster Recovery Team"

Prior to a major storm having landfall in the vicinity of Tyrrell County, when evacuation orders are issued, the Chairman of the County Board of Commissioners shall appoint a "Post-Disaster Recovery Team". This team shall consist of all of the members of the Evacuation Plan Support Group as identified in the Tyrrell County Evacuation Plan, and others whom the Chairman may appoint. The total team may consist of the following:

1. County Finance Officer
2. Emergency Preparedness Coordinator (Team Leader)
3. County Sheriff
4. County Building Inspector
5. Director of Social Services
6. Local realtor or building contractor

The Emergency Preparedness Coordinator will serve as the Team Leader and will be responsible to the Chairman of the Board of Commissioners. The base of operations will be the Emergency Operations Center (EOC) identified in the County Evacuation Plan (the Sheriff's Department). The Disaster Recovery Team will be responsible for the following:

1. Establishing an overall restoration schedule.

2. Setting restoration priorities.

3. Determining requirements for outside assistance and requesting such assistance when beyond local capabilities.

4. Keeping the appropriate County and State officials informed.

5. Keeping the public informed.

6. Assembling and maintaining records of actions taken and expenditures and obligations incurred.

7. Recommending to the Chairman of the Board of Commissioners to proclaim a local "state of emergency" if warranted.

8. Commencing and coordinating cleanup, debris removal and utility restoration which would include coordination of restoration activities undertaken by private utility companies.

9. Coordinating repair and restoration of essential public facilities and services in accordance with determined priorities.

10. Assisting private businesses and individual property owners in obtaining information on the various types of assistance that might be available to them from federal and state agencies.

b. Immediate Clean-Up and Debris Removal

Coordination of this activity will be the responsibility of the Disaster Recovery Team.

c. Long Term Recovery/Restoration

The Disaster Recovery Team will be responsible for overseeing the orderly implementation of the reconstruction process after a major storm or hurricane in accord with the County's policies.

1. Damage Assessments

Damage assessments will be necessary to determine as quickly as possible a realistic estimate of the amount of damage caused by a hurricane or major storm. Information such as the number of structures damaged, the magnitude of damage, and the estimated total dollar loss will need to be developed.

As soon as practical after the storm, i.e., clearance of major highways and paved roads in the County, the Disaster Recovery Team Leader shall set up a Damage Assessment Committee (DAC), consisting of the Building Inspector, Emergency Preparedness Coordinator, a local realtor or building contractor, and appropriate personnel from the Tyrrell County tax department. The DAC will immediately begin to make "windshield" surveys of damaged structures to initially assess damages and provide a preliminary dollar value of repairs or replacement. The following general criteria shall be utilized:

a. Destroyed (repairs would cost more than 80 percent of value).

b. Major (repairs would cost more than 30 percent of the value).

c. Minor (repairs would cost less than 30 percent of the value, but the structure is currently uninhabitable).

d. Habitable (some minor damage, with repairs less than 15 percent of the value).

Each damage assessment will be documented according to County tax records. Also, County tax maps (including aerial photographs) and/or records may be used for identification purposes. The total estimated dollar value of damages will be summarized and reported to the Disaster Recovery Team Leader.

2. Reconstruction Development Standards

Generally, reconstruction shall be held at least to the same standards as before the storm. However, developed structures which were destroyed and which did not conform to the County's storm hazard mitigation policies, i.e., with basic measures to reduce damage by high winds, flooding, wave action or erosion, must be redeveloped according to those policies. In the event the loss of property containing shoreline structures is substantial enough to prohibit the reissuing of a septic tank permit, the County will support the decision of the Sanitarian. In some instances, this may mean relocation of construction, or no reconstruction at all. To the extent feasible, when relocation is required, such relocation will be placed in less hazardous areas. Building permits to restore destroyed or damaged structures, which were built in conformance with the State Building Code and County storm hazard mitigation policies, shall be issued automatically, all structures suffering major damage will be repaired according to the State Building Code. All structures suffering minor damage, regardless of location, will be allowed to be rebuilt to the original condition prior to the storm.

3. Development Moratoria

Tyrrell County, because of a lack of densely populated areas, does not foresee the need to prohibit any and all development for any specified period of time. Residents shall be allowed to proceed with redevelopment and reconstruction as soon as practical and in accord with the various levels of State and federal disaster relief provided to them. Damage to the properties in some areas of the County may indicate a

higher susceptibility to storm damage than other areas. If the County determines that some areas are more vulnerable to storm damage than others, then the Board of Commissioners may declare a development moratorium, prohibiting all redevelopment for a specified period of time. This will allow the County time to assess previous damage mitigation policies for their effectiveness and possible modification.

4. Repair/Reconstruction Schedule

The following schedule of activities and time frame are proposed with the realistic idea that many factors of a hurricane may render the Schedule infeasible.

	Activity	Time Frame
a)	Complete and Report Damage Assessments	Two weeks after storm
b)	Begin Repairs to Critical Utilities and Facilities	As soon as possible after storm
c)	Permitting of Reconstruction activities for all damaged structures ("minor" to pre-storm original status, "major" to State building code and hazard mitigation standards	Two weeks after damage assessments are complete

5. Agency Responsible for Implementation

The Chairman of the Tyrrell County Board of Commissioners, as chief elected official of the County, will serve as overall Emergency Coordinator. The Board Chairman will delegate the oversight of the reconstruction and recovery effort and implementation of the plan.

6. Repair and Replacement of Public Utilities

If water lines or any component of the water system are damaged and it is determined that the facilities can be relocated to a less hazardous location, then they will be relocated during reconstruction.

3. Hurricane Evacuation Plan

Tyrrell County has an official "Civil Preparedness Hurricane Evacuation Plan" which was adopted in March, 1977. A review of this plan indicates that it is generally adequate for the County's needs, all factors considered, many over which the County has no control. For example, since most of the County is in the 100-year floodplain, all of the evacuation routes pass through at least part of the flood hazard area. The plan indicated a projected evacuation time of from 4-6 hours, which is adequate within the National Weather Service warning system guidelines. The Civil Preparedness Plan involves a number of County personnel and local agencies, with varying specific duties and responsibilities. The primary shelter is the Columbia High School. The County has tentatively arranged for the school system to provide food through the cafeteria. However, since there are no "stocked shelters," residents are also encouraged to bring food to the shelter site.

4. Re-Entry

Factors regarding re-entry are also included in the Civil Preparedness Hurricane Evacuation Plan. Because of the possibility of fallen power lines, or telephone lines, re-entry will be closely coordinated with utility companies such as VEPCO.

The Plan was also reviewed by the North Carolina Division of Emergency Management, without any substantive comments.

When Hurricane Diana was preparing to strike North Carolina's Coast at an uncertain location during the autumn of 1984, Tyrrell County implemented the evacuation plan. Although the storm struck land well to the south of Tyrrell, implementation of the evacuation plan was a useful "dry run" for the County. The evacuation plan will be incorporated into the Land Use Plan by reference.

SECTION III
LAND CLASSIFICATION SYSTEM

SECTION III: LAND CLASSIFICATION SYSTEM

The land classification system provides a uniform way of looking at how the planned use of land interacts with environmentally sensitive areas and with the development of a County or Town. It is not a strict regulatory device in the sense of a zoning ordinance or zoning map. It represents more of a tool to understand relationships between various land use categories and how these relationships help shape local policy. Particular attention is focused on how intensely land is utilized and the level of services required to support that intensity. Land classification is also useful in the staging of services necessary to support development. The regulations for the Coastal Area Management Act state:

> "The land classification system provides a framework to be used by local governments to identify the future use of all lands. The designation of land classes allows the local government to illustrate their policy statements as to where and to what density they want growth to occur, and where they want to conserve natural and cultural resources by guiding growth." (7B.0204) (b)

There are five general land use classifications under CAMA: Developed; Transition; Community; Rural; and Conservation. In applying the land classification system, each local government should give careful consideration to how, where and when certain types of, and intensity of "development," will be either encouraged or discouraged. A brief summary of the five broad classifications, as contained in the CAMA rules, might illustrate this. For example:

> "Urban land uses and higher intensity uses which presently require the traditional urban services should be directed to lands classified developed. Areas developing or anticipated to develop at urban densities which will eventually require urban services should be directed to lands classified transition. Low density development in settlements which will not require sewer services should be directed to areas classified as community. Agriculture, forestry, mineral extraction and other similar low intensity uses and very low density, dispersed residential uses should be directed to lands classified rural. Generally, public or private water or sewer systems will not be provided in areas classified rural as an incentive for intense development." (7B.0204) (c)

The purpose of the conservation class is to "provide for the effective long-term management and protection of significant, limited, or irreplaceable areas." Consequently, urban services (whether public or private) should not be provided to those areas as an incentive to "stimulate" more intense development. Each of these classes must be represented on a Land Classification Map.

The five land classifications and Land Classification Map are therefore intended to serve as a visual reflection of the policies previously stated in Section II. Ideally, the map which depicts these classifications should be as flexible as the policies that guide them. (See Map 8, attached, Land Classification Map)

The five land use classifications, as they will be applied in Tyrrell County, are identified and defined below.

A. DEVELOPED

The developed class of land use provides for continued intensive development and redevelopment of existing cities or municipalities. Areas to be classified as "developed" include lands currently developed for urban purposes or approaching a density of 500 dwellings per square mile that are provided with usual municipal or public services, police and fire protection. In other words, such areas must currently be "urban" in character, i.e. have mixed land uses such as residential, commercial, industrial and institutional, or other uses at high to medium densities.

In predominantly rural Tyrrell County, the only area meeting this criteria is the Town of Columbia. Columbia provides all of the usual municipal services as well as water and sewer. In fact, the only municipal sewer service in the County is located in Columbia. As was presented in Section I, the water and sewer service supply is projected to be more than adequate throughout the planning period.

B. TRANSITION

Transition land is classified as those lands providing for future intensive urban development within the ensuing ten years on lands that are most suitable and that will be scheduled for provision of necessary public utilities and services. They may also provide for additional growth when additional lands in the developed class are not available or when they are severely limited for development.

Lands classified "transition" may include:

1. lands currently having urban services;
2. lands necessary to accommodate the population and economic growth anticipated within the planning jurisdiction over the next five to ten years;
3. areas which are in, or will be in, a "transition" state of development, i.e. going from a lower intensity to a higher intensity, of uses and will eventually require urban services.

Transition lands must further:

1. be served or be readily served by public water, sewer, and other urban services including public streets, and
2. be generally free of severe physical limitations for urban development.

The "transition" class should not include:

1. lands of high potential for agriculture, forestry, or mineral extraction, or land falling within extensive rural areas being managed commercially for these uses, when other lands are available;
2. lands where urban development might result in major or irreversible damage to important environmental, scientific, or scenic values, or;
3. land where urban development might result in damage to natural systems or processes of more than local concern; and
4. lands where development will result in undue risk to life or property from natural hazards or existing land uses.

The areas to be classified as "transition" in Tyrrell County include the areas immediately adjacent to the Town of Columbia which currently receive or are able to be served by the Town's municipal services. This area extends along US 64, both to the east of the Town and to the west for a short distance. However, another area which is not adjacent to Columbia but which has been developing more since the 1980 Land Use Plan and should also come under this classification, is the Rider's Creek area. Currently, the Rider's Creek area has central water from the County water system. If funds become available and it becomes economically feasible, the County would also like to see sewer service provided to this area. The land use analysis showed that there were generally suitable soils in this area, as well as a significant area considered "minimally flooded."

The relationship between the "developed and transition" classification is important in predominantly rural counties like Tyrrell. The first class is meant to define the already developed areas and/or those areas where public investment decisions will be required to provide the necessary urban services. These become important areas to closely monitor. The Coastal Resources Commission has further clarified this relationship as described below:

The Developed and Transition classes should be the only lands under active consideration by the County or municipality for intensive urban development requiring urban services. The area within these classes is where detailed local land use and public investment planning will occur. State and Federal expenditures on

projects associated with urban development (water, sewer, urban street systems, etc.) will be guided to these areas. Large amounts of vacant land suitable for urban development within the Developed class should be taken into account when calculating the amount of additional lands needed to accommodate projected growth.

C. COMMUNITY

The "Community" classification provides for clustered land uses to meet housing, shopping, employment, and public service needs within the rural areas of the County. It is usually characterized by a small grouping of mixed land uses which are suitable and appropriate for small clusters of rural development not requiring municipal sewer service.

This is an important classification in Tyrrell County, since most of the County's population not residing in the areas classified previously as either "Developed" or "Transition," live in such clusters. There are no other incorporated municipalities in Tyrrell County, other than Columbia, but many small communities are located along the primary roads in the County. Areas classified as "Community" include: Travis, Goat Neck, Alligator, Gum Neck, Kilkenny, and Ft. Landing. Also, the waterfront developing areas of Colonial Beach and the River Neck area should also be considered "Community." All of these areas except Alligator currently are serviced by the County water system. Although classified as "Community," the Alligator community needs to be provided centralized water service in order to mitigate potential health problems resulting from the use of relatively shallow wells.

D. RURAL

The "Rural" class provides for agriculture and forest management, mineral extraction and other low intensity uses on large sites including residences where urban services are not required and where natural resources will not be unduly impaired. These are lands identified as appropriate locations for resource management and allied uses; land with high potential for agriculture, forestry or mineral extraction; lands with one or more limitations that would make development costly and hazardous; and land containing irreplaceable, limited, or significant natural, recreational or scenic resources not otherwise classified.

The majority of land within Tyrrell County falls within the "Rural" classification. This classification is very important in Tyrrell County, because of the economic importance of agriculture and forestry activities. Also, within the planning period, mining of peat deposits within the County is also anticipated to assume increased significance.

E. Conservation

The final land use category, according to CAMA guidelines, is the "Conservation" class, which provides for effective long-term management of significant, limited, or irreplaceable resources, specifically, and at minimum, all of the statutorily defined AECs. However, beyond the presence of AECs, other areas within the County, because of natural, cultural, recreational, productive, or scenic value, may also require similar "effective long-term management." Examples could include major wetlands (other than statutorily defined coastal wetlands); essentially undeveloped shorelines that are unique, fragile, or hazardous for development; lands that provide necessary habitat conditions (especially for remnant species); pocosins; or publicly owned water supply watersheds and acquifers.

The designation "Conservation" should not be misconstrued to imply "non-use," but does imply a need for careful and cautious management of any allowable use. For example, within a "conservation" area, there may be high ground areas which are suitable for "development," in which case development should be allowed to take place under carefully managed conditions. The term "preservation," on the other hand, implies total restriction on all uses. Within lands designated Conservation, each proposal, or application for any "developed" use should be reviewed on a case by case basis.

The Board of Commissioners of Tyrrell County recognizes that additional areas of Tyrrell County could be considered by some to have special features conducive to being placed in the Conservation classification. However, since most of these lands are held in private ownership, the County does not wish to impose undue and unnecessary restrictions on the use of private lands. The overall premise for the designation "Conservation" in Tyrrell County, will be to strike the delicate balance between careful long-term management of sensitive or valuable resources and the freedom of landowners to utilize their properties.

Therefore, in Tyrrell County, the environmentally sensitive areas identified as Areas of Environmental Concern (AECs), i.e., Estuarine Waters, Estuarine Shorelines, and Public Trust Areas are classified as "Conservation." There are no significant coastal wetlands, or "salt marshes" in Tyrrell County. However, outside of these Areas of Environmental Concern, the primary designation of "Conservation" areas in Tyrrell County will be for the purpose of sustaining shoreline stability and protecting water quality, along the County's estuarine waterways, i.e. the Alligator and Scuppernong Rivers and related creeks and tributaries such as Alligator, Second, Juniper, and Rider's Creek, and the southwest and northwest forks in the southeast portion of the County.

Specifically, designated conservation areas shall include land areas extending to approximately 1/4 mile, i.e. 1,320 linear feet on either side of the banks of these waterways. Along the Albemarle Sound shoreline, conservation lands shall consist of specific soil types with known nutrient or pollutant filtering qualities, specifically Dorovan Muck, and Chowan Silt (numbers 38 and 39, respectively, according to the Special Soil Survey Report for Tyrrell County, 1982, prepared by the U.S.D.A. Soil Conservation Service) will be so designated, when they occur within 1/4 mile of the waterway, or 1,320 linear feet inland (See Land Classification Map). This natural riverine floodplain buffer will help sustain shoreline stability and contribute to water quality. It should be noted that this soil information was not available during preparation of the 1980 Plan Update.

Also included in this classification is the recently designated federally managed Alligator River National Wildlife Refuge, and shorelines around the Frying Pan. North of the Frying Pan (from Goose Creek) and around the Frying Pan and along the southeast shoreline of the Alligator River to the northwest fork, in addition to Dorovan Muck, the soil type, Pungo Muck, identified in the 1982 Special Soil Survey, is also considered to have suitable filtering properties. Dorovan Muck, Chowan Silt, and Pungo Muck all have severe limitations for any "developed" use, including agriculture. The County will view any proposed use of these areas with caution.

Since, as stated previously, "Conservation" does not imply "Preservation," specific allowable uses in the Conservation class shall include:

1. Drainage: Adequate drainage is essential to the economic vitality of Tyrrell County; therefore, drainage facilities over and through these areas, but not with the intent of draining the Conservation areas for "developed" purposes, will be allowed. Such facilities may include diking, tiling, and piping systems.

2. Low density residential development if and as allowed by the County Health Department and the U. S. Soil Conservation Service. However, water and sewer services will not be extended to such a residential area merely to stimulate additional growth and development. On-site services will be required.

3. Water-oriented uses such as piers, docks, and marinas, if they are shown not to cause detriment to the estuarine waters or the Conservation lands.

4. Necessary utility service lines, such as water, sewer, electrical, natural gas, etc., when it is demonstrated that the ecological system of the Conservation estuarine

area will not be significantly altered. (As noted in Item 2 above, development of and/or extension of necessary utilities and services will not be done merely as a stimulus for additional growth and development, only to the extent needed).

5. Roadways, when construction of roadways can be conducted without significantly altering the ecological system, and in compliance with existing federal, state, and local regulations.

6. Timber harvesting with approved management practices.

7. Barge landings.

8. Marinas (upon careful determination that substantial pollution will not occur).

In conjunction with the Policy Statements section of this Plan, each application for a "developed" use in the Conservation classification, shall be brought before the County Planning Board and reviewed on a case by case basis prior to approval. The County Planning Board may recommend modification of the Proposal.

F. LAND CLASSIFICATION SUMMARY

The proposed classification of land for varying levels of intensity and provision of public services in Tyrrell County were presented in parts A through E, above. These classifications relate directly to the "policy statements" contained in Section II of this Plan. Additional information on the relationship between the land classification system and policies will be presented in the following Section IV.

SECTION IV
RELATIONSHIP BETWEEN POLICIES AND LAND CLASSIFICATIONS

SECTION IV: RELATIONSHIP OF POLICIES AND LAND CLASSIFICATIONS

As required by the Coastal Area Management Act, the land use plan must relate the policies section to the land classification map and provide some indication as to which land uses are appropriate in each class.

A. DEVELOPED AND TRANSITION CLASSES

As mentioned in the discussion of existing conditions, most of the County's growth will occur around the developed community of Columbia, in both the Columbia and Scuppernong Townships. This is the area where basic services such as water, sewer, and community support services are available or might be feasible within the planning period. The developed and transition classes were specifically designated to accommodate these more intensively developed areas and land uses, including residential, commercial, industrial parks and open space, community facilities and transportation. Hazardous or offensive uses such as land application systems, power plants, airports and bulk chemical storage facilities will be located away from these classes.

B. COMMUNITY CLASS

Intensive development will not be encouraged in this class due to the lack of urban services and/or physical limitations. The general range of acceptable uses are limited to residences, isolated general and convenience stores and churches, and other public facilities. These areas are usually found at crossroads within the "rural" classification. Most of these areas are currently served by the County water system, and because of the low-density development, do not require centralized sewage collection and disposal. The Alligator community does not receive County water because of economic infeasibility. However, because of the potential health threat, this area needs to have centralized water if it becomes economically feasible.

C. RURAL CLASS

The rural class is the broadest of the land classes and is designated to provide for agriculture, forest management, mineral extraction and other low intensity uses. Residences may be located within the rural class where urban services are not required and where natural resources will not be permanently impaired. Some large developments may be encouraged in the rural class when there is an absence of otherwise suitable land within the development and transition classes and/or when there is a possible threat to the urban populace. Such large developments include airports and power plants. The County also reserves the privilege of allowing specific types of industrial development in the rural areas if in the opinion of the government there will be no harmful or adverse effects from such a location.

D. CONSERVATION CLASS

The conservation class is designated to provide for effective long-term management of significant limited or irreplaceable areas which include Areas of Environmental Concern (undeveloped shorelines that are unique, fragile, or hazardous for development), and publicly owned gamelands and parks and undeveloped forest lands and cultural and historical sites. Development in the estuarine system should be restricted to such uses as piers, bulkheads, marinas, and other water-dependent uses. Policy Statements under Resource Protection, and Resource Production and Management in Section II of this plan address the County's intentions under this class. Also, a more detailed discussion of the Conservation classification, along with permissible uses, is included in the preceding Section III.

SECTION V: INTERGOVERNMENTAL COORDINATION:

SECTION V: INTERGOVERNMENTAL COORDINATION

Throughout the development of this Plan, effort was made to make the policies consistent and compatible with other local, State and Federal requirements. Implementation of the Plan will likewise follow the same intergovernmental concern.

APPENDIX A

Preliminary Overview of Peat Mining Operations

In large areas of northeastern North Carolina, the surface is covered by accumulations of organic matter commonly referred to a peat. Such peat accumulations, if covered by mineral sediment and left for several hundred thousand years, will form coal. The peat lands in Tyrrell County support a vegetative cover of broad leaf evergreen shrubs and occasionally mixed hard wood forest. As agricultural soils, most "fuel quality" peatlands are of poor quality. They contain large quantities of buried wood (as much as 15% by volume) throughout the organic depth and they are very acid. Peat bogs offer limited habitats for waterfowl and marginal habitats for deer, bobcat and bear. Because peat in Tyrrell County and the adjoining counties has energy values similar to lignite coal, it can be used as a fuel when dried of its excess moisture content. In the Soviet Union, Finland and Ireland, peat supplies a portion of the total energy requirement for electrical power generation. Peat is a versatile fuel. In addition to being burned directly, it can be gasified and converted to methanol and it has been mixed with oil or coal to extend these sources of energy.

Peat Proposal in North Carolina

First Colony Farms owns 120,000 acres of peat reserves spread over four counties in northeastern North Carolina. These peat reserves are estimated to yield a harvest of approximately 165 million dry tons of peat. Each ton, in turn, promises to yield about 10,200 BTU's per pound. The energy of these reserves is equi-

valent to that of 350 million barrels of fuel oil or 135 million tons of good grade eastern coal. Put in another perspective, the peat reserves are sufficient to fuel a 800 megawatt power plant for 59 years or a 5,000 ton per day methanol plant for 36 years.

In September, 1978 First Colony Farms (FCF) was granted a permit from DNRCD, Division of Land Resrouces, to operate a peat mine on 405 acres designated as "Experimental Peat Mine, #1". In 1979 FCF applied for a permit to mine 32,750 acres of peat in Washington, Tyrrell and Hyde Counties. The proposal calls for strip mining the land to a depth of 5.5 feet and a reclamation of the land for agricultural purposes, particularly for row crops. A draft permit was tendered to FCF for mining of 15,012 acres. At least two other smaller companies have applied for a permit to mine peat in Hyde County; one is to produce a commercial horticultural peat product and the other is for energy related uses.

First Colony Farms has spent most of its efforts to date in developing the equipment and procedures for harvesting peat from its natural environment and testing reclamation procedures following peat harvest. Raw peat contins roughly about 85% moisture. To be used as a fuel, peat needs to be dried to or below 50% moisture. To remove this excess moisture by artificial means would consume as much energy as could be generated. Consequently, the excess moisture is driven away in the field by solar heat. Equipment and procedures utilized by the Soviet Union and Finland to field dry and harvest peat were tried in 1978 by FCF. Most of the pre-existing equipment could not cope with the large wood (size and quantity) found throughout the

depths of North Carolina peats, therefore new equipment and procedures for drying and harvesting peat have required development. Two field drying and harvesting approaches have resulted. Both procedures incorporate the residual wood with the peat instead of trying to remove the wood before drying and harvesting the peat. One is referred to as the "sod peat" method. The procedure utilizes circular saws which cut through the soil 12-16 inches deep, propelling a mixture of raw peat and wood chipa upward into an auger which compresses and expels the mixture through a round extruding head. The extruded material (sods) sun dries and is harvested. The second procedure is the old milled peat procedure where the residual buried wood is ground in place to a depth of about 4" at a time and the resulting peat and chips are harvested in approximately 1/2 inch increments as the land surface dries.

In order to operate one (1) 400 MW power plant, FCF would need approximately 2.6 x 10^9 tons per year of peat. To obtain a working unit, 5,562 acres would have to be cut to a depth of 10.5 inches annually. After five years, the working tract would be exhausted and the tracts would be moved to a new site. Originally these large tracts would be divided into six smaller tracts of 927 acres--each with equipment, access and drainage.

In order to move the peat from each working unit to the powerplant, FCF proposes to use either trucks, a train or conveyor. FCF estimated that the total payroll to harvest and operate the peat for one 400 MW plant would be 182 persons. If the land is reclaimed, it should not in fact depreciate in worth. Local tax revenues could be expected from the land and the equipment as well as secondary revenues from purchases of employees, both real estate, personalty and a share of the sales tax.

By and large, real estate tax revenue should account for 60 to 70% of revenue from all sources. Additional revenue could be provided if the municipality were to find a method to tax the removal of resources (something which has been accomplished in many other states). In the event that a powerplant is located within the county, it will also provide perhaps as many as 100 jobs following construction and add significantly to the tax base. Sales between the FCF and the utility will generate additional revenues. (A complete study of these secondary effects ought to be initiated.)

The Environment

In order to assess the effects of the project, we should attempt to understand the nature of the natural systems.

General Character. The region in which fuel quality peat resources exist includes a significant part of the Albemarle-Pamlico peninsula and especially a large part of Tyrrell County. The region contains the largest contiguous tract of peat lands in North Carolina. (Heath, 1975) (Ingram and Otte, 1980).

Physiography. The dominant feature of the region is its gradual slope. Elevation on the peninsula ranges from 20 feet to sea level. 66% of the area is below 5 feet above m.s.l. The Phelps peat bog occupies relatively high ground at 12 feet above m.s.l.

Hydrology. The entire natural area is termed "swampland" and ridden. Prior to drainage, natural runoff is by "sheetflow" to a few small creeks which ultimately flow to bays and sounds. (Heath, 1975)

Soils. The region is made up of three general soil classifications: mineral, shallow organic and deep organic. The deep organic soils

typically exhibit an organic surface greater than 51 inches deep. Most of the deep organics range from 5 to 8 feet, but there are a few channels containing peat up to 19 feet thick. Most of the peat is moderately to highly decomposed with low ash content (2-5%). (Ingram and Otte, 1980). Shallow organic soils have an organic surface depth of 16 to 51 inches. No more than half of these soil areas possess "fuel quality peat containing less than 15-20% ash.

Almost all of the deep organic soils are composed of the Pungo and Dare soil series. The shallow and deep organic soils are formed over mineral marine sediments low in base saturation. The result is these soils are low in bases (calcium and magnesium), therefore the pH of the organic material is very acid (pH 3.5 to 3.9). By use of pollen and carbon dating techniques, it is proposed that these organic surfaces began accumulating in their wet envirohment about 9000 years ago at the end of the Wisconsin glacial period (Dolman and Buol, 1967).

Climate. The region is subject to a humid subtropical climate. It receives 50+ inches of precipitation per year and loses 36 inches to evapotranspiration, leaving a yearly surplus of 15 inches. Soil moisure is lowest in June to September due to the high evapotranspiration rate during this period. Wind speeds prevailing from the southwest average 9-12 mph (Clay, et. al, 1978). Wind direction varies greatly with seasons, however.

Vegetation. The region is covered by pocosin vegetation which occurs in broad flat uplands. Dominant species are broad leafed evergreen shrubs. Variability of species varies through the bog community. Increased drainage can cause some shift in the dominant association, originally cyrilla racemiflora to ilex glabra and myrica heterophylla

(Kologiski, 1977). Repeated fires have also had a great influence on existant vegitation in many areas. There appears to be few endangered or threatened plant species in the region.

Wildlife. The peat mining areas are adjacent to important wildlife habitats. High bog locations provide limited waterfowl potential and marginal habitat for deer, bobcat and bear.

The Effects of Mining

Land Preparation. The first site to be mined (Phelps Peat Bog) by FCF is already diteched. All other areas have at least part of the primary drainage installed by previous land owners. Ditches are proposed to be installed two years before mining activity is to commence. After drainage, any existing commercial timber is to be removed and remaining shrub vegetation is cleared by bulldozers.

The environmental effects from land preparation for peat are similar to the effects of agricultural preparation minus the influences of liming, fertilizer and pesticide applications. The most profound impact is the elimination of terrestrial communities on the site. The completed drainage system will lower the water table. A three-year study conducted by Skaggs, et. al., on the "Effect of Agricultural Land Development on Drainage Waters in the North Carolina Tidewater Region" showed that average annual water tables on developed soils are approximately 12 inches lower than on undeveloped soils. The soil types studied included the shallow and deep organics in Tyrrell and Washington Counties. This study also showed that there was basically no difference in total flow of water from developed and undeveloped soils, but the primary influence of drainage was that the flow rate (that amount that

did drain from the land) increased 3½ times with agricultural development. Since there are no plants growing on the land during peat harvest, there will be induced evaporation from the land but there will be no transpiration. Therefore, there should be a slight increase in total flow from these areas until peat harvest is completed and the land put into agricultural production. The influence of total increase in freshwater flow is questionable since the number of acres involved in active peat harvest at any one time is not extensive in relative terms. Peat harvest on lands in Tyrrell and Dare Counties will drain ultimately into the Alligator River which is fresh to brackish. This drainage will be by pump which will be discharged into standing swamps at least ½ mile before reaching the receiving streams. Such practices are known to serve as effective filters for dissolved and suspended material in drainage waters and will also influence the flow rate entering streams. Therefore, the influence of mining and agriculture on water quality is anticipated to be small. Such possible changes should and will be studied and monitored.

Mining. Maximum area being mined at one time is 10,000 acres (one plant). Areas are expected to decline in elevation gradually. As peat is removed, canals will ultimately have to be deepened. Peat mining will create a new lower-lying landform by the amount of depth equal to and not exceeding the thickness of the fuel quality peat.

Wind erosion may be noticeable during the mining period. Since the colloidal organic material dries and forms a coarse, chaffy surface, most of the airborne particles will be that which is stirred up by traffic activity during harvest.

Reclamation Period. Once peat mining is complete and the land

is converted to agriculture (the anticipated land use following reclamation), the quality of drainage waters will be similar to that of the dark surface mineral soils which are presently being cultivated in Tyrrell County. Drainage waters from such soils are shown to have slight increases in sediment load. Dissolved oxygen, biochemical oxygen demand, temperature, pH and other water quality parameters are measurably affected as compared to undeveloped areas, but the changes are relatively small. Other parameters that change but have no apparent effect on water quality are Ca, Mg, K, Na and Cl concentrations. Nitrogen content in drainage waters from these soil types also increases slightly, but remain lower than the content found in any other agricultural soil types (Skaggs, et. a., 1980).

The resulting water level will be lowered by that depth or thickness of peat which has been removed by mining plus the 10 to 12-inch average annual water table drop that results from developed vs. undeveloped land use. This represents a reduction in present hydraulic head, but the influence of such reduction is of intense debate since the mineral substrata is imbedded with many impervious layers.

APPENDIX B

TYRRELL COUNTY
Board of Commissioners

RESOLUTION

WHEREAS, the citizens of Tyrrell County have consistently shown their strong support for the military, and;

WHEREAS, it is not in the best interest of the military, the civilian population, the environmental effects to this region, economic development of this region, and cost effectiveness, now;

THEREFORE, be it resolved that the following military restricted and Military Operation Areas (MOA's) be changed as follows:

I. Delete the following special use air space:

(a) R-5301 A, B, C and R-5302 (Harvey Point)

(b) R-5313 (Stumpy Point)

(c) Stumpy Point MOA

(d) Pamlico A MOA

(e) Pamlico B MOA

(f) VR - 73 (low level mil. training route)

(g) VR - 1057 (low level mil. training route)

(h) VR - 1058 (low level mil. training route)

(i) VR - 1758 (low level mil. training route)

(j) VR - 85 (low level mil. training route)

(k) Hatteras F MOA (low level mil. training route)

II. Install a radar system to provide low altitude air traffic advisory service in eastern North Carolina. Specifically, fill the radar "GAP" existing between Cherry Point and Oceana Approach Control. The "GAP" area is currently controlled by Washington Center.

III. Restructure, (reduced the size), the physical dimensions R-5314 (Dare Range) and R- 5306A (Cherry Point) to provide for safe turn radiuses, entry and egress corriders.

IV. Restructure R-5306C and D to provide a corrider along the coast from W-122H to 2 NM inland, from ground level to 3000 feet.

This resolution duly voted and authorized by the Tyrrell County Board of Commissioners on October 15, 1985.

I, Kim V. Suter, Clerk to the Board of Commissioners of Tyrrell County, North Carolina, Do Hereby Certify That the Foregoing Resolution was Adopted by Said Board in its Session of October 15, 1985, And the Same Appears in the Minutes of Said Session. In Witness Whereof, I have Hereunto Set My Hand and the Seal of Said Board This October 15, 1985.

Kim V. Suter

Kim V. Suter, Clerk

MAPS

NOAA COASTAL SERVICES CENTER LIBRARY
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