

# BRUNSWICK COUNTY



## CAMA CORE LAND USE PLAN EXECUTIVE SUMMARY

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BRUNSWICK COUNTY  
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EXECUTIVE SUMMARY

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## EXECUTIVE SUMMARY

### **1. PREFACE**

Brunswick County faces many challenges. From 1980 to 2000 the County grew from 35,774 to 73,154 population, a 104.5% increase. North Carolina's population increased from 5,880,095 to 8,049,313, a 36.8% increase. Brunswick County is now the fourth fastest growing county in North Carolina.

This explosion of growth is complicated by the County's diversity. Brunswick County has:

- ▶ a developing industrial base
- ▶ a strong tourism economy
- ▶ significant natural resources
- ▶ strong construction and retail trade economies
- ▶ rapidly developing municipalities
- ▶ an important transportation system with good regional connections

Residents from other parts of the United States are moving to North Carolina at the fifth highest rate in the nation, and the state's overall growth rate is the sixth highest in the nation. Brunswick County is being directly impacted by this growth rate.

The swiftly changing demographics, demands for infrastructure, affordable housing, and public service needs will leave Brunswick County with fiscal challenges. The trends facing the County include:

- ▶ Rapid population growth.
- ▶ Influx of seasonal vacationers and retirees attracted to the county's natural resources.
- ▶ Scattered development of vacation homes, which leads to expensive county services delivery.
- ▶ Long-time residents may experience higher taxes, adverse environmental impacts, decline of traditional economics, and cultural conflicts between newcomers and long-time locals.
- ▶ Water quality, rapid development, and redevelopment after natural hazards all present challenges.

In order to respond to the complex issues which confront Brunswick County, this plan should comprehensively set goals and objectives for the county. It should provide for a continuous

planning process which is timely and responsive to the needs and desires of Brunswick County. Finally, the plan should provide a legal basis for land use regulations and a guide for capital improvements planning.

Once the plan is prepared, the county must realize that the plan is not the end of the process. The County must continuously work at accomplishing plan implementation and establishing an effective planning program. Brunswick County must view the preparation of this document as the first step in a continually evolving process.

This plan is organized to adhere to the 15A NCAC 7B requirements. This is a Core Land Use Plan. The Core Plan is defined as follows:

**Core Plan:** This plan addresses all of the plan elements in Rule .0702 of Section 7B (Elements of CAMA Core and Advanced Core Land Use Plans) in a complete and thorough manner. These are summarized as follows: (1) Organization of the Plan, (2) Community Concerns and Aspirations, (3) Analysis of Existing and Emerging Conditions with the jurisdiction, and (4) Plan for the Future. This type of plan is the standard CAMA Land Use Plan required for all 20 coastal counties.

The reader should not attempt to understand the plan by reading only several sections of the document. All sections of the plan are inter-related.

## **2. INTRODUCTION**

This Fiscal Year 2004/2005 - 2005/2006 Brunswick County Core CAMA Land Use Plan is prepared in accordance with the requirements of the North Carolina Coastal Area Management Act (CAMA). Specifically, this document complies with Subchapter 7B, "CAMA Land Use Planning Requirements," of the North Carolina Administrative Code, as amended, August 1, 2002. This plan was prepared at a time when Brunswick County was undergoing tremendous fiscal and social change.

The 7B guidelines provide that each of the twenty coastal counties and the municipalities within those counties prepare and adopt a Core CAMA Land Use Plan that meets the planning requirements adopted by the Coastal Resources Commission (CRC). If a County chooses not to prepare a plan, the guidelines specify that the CRC will prepare and adopt a CAMA Land Use Plan for that County and the municipalities in the County which choose not to prepare their own plan. Municipalities not preparing their own plan will be included in the plan for the County in which the municipality is located. The following municipalities participated in the development of this plan: Belville, Boiling Spring Lakes, Carolina Shores, Northwest, and Saint James.

In general, 7B requires that a plan include analysis of existing and emerging conditions. This plan includes information regarding population, housing, and economy, a natural systems analysis, existing land use, a description of community facilities, a land suitability analysis, and a review of current plans, policies, and regulations to fulfill that requirement. This section of the plan also includes extensive mapping. The plan is also required to have a plan for the future. To meet that requirement, this plan includes community facility demand information, a future land use plan, and specific land use/development goals/policies. Finally, the plan has tools for managing development. The management tools must specify the actions that Brunswick County will take to implement this plan.

Brunswick County adopted a Citizen Participation Plan which is intended to ensure that all interested citizens have an opportunity to participate in the development of this plan through both oral and written comments. An ad hoc committee was appointed by Brunswick County to oversee the development of this plan. The committee included representatives of the participating municipalities, one Brunswick County Planning Board member and three at-large representatives from Brunswick County.

Following adoption of the plan by the Brunswick County Board of Commissioners, it was submitted to the CRC for certification. Certification of the plan was achieved on November 30, 2007.

### **3. BRUNSWICK COUNTY VISION STATEMENT**

Brunswick County prepared a 1998 CAMA Land Use Plan which was certified by the North Carolina Coastal Resources Commission on November 20, 1998. In addition, in 2003-2004, the County prepared the Brunswick Tomorrow plan which presents a future vision for Brunswick County. The following vision statement is a combination of these two efforts.

Brunswick County shall seek to preserve and enhance its natural and human resources. The County will plan for and accommodate future growth while simultaneously maintaining the quality of life for current and future residents. Brunswick County will pursue accomplishment of the following mission statements:

- ❖ Set high standards for responsible, well managed growth, and guide development patterns through comprehensive planning and community involvement.

- ❖ Develop a high degree of cooperation among County government and municipal governments and citizens.
- ❖ Promote quality education and lifelong learning opportunities in Brunswick County.
- ❖ Identify goals and propose strategies for the development of new businesses and industries, agribusinesses, seafood products, tourism, and recreational and retirement areas in all parts of the County.
- ❖ Provide an infrastructure system that meets the present and future needs of its citizens, supports a vibrant economy, protects the environment, and adds to the overall quality of life.
- ❖ Provide county-wide services that enhance the health, safety, and quality of life for Brunswick County citizens.
- ❖ Enable Brunswick County residents to meet their needs for food, clean water, clothing, housing, employment, health care, and life enrichment activities.
- ❖ Preserve and protect our natural and man-made environment for present and future generations.

#### **4. KEY ISSUES**

The following summarizes key issues confronting Brunswick County:

- ▶ Scattered and sprawling large lot subdivision activity.
- ▶ Unplanned commercial strip development.
- ▶ Sewage problems/sewage solutions.
- ▶ Concern with storm water runoff and drainage.

These issues were reviewed and supplemented at a public information meeting on December 5, 2005, attended by over 20 members of the public and Brunswick County officials. The following provides a listing of the key issues identified, ranked in priority order:

1. Evacuation plan – response time (potential flood)
2. Inadequate roads
3. Stormwater with drainage/flooding
4. Protection of water quality (surficial water)
5. Proper funding for infrastructure
6. Maintenance of ICW
7. (Cumulative impacts) – Define purpose of water, sewer, schools, fire in Technical Review Committee process – Review on regional level
8. Shoreline access
9. Inadequate emergency services (funding support)
10. Imposition of impact fees
11. Clean drinking water in rural areas
12. Impact of Skyway Bridge
13. Impact of third nuclear plant in Brunswick County
14. Provide affordable housing
15. Establish vegetative line on oceanfront property
16. Transportation – senior citizens

In November, 2005, a total of 4,580 surveys were randomly mailed to absentee property owners; this was approximately 10% of the absentee property owners. The following summarizes the survey distribution and responses received:

	<u>Mailed</u>	<u>Received</u>	<u>% Returned</u>
Northwest	48	7	(14.6%)
Belville	66	16	(24.2%)
Carolina Shores	354	92	(26.0%)
St. James	372	122	(32.8%)
Boiling Spring Lakes	567	124	(21.9%)
County	3,173	842	(26.5%)
TOTAL	4,580	1,203	(26.3%)

Source: Holland Consulting Planners, Inc.

The specific results of the surveys are summarized below.

BRUNSWICK COUNTY

<u>KEY ISSUES</u>	<u>RANK</u>
Sewage problems/sewage solutions . . . . .	1
Brunswick County should protect its natural environment . . . . .	2
Responsible managed growth . . . . .	3
Brunswick County should promote quality education for present and future generations . .	4
Preserve and protect wetlands from development pressure . . . . .	5
Concern with stormwater runoff and drainage . . . . .	6
Unplanned commercial strip development . . . . .	7
Scattered and sprawling subdivision activity . . . . .	8
Expand employment opportunities . . . . .	9
Improve the availability of affordable housing . . . . .	10

BELVILLE

<u>KEY ISSUES</u>	<u>RANK</u>
Brunswick County should promote quality education for present and future generations	1
Sewage problems/sewage solutions . . . . .	2
Responsible managed growth . . . . .	3
Concern with stormwater runoff and drainage . . . . .	4
Expand employment opportunities . . . . .	5
Scattered and sprawling subdivision activity . . . . .	6
Brunswick County should protect its natural environment . . . . .	7
Unplanned commercial strip development . . . . .	8
Preserve and protect wetlands from development pressure . . . . .	9
Improve the availability of affordable housing . . . . .	10

BOILING SPRING LAKES

<u>KEY ISSUES</u>	<u>RANK</u>
Sewage problems/sewage solutions . . . . .	1
Responsible managed growth . . . . .	2
Brunswick County should promote quality education for present and future generations	3
Brunswick County should protect its natural environment . . . . .	4
Unplanned commercial strip development . . . . .	5
Scattered and sprawling subdivision activity . . . . .	6
Concern with stormwater runoff and drainage . . . . .	7
Expand employment opportunities . . . . .	8
Preserve and protect wetlands from development pressure . . . . .	9
Improve the availability of affordable housing . . . . .	10

CAROLINA SHORES

<u>KEY ISSUES</u>	<u>RANK</u>
Responsible managed growth . . . . .	1
Brunswick County should promote quality education for present and future generations	2
Sewage problems/sewage solutions . . . . .	3
Brunswick County should protect its natural environment . . . . .	4
Unplanned commercial strip development . . . . .	5
Preserve and protect wetlands from development pressure . . . . .	6
Concern with stormwater runoff and drainage . . . . .	7
Scattered and sprawling subdivision activity . . . . .	8
Expand employment opportunities . . . . .	9
Improve the availability of affordable housing . . . . .	10

NORTHWEST

<u>KEY ISSUES</u>	<u>RANK</u>
Sewage problems/sewage solutions . . . . .	1
Brunswick County should promote quality education for present and future generations	2
Expand employment opportunities . . . . .	3
Responsible managed growth . . . . .	4
Concern with stormwater runoff and drainage . . . . .	5
Brunswick County should protect its natural environment . . . . .	6
Improve the availability of affordable housing . . . . .	7
Unplanned commercial strip development . . . . .	8
Preserve and protect wetlands from development pressure . . . . .	9
Scattered and sprawling subdivision activity . . . . .	10

ST. JAMES

<u>KEY ISSUES</u>	<u>RANK</u>
Responsible managed growth . . . . .	1
Sewage problems/sewage solutions . . . . .	2
Unplanned commercial strip development . . . . .	3
Concern with stormwater runoff and drainage . . . . .	4
Brunswick County should protect its natural environment . . . . .	5
Brunswick County should promote quality education for present and future generations	6
Preserve and protect wetlands from development pressure . . . . .	7
Scattered and sprawling subdivision activity . . . . .	8
Expand employment opportunities . . . . .	9
Improve the availability of affordable housing . . . . .	10

There are similarities in the identification of the top ranked issues:

- Sewage problems/sewage solutions
- Managed growth
- Quality education
- Protection of natural environment
- Expedited employment opportunities

## 5. POPULATION SUMMARY

Historical population growth and forecast of population growth are summarized in the following tables.

**Table 1.**  
**Brunswick County Population Growth, 1980-2005**

Municipality	Total Population				% Change			Overall 1980-2005
	1980	1990	2000	2005 Estimate	1980- 1990	1990- 2000	2000- 2005	
Belville	102	66	363	445	-35.3%	450.0%	22.6%	336.3%
Boiling Spring Lakes	998	1,650	2,972	3,767	65.3%	80.1%	26.7%	277.5%
Carolina Shores*	0	1,031	1,482	2,536	N/A	43.7%	71.1%	145.9%
Northwest*	0	611	671	776	0.0%	9.8%	15.6%	27.0%
St. James**	0	0	804	1,873	0.0%	0.0%	132.9%	132.9%
Brunswick County	35,777	50,985	73,141	89,469	42.5%	43.5%	22.3%	150.1%

\*This municipality incorporated or reactivated between the 1980 and 1990 censuses. The overall percent change reflects 1990-2005.

\*\*This municipality incorporated between the 1990 and 2000 censuses. The overall percent change reflects 2000-2005. It should be noted that the Town of Saint James paid for a special census to be completed as a result of some annexations that occurred after the 2000 Census was taken. The special census, dated June 10, 2004, reflects a census count of 1,831 persons. Municipalities may challenge a census count within three years of when the census is taken in order to have the population changed. The special census taken for Saint James was completed after that time period, and therefore the official decennial census count was not changed. However, the state demographer gave Saint James an updated census count of 1,814. This figure was based on the town's boundaries, including the 2001 annexed areas. (This information was obtained from the North Carolina State Data Center.)

Source: US Census Bureau.

**Table 2.**  
**Brunswick County Population Projections, 2000-2025**

Location	2005	2010	2015	2020	2025	Overall % Change
Belville	445	556	723	940	1,222	+175.0%
Boiling Spring Lakes	3,767	4,332	4,982	5,729	6,588	+74.8%
Carolina Shores	2,536	2,916	3,353	3,856	4,434	+74.8%
Northwest	776	854	939	1,033	1,136	+46.0%
St. James	1,873	2,341	2,926	3,658	4,573	+144.0%
Brunswick County	89,469	102,799	115,517	127,265	139,212	+55.6%

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

The following provides a summary of the significant demographic factors:

- ▶ Brunswick County ranked fourth in the state for total population growth (11.9%) between 2000 and 2003 and also ranked fourth in the state for net migration (11.3%) during the same period.
- ▶ In 2003, the municipalities of Belville, Boiling Springs Lakes, Carolina Shores, Northwest and Saint James had a total estimated population of 8,291 or 27.7% of the county's municipal population and 10.1% of the county's overall population.
- ▶ The overall percentage of the white population in Brunswick County increased by almost six percent (5.8%) between 1980 and 2000 while the non-white percentage decreased from 23.5% in 1980 to 17.7% in 2000.
- ▶ Brunswick County experienced a population increase in every age group, but the percentage of the population under 35 decreased.
- ▶ 33.4% of Brunswick County's population had high school degrees compared to 28.6% for the state. In addition, 5.2% of the county's population had graduate/professional degrees compared to 2.5% for the state's population.

## **6. HOUSING SUMMARY**

- ▶ Based on the 2000 U.S. Census, Brunswick County has a total of 51,431 dwelling units, an increase of 38.5% since 1990.
- ▶ The County's seasonal housing increased from 12,737 in 1990 to 16,376 in 2000.
- ▶ The municipalities of Belville, Boiling Spring Lakes, Carolina Shores, Northwest, and Saint James are primarily occupied by year-round residents.
- ▶ Compared to other selected North Carolina coastal counties, Brunswick County has a higher percentage of mobile homes in its housing inventory and a relatively lower percentage of dwelling units connected to public sewer.
- ▶ Brunswick County's housing inventory is very young, with 85.3% of the housing inventory constructed since 1970.

## **7. EMPLOYMENT AND ECONOMY SUMMARY**

- ▶ While the County trails many other North Carolina counties in economic conditions, the economic indicators greatly improved from 1990 to 2000.
- ▶ In 2000, the County's median income exceeded that of the state by \$2,853.
- ▶ The construction industry is the largest employer in Brunswick County.
- ▶ Based on second quarter 2004 data, the largest producers of income in Brunswick County were retail trade, construction, and accommodation/food services.
- ▶ Agriculture continues to be a significant contributor to the Brunswick County economy.
- ▶ Because of in-County employment opportunities, Brunswick County residents have a low mean travel time to work.
- ▶ Tourism is a major contributor to the Brunswick County economy.
- ▶ Brunswick County has a rapidly expanding industrial base.

## **8. ENVIRONMENTAL CONDITIONS**

Brunswick County includes portions of the Cape Fear River Basin and the Lumber River Basin. These plans were approved by the North Carolina Division of Water Quality (DWQ) in October 2005 and December 2003, respectively. The following are the goals of DWQ's basinwide program:

- ▶ Identify water quality problems and restore full use to impaired waters.
- ▶ Identify and protect high value resource waters.
- ▶ Protect unimpaired waters, yet allow for reasonable economic growth.

These goals are accomplished through the following objectives:

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

This section will serve to take a closer look at land use in Brunswick County and how it relates to water quality. This section has been compiled with information provided by the North Carolina Division of Water Quality (DWQ). Under the Basinwide Management Program, the DWQ completes Basinwide Assessment Reports every five years to be utilized as a basis for the Basinwide Management Plans.

Basinwide water quality planning is a non-regulatory, watershed-based approach to restoring and protecting the quality of North Carolina's surface waters. Preparation of a basinwide water quality plan is a five-year process. While these plans are prepared by the DWQ based on data provided through the Basinwide Assessment Reports, their implementation and the protection of water quality entails the coordinated efforts of many agencies, local governments, and stakeholder groups in the state. The first cycle of plans was completed in 1994 for the Lumber River Basin and 1996 for the Cape Fear River Basin. Each assessment report and plan is updated at five-year intervals.

It should be noted that the results of the monitoring efforts are not intended to provide precise conclusions about pollutant budgets for specific watersheds. Since the assessment methodology is geared toward general conclusions, it is important not to manipulate the data to support policy decisions beyond the accuracy of the data.

Two primary methods of water quality testing were performed in Brunswick County. The details of this methodology are described below so that the information on the results of this testing can be better understood. The methods utilized were Benthic Macroinvertebrate Monitoring and the Ambient Monitoring System. DWQ also observes water bodies for the existence of algal blooms, which are an indication of poor water quality.

Benthic macroinvertebrates are organisms, primarily aquatic insect larvae, which live in and on the bottoms of rivers and streams. The use of macroinvertebrate data has proven to be a reliable water quality monitoring tool because most macroinvertebrates are immobile and sensitive to subtle changes in water quality. Benthic communities also respond to, and show the effects of, a wide array of potential pollutant mixtures.

The Ambient Monitoring System (AMS) is a network of stream, lake, and estuarine (saltwater) water quality monitoring stations (about 420 statewide) strategically located for the collection of physical and chemical water quality data (or parameters). Water quality parameters are arranged by freshwater or saltwater water body classification and corresponding water quality standards. Under this arrangement, Class C waters are assigned minimum monthly parameters, with additional parameters assigned to waters with classifications such as trout waters and water supplies.

Prolific growths of phytoplankton, often due to high concentrations of nutrients, sometimes result in “blooms” in which one or more species of alga may discolor the water or form visible mats on the water's surface. Blooms may be unsightly and deleterious to water quality causing fish kills, anoxia, and taste and odor problems.

As existing and future land use is considered in Brunswick County, these goals and objectives should be kept in mind.

It should be noted that DWQ concluded that its current coastal stormwater rules have not been adequately effective towards addressing water quality impacts to public trust waters. DWQ's review of scientific studies resulted in a determination that local governments' simply deferring to state and federal rules to address water quality issues still results in impaired local water quality based on the following conclusions:

- ▶ Areas with impervious surfaces of 10% or greater can be linked to local stream degradation.
- ▶ Biological diversity has been shown to drop when impervious surfaces increase beyond 10-15%.
- ▶ Stream stability is affected when impervious surfaces approach 10% in an area.
- ▶ Estuaries generally degrade with impervious surfaces of greater than 10%.
- ▶ Sensitive fish species loss increased after about 12% impervious surface.

The following information is provided by subbasins that geographically include some areas located outside of Brunswick County. Brunswick County includes portions of the following subbasins: 03-07-57, 03-07-59 (Lumber River Basin), and 03-06-17 (Cape Fear River Basin). The following provides a summary of existing conditions in the three subbasins.

A. Subbasin 03-07-57 (Lumber River Basin)

Most of the land use in this subbasin is either forest or agriculture. All tributary streams tend to be intermittent, with little or no flow during dry summer months. For this reason, most of the DWQ sampling in this subbasin focused on the Waccamaw River. Many of the Carolina Bays in this subbasin were drained for agricultural land use.

There are four (4) NPDES wastewater discharge permits with a total permitted flow of 1.6 MGD. The largest discharger is Tabor City WWTP (1.1 MGD). There are 15 registered swine operations in this subbasin.

During the Water Quality plan development, there were four (4) benthic macroinvertebrate community sites sampled, two special study sites, and data collected from three (3) ambient monitoring stations. The results of those monitoring efforts are included in the Table 3.

<b>Subbasin 03-07-57</b>	
Land and Water Area (sq.mi.)	
Total area:	555
Land Area:	552
Water area:	3
Population	
1990 Est. Population:	37,457
Population Density:	37 persons/sq.mi.
1996 Land Cover (%)	
Forest/Wetland:	74%
Agriculture:	25%
Urban:	<1%
Water:	1%
Municipalities: Carolina Shores, Calabash, Tabor City, and Shallotte	

**Table 3.**  
**Summary of Use Support Ratings by Use Support Category in Subbasin 03-07-57**

Use Support Rating	Basis	Aquatic Life	Recreation	Fish Consumption
Supporting	Monitored	41.2 mi	32.3 mi	0
	All Waters	41.2 mi	32.3 mi	0
Impaired	Monitored	0	0	0
	All Waters	0	0	358.7 mi
Not Rated	Monitored	33.1 mi	0	0
No Data	N/A	284.3 mi	326.3 mi	0
Total	Monitored	74.4 mi	32.3 mi	0
	All Waters	358.7 mi	358.7 mi	358.7 mi
	Percent Monitored	20.7%	9.0%	0.0%

NOTE: All waters include monitored, evaluated and waters that were not assessed.  
Source: 2003 Lumber River Basinwide Water Quality Plan.

Recommendations: The 1994 Lumber River Basinwide Plan identified several stream segments as impaired. These include the Waccamaw River, Muddy Branch, Bear Branch, Gore Creek (Gore Lake), Toms Fork, Monie Swamp, and Caw Caw Swamp. The planned management strategy for these waters was to investigate sources of impairment, to continue existing nonpoint source control programs, and to conduct fish tissue monitoring and investigate sources of mercury in the Waccamaw River. DWQ also recognized the need to more accurately determine natural versus impacted swamp conditions.

In addition, management strategies to maintain adequate levels of oxygen in stream were recommended. These strategies were aimed at new dischargers into the Waccamaw River watershed.

**B. Subbasin 03-07-59 (Lumber River Basin)**

This subbasin is entirely located in Brunswick County and is the only subbasin in the entire Lumber River basin where all waters drain to the Atlantic Ocean. Population growth in the subbasin is primarily concentrated in the coastal communities, but also around the towns of Shallotte and Calabash.

There are three National Pollutant Discharge Elimination Systems (NPDES) wastewater discharge permits in this subbasin with a total permitted flow of 0.02 MGD. There is also one individual NPDES stormwater permit in the subbasin. Brunswick County and South Brunswick Water and Sewer Authority are required to develop a stormwater program under Phase II.

During the Water Quality plan development, there were three benthic macroinvertebrate community sites sampled. There was one fish community site sampled, and data was also collected from 13 ambient stations. The results of those monitoring efforts are found in the following tables.

<b>Subbasin 03-07-59</b>	
Land and Water Area (sq.mi.)	
Total area:	267
Land Area:	260
Water area:	7
Population Statistics	
2000 Est. Population:	21,177 people
Land Cover (%)	
Forest/Wetland:	75%
Surface Water:	3%
Urban:	4%
Agriculture:	18%
Municipalities: Boiling Spring Lakes, Bolivia, Carolina Shores, Holden Beach, Oak Island, Ocean Isle Beach, Shallotte, Sunset Beach, and Varnamtown	

**Table 4. Summary of Use Support Ratings by Use Support Category in Subbasin 03-07-59**

Use Support Rating	Basis	Aquatic Life	Fish Consumption	Recreation	Shellfish Harvesting
Supporting	Monitored	22.2 mi 2,170.0 Est. ac	0	22.2 mi 2,039.2 Est. ac 25.6 coast	673.9 Est. ac
	All Waters	22.2 mi 2,170.0 Est. ac	0	22.2 mi 2,039.2 Est. ac 25.6 coast	673.9 Est. ac
Impaired	Monitored	0	25.6 coast	0	3,607.0 Est. ac
	All Waters	0	146.5 mi 4,305.6 Est. ac	0	3,607.0 Est. ac

Use Support Rating	Basis	Aquatic Life	Fish Consumption	Recreation	Shellfish Harvesting
Not Rated	Monitored	5.9 mi	0	0	0
No Data	N/A	118.4 mi 2,135.5 Est. ac	0	123.7 mi 2,267.3 Est. ac	0
Total	Monitored	28.1 mi 2,170.0 Est. ac	25.6 coast	22.2 mi 2,039.2 Est. ac 25.6 coast	4,280.8 Est. ac
	All Waters	146.5 mi 4,305.6 Est. ac 25.6 coast	146.5 mi 4,305.6 Est. ac 25.6 coast	146.5 mi 4,305.6 Est. ac 25.6 coast	4,280.8 Est. ac
	Percent Monitored	19.2% mi 50.4% Est. ac	100.0% coast	15.2% mi 47.4% Est. ac 100% coast	100%

NOTE: All waters include monitored, evaluated and waters that were not assessed.  
Source: 2003 Lumber River Basinwide Water Quality Plan.

**Table 5.  
Previously Impaired Shellfish Harvesting (SA) Waters in Subbasin 03-07-59**

Name	1999 Status	Acres
Calabash (DEH Area A-1)	Partially Supporting	1,138
Shallotte River (DEH Area A-2)	Partially Supporting	571
Lockwoods Folly River (DEH Area A-3)	Partially Supporting	913
Total 1999 Impaired Acres		2,622

Source: 2003 Lumber River Basinwide Water Quality Plan.

**Table 6.  
Currently Impaired Shellfish Harvesting (SA) Waters in Subbasin 03-07-59**

Name	Assessment Unit Number	DEH Classification Status*	Acres
Portions of Intracoastal Waterway	15-25	CAO, PRO, CAC	2,118.0
Portions of Lockwoods Folly River	15-25-1-(16)	CAO, PRO, CAC	606.2
Portions of Shallotte River	15-25-1-(10)	CAO, PRO, CAC	647.3
Mullet Creek	15-25-1-19	PRO	5.7
Sams Branch	15-25-2-12-(2)	PRO	1.0
Spring Creek	15-25-1-21	PRO	2.4
Jinnys Branch	15-25-2-16-1-(2)	PRO	1.0
Kilbart Slough	15-25-4	PRO	0.7
Mill Creek	15-25-1-18-(2)	PRO	2.0

Name	Assessment Unit Number	DEH Classification Status*	Acres
The Mill Pond	15-25-2-11-(2)	PRO	3.0
The Swash	15-25-2-14	CAO	3.9
Shallotte Creek	15-25-2-15-(3)	CAO	135.6
Saucepan Creek	15-25-2-16	PRO	62.6
Goose Creek	15-25-2-16-4-(2)	PRO	4.2
Calabash River	15-25-5	PRO	3.4
Hangman Branch	15-25-5-1	PRO	10.2
Total 2003 Impaired Acres			3,606.9

\*Division of Environmental Health Classifications: PRO = Prohibited; COA = Conditionally Approved-Open; and CAC = Conditionally Approved Closed.

Source: 2003 Lumber River Basinwide Water Quality Plan.

## 1. Status and Recommendations of Previously Impaired Waters

Impaired Class SA Waters: Portions of Lockwood Folly and Shallotte Rivers, the Intracoastal Waterway, and all of Calabash Creek were partially supporting in the 1999 basin plan because they were classified as prohibited and conditionally approved-closed to shellfish harvesting by DEH-SS. It was recommended that management strategies be developed for shellfish harvesting waters. These strategies included, but were not limited to, reducing nonpoint source (NPS) runoff, resolving septic system impacts, and working more closely with other state and local agencies to address all pollution impacts to SA waters. The differences in acreage estimates between years are not necessarily related to changes in water quality, but to different methods of estimating acreage and changes in use support methodology.

## 2. Status and Recommendations of Waters Newly Impaired (portions of the Intracoastal Waterway, Lockwood Folly River, Shallotte River, Mullet Creek, Sams Branch, Spring Creek, Jinnys Branch, Kilbart Slough, Mill Creek, The Mill Pond, The Swash, Shallotte Creek, Saucepan Creek, Goose Creek, Calabash River, Hangman Branch)

Status: Portions of all of these waters are currently impaired. These areas are prohibited, conditionally approved-closed, or conditionally approved-open to shellfish harvesting because of bacteria levels that do not meet approved area criteria. All waters in the subbasin are considered impaired on an evaluated basis because of fish consumption advice.

Recommendations: DWQ, DEH-SS, and the NC Coastal Nonpoint Source Program are developing the database and expertise necessary to assess shellfish harvesting use support

using a frequency of closure based approach. This database will allow DWQ to better assess the extent and duration of closures in Class SA waters. These tools are not available for use support determinations in Class SA waters for the 2003 Lumber River basin assessment. DWQ believed it important to identify frequency of closures in these waters, resulting in an interim methodology to be used based on existing databases and GIS shapefiles. This will likely bring changes in reported acreages in future assessments using the permanent methods and tools that define areas and closure frequency.

For the 2003 Lumber River basin assessment, DWQ used an interim frequency of closures based method to assign use support ratings to Class SA waters. DWQ worked with DEH-SS to determine the number of days and acreages that identified conditionally approved-open Class SA waters which were closed to shellfish harvesting in the Lumber River basin during the assessment period (September 1, 1996 to August 31, 2001). For the one growing area with conditionally approved-open Class SA waters, DEH-SS and DWQ staff defined subareas (within the larger conditionally approved-open area) that were opened and closed at the same time. The number of days these conditionally approved-open waters were closed was determined using proclamation summary sheets and the original proclamations. The number of days that approved areas in the growing area were closed due to preemptive closures because of named storms was not counted. DEH-SS will continue to monitor bacteriological water quality in these waters. DWQ, DEH, DCM and DMF are currently developing tools to better track water quality changes, make use support decisions, and support research in shellfishing harvesting waters of North Carolina.

The Division of Marine Fisheries (DMF) is in the process of developing Coastal Habitat Protection Plans (CHPP) with DWQ and DCM. These plans will identify existing and potential threats to habitats important to coastal fisheries and recommend actions to restore and protect them. The plans will also provide a framework for adoption of rules to protect habitats vital to coastal fisheries. The plans will help to assure consistent actions among the Coastal Resources Commission (CRC), Environmental Management Commission (EMC), and the Marine Fisheries Commission (MFC).

It should be noted that Brunswick County is currently working on a project in conjunction with the N.C. Coastal Federation to identify growth management practices that are compatible with maintaining water quality in the river. The project was funded through the Environmental Protection Agency, and has been modeled after successful programs implemented in the upper Chesapeake Bay.

### 3. Atlantic Ocean – Status and 2002 Recommendations

The Atlantic Ocean (25.6 coastline miles) is currently impaired in the fish consumption category because there is a statewide consumption advice for mercury in fish tissue that is applied to waters east and south of I-85, including the Atlantic Ocean where king mackerel fish tissue was analyzed in 1999.

### 4. Status and Recommendations for Waters with Noted Impacts

The surface waters discussed in this section are supporting designated uses based on DWQ's use support assessment and are not considered to be impaired unless otherwise noted. However, notable water quality problems and concerns have been documented for some waters based on this assessment. Attention and resources should be focused on these waters to prevent additional degradation or facilitate water quality improvement.

Calabash River: Status and 2003 Recommendations - The Calabash River is currently impaired for shellfish harvesting. However, it is observed from the DWQ ambient monitoring station, I9916000, that the pH values (Site A-13) were lower than 6.8 in 18.4% of the samples. The 10<sup>th</sup> percentile illustrates the value of the lower 10% of the measurement. The 10<sup>th</sup> percentile of pH was 6.7. The state's standard for saltwater is a range of 6.8 to 8.5. Possible adjacent swamp waters could be influencing this watershed. It was also observed at this ambient site that the fecal coliform values exceeded the geometric mean of 14/100 ml in more than 10% of the samples for Class SA waters.

Water Quality Initiatives - The Calabash River watershed comprises one of 20 watersheds in the Lumber River basin that has been identified by the NC Wetlands Restoration Program (NCWRP) as an area with the greatest need and opportunity for stream and wetland restoration efforts. This watershed will be given higher priority than nontargeted watersheds for the implementation of NCWRP restoration projects.

South Brunswick Water & Sewer Authority received \$3,000,000 in state Revolving Grant funds for a new collection system.

Shalotte River: Status and 2003 Recommendations - Site B-2 near US 17 was reduced from a good-fair bioclassification in 1996 to a fair bioclassification during the 2001 assessment. The decrease in bioclassification was possibly due to drought conditions and subsequent effects of brackish intrusion during the low flow period. DWQ resampled this site in September 2003 to assess potential drought impacts. The site assessment in 2003 received a good-fair bioclassification. However, this assessment found the highest number of species out of its

historical sampling regime including the freshwater/brackish shrimp, *macrobrachium olfersii*. This crayfish-like species inhabits the transitional zones between fresh and brackish water and is rarely seen. This is only the second location found in North Carolina. The Shallotte River is currently rated supporting for the aquatic life category.

Water Quality Initiatives - The Shallotte River watershed comprises one of 20 watersheds in the Lumber River basin that has been identified by the NCWRP as an area with the greatest need and opportunity for stream and wetland restoration efforts. This watershed will be given higher priority than nontargeted watersheds for the implementation of NCWRP restoration projects.

Lockwood Folly River: Status and 2003 Recommendations - Lockwood Folly River from north of Varnum to the mouth is impaired for the shellfish harvesting category. The data from ambient monitoring sites I9440000 and I9450000 showed the fecal coliform values exceeded the geometric mean of 14/100 ml in more than 10% of the samples for Class SA waters. DWQ will continue to monitor these stations.

Water Quality Initiatives - The NC Coastal Land Trust received a \$652,000 grant from the Clean Water Management Trust Fund (CWMTF) to acquire 263 acres along Lockwood Folly River and Sandy Branch.

The Lockwood Folly River watershed comprises one of 20 watersheds in the Lumber River basin that has been identified by the NCWRP as an area with the greatest need and opportunity for stream and wetland restoration efforts. This watershed will be given higher priority than nontargeted watersheds for the implementation of NCWRP restoration projects.

The Army Corps of Engineers has a \$1,440,000 aquatic habitat restoration project on the lower Lockwood Folly River.

Brunswick County will continue to monitor water quality in the Lockwood Folly River pending the results of the Lockwood Folly Water Quality Study.

Doe Creek: Status and 2003 Recommendations - A private developer was assessed a civil penalty for land clearing activities where earth and fill were deliberately placed into wetlands. These activities caused extreme turbid water in an unnamed tributary to Doe Creek. DWQ has required the developer to implement a restoration plan.

Mill Creek: Status and 2003 Recommendations - A private owner was assessed a civil penalty for excavating 19,000 linear feet of ditches in wetlands. An unnamed tributary of Mill

Creek was impacted by this activity. DWQ has required the owner to implement a restoration plan.

Jinnys Branch and Saucepan Creek: Status and Water Quality Initiatives - Jinnys Branch and Saucepan Creek are currently impaired for the shellfish harvesting category. The Jinnys Branch/Saucepan Creek watershed comprises one of 20 watersheds in the Lumber River basin that has been identified by the NCWRP as an area with the greatest need and opportunity for stream and wetland restoration efforts. This watershed will be given higher priority than nontargeted watersheds for the implementation of NCWRP restoration projects.

Davis Creek: Water Quality Initiatives - The Town of Oak Island received a \$456,000 grant from the CWMTF to acquire 30 acres along Davis Creek.

Bird Island: Water Quality Initiatives - The NC Division of Coastal Management received a \$2,750,000 grant from the CWMTF to purchase Bird Island. Bird Island now falls under the jurisdiction of the NC Division of Coastal Management, who established a management plan for the 1,300 acres of coastal reserve located along Bird Island.

Montgomery Slough: Status - Montgomery Slough is currently supporting for the aquatic life category. However, it is currently impaired for the shellfish harvesting category.

Water Quality Initiative - The Town of Oak Island received a total of \$2,200,155 from the State Revolving Grants program for new collection lines and treatment modifications.

#### 5. Additional Water Quality Issues within Subbasin 03-07-59

This section discusses issues that may threaten water quality in the subbasin that are not specific to particular streams, lakes or reservoirs. The issues discussed may be related to waters near certain land use activities or within proximity to different pollution sources.

Water Quality Threats to Streams in Urbanizing Watersheds: Streams in this subbasin are already impacted from urban stormwater runoff in shellfish harvesting waters and continue to be threatened by development pressure. In order to prevent aquatic habitat degradation and impaired biological communities, protection measures must be put in place immediately. The County is a named community under Phase II of the National Pollutant Discharge Elimination System Program. As a named community, the County has been required to establish a comprehensive stormwater management program. The permitting process, as well as the County's program, is discussed in detail in the Stormwater Management Section of this plan.

Impacts of Post-Hurricane Desnagging on Instream Habitats: Many streams in the subbasin have noted impacts from the recent hurricanes. The biological community in the streams can recover rapidly if instream habitat is maintained. Desnagging operations should carefully remove debris from stream channels to restore natural flow and leave enough instream habitats so the biological community can recover.

Golf Courses: The number of golf courses in Brunswick County has grown vastly through the last five years, making many of the small towns centers of golf activity. Utilizing best management practices during and after construction of the courses can greatly reduce nonpoint source pollution to adjacent streams. It is critical to implement and maintain these management practices throughout the life of the golf course. It should be noted that since the basinwide water quality plan was published, the trend toward golf course development in Brunswick County has slowed.

C. Subbasin 03-06-17 (Cape Fear River Basin)

Subbasin 03-06-17 is located in the outer Coastal Plain and in estuarine regions of the basin. Most tributaries in this subbasin are slow moving tannin stained streams or tidal creeks. There are 41 individual NPDES wastewater discharge permits in subbasin 03-06-17. The permitted flow is 99.9 MGD. The largest dischargers are International Paper (50 MGD), Progress Energy (3.5 MGD), New Hanover County WWTP (4 MGD), Wilmington Northside WWTP (16 MGD), and Wilmington Southside WWTP (12 MGD).

During development of the 2005 Basinwide Plan, there were eight (8) benthic community samples collected, data was collected from 17 ambient monitoring stations, and two (2) reservoirs were monitored. Use support ratings were assigned for waters in the subbasin for aquatic life, recreation, fish consumption, and water supply categories. All waters are Impaired on an evaluated basis in the fish consumption category because of fish consumption advice that applies to the entire basin. In the water supply category, all WS classified waters (1.6 miles) are Supporting on an evaluated basis based on reports from DEH regional water treatment plant consultants. The following table summarizes the resulting water quality monitoring efforts.

<b>Subbasin 03-06-17</b> (2005 Basinwide Plan)	
Land and Water	
Total area:	547 mi <sup>2</sup>
Land area:	498 mi <sup>2</sup>
Water area:	49 mi <sup>2</sup>
Population Statistics	
2000 Est. pop.:	78,348 people
Pop. density:	143 persons/mi <sup>2</sup>
Land Cover	
Forest/Wetland:	74.7%
Surface Water:	9.3%
Urban:	4.1%
Cultivated Crop:	7.6%
Pasture/Managed Herbaceous:	4.3%
Municipalities: Bald Head Island, Belville, Boiling Spring Lakes, Bolton, Caswell Beach, Leland, Navassa, Northwest, Oak Island, Wilmington, Sandy Creek, Southport, and St. James	

**Table 7.  
Water Quality Monitoring Subbasin 03-06-17**

Aquatic Life Rating Summary			Recreation Rating Summary			Fish Consumption Rating Summary		
S	14,125.4	S acres	S	21,092.3	S acres	I	35.9	FW miles
NR	2.0	S acres	I	96.6	S acres	I	23,443.5	S acres
I	6,457.0	S acres	S	44.1	FW miles	I	277.3	FW miles
S	75.4	FW miles	NR*	5.6	Coast mile	I	1,251.5	FW acres
NR	22.3	FW miles	I	4.7	Coast mile	I	22.8	Coast mile
NR	406.9	FW acres	ND	2,254.6	S acres			
ND	2,859.2	S acres	ND	269.1	FW miles			
ND	215.4	FW miles	ND	1,251.5	FW acres			
ND	844.5	FW acres	ND	12.5	Coast mile			
ND	22.8	Coast mile						

S = Supporting; S acres = Salt water acres; NR = Not rated; I = Impaired; FW = Freshwater; ND = No data; NR\* = Not rated for recreation. Source: 2005 Cape Fear River Basinwide Water Quality Plan.

The following recommendations were provided in the 2005 Water Quality Plan:

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

**Beaverdam Creek.** Beaverdam Creek from source to Polly Gully Creek (1 mile) is Not Rated for aquatic life because benthic community ratings could not be assigned at sites BB17, BB39, and BB204 in 1999. The watershed was studied in 1999 to evaluate the effects of ditching associated with the St. James Plantation development. Large amounts of silt in the creek promoted a shift toward silt tolerant species. The Brunswick WTP discharge provided permanent flow and increased the pH of the stream above what would be natural for streams in this area. A surprisingly pollution intolerant benthic community was present in some areas of the watershed. Beaverdam Creek from Polly Gully Creek to ICWW (11.3 acres) is Impaired for shellfish harvesting because this segment is classified by DEH SS as prohibited in growing area B-1. DWQ will continue to monitor Beaverdam Creek. It is recommended that further development in this area avoid ditching and use BMPs to prevent further siltation of streams in this watershed. Segment 18-88-9-1-(1.5) will be added to the 303(d) list of Impaired waters.

**Cape Fear River Estuary, Brunswick River, Cape Fear River.** The Brunswick River from source to the Cape Fear River (743.7 acres) is Impaired for aquatic life because the dissolved oxygen standard was violated in 14.3 percent of samples at site BA707. The dissolved oxygen standard for SC classified waters is 5 mg/l. The pH standard was also below standard in 19.6 percent of samples. The low pH may be associated with swamp drainage from the Black and Northeast Cape Fear Rivers. Clairmont Shopping Center had significant violations of ammonia

permit limits during the last two years of the assessment period as well. The Cape Fear River from International Paper intake to Bryant Mill Creek (3.8 miles) is Impaired on a monitored basis in the fish consumption category.

The Cape Fear River from Bryant Mill Creek to Toomers Creek (18.5 miles) is Not Rated because dissolved oxygen was below 4 mg/l in 11 and 13.8 of samples collect at sites BA640 and BA639. This segment is classified as C Sw, which acknowledges natural characteristics of swamps such as low pH. Also, BASF had significant violations of biological oxygen demand permit limits, and Leland Industrial Park WWTP had significant violations of total suspended solids permit limits during the last two years of the assessment period. BASF is under a special order of consent that expires in August 2005.

The Cape Fear River from Toomers Creek to Snows Cut (5,616.7 acres) is Impaired for aquatic life because the dissolved oxygen standard was violated in 42.9, 37.1, 16.4, 29.5, 23.2 and 10.4 percent of samples collected at sites BA642, BA644, BA708, BA709, BA713 and BA716. The dissolved oxygen standard for SC waters is 5 mg/l. The pH standard was also below the standard in 38.5, 37.1, 10.4, 20.5, and 19.6 percent of samples at the same sites. The low pH may be associated with swamp drainage from the Black and Northeast Cape Fear Rivers. The segment of the Cape Fear River upstream of this area has a supplemental classification of Sw that acknowledges that swamp streams may have lower dissolved oxygen and pH.

The Cape Fear River from Snows Cut to Federal Marsh (7,856.7 acres) is Supporting aquatic life because no criteria were exceeded at site BA722, although Kure Beach WWTP had significant violations of total suspended solids permit limits during the last two years of the assessment period.

The Cape Fear River from Polly Gully Creek to ICWW (11.3 acres) is Impaired for shellfish harvesting because these segments are classified by DEH SS as prohibited in growing areas B-1 and B-4. Segments 18-(87.5)a is Supporting aquatic life and recreation because no criteria were exceeded at sites BA722 and S-43. Segment 18-(87.5)b is Supporting shellfish harvesting and aquatic life because this area is approved and no criteria were exceeded at site BA734.

DWQ is developing a TMDL to address the low dissolved oxygen in these segments. TMDL targets and allocations will be addressed as part of the process. Modeling efforts will include a watershed model of the Northeast Cape Fear River and hydrodynamic and water quality modeling of the estuary. The TMDL was scheduled to be submitted to EPA in late 2005. Until the TMDL is approved by EPA, new and expanding discharges will be carefully considered on a case-by-case basis. The NPDES compliance process will be used to address the significant permit violations noted above. Segment 18-(71)a and 18-77 will remain on the 303(d) list of

Impaired waters replacing the Cape Fear (DEH Area) B10 listing. Segments 18-(63)a and 18-(87.5)a, c and d will be added to the list. In 2005, a NOAA grant was used to implement BMPs at the Carolina Beach State Park Marina. The BMPs included two rain gardens to treat runoff from parking lots and two inlet slip filters to filter sediment, oils, and grease from runoff.

Coward Creek. Coward Creek from source to the Cape Fear River (5.9 acres) is Impaired for shellfish harvesting because this segment is classified by DEH SS as prohibited in growing area B-1. Coward Creek will be added to the 303(d) list of Impaired waters.

Dennis Creek. Dennis Creek and Piney Point Creek south of the ICWW (45.7 acres) are Impaired for shellfish harvesting because these segments are classified by DEH SS as prohibited in growing area B-1. These creeks will be added to the 303(d) list of Impaired waters.

Dutchman Creek, Dutchman Creek Outlet Channel, and Dutchman Creek Shellfish Area. Dutchman Creek, the Outlet Channel, and Shellfish Area north of the ICWW (192 acres) are Impaired for shellfish harvesting because these segments are classified by DEH SS as prohibited in growing area B-1. These creeks will be added to the 303(d) list of Impaired waters.

Elizabeth River, Elizabeth River Shellfishing Area, and Molasses Creek Shellfish Area. Elizabeth River, Shellfish Area, and Molasses Creek south of the ICWW (290.1 acres) are Impaired for shellfish harvesting because these segments are classified by DEH SS as prohibited in growing area B-1. These creeks will be added to the 303(d) list of Impaired waters.

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

Intracoastal Waterway (ICWW). The Intracoastal Waterway from channel marker F1 to Dutchmans Creek Outlet Channel (226.6 acres) is Impaired for shellfish harvesting because this segment is classified by DEH SS as prohibited in growing area B-1. This segment is Supporting recreation because no criteria were exceeded at site S-41. The Intracoastal Waterway from Dutchmans Creek Outlet Channel to Cottage Creek (96.6 acres) is Impaired for aquatic life because the dissolved oxygen standard was violated in 11 percent of samples at site BA740. The dissolved oxygen standard for SC classified waters is 5 mg/l. This segment is also Impaired for shellfish harvesting and recreation because this segment is classified by DEH SS as prohibited in growing area B-1 and because of permanent swimming advisories at site S-42. DWQ and DEH will continue to monitor the ICWW and work with local governments to identify sources of bacteria and oxygen-consuming materials. This segment of the ICWW will be added to the 303(d) list of Impaired waters. TMDLs will be developed for identified stressors within 8-13 years of listing.

Town Creek. Town Creek from source to the Cape Fear River (32.1 miles) is Supporting aquatic life because of a natural benthic community rating at site BB13. A sample in November 1999, after three hurricanes, indicated the benthic community was not severely impacted by the storms. Town Creek is Impaired on a monitored basis in the fish consumption category and will be added to the 303(d) list of Impaired waters. In 2000, the NC Coastal Land Trust received a \$305,000 CWMTF grant to acquire 260 acres conservation easements along Town Creek, with an additional 320 acres of donated conservation easements included in the project. In 2001, the NC Coastal Land Trust received a \$277,000 CWMTF grant to acquire 115 acres conservation easements along Town and Russell Creeks, with an additional 135 acres of donated conservation easements included in the project. In 2002, the NC Coastal Land Trust received a \$2,095,000 CWMTF grant to acquire 638 acres along Town Creek.

Southport Restricted Area. The Southport Restricted Area, on the west bank of the Cape Fear River from Price Creek to Southport (715.3 acres), is Not Rated for aquatic life on an evaluated basis because the ADM Southport Plant had significant violations of total settleable solids permit limits during the last two years of the assessment period that could have negatively impacted aquatic life. The NPDES compliance process will be used to address the significant permit violations noted above.

D. Shellfishing

The following table provides updated information regarding shellfishing areas throughout Brunswick County. This information is current and should clarify any discrepancies present in the basinwide plans. At this time, acreages for conditionally opened and closed areas are not available. The plan will be updated to reflect this information when it becomes available.

**Table 8.**  
**Status of Shellfishing Areas in Brunswick County**

Area	Acres	
	Open	Closed
Calabash Creek	602	1,198
Shalotte River	794	556
Lockwood Folly River	718	932
Southport Area	-0-	1,325
Buzzard Bay	2,733	117
The Basin Area	75	-0-

Source: NCDENR Recreation and Shellfish Division.

## 9. ANALYSIS OF LAND USE AND DEVELOPMENT

### A. Introduction

The Division of Coastal Management Land Use Plan Guidelines (15A NCAC 7B.0207) require that existing land uses and water uses be mapped. The land and water use maps should be utilized as working documents and serve as a basis for the development of the future land use map(s). Specifically, this plan should address the following:

- ▶ Significant land use compatibility problems;
- ▶ Significant water use compatibility problems including those identified in any water supply plan appendix and those identified in the applicable Division of Environmental Management basinwide plan;
- ▶ Significant problems that have resulted from unplanned development and that have implications for future land use, water use, or water quality;
- ▶ An identification of areas experiencing or likely to experience changes in predominant land uses, including agricultural and forestry land being converted to other uses and previously undeveloped shoreline areas where development is now occurring;
- ▶ Significant water quality conditions and the connection between land use and water quality.

### B. Land Use in Relation to Water Quality

Water quality monitoring is conducted and reported at the subbasin level. Brunswick County falls within two major river basins, and within these two basins three separate subbasins. The subbasins that fall within Brunswick County are the Cape Fear River Basin (03-06-17) and the Lumber River Basin (03-07-59 and 03-07-57). The following provides a summary of water quality issues within each of the subbasins, as well as how land use in these areas impact the overall water quality ratings.

#### 1. Cape Fear River Basin (Subbasin 03-06-17)

This subbasin falls primarily along the southern reaches of the Cape Fear River Basin. The area encompassed by the subbasin takes in a small portion of Wilmington, located in New

Hanover County, but is predominantly located within the eastern portion of Brunswick County including the towns of Leland, Belville, Navassa, Boiling Spring Lakes, and Southport. Development within this subbasin has been extremely rapid over the last ten years, and this pace is expected to continue. Within this subbasin there are several large water-dependent significant natural heritage areas. There are currently 41 NPDES permitted dischargers in the subbasin. One of the largest recorded dischargers is located within Brunswick County (Progress Energy).

The following table provides a summary of all biological assessment sampling sites located within Brunswick County. The table provides the 1998 and 2003 bioclassification of each site. Hood Creek is classified as occurring in the Swamp P region. Hood Creek can have very low summer flows, so this stream was sampled for benthic macroinvertebrates in March 1998 and February 2003. Summer flows in 2003 were actually well below normal. Hood Creek at US74/76 was rated Natural in 1998, but declined to Moderate in 2003. There was no change in the dominant species between years; most of the change was due to the loss of rare taxa. Some of this decline may have been related to the high flows recorded throughout most of late 2002 and early 2003. Lewis Swamp drains a largely forested area, although some residential land use also occurs in this area. The stream had a distinct channel downstream of the bridge, but in 2003 there was a beaver pond in the upstream area. Below the beaver dam, the swamp had a more braided channel. There was an area of relatively swift flow immediately upstream of the bridge. The benthic fauna was sampled in the winter and classified with Region P swam stream criteria. Although there were many between-year changes in the composition of the community, summary parameters were fairly stable between 1998 and 2003.

Detailed information regarding all three subbasins is provided in the environmental conditions/water quality section of the plan. This section begins on page 10. Discussions within this section include recommendations for improving water quality within the subbasin.

**Table 9.**  
**Waterbodies Monitored in Subbasin 03-06-17 in the Cape Fear River Basin, Brunswick County, 1998 and 2003 (Benthic Macroinvertebrate Community Monitoring Sites)**

Site #	Stream	Location	1998	2003
B-2	Hood Creek	US 74/76	Natural	Moderate
B-4	Lewis Swamp	SR 1410	Natural	Natural

Source: 2004 Cape Fear River Basinwide Assessment Report.

2. Lumber River Basin (Subbasin 03-07-57)

This subbasin covers the western third of Brunswick County. The largest town within this subbasin is Tabor City, which is located in Columbus County. A portion of Carolina Shores is also located within this subbasin. Land use within this subbasin is predominantly forested with higher concentrations of development within Tabor City, as well as the extraterritorial jurisdiction of Carolina Shore along US Highway 17. Development within this subbasin has not been as rapid as in the eastern and south/central portions of the County, however, the pace of development is beginning to increase. There are currently four permitted NPDES dischargers in the subbasin, however the only municipal discharge is currently Tabor City. There was one benthic macroinvertebrate community monitoring site within Brunswick County but it was not rated.

3. Lumber River Basin (Subbasin 03-07-59)

This subbasin covers the entire central portion of Brunswick County. The entire subbasin is located within Brunswick County, and all waters within the subbasin flow to the Atlantic Ocean. The largest municipality within the subbasin is Shallotte, as well as the beach communities located to the south. Growth within the southern portion of this subbasin has been significant, and this trend is expected to continue as more high to moderate density subdivisions are platted and developed south of the US Highway 17 corridor. There are currently three NPDES wastewater discharge permits within the subbasin. Please refer to the environmental conditions/water quality discussion of the plan for a detailed discussion of impaired waters and recommendations for improving water quality with in this subbasin. The following provides a summary of the waterbody monitoring sites for Subbasin 03-07-59.

**Table 10.**  
**Waterbodies Monitored in Subbasin 03-07-59 in the Lumber River Basin, Brunswick County, 1996 and 2001 (Benthic Macroinvertebrate Community Monitoring Sites)**

Site #	Stream	Location	1996	2001
B-1	Royal Oak Swamp	NC 211	Good-Fair	Not Rated
B-2	Shallotte River	Near US 17	Good-Fair	Fair

Source: 2002 Lumber River Basinwide Assessment Report.

Royal Oak Swamp drains a watershed that is mostly forested with no municipalities and no NPDES facilities. At NC 211, the site is seven meters wide with a substrate composed largely of muck and woody debris. The riparian area is completely forested and excellent instream habitat included abundant snags and logs and emergent macrophytes. The swamp has

periods of flow interruption during summer months, therefore, this stream was evaluated using swamp methods during the winter. This site is intermediate between a Coastal A (permanent) stream and a swamp stream. During a relatively wet summer, this stream will have good flow, but a lack of flow has been observed during summer droughts.

The Shallotte River is located in an area where the stream is braided and shallow with good flow. A large city park, located just upstream has eliminated most of the riparian area on that side. Substrate was mostly sand with a layer of detritus. Woody debris was abundant, while root mats and macrophytes were absent. The water was turbid and there was evidence of a recent high-flow event.

#### 4. Total Maximum Daily Load (TMDL)

The Environmental Protection Agency (EPA) requires, as a result of the Clean Water Act, states to develop a list of all waters not meeting uses or where standards are violated (Section 303(d) list) and to develop TMDLs or management plans that can guide the restoration of those water bodies. The Modeling/TMDL unit within the North Carolina Division of Water Quality (DWQ) develops the 303(d) list and the TMDLs for North Carolina.

The DWQ reports that a TMDL is a calculation of the maximum amount of a pollutant, point and nonpoint sources, that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. Water quality standards are set by the state that identify the uses for each waterbody. In 2002 the Modeling/TMDL Unit set a goal to develop TMDLs for all impaired waterbodies within 10 years of their first placement on the state's 303(d) list.

Implementation plans are the basis for initiating local, regional, and state actions that reduce pollutant loads to levels established in TMDLs. Implementation may affect land use in areas with waterbodies on the state's 303(d) list. This could include establishing more stringent storm water requirements, revising building setback lines, and/or increasing buffer requirements.

#### C. Brunswick County Land Use

The following table provides approximate land use acreage summaries for the Brunswick County planning jurisdiction, including unincorporated areas and all municipalities participating in this plan. Brunswick County has a land coverage of 484,449 acres or 756.9 square miles.

**Table 11.**  
**Brunswick County Total Acreage, 2005**

Land Use	Parcels	Acres	% of Total
Commercial	221	752.90	0.16%
Industrial	140	1,682.12	0.35%
Multi-Family Residential*	208	156.95	0.03%
Mobile Home	33	165.60	0.03%
Office & Institutional	190	2,569.94	0.53%
Residential/Agricultural**	3,596	98,201.57	20.27%
Recreation	29	1,368.89	0.28%
Single-Family Residential***	16,174	9,626.78	1.99%
Vacant	51,219	369,288.62	76.23%
Water	46	635.93	0.13%
<b>Total</b>	<b>71,856</b>	<b>484,449.32</b>	<b>100.00%</b>

\*There is no assumption of density. This category includes parcels where there are more than one dwelling unit per parcel.

\*\*Low density residential includes areas where residential density is primarily 1.5 acres per dwelling unit or greater.

\*\*\*Residential includes areas where residential density is primarily less than 1.5 acres per dwelling unit.

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

## **10. LAND USE/DEVELOPMENT GOALS AND IMPLEMENTING ACTIONS**

### **A. Introduction**

The purposes of the Coastal Resources Commission (CRC) management topics are to ensure that CAMA Land Use Plans support the goals of CAMA, to define the CRC's expectations for the land use planning process, and to give the CRC a substantive basis for review and certification of CAMA Land Use Plans. Each of the following management topics (Public Access, Land Use Compatibility, Infrastructure Carrying Capacity, Transportation, Natural Hazard Areas, Water Quality, and Local Areas of Concern) include three components: a management goal, a statement of the CRC's planning objective, and requirements for the CAMA Land Use Plan. These policies apply to the entire county and the participating municipalities. Most of the policies and implementing actions are continuing activities. In most situations, specific timelines are not applicable. The policies and implementing actions frequently utilize the following words: should, continue, encourage, enhance, identify, implement, maintain, prevent, promote, protect, provide, strengthen, support, work. Please note: Policies and Implementing Actions are number consecutively throughout this document with the letter "P" denoting a policy and the letter "I" denoting an implementing action.

The development of this land use plan has relied heavily on the CAMA-prescribed existing suitability analysis. It is intended that this document is supportive of the CAMA regulations for protection of AEC's (15A NCAC 7H).

This plan is intended to support Brunswick County's vision statement (page 3 and 4) which was developed based on the key issues identified on pages 4 through 8 of this document, the CAMA AEC regulations 15 NCAC 7H, and the Brunswick Tomorrow, 2003 (Brunswick County Vision Statement). No negative impacts are anticipated by the implementation of the goals, objectives, and policies which are included in this plan.

**Note: It is intended that all policies are consistent with applicable State and Federal requirements when State and Federal requirements apply.** If a policy exceeds State or Federal requirements, that fact will be noted.

B. Public Access

1. Management Goal: Brunswick County/and its participating municipalities will maximize public access to their shorelines and public trust waters. Specifically their goal includes developing facilities for additional public beach and coastal waterfront access, particularly access to the creeks, rivers, and sounds of the County for both pedestrian and boating traffic. Strong consideration should be given to developing access facilities that allow for progressive and continual ingress and egress of users along the fresh and estuarine waters of Brunswick County.
2. Planning Objective: Brunswick County and the participating municipalities will develop comprehensive policies that provide public trust water access opportunities for the public along the shorelines within their planning jurisdictions.
3. Land Use Plan Requirements: The following are Brunswick County's policies/implementing actions for waterfront access. All policies are continuing activities.

**Policies – Public Access:**

- P.1 Brunswick County and its participating municipalities support the frequency of shoreline access as defined by 15A NCAC 7M, Section .0300, Shorefront Access Policies, and supports the protection of water quality during any development.

The County and its participating municipalities also support the preservation and maintenance of areas that have historically and traditionally been used for public access or working waterfronts.

- P.2 Brunswick County and the participating municipalities support providing shoreline access for persons with disabilities.
- P.3 Emphasis will be placed on increasing parking for beach access sites in both the County and its participating municipalities. The jurisdiction will actively seek shoreline access funds from the Division of Coastal Management.
- P.4 Additional public beach and coastal waterfront access facilities are desirable, especially those accommodating small, motorized boats, canoes, kayaks, and other recreational vehicles and uses. These public beach and coastal waterfront access sites should include boat ramps, fishing piers and observation decks, and provide limited parking and restroom facilities.
- P.5 The County supports its 2003 Shoreline Access Plan Update. A summary of that plan's policy section is included as Appendix IX.

**Implementing Actions – Public Access:**

- I.1 Brunswick County and the participating municipalities will explore revising the Unified Development Ordinance to include the provisions of NCGS 153A-331 which allows for requiring the developer of a subdivision to be charged recreation fees as follows: "The subdivision ordinance may provide that a developer may provide funds to the County whereby the County and its participating municipalities may acquire recreational land or areas to serve the development or subdivision, including the purchase of land which may be used to serve more than one subdivision or development within the immediate area." These funds may be utilized to provide increased shoreline access. Schedule: FY2008-2009 and Continuing.
- I.2 Brunswick County, having revised its Shoreline Access Plan in 2003, will request Division of Coastal Management funding for additional shoreline access. The existing 2003 Shoreline Access Plan policies, which are specified in Appendix IX, are supported by Brunswick County and its participating municipalities that have shoreline areas. Schedule: Continuing Activity.

- I.3 Brunswick County and its participating municipalities will pursue private sources of funding for the development of shoreline access facilities, including donation of land. Schedule: Continuing Activity.
- I.4 The County and its participating municipalities will cooperate with state and federal agencies to secure estuarine access areas to ensure adequate shoreline access within all areas of the County. Schedule: Continuing Activity.
- I.5 The County and its participating municipalities support implementation of the 2003 Brunswick County Shoreline Access Plan which specifies improvements that have not been accomplished. Schedule: Continuing Activity as specified in the Shoreline Access Plan.

NOTE: Except for the Baptist Center adjacent to Caswell Beach, there are no shoreline areas in Brunswick County or its participating municipalities targeted for shoreline/beach nourishment.

C. Land Use Compatibility

- 1. Management Goal: Brunswick County and its participating municipalities will ensure that development and use of resources or preservation of land minimize direct and secondary environmental impacts; avoid risks to public health, safety, and welfare; and are consistent with the capability of the land based on the land suitability analysis map.
- 2. Planning Objectives:
  - i. The land use policies' objectives and requirements will support the concept of smart growth. Brunswick County and its participating municipalities will strive to manage the "boom" in growth and development.
  - ii. Brunswick County and its participating municipalities' policies will provide clear direction to assist local decision making and consistency findings for zoning, divisions of land, and public and private projects.

3. Land Use Plan Requirements: The following are Brunswick County's and its participating municipalities' policies/implementing actions for land use compatibility for residential, commercial/industrial, conservation, stormwater control, highway corridor areas, and local concerns.

**Policies – Residential:**

- P.6 Brunswick County and its participating municipalities support provision of diversity in housing including price, style, and type (i.e., single-family/multi-family).
- P.7 Brunswick County and its participating municipalities will emphasize the provision of workforce/affordable housing.
- P.8 Brunswick County and its participating municipalities support smart growth land use concepts for residential development.
- P.9 Brunswick County and its participating municipalities will support mixed use development of residential and supporting non-residential land uses.
- P.10 Brunswick County and its participating municipalities will place emphasis on locating residential developments with emphasis on convenience to town or village-based services to reduce transportation, infrastructure, and service delivery costs.
- P.11 Brunswick County and its participating municipalities will support redevelopment/revitalization in areas that have substandard housing conditions.
- P.12 Brunswick County and its participating municipalities support revisions to the North Carolina General Statutes which would allow the local imposition of special legislation or impact fees that would be levied against land developers to establish a revenue source to support the additional demand for services generated by the people occupying the proposed developments such as roads, schools, water and sewer infrastructure, and recreational facilities.
- P.13 Brunswick County and its participating municipalities support repair and reconstruction of privately-owned dwelling units through private funds and/or grants. It supports the enforcement of existing regulations of the local Health Department regarding sanitary conditions.

- P.14 Brunswick County and its participating municipalities support utilization of office/institutional/multi-family development as a buffer between light industrial and commercial development and adjacent residential land uses.
- P.15 Brunswick County and its participating municipalities support greater residential densities in areas that are accessible to water and/or sewer service(s). Agricultural and low-density residential land uses should be located in areas that do not have central water or sewer service.

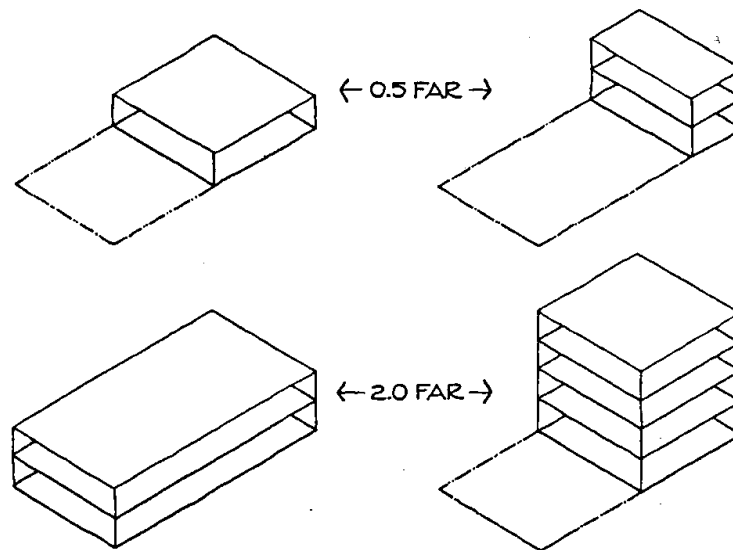
### **Implementation – Residential**

- I.6 Brunswick County will enforce/support its Unified Development Ordinance (UDO) that was prepared in 2005/2006 and adopted April 2, 2007 (effective May 1, 2007). Schedule: Continuing Activity.
- I.7 Brunswick County will explore different approaches to creating an ample workforce/ affordable housing stock within the County. Schedule: Continuing Activity.
- I.8 Brunswick County and its participating municipalities will follow the implementing actions specified on pages 6-13 to 6-15 of the CAMA Land Use Plan. Schedule: Continuing Activity.
- I.9 Brunswick County and its participating municipalities will permit residential development to occur in response to market needs provided that the following criteria are met:
- (1) Due respect is offered to all aspects of the environment.
  - (2) If deficient community facilities and services are identified, the County should attempt to improve such to the point of adequately meeting demands.
  - (3) Additional residential development should concurrently involve planning for improvements to community facilities and services if excess capacity does not exist within those facilities and services.
  - (4) Residential development is consistent with other County policies and the land use map contained in this plan update.

This implementing action will be enforced through the Brunswick County UDO and its participating municipalities' zoning and subdivision ordinances. Schedule: Continuing Activity.

- I.10 Brunswick County will review its UDO and its participating municipalities will review their UDO and zoning and subdivision ordinances and will consider establishing floor area ratio requirements to ensure that development is consistent with the density and intensity requirements of this plan. Schedule: Fiscal Year 2008-2009.

Comment. Floor area ratio (FAR) is determined by dividing the gross floor area of all buildings on a lot by the area of that lot. The floor area ratio (FAR) was developed as a more refined and adaptable measure of intensity than building coverage. It expresses in one measure, instead of several, the mathematical relation between volume of building and unit of land. However, FAR cannot replace more traditional bulk controls entirely. Often, it is not a sufficient height control nor does it regulate the placement of the building on the site.



FLOOR AREA RATIO

- I.11 Brunswick County will regulate the development of conflicting land uses along the US 17, NC 133, and NC 211 highway corridors through its zoning and subdivision ordinances. The County will also adopt a minimum housing code. Schedule: Continuing Activity.

- I.12 Brunswick County will enforce its minimum housing code to require the improvement of removal of substandard housing. Schedule: Continuing Activity.
- I.13 Brunswick County will continue to pursue Community Development, NC Housing Finance Agency, and US Department of Agriculture funds from state and federal sources for rehabilitation or redevelopment of substandard housing. Schedule: Continuing Activity.

### **Policies – Commercial**

- P.16 Brunswick County and its participating municipalities strongly support commercial nodes, including town or village centers, and the prohibition of strip commercialization.
- P.17 Brunswick County encourages/supports commercial development (nodes) at the intersections of major roads consistent with the County's future land use map.
- P.18 Brunswick County and its participating municipalities will support highway beautification and landscaping of commercial areas.
- P.19 Brunswick County and its participating municipalities support utilization of office and institutional zoning/transitional overlay as a buffer between residential and commercial development.
- P.20 Brunswick County supports commercial development in areas of environmental concern that is consistent/supports 15A NCAC 7H.

### **Implementing Actions – Commercial**

- I.14 Brunswick County will enforce/support its UDO which was prepared in 2005/2006 and adopted April 2, 2007 (effective May 1, 2007). Schedule: Continuing Activity.
- I.15 Implementation of the UDO will focus on control/limitation of strip commercialization. Schedule: Continuing Activity.

- I.16 A specific development/commercialization plan will be prepared for the area surrounding NC 133 and its intersection with the connection to the Cape Fear Skyway. Schedule: FY2009-2010.
- I.17 The County's UDO will be utilized to regulate development in areas of environmental concern (AECs). Schedule: Continuing Activity.
- I.18 Commercial fishing and marina operations will be regulated through the County's UDO, consistent with 15A NCAC 7H. Schedule: Continuing Activity.
- I.19 Through implementation of the County's UDO, commercial development should not be permitted to infringe on the County's natural heritage and protected land areas. Schedule: Continuing Activity.
- I.20 Brunswick County will support commercial forestry activities, provided significant adverse impacts on natural resource systems are fully mitigated. Such activities should be considered in accordance with the standards and recommendations of the US Forest Service. The County also advocates the voluntary participation of commercial forestry interests in the State of North Carolina's best management practice program for forestry management. Schedule: Continuing Activity.

**Policies – Industrial**

- P.21 Brunswick County will encourage/support the development of clean industries in locations where services can be provided, environmental impacts can be mitigated, surrounding land uses are compatible, and transportation systems can support the development.
- P.22 Brunswick County will support education and training of its work force to attract diverse industries.
- P.23 Brunswick County will support properly permitted mining activities within its borders.
- P.24 Industrial development should not adversely affect AECs (15A NCAC 7H). Brunswick County supports the proper planning for and location of the new International Port and the proposed Cape Fear Skyway.

## **Implementing Actions – Industrial**

I.21 Brunswick County will undertake the following actions to educate and train its work force to support diverse industries:

- (1) Increase and enhance apprentice programs to target improve the link between educational and vocational opportunities.
  - (2) Cultivate relationships with the NC Employment Security Commission, Brunswick Community College, and other institutions to underwrite job training programs.
  - (3) Seek industry/business support for apprenticeship programs.
  - (4) Provide transportation for job training for those who need it.
  - (5) Support existing apprenticeship and job sharing programs in Brunswick County schools.
  - (6) Develop work training programs to better train work force.
- Schedule: Continuing Activity.

I.22 Brunswick County will rely on its UDO to target industrial growth in existing or future industrial parks. Schedule: Continuing Activity.

I.23 Brunswick County and its participating municipalities allow industrial development within fragile areas and areas with low land suitability acceptable, only if the following conditions are met:

- (1) CAMA minor or major permits can be obtained (compliance with 15A NCAC 7H).
- (2) Applicable zoning ordinance provisions are met.
- (3) No industrial use will be permitted within coastal wetlands, estuarine waters, and public trust waters, unless such use is water-related and fully complies with 15A NCAC 7H.

This policy applies to both new industrial development and to expansion of existing industrial facilities. Schedule: Continuing Activity.

I.24 Brunswick County opposes the establishment of private solid waste/landfill sites in the County that are not licensed by the County. Schedule: Continuing Activity.

- I.25 The County's natural heritage areas and protected lands should be protected from negative impacts resulting from industrial development and/or expansion through implementation of the UDO. Schedule: Continuing Activity.
- I.26 In order to expand employment opportunities, Brunswick County will undertake the following:
- (1) Formulate and expand local incentives to attract industry.
    - Inventory unused business facilities.
    - Support County water and sewer systems and other infrastructure.
    - Support and enhance incubator program for startup businesses.
    - Identify and recruit industries that are compatible with and complement Brunswick County's geography, culture, and climate.
    - Create awareness of incentives for the employment of the elderly.
  - (2) Encourage clean industry to locate in Brunswick County to promote a healthy environment.
    - Support businesses involved with computer software business, medical technology, and telecommunications.
    - Promote awareness of service industries catering to tourists' opportunities.
- Schedule: Continuing Activity.
- I.27 The County will review the plans and consider impacts once additional information is available regarding the proposed International Port and the Cape Fear Skyway. Schedule: When information becomes available.

### **Policies – Conservation**

- P.25 Brunswick County will preserve/protect wetlands and swamps from development pressures.
- P.26 Brunswick County will protect the water quality of its streams and rivers.
- P.27 Brunswick County will support beach municipalities in maintenance/protection of beaches as a valuable natural resource as well as protecting shorelines under County jurisdiction.

- P.28 Brunswick County will support educational programs on the importance of preserving wetland areas.
- P.29 Brunswick County supports increasing usable open space in major subdivisions.
- P.30 Brunswick County supports forestation to maintain key wildlife areas.
- P.31 Brunswick County supports reuse of existing/abandoned commercial and industrial sites to maintain valuable open space.
- P.32 Brunswick County is one of the most biologically diverse areas in the State of North Carolina. The County shall take no action nor approve of any action which would seriously or irreparably harm the long-term biodiversity and productivity of the area.
- P.33 Commercial forestry activities shall be supported in Brunswick County, provided significant adverse impacts on natural resource systems are fully mitigated.
- P.34 Mining activities that would jeopardize the short- or long-term viability of valuable natural resources or create hazardous conditions in the County shall not be permitted.
- P.35 Brunswick County supports efforts to maintain and enhance the fisheries resource of its waters, including water quality protection measures, nursery and habitat preservation, proper fisheries management and enforcement, aquaculture development, and artificial reef activities.
- P.36 Brunswick County discourages the use of off-road vehicles in all fragile areas because of potential adverse environmental impacts.
- P.37 Brunswick County supports state and federal regulations prohibiting off-road vehicles on lands that they control.
- P.38 Brunswick County does not support new development and redevelopment activities which would significantly degrade the quality of natural and scenic resources in Brunswick County, prematurely diminish the predominantly rural character of the area, or create incompatibilities of scale, design or land use, shall not be permitted.

- P.39 Brunswick County supports efforts to maintain and enhance public and private gamelands, including habitat protection and management, and the proper management of hunting clubs and hunting activities.
- P.40 Brunswick County and its participating municipalities support protection/preservation of all AECs (15A NCAC 7H).

### **Implementing Actions – Conservation**

- I.28 Brunswick County will require the following to be delineated on all preliminary subdivision plats for lands within and adjacent to the proposed subdivision: AECs, prime farmlands, 404 wetlands, significant natural heritage areas, protected areas, historic sites, 100-year floodplain areas, and public gamelands. Schedule: Continuing activity in the subdivision review process.
- I.29 Brunswick County will coordinate all housing code enforcement/redevelopment/public works projects with the NC Division of Archives and History to ensure preservation and identification of significant historic structures and archaeological sites. Schedule: Continuing Activity.
- I.30 Brunswick County will designate a staff person to be responsible for assembling and organizing a "Conservation Council" which will be advisory to the County's planning board and board of commissioners. The council will include representation of conservation groups, forest industry, farming/agriculture, environmental educators, land developers, real estate professionals, senior citizens, fishing/aquaculture, NC Wildlife Resource Commission/hunting groups, Brunswick County planning and parks & recreation departments, and municipal representatives. When established, specific powers and responsibilities will be determined. Schedule: FY2008-2009 and continuing.
- I.31 Brunswick County will adopt a tree preservation ordinance that will address the following:
- Increase buffering along areas of deforestation or clear cutting.
  - Provide vegetative medians as a best management plan as highways are expanded or improved when feasible.
  - Educate the public of the benefits of controlled burns on "natural areas" by certified professional foresters.
- Schedule: FY2008-2009.

I.32 Brunswick County will work with economic development to promote reuse of abandoned commercial and industrial sites, and to explore funding opportunities for brownfield site cleanup and redevelopment. Schedule: Continuing Activity.

I.33 In order to protect wetlands, Brunswick County will implement the following programs:

- (1) Develop a "Nature's Classroom Program" in our public school system for wetlands education.
- (2) Coordinate the wetlands education program with Brunswick County Community College, UNC-W, and other universities.
- (3) Develop a volunteer-supported educational program as part of the NC Cooperative Extension Service, to include agriculture, aquaculture, horticulture, and zoology.
- (4) Create trails and access into natural areas and wetlands.
- (5) Expand the program that cooperates with schools from the mountains and Piedmont to plan for weekend "Eco-camps" for students to visit Brunswick County.
- (6) Work with the NC Cooperative Extension 4-H to create state-wide high school program for "eco-education projects."

Schedule: Starting in FY2008-2010 and Continuing.

I.34 Brunswick County and its participating municipalities will preserve open space through implementation of its UDO. Schedule: Continuing Activity.

I.35 In order to assist in protecting wetlands, Brunswick County will accomplish the following:

Educational

- (1) Expand public awareness of the importance of wetlands and swamps.
  - Prepare newsletter for public distribution.
  - Use NCDENR to present program to schools and civic organizations.
  - Promote youth interest in environment and marine ecology with local activities (e.g., beach cleanup, turtle watches, boat rides, etc.)
- (2) Prepare quick facts for consumers and developers with list of action items that help protect these environments.

- (3) Expand Brunswick County web site with links to local groups focusing on environmental issues.
- (4) Host international meetings with environmental groups to better coordinate ecotourism and other conservation efforts.

UDO

- (1) Prepare policy on wetlands and swamp protection.
- (2) Create bike paths and/or horse trails adjacent to prime areas to foster greater awareness. Trails may go through sensitive areas if they are managed and impact is minimal.

Schedule: The educational actions will be continuing activities. The UDO items will be accomplished in FY2008-2009.

I.36 Brunswick County will undertake the following educational actions:

- (1) Advise property owners on backyard conservation activities that protect streams and rivers.
- (2) Expand the Brunswick County web site with links to local groups that focus on river water quality and marine ecology programs.
- (3) Collaborate with universities to provide areas for sampling and access for water quality studies.

Schedule: Continuing Activities.

I.37 Expand the Brunswick County web site with links to local groups that focus on beach quality and marine ecology programs. Schedule: FY2007-2008.

I.38 Establish a regional ecotourism board and link with Brunswick County resources to unify interests of different groups across the Cape Fear region. Schedule: FY2009-2010.

I.39 Continue volunteer efforts through the NC Cooperative Extension Services to plant beach grass after beach replenishment. Schedule: Continuing Activity.

I.40 Establish a contingency/emergency response for an oil spill or other beach-related catastrophe. Schedule: FY2008-2009.

I.41 Collaborate with universities to provide areas for sampling and access for water quality studies. Schedule: Continuing Activity.

- I.42 Development of Brunswick County's sound and estuarine system islands, while not encouraged, is permitted, provided that impacts on the natural environment are properly mitigated. When such islands are deemed to have greater than local significance, the County encourages the state or federal government to purchase these environmentally-sensitive areas for the benefit of all residents of the state. If such islands must be developed, low intensity uses such as open space, recreation, and very low density residential development shall be the preferred uses. Schedule: Enforcement of UDO, Continuing Activity.
- I.43 Through the development review process, the diversity of wildlife in Brunswick County shall be preserved and enhanced through protection of the unique coastal ecosystems, including marshes, woodlands, open fields, and other areas upon which they depend. Schedule: Continuing Activity.
- I.44 Brunswick County will continue to support the actions taken by Boiling Spring Lakes to respond to the Red Cockaded Woodpecker concern(s) and amend this plan as necessary in coordination with Boiling Spring Lakes to reflect actions to be taken by the Town to respond to the Red Cockaded Woodpecker infestation. Schedule: Continuing Activity.

### **Policies – Stormwater Control**

- P.41 Brunswick County and its participating municipalities will continue to support a proactive role in the development of stormwater management and design standards intended to protect the quality of the County's streams, rivers, marshes, and estuarine systems.
- P.42 Brunswick County and its participating municipalities will support reducing soil erosion, runoff, and sedimentation to minimize the adverse effects on surface and subsurface water quality.
- P.43 Brunswick County and its participating municipalities support the enforcement of all controls and regulations, specifically design standards, tie-down requirements, construction and installation standards, elevation requirements, floodproofing, CAMA regulations, and FEMA regulations deemed necessary by the Board of Commissioners to mitigate the risks of lives and property caused by severe storms and hurricanes.

## **Implementing Actions – Stormwater**

- I.45 Brunswick County will ensure that its UDO supports the following:
- (1) A program of vegetated buffers adjacent to all streams, rivers, marshes, and estuarine waters in the County, with the intent of reducing the flow of nutrients and other contaminants into area surface waters.
  - (2) Accomplish stormwater runoff management in which there is no more than a 5% runoff increase from pre-development to post-development conditions. Schedule: FY2008-2009.
- I.46 Brunswick County will consider adopting and enforcing a soil erosion and sediment control ordinance. Schedule: FY2009-2010.
- I.47 Brunswick County and its participating municipalities will support control of agricultural runoff through implementation of Natural Resources Conservation Service "Agricultural Best Management Practices" program (see Appendix X). Schedule: Continuing Activity.
- I.48 Brunswick County and its participating municipalities will support control of forestry runoff through implementation of "Forestry Best Management Practices" as provided by the NC Division of Forest Resources (see Appendix XI). Schedule: Continuing Activity.
- I.49 Brunswick County will formulate an educational program to inform the public of its need for adequate stormwater management. Schedule: Continuing Activity.
- I.50 Brunswick County will continue to enforce its stormwater control ordinance that includes regulations for water detention and/or retention facilities in new developments and provide regulations to control the amount of impervious surface in a development. Schedule: Continuing Activity.
- D. Infrastructure Carrying Capacity
1. Management Goal: Brunswick County will provide an infrastructure system which meets its citizens' present and future needs, supports a vibrant economy, protects the environment, provides for continuous growth of the wastewater collection and treatment systems, and adds to the overall quality of life.

2. Planning Objective: Brunswick County and its participating municipalities will reflect/incorporate the future needs as identified in this document in all future infrastructure planning.
3. Land Use Plan Requirements: The following are Brunswick County's and its participating municipalities' needs for infrastructure carrying capacity.

### **Policies – Infrastructure**

- P.44 Brunswick County and its participating municipalities will seek regional cooperation by all local governments to maximize service delivery while minimizing duplication of infrastructure, parks, community facilities, and other services.
- P.45 Brunswick County and its participating municipalities support wastewater treatment in areas of need that is responsive to the conservation policies and implementing actions identified in this plan.
- P.46 Coordination among the County, its municipalities, sewer districts, and major industries shall be encouraged in planning and providing for capital facilities and services.
- P.47 Brunswick County and its participating municipalities shall plan ahead for the timely and cost effective provision of major capital improvements and services on the basis of anticipated growth and demand.
- P.48 Brunswick County and its participating municipalities support providing sufficient water and sewer service to promote economic development and to alleviate public health problems created by the absence of public water and sewer services in the County and its municipalities.
- P.49 Brunswick County and its participating municipalities support directing more intensive land uses to areas that have existing or planned infrastructure.
- P.50 Brunswick County and its participating municipalities support the installation and use of properly permitted septic tank systems and the enforcement of district Health Department regulations and local development regulations regarding lot sizes and waste disposal system placement.

- P.51 Brunswick County and its participating municipalities will encourage re-use of effluent for irrigation. Where feasible, package treatment plants should use treated effluent for irrigation.
- P.52 Brunswick County and its participating municipalities will also encourage the NC Department of Environment and Natural Resources to investigate the feasibility of using alternative waste processing systems such as flushless toilets, incineration, and artificial wetlands in areas with severe soil limitations.
- P.53 Brunswick County and its participating municipalities support providing water and sewer services to identified industrial areas when County resources are sufficient in order to encourage industrial development.
- P.54 Brunswick County and its participating municipalities support the extension of water services from existing systems and encourage the use of central systems for new developments whether residential, commercial or industrial in nature, which support the principles and smart growth.
- P.55 Brunswick County and its participating municipalities support the continued public provision of solid waste disposal, law enforcement, recreation, emergency management, and educational services to all citizens of the County.

**Implementing Actions – Infrastructure**

- I.51 Brunswick County will prepare a detailed community facilities plan to address solid waste disposal, law enforcement, emergency management, recreation, and educational services needs. Schedule: FY2008-2009.
- I.52 Brunswick County and its participating municipalities will develop a County/municipal association to initiate discussion for cooperation and coordination between local governments for service delivery. Schedule: FY2008-2009.
- I.53 Brunswick County and its participating municipalities will establish a County-wide public utilities board to govern county-wide water and sewer systems. Schedule: FY2008-2009.

- I.54 Brunswick County and its participating municipalities will vigorously pursue grants to expand the water system for small and traditional communities. Schedule: Continuing Activity.
- I.55 Brunswick County and its participating municipalities will encourage the Lower Cape Fear Water & Sewer Authority (LCFWSA) to implement state of the art vigorous control and monitoring for possible contamination of primary water source. Schedule: Continuing Activity.
- I.56 Brunswick County and its participating municipalities will enhance the fire protection system as the water distribution system is expanded (i.e., fire hydrants, elevated storage, and other needs). Schedule: Continuing Activity.
- I.57 Brunswick County will continue to update its comprehensive, County-wide wastewater collection and treatment plan and timeline for development. Schedule: Continuing Activity.
- I.58 Brunswick County will continue to update its comprehensive, County-wide water master plan and timeline for development. Schedule: FY2009-2010.
- I.59 Brunswick County will pass an ordinance to prohibit disposal of septage and biosolids in the County that originated outside of Brunswick County, and will implement a County permitting process for biosolids and septage land application sites. Schedule: FY2008-2009.
- I.60 Brunswick County will maintain a major thrust toward a County-wide wastewater system, to include:
- Continue monitoring rates and update them as needed.
  - Continue charging capital recovery fees for new development.
- Schedule: FY2008 and Continuing.
- I.61 Brunswick County will amend the future land use map, when needed, to reflect the County's water and sewer extension projects as they are planned. Schedule: Continuing Activity.
- I.62 When considering new public facilities and private developments, Brunswick County will review new proposals against the Future Land Use Map to ensure consistency. If the proposal is inconsistent, the proposal will be revised or the

County will review the Land Use Plan to see if revision is needed there.  
Schedule: Continuing Activity.

I.63 Brunswick County will consider revising water and sewer extension policies to ensure that public/private cooperation in the provision of infrastructure to serve new development is encouraged. Schedule: FY2007-2008.

I.64 Brunswick County will include in its subdivision ordinance (UDO adoption) provisions to allow for the dedication of public park property, public access sites, and/or open space. This may include a provision for payment in lieu of dedication if approved by the County. Schedule: FY2008-2009.

I.65 Brunswick County will consider establishing a land banking fund into which the County may annually contribute funds for the purchase of recreation, public access sites, and open space lands. Schedule: FY2009-2010.

I.66 Brunswick County will coordinate the development of recreational facilities with the school system. Schedule: Continuing Activity.

I.67 Brunswick County will appoint a public safety study review team composed of County and municipal citizens and fire, rescue, emergency medical services personnel and volunteers to evaluate the recently completed public safety study.

- (1) Determine what recommendations in the public safety study will work best for Brunswick County and its participating municipalities.
- (2) Develop an action plan to implement recommendations of the review team.
- (3) Keep the Brunswick County and its participating municipalities' public informed of the activities and progress of the review team.
- (4) Foster cooperation and coordination between the County and its participating municipalities' and volunteer units, and volunteer units with each other.

Schedule: FY2009-2010 and Continuing.

I.68 Brunswick County will consider the construction of a multi-purpose complex for local, regional, and state athletic events, trade shows, and cultural/heritage exhibitions, and will:

- (1) Partner with educational, business, and local governments to construct a centrally located multi-purpose complex.

- (2) Consider including space for a potential County fairground and other outdoor spectator events.

Schedule: FY2008-2009.

I.69 The County will continue research and develop initiatives for the construction of the equivalent of two elementary schools and one high school. The County will continue to monitor the capacity versus growing enrollments in all Brunswick County schools. Schedule: FY2008-2010.

I.70 Brunswick County will support the Capital Improvements Plan (Fiscal Years 2008-2012) which was adopted by the Board of Commissioners on June 18, 2007. Schedule: Continuing Activity.

E. Transportation

1. Management Goal: Brunswick County and its participating municipalities will develop transportation systems to accommodate future growth.
2. Planning Objective: Brunswick County and its participating municipalities will coordinate transportation improvements with planning, infrastructure improvements, economic development, and conservation of natural resources.
3. Land Use Plan Requirements: The following are Brunswick County's and its participating municipalities' policies for transportation.

**Policies – Transportation**

P.56 Brunswick County and its participating municipalities shall be active participants in plans and actions related to transportation improvements to and within the County.

P.57 Brunswick County and its participating municipalities support regional intergovernmental planning and cooperation for transportation improvements to and within southeastern North Carolina and northeastern South Carolina.

P.58 Brunswick County and its participating municipalities' continued use and planned development of the Cape Fear River, Atlantic Intracoastal Waterway, and the Brunswick County Airport shall be encouraged.

- P.59 Brunswick County and its participating municipalities support cost effective public transportation.
- P.60 Brunswick County and its participating municipalities support the provision of safe evacuation routes.
- P.61 Brunswick County and its participating municipalities support the provision of a system of safe, coordinated bike and pedestrian trails throughout the County.
- P.62 Brunswick County and its participating municipalities support implementation of the 2006-2012 North Carolina Transportation Improvement Program.
- P.63 Brunswick County and its participating municipalities support interconnected street systems for residential and non-residential development.
- P.64 Brunswick County and its participating municipalities support limited access from development along all roads and highways to provide safe ingress and egress.
- P.65 Brunswick County and its participating municipalities support subdivision development that utilizes the NC Department of Transportation Traditional Neighborhood Development (TND) Street Design Guidelines. A TND is a human scale, walkable community with moderate to high residential densities and a mixed use core.
- P.66 (1) Brunswick County and its participating municipalities support maintaining an effective signage and addressing system for all streets, roads, and highways.
- (2) Brunswick County and its participating municipalities support state and federal funding for maintenance/dredging of the Intracoastal Waterway.
- P.67 Brunswick County will provide leadership to lobby NCDOT to incorporate and fund the County's local Transportation Improvement Program (TIP) through the statewide NCDOT TIP.
- P.68 The County supports the provision, enhancement, and/or prevention of loss of existing access for public fishing when bridges are replaced or improved.

## **Implementing Actions – Transportation**

- I.71 Brunswick County will develop a County Transportation Improvement Plan (supplementary to NCDOT TIP) to identify transportation needs to meet future growth. This action will be closely coordinated with the County's municipalities. Schedule: FY2009-2011.
- I.72 Brunswick County will include multi-tier development standards (overlay) in its UDO for major transportation corridors and high-speed transportation routes:
- US Highway 17
  - NC 211
  - Proposed I-74 Corridor
  - Proposed I-140 Bypass
  - Proposed 2<sup>nd</sup> Bridge to Oak Island
  - Connections to the 2<sup>nd</sup> Oak Island Bridge
  - Proposed Cape Fear Skyway
  - NC 87
  - NC 183
  - NC 130
  - NC 904
  - NC 179 (Old Georgetown Road)
- Schedule: FY2008-2009.
- I.73 Brunswick County will endorse and implement the NC Department of Transportation US Highway 17 corridor access management study. Schedule: Continuing Activity.
- I.74 Brunswick County will undertake the following activities to support the Brunswick Transit System:
- Generate awareness of current capabilities of Brunswick Transit System.
  - Prepare a comprehensive public transportation plan.
  - Develop a slogan and marketing plan for easier identification.
  - Explore innovative means to increase funding available for the Brunswick Transit System.
- Schedule: Continuing Activity.

I.75 Brunswick County will include in its UDO the requirement for construction of bike and pedestrian paths in major subdivisions. Schedule: Continuing Activity.

I.76 Brunswick County will continue to support bikeways, pedestrian paths, and blueways by implementing the following:

- Encourage appropriate thoroughfares (state-maintained roads) to include bike lanes as they are designed and expanded.
- Coordinate efforts for construction of bike and pedestrian paths with the East Coast Greenway and County and municipal park systems.
- Include bike and pedestrian trails at all County parks.
- Secure access to and provide for bike and pedestrian trails along rivers and streams for sites denoted in the Brunswick County Shoreline Access Plan.

Schedule: Continuing Activity.

I.77 Brunswick County will undertake the following actions to support maintenance of safe hurricane evacuation routes:

- Identify and support improvements to roads that serve as hurricane evacuation routes.
- Perform routine bridge and culvert maintenance, and raise bridges over streams that have documented flooding during significant rain events.
- Support the planning and implementation of regional roadways.
- Support the construction of a second Oak Island bridge, and new bridge for Sunset Beach and the Southern Bridge for the Cape Fear River.

Schedule: Continuing Activity.

I.78 Brunswick County and its participating municipalities will require, where reasonably possible, the utilization of frontage roads in non-residential developments along federal and state major highways. Schedule: FY2008-2009.

I.79 Brunswick County and its participating municipalities will establish a requirement for reverse frontage lots within subdivisions to orient lots towards internal subdivision streets, not secondary roads and highways. This will be accomplished through the County's UDO and municipal subdivision ordinances. Schedule: FY2008-2009.

- I.80 Brunswick County and its participating municipalities will require the construction of acceleration/deceleration lanes for the entrances to major commercial and residential developments. This should be accomplished through revisions to the County's UDO and municipal ordinances. Schedule: FY2008-2009.
- I.81 Brunswick County and its participating municipalities will consider revising its UDO/applicable zoning and subdivision ordinances to encourage the development of joint or shared driveways in newly approved subdivisions. Schedule: FY2008-2009.
- I.82 Brunswick County will continuously monitor the construction of a state port facility in Brunswick County and support state, local, and federal actions to mitigate adverse impacts on the County's transportation system, in particular NC 133, NC 211, and NC 87. Schedule: Continuing Activity.
- I.83 Brunswick County will support the designation of US 17, US 74/76, NC 87, NC 211, and NC 133 as growth corridors. Schedule: Continuing Activity.

F. Natural Hazard Areas

- 1. Management Goal: Brunswick County is sensitive to preservation of its natural resources and will protect/maintain its floodplains, shorelines, and other coastal features for their natural storm protection functions and their natural resources to protect the public health, safety, and welfare.
- 2. Planning Objective: Brunswick County will support policies that minimize threats to life, property, and natural resources resulting from development located in or adjacent to hazard areas, including those subject to erosion, high winds, storm surge, flooding or sea level rise.
- 3. Land Use Plan Requirements: The following are Brunswick County's policies/ implementing actions for natural hazard areas. All policies are continuing activities.

**Policies – Natural Hazard Areas**

- P.69 Brunswick County will support development within areas susceptible to sea level rise, shoreline erosion, and/or wetland loss which takes into consideration such conditions upon initial development. In the event such development is later threatened by shoreline loss, the County shall support the AEC use standards governing shoreline protection and management.

- P.70 Minimize flooding and resulting damage to life and property during normal and significant rainfall events in order to restore and preserve water quality so residents and visitors can enjoy water-related activities.
- P.71 Brunswick County will continue and expand the "Hickman" mosquito control program.
- P.72 Brunswick County supports the enforcement of local controls and the efforts of state and federal agencies with regulatory authority to restrict development within areas up to five (5) feet above mean high water susceptible to sea level rise and wetland loss.
- P.73 Brunswick County supports the installation of properly engineered and permitted bulkheads to protect against erosion and sea level rise.
- P.74 Brunswick County supports the US Army Corps of Engineers' regulations, the applicable guidelines of the Coastal Area Management Act, and the use of local land use ordinances to regulate development of fresh water swamps, marshes, and 404 wetlands.
- P.75 Brunswick County supports relocation of structures endangered by erosion, if the relocated structure will be in compliance with all applicable policies and regulations.
- P.76 Brunswick County supports cooperation with local, state, and federal efforts to inform the public of the anticipated effects of sea level rise.
- P.77 Brunswick County supports hazard mitigation planning. The Land Use Plan and the Hazard Mitigation Plan should be consistent with one another. When either are revised, the other should be reviewed for consistency. Should there ever be conflicting policies, the Land Use Plan shall take precedence. The Hazard Mitigation Plan goals, objectives, and mitigating actions are formally included as part of the policy of the County's Land Use Plan.
- P.78 Brunswick County supports the future land use densities that are specified in Section 6.V.D of the CAMA Land Use Plan. Through enforcement of the zoning ordinance, these densities will minimize damage from natural hazards and support the hazard mitigation plan.

- P.79 Brunswick County opposes the location of floating structures within its planning jurisdiction.<sup>1</sup>
- P.80 Because of shallow water depth, mooring fields are opposed within Brunswick County.
- P.81 Brunswick County is supportive of resource protection, in particular preservation of conservation areas as defined by this plan. All 15A NCAC 7H minimum use standards will be supported by the policies contained in this plan.

### **Implementing Actions – Natural Hazard Areas**

- I.84 Brunswick County will monitor development proposals for compliance with Section 404 of the Clean Water Act and will continue to enforce local land use ordinances to regulate development of fresh water swamps, marshes, and 404 wetlands. Schedule: FY2007-2008 and Continuing.
- I.85 Brunswick County will continue to enforce its floodplain ordinance and participate in the National Flood Insurance Program. Subdivision regulations will be enforced – requiring elevation monuments to be set so that floodplain elevations can be more easily determined. Schedule: Continuing Activity.
- I.86 Brunswick County will continue to permit the redevelopment of previously developed areas provided all applicable policies, regulations, and ordinances are complied with. Redevelopment, including infrastructure, should be designed to withstand natural hazards. Schedule: Continuing Activity.
- I.87 Brunswick County will utilize the future land use maps as a development management tool. These maps are coordinated with the land suitability map and proposed infrastructure map. Schedule: Continuing Activity.

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<sup>1</sup> NOTE: A floating home or structure is any structure, not a boat, supported by means of flotation and designed to be used without a permanent foundation for human habitation or commerce. A structure is considered a floating home or structure if it is inhabited or used for commercial purposes for more than 30 days in any one location. A boat may be deemed a floating structure if its means of propulsion have been removed or rendered inoperative and it contains at least 200 square feet of living area.

I.88 Brunswick County will regulate floating homes through preparation of a local ordinance. FY2008-2009 and Continuing.

I.89 Brunswick County will revise and maintain local ordinances to oppose mooring fields. Schedule: Continuing Activity.

I.90 Brunswick County will implement the following activities to accomplish effective mosquito control.

- ▶ Identify and train qualified personnel to continue the “Hickman” mosquito control program.
- ▶ Begin an education program on individual mosquito control and protection.
  - Coordinate an educational program in the public school system with the current recycling program.
  - Initiate a public service program on mosquito personal protection and elimination of breeding places around the home.
- ▶ Maintain funding for mosquito control research and an appropriate capital reserve fund.
- ▶ Continue a regional approach to a mosquito control program.
- ▶ Expand the County snagging and ditching program.
- ▶ Develop standards for building/maintaining stormwater management systems that reduce mosquito habitats.

Schedule: Continuing Activities.

I.91 Brunswick County will consider mineral production and mining activities on a case by case review of economic benefits and environmental and land use impacts. Schedule: Continuing Activity.

G. Water Quality

1. Management Goal: Brunswick County will maintain, protect, and enhance surface and subsurface water quality throughout the County, including all coastal wetlands, rivers, streams, and estuaries. This will include addressing the complex problem of planning for rapidly increasing development and economic growth.

2. Planning Objective: Brunswick County will adopt policies for coastal and subsurface waters within its jurisdiction to help ensure that water quality is maintained if not impaired, and improved if impaired.
3. Land Use Plan Requirements: The following provides Brunswick County's policies/ implementing actions for surface and subsurface water quality.

### **Policies – Water Quality**

- P.82 Brunswick County will protect the quality of its water resources.
- P.83 Brunswick County strongly supports the efforts of state and federal agencies to properly designate and preserve coastal wetlands because wetlands play a critical role in protecting the quality of estuarine waters and in providing habitat for fish and wildlife.
- P.84 Brunswick County supports the designation of public water supply AECs when such designation meets state prerequisites and when such action is deemed necessary to ensure the long-term viability of the County's public water supplies.
- P.85 Brunswick County will continue to support the efforts of the CAMA program and the US Army Corps of Engineers' 404 permitting program to preserve and protect sensitive fresh water swamp and marsh areas.
- P.86 Brunswick County supports state and local efforts to restore the water quality of the Lockwood Folly River, as well as other estuarine waters in the County, to a water quality level deserving of ORW designation. This policy includes implementing the Lockwood Folly River Water Quality Study (see Appendix XII for the implementation strategies, which are supported by this plan).
- P.87 Brunswick County supports and encourages the activities of the state's Shellfish Management Program. The County shall continue to promote estuarine water quality through its stormwater management planning and stormwater runoff policies.
- P.88 Brunswick County's groundwater resources, including but not limited to the Castle Hayne Aquifer, shall be recognized as an invaluable source of public and private potable water and shall receive the highest level of protection when considering County policies, standards, and actions.

- P.89 Brunswick County supports a reduction of dependence on septic tanks within the County and its participating municipalities in order to improve water quality.
- P.90 Brunswick County supports federal, state, and local efforts to protect the quantity and quality of water in the Cape Fear River, whether such protection involves controls over point source discharges, surface runoff, interbasin water transfers, or other appropriate means, including upstream activities.
- P.91 Brunswick County supports a program of vegetated buffers adjacent to all streams, rivers, marshes, and estuarine waters in the County, with the intent of reducing the flow of nutrients and other contaminants into area surface waters.
- P.92 Brunswick County shall encourage and support state and federal standards which seek to prevent or minimize adverse water quality impacts.
- P.93 Brunswick County supports the guidelines of the Coastal Area Management Act and the efforts and programs of the NC Department of Environment and Natural Resources, Division of Coastal Management, and the Coastal Resources Commission to protect the coastal wetlands, estuarine waters, estuarine shorelines, and public trust waters of Brunswick County.
- P.94 Brunswick County supports the use of best management practices recommendations of the US Soil Conservation Service for both agricultural and forestry areas.
- P.95 Brunswick County supports conservation of its surficial groundwater resources.
- P.96 Brunswick County supports commercial and recreational fishing in its waters, and will cooperate with other local governments and state and federal agencies to control pollution of these waters to improve conditions so that commercial and recreational fishing will increase.
- P.97 Brunswick County opposes the disposal of any toxic wastes, as defined by the US Environmental Protection Agency's Listing of Hazardous Substances and Priority Pollutants (developed pursuant to the Clean Water Act of 1977) within its planning jurisdiction.

- P.98 Brunswick County supports implementation of the Cape Fear and Lumber River Basin water quality management plans. Recommendations from those plans are included in Section 5.II.C of the CAMA Land Use Plan.
- P.99 Brunswick County supports protection of those waters known to be of the highest quality or supporting biological communities of special importance.
- P.100 Brunswick County supports the policy that all State of North Carolina projects should be designed to limit, to the extent possible, stormwater runoff into coastal waters.
- P.101 Brunswick County supports all aquaculture activities that meet applicable federal, state, and local policies and permit requirements. However, the County reserves the right to comment on all aquaculture activities that require Division of Water Quality permitting.

### **Implementing Actions – Water Quality**

- I.92 In support of water quality and Brunswick County’s Stormwater Management Discharge Program, Brunswick County will accomplish the following:
- ▶ Identify point and non-point pollution sources on rivers and streams.
    - Make recommendations to reduce and eliminate pollution sources.
    - Determine the feasibility of implementing a sentinel device or tracking system that will trigger an alarm and subsequent investigation.
  - ▶ Advise property owners on backyard conservation activities that protect streams and rivers.
  - ▶ Continuously expand the Brunswick County web site with links to local groups that focus on river water quality and marine ecology programs.
  - ▶ Collaborate with universities to provide areas for sampling and access for water quality studies.
- Schedule: Continuing Activities.
- I.93 The County shall work proactively with the state on measures to reduce stormwater runoff rates, soil erosion and sedimentation, and point source discharges into area waters. Schedule: Continuing Activities.

- I.94 Brunswick County will enforce its zoning and subdivision regulations to aid in protecting sensitive shoreline areas. It will rely on state and federal agencies to promote and protect the Green Swamp, as well as nursery and habitat areas. Schedule: Continuing Activities.
- I.95 Brunswick County will rely on the technical requirements and state program approval for underground storage tanks (40CFR, Parts 280 and 281), and any subsequent state regulations concerning underground storage tanks adopted during the planning period. Schedule: Continuing Activities.
- I.96 Brunswick County will continuously enforce, through the development and zoning permit process, all current regulations of the NC State Building Code and NC Division of Health Services relating to building construction and septic tank installation/replacement in areas with soils restrictions. Schedule: Continuing Activity.
- I.97 Brunswick County will comply with CAMA and NC Division of Water Quality stormwater runoff regulations, and by coordinating local development activities involving chemical storage or underground storage tank installation/abandonment with the Brunswick County Emergency Management personnel and the groundwater section of the NC Division of Water Quality. Schedule: Continuing Activities.
- I.98 Brunswick County will review the UDO with regard to underground chemical and gasoline storage regulations to ensure a minimum of risk to local groundwater resources. Schedule: FY2008-2009.
- I.99 The County recognizes the negative impact that non-point source pollutants have on shellfish harvesting waters and will strictly enforce riparian buffer requirements. Schedule: Ongoing.
- I.100 As a result of comments made to the CRC by Tom Reeder at the NC Division of Water Quality regarding current stormwater rules being inadequate in addressing water quality impacts to public trust waters, the County will consider revising current impervious surface requirements. Schedule: FY2009-2010.
- I.101 The County will encourage Site Design Best Management Practices to decrease NPS pollutants from entering SA waters. Those practices include Low Impact Development Strategies such as:

- ▶ Disconnecting impervious surfaces;
- ▶ Maintaining green space; and
- ▶ Utilizing cluster and traditional neighborhoods.

Schedule: Ongoing.

#### H. Areas of Local Concern

1. Management Goal: Brunswick County will integrate local concerns with the overall goals of CAMA in the context of land use planning.
2. Planning Objective: Brunswick County will identify and address local concerns and issues, such as cultural and historic areas, scenic areas, economic development, or general health and human services needs.
3. Land Use Plan Requirements: The following provides Brunswick County's policies/ implementing actions on areas of local concern. All policies are continuing activities.

#### **Policies – Cultural, Historic, and Scenic Areas**

- P.102 Brunswick County supports preservation of historic sites, buildings, written records, and oral history.
- P.103 Brunswick County encourages efforts to protect cultural and historic resources to preserve their cultural, educational, and aesthetic values and qualities.
- P.104 Brunswick County supports protection and preservation of the Green Swamp, which has both historic and environmental significance.
- P.105 The County supports local, state, and federal efforts to protect historic properties within its borders and to perpetuate its cultural heritage.

#### **Implementing Actions – Cultural, Historic, and Scenic Areas**

- I.102 Brunswick County will guide development so as to protect historic and potentially historic properties in the County and to perpetuate the County's cultural heritage.  
Schedule: Continuing Activity.

I.103 To support historic preservation, Brunswick County will:

- ▶ Create a Brunswick County historical placard. Schedule: FY2009-2010.
- ▶ Place paintings/renderings of local artists depicting historical and cultural elements of Brunswick County in the Brunswick County Courthouse.
- ▶ Promote the maritime history with focus on local stories and films of elders.
- ▶ Create and sustain a "County Corner" at public library(ies) where information is available to citizens.
- ▶ Incorporate the private sector in promoting the history of Brunswick County. Schedule: Continuing Activities.

I.104 Brunswick County will encourage a County-wide survey of historical sites by local volunteers or state and federal agencies and will seek grant monies within the next two years for the complete inventory of historically significant structures and sites. Schedule: Continuing Activity.

I.105 Brunswick County shall coordinate all housing code enforcement/redevelopment projects with the NC Division of Archives and History, to ensure that any significant architectural details or buildings are identified and preserved. Schedule: Continuing Activity.

I.106 Brunswick County will coordinate all County public works projects with the NC Division of Archives and History, to ensure the identification and preservation of significant archaeological sites. Schedule: Continuing Activity.

**Policies - Economic Development:**

P.106 Brunswick County will continue to maintain a diversified local economy, while at the same time protecting the natural and manmade environment and improving the area as a more attractive community in which to work, live, and play.

P.107 Brunswick County encourages the development of clean industry in locations where appropriate services can be provided, where transportation facilities are adequate, where environmental impacts can be fully mitigated, and where surrounding land uses are compatible in nature.

- P.108 Brunswick County supports applicable state and federal programs regarding economic and community development, especially those programs related to better jobs, water quality, fisheries, and water and land transportation system improvements.
- P.109 Brunswick County will continue to encourage the development of a high quality tourism trade as a primary element of the County's economic future.
- P.110 Brunswick County supports development of economic and employment opportunities that provide meaningful and fruitful employment.
- P.111 Brunswick County will expand employment opportunities in all areas of the County.
- P.112 Brunswick County will encourage industrial and commercial development in areas with existing infrastructure that does not infringe on existing medium density residential areas.
- P.113 Brunswick County will support a tourism development strategy that capitalizes upon the area's unique natural and scenic resources, specifically avoiding the congestion and garish visual blight often associated with more urban or entertainment-oriented tourist destinations.
- P.114 Brunswick County supports the Town of Belville's dedicated efforts to redevelop the Central Business District, as well as to codify its current zoning and subdivision ordinances and efforts to enhance the overall quality of life as it relates to land use planning for the citizens of Belville.

**Implementing Actions - Economic Development:**

- I.107 Brunswick County will continue to implement the following activities to support ecotourism:
- ▶ Promote ecotourism to enhance traditional tourism.
    - Develop brochures to publicize existing ecotourism/tourism attractions.
    - Publicize through multimedia to make ecotourism data available to the general public.

- Form a relationship with local tourist development agencies to utilize their contacts and advertising media.
- Identify and publicize ecotourism/agri-tourism attractions that could be successful in Brunswick County.
- Work with NC Cooperative Extension to set up a task force to support the training of individuals in eco/agri-tourism.
- ▶ Promote new farm crops to develop alternate farming methods and make effective use of farmlands.
  - Encourage local restaurants to utilize local crops for their businesses.
  - Support a Farmers’ Market and Heritage Tourism.
  - Support NC Cooperative Extension’s efforts in development and implementation of alternative crops.
- ▶ Explore the potential of a County agricultural fair at multipurpose complex (a joint venture of Brunswick County and Brunswick Community College).
- ▶ Encourage private sector to develop adventure sports.
  - Promote adventure sport competitions.
- ▶ Explore opportunities to make commercial fishing more profitable.

Schedule: Continuing Activities.

I.108 Brunswick County will implement the following activities to support economic development:

- ▶ Formulate and expand local incentives to attract industry.
  - Support the continued inventory of unused business facilities.
  - Support County water and sewer systems and other infrastructure.
  - Support and enhance incubator program for startup businesses.
  - Identify and recruit industries that are compatible with and complement Brunswick County’s geography, culture, and climate.
  - Create awareness of incentives for the employment of the elderly.
- ▶ Encourage clean industry to locate in Brunswick County to promote a healthy environment.
  - Support businesses involved with computer software business, medical technology, and telecommunications.
  - Promote awareness of service industry catering to tourists’ opportunities.

- ▶ Establish a regional ecotourism board and link with Brunswick County resources to unify interests of different groups across the Cape Fear region.
- ▶ Expand opportunities (both public and private) for employment and procurement by using local vendors.

Schedule: Continuing Activities.

I.109 Brunswick County will implement economic and community development initiatives that capitalize upon and enhance a distinct "town and country" character. Schedule: Continuing Activity.

I.110 Brunswick County will continue to support the activities of the North Carolina Division of Travel and Tourism; specifically, the monitoring of tourism-related industry, efforts to promote tourism-related commercial activity, and efforts to enhance and provide shoreline resources. Schedule: Continuing Activity.

I.111 The County will support projects that will increase public access to shoreline areas. Schedule: Continuing Activity.

I.112 Brunswick County will support North Carolina Department of Transportation projects to improve access to and within the County. Schedule: Continuing Activity.

I.113 Brunswick County will continue to support agriculture and tourism as valuable economic resources. Schedule: Continuing Activity.

I.114 Brunswick County supports the following implementing actions for the Town of Belville:

- ▶ Incorporate the recommended Town of Belville Master Plan prepared by the Lawrence Group, to be approved in 2007 by the Belville Board of Commissioners. Schedule: FY2007-2008.
- ▶ Implement approved Belville Master Plan to the greatest extent that it is economically feasible for the citizens of the Town of Belville. Schedule: Continuing Activity.
- ▶ Re-codify the current zoning and subdivision ordinances, using the approved Town of Belville Master Plan as a guidance tool. Schedule: Continuing Activity.

- ▶ Incorporate smart growth and new urbanism land use principles as appropriate during the codification of the zoning and subdivision ordinances. Schedule: Continuing Activity.

### **Policies – General Health and Human Service Needs**

P.115 Brunswick County's local requirements for solid waste disposal facilities shall continue to be anticipated through advanced planning; facilities shall be located and designed so as not to adversely impact significant natural or manmade resources.

P.116 Research and development of recycling and resource recovery programs, whether public or private, shall be encouraged and supported.

P.117 In an effort to improve health conditions, Brunswick County supports the following water and sewer policies:

- ▶ Brunswick County supports the extension of central water service into all areas of the County shown on the future land suitability analysis map as suitable for development, including the construction of lines to and through conservation areas to serve development which meets all applicable state and federal regulations.
- ▶ Brunswick County recognizes the importance of protecting potable water supplies, and therefore supports the enforcement of NCAC Subchapters 2L and 2C regulations to regulate land uses near groundwater sources.
- ▶ Brunswick County will continue to support all efforts to secure available state and federal funding for the construction and/or expansion of public and private water/sewer systems.
- ▶ Brunswick County will continue to support the construction of water systems with adequate line sizes to ensure adequate water pressure and fire protection.

P.118 Brunswick County will provide accessible and affordable resources and programs that focus on prevention of injury/illness, chronic disease management, and provide information links to other support services and groups.

- P.119 Brunswick County will continue to provide for the well being of our senior citizens by increasing their participation in current programs while developing adequate facilities and support for an independent life style.
- P.120 Brunswick County will encourage continued senior citizen involvement in the community, providing them with opportunities to share their skills and work experience for community benefit.
- P.121 Brunswick County will continue to place emphasis on the need to work directly with underprivileged youth.
- P.122 Brunswick County will provide information that is readily accessible about County services.
- P.123 Brunswick County, in collaboration with Southeastern Center, will facilitate the provision of accessible mental health services, youth programs, and pre-natal care.
- P.124 Brunswick County will provide its citizens with cost effective and task efficient regional fire and rescue protection and emergency medical services that meet national standards.
- P.125 Brunswick County will continue to recruit and train a corps of volunteers for youth services.

### **Implementing Actions – General Health and Human Service Needs**

- I.115 Brunswick County will implement the following activities to support health care:
- ▶ Prevention/intervention.
    - Expand the Brunswick County web site with links to federal, state, and local organizations that focus on wellness and/or provide health care resources.
    - Increase the use of mobile health unit and inform public through the media of locations, times, and routes.
    - Hold more public health fairs.
    - Support wellness initiatives via bike rallies, marathons, fishing tournaments, etc., that provide the County a link with regional and private resources.

- Work with state and federal legislators to obtain grant money for initiatives to reduce health care costs.
- ▶ Crisis management – individual and area-wide.
  - Create a “super number” and web site that residents can access to aid in finding resources.
  - Work with local religious groups to provide emergency support systems for large scale or traumatic events.
  - Continue County-wide test drills of our emergency preparedness system.
- ▶ Chronic disease management (e.g., diabetes, cancer, pulmonary disease)
  - Create a task force of volunteers to help with specific suggestions and/or grant writing to fund a group that will network with federal, state, local, and private resources in this area.
  - Develop support for youth health programs.

Schedule: Continuing Activities.

I.116 To support its senior citizens, Brunswick County will:

- ▶ Establish/expand and ensure full accreditation at nutrition sites and senior centers.
- ▶ Offer a wider variety of activities and programs at senior centers.
- ▶ Collaborate with other entities to provide a wider range of health and wellness programs.
- ▶ Support a comprehensive information and referral program to support independent living.
- ▶ Develop a comprehensive fund-raising plan to support senior centers and activities.
- ▶ Continue to support the efforts of the Brunswick Transit System (BTS).
- ▶ Seek federal funding for a retired senior volunteer program in Brunswick County.
- ▶ Develop a County-wide approach to the recruitment and deployment of Title V subsidized workers for community service.
- ▶ Advocate a greater utilization of senior citizen experience on area nonprofit boards, governmental advisory boards, etc.
- ▶ Work with the local chapters of AARP and others to involve seniors in community service.

Schedule: Continuing Activities.

I.117 To support its youth, Brunswick County will:

- ▶ Establish a youth in need initiative.
  - ▶ Sustain a higher level of parent or guardian involvement in the youth in need initiative.
  - ▶ Encourage wellness education.
  - ▶ Encourage our youth to stay in school.
  - ▶ Maintain and expand support for Brunswick County's parks and recreation facilities and programs.
  - ▶ Continue to communicate the programs, athletics, classes, etc., available for the youth of the County.
  - ▶ Improve transportation as a barrier for youth participation in activities.
- Schedule: Continuing Activities.

I.118 Brunswick County will improve the distribution of information on County programs through the following actions:

- ▶ Support a community relations office with staff.
- ▶ Identify existing outlets that are accessible to all citizens to distribute information about County-wide services.
  - County government
  - Municipal governments
  - Nonprofit and other civic organizations
- ▶ Create new outlets to distribute information on County-wide services.
  - Information center at the County government complex.
  - "How to/Where to" guide for County residents.
  - Create new outlets to distribute information on County-wide services.
  - Towns and County help each other in distribution of printed information and brochures.
  - Create a "County Corner" at public libraries where information is available to citizens.

Schedule: Continuing Activities.

I.119 To support volunteer youth programs, Brunswick County will:

- ▶ Make the public aware of the challenges and opportunities of volunteering for youth services.
- ▶ Encourage industry participation in volunteer work.

- ▶ Partner with civic clubs, churches, 4-H, junior achievement, and mentoring organizations for funds and services to support youth programs.
- ▶ Recruit more senior volunteers through Brunswick Senior Resources, Inc. (BSRI).

Schedule: Continuing Activities.

I.120 In support of fire and emergency services, Brunswick County will:

- ▶ Appoint a Public Safety Study Review Team composed of local citizens and fire, rescue, emergency medical services personnel, and volunteers to evaluate the recently completed public safety study.
  - Determine what recommendations in the public safety study will work best for Brunswick County.
  - Develop an action plan to implement recommendations of the review team.
  - Keep the Brunswick County public informed of the activities and progress of the review team.

Schedule: FY2009-2010.

- ▶ Continue to foster cooperation and coordination between the County and volunteer units, and volunteer units with each other.
- ▶ Brunswick County will coordinate redevelopment efforts with the Brunswick County Building Inspections Department .

Schedule: Continuing Activities.

I.121 To effectively manage Brunswick County's investment in existing and proposed community facilities and services, the County will:

- ▶ Develop a specific capital improvements plan (CIP) with emphasis placed on services and facilities which affect growth and development. Schedule: FY2009-2010.
- ▶ Provide the Brunswick County Board of Education with locational information on all residential development. Schedule: Continuing Activity.

## **Policies – Redevelopment**

- P.126 Brunswick County supports and encourages the restoration and/or appropriate adaptive reuse of significant and architecturally important historic and cultural structures and sites.
- P.127 Redevelopment and/or rehabilitation of substandard structures within the County shall be supported through public and private sector initiatives for the economic betterment of area residents.
- P.128 Recognizing that most erodible areas are within the planning jurisdictions of the County's municipalities, the County nonetheless supports a policy of relocation and retreat, rather than shoreline hardening, when structures are threatened by shoreline erosion.
- P.129 Brunswick County supports repair and reconstruction of privately owned dwelling units through private funds and/or grants.

## **Implementing Actions – Redevelopment**

- I.122 Brunswick County will seek state and federal financial aid and technical assistance for community improvements. The County will apply for Community Development Block Grants and NC Housing Finance Agency grants for the rehabilitation of areas of substandard housing after identifying same. Schedule: Continuing Activity.
- I.123 Brunswick County will adopt a minimum housing code. Schedule: FY2008-2009.
- I.124 Brunswick County will allow the reconstruction of any structures demolished by natural disaster which will comply with all applicable local and state regulations. Schedule: Continuing Activity.

## **Implementing Actions - Funding Options**

- I.125 Brunswick County will continue to support state and federal programs that are deemed necessary, cost-effective, and within the administrative and fiscal capabilities of Brunswick County. Schedule: Continuing Activity. These include:
- Community Development Block Grant Program
  - Area Agency on Aging
  - Emergency Medical Services
  - JTPA Work Program
  - Farmer’s Home House Preservation Program
  - Coastal Area Management Act, including shoreline access funds
  - Small Business Association
  - Economic Development Administration Funds
  - Farmer’s Home Administration – Federal Grant Program
  - Federal Emergency Management Program
  - Aid to Families with Dependent Children
  - MEDICAID
  - Day Care
  - Crisis Intervention
- I.126 Brunswick County will selectively support state and federal programs related to Brunswick County. The County, through its boards, commissions, and committees, will monitor state and federal programs and regulations. It will use opportunities as they are presented to voice support for or to disagree with programs and regulations that are proposed by state and federal agencies. Schedule: Continuing Activity.
- I.127 Brunswick County officials will continue to work with the Army Corps of Engineers and any other state and federal agencies to ensure continued dredging and maintenance of channels and rivers as needed to keep these facilities open to navigation. These efforts shall comply with applicable state and federal regulations. Providing borrow or spoil areas and provision of easements for work will be determined on case-by-case basis. The County will encourage spoil material being placed on those areas where easements for such use already exist. Channel maintenance has major economic significance and is worthy of state and federal funding. Schedule: Continuing Activity.