

# CRITICAL AND SENSITIVE AREAS

In every community there are unique features that contribute to the area's character and identity. In many instances, these unique features play a pivotal role in maintaining the health and welfare of the community through provision of safe potable water, or drainage controls, etc. A well-designed blend of nature and development is not only aesthetically pleasing, it can also protect waterways from contamination, preserve ecologically valuable land, reduce air pollution from traffic congestion and improve property values.

*This chapter of the Comprehensive Plan addresses the general guidance for development decisions that affect environmental features and processes. It encourages development to minimize any impact on these resources.*



## I. EXISTING CONDITIONS

Determining the suitability of land for future development necessitates analyzing and understanding its relationship to the natural environment. Such analysis should include a basic knowledge of the availability of potable water, soil types, topography, size and location of floodplains and drainage characteristics. Once these features are identified, areas can be evaluated to determine their potential usefulness for intensive urban types of development.

This chapter identifies the key natural features of the Study Area and how they will affect future development.

### A. CLIMATE

Rocky Mount has a mild climate year-round, with generally adequate rainfall and little snow.

The average annual amount of precipitation is approximately 46 inches with the greatest amounts falling during the summer months. Average rainfalls for March, July and November are 4.2, 6.0 and 3.2 inches, respectively.

The average January temperature is 41.3 degrees, and the average July temperature is 78.9 degrees. Frost-free nights normally occur from early April to the end of October, providing a long growing season.

### B. AIR QUALITY

The City currently meets minimum air quality standards. At one time, the City's wastewater treatment plant operated a sludge incinerator. This action necessitated regular monitoring of the Total Suspended Particulate (100+ microns) by the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Air Quality. While this monitoring no longer takes place, regular measurements of Particulate Matter (10 microns or less) are still taken at this site.

To date, Rocky Mount has not dealt directly with air quality issues affecting other parts of North Carolina, as significant air pollutants have not been a major issue in the area. However, the United States Environmental Protection Agency (EPA) and NCDENR have proposed new air quality standards. If these standards were adopted in their current form, the City would no longer meet the minimum standards for ozone pollution. Compliance with the new standards would require vehicle emissions testing, more stringent industrial smokestack emissions permitting and addition of air quality impact analysis to transportation planning.

## C. DRAINAGE AND WATER

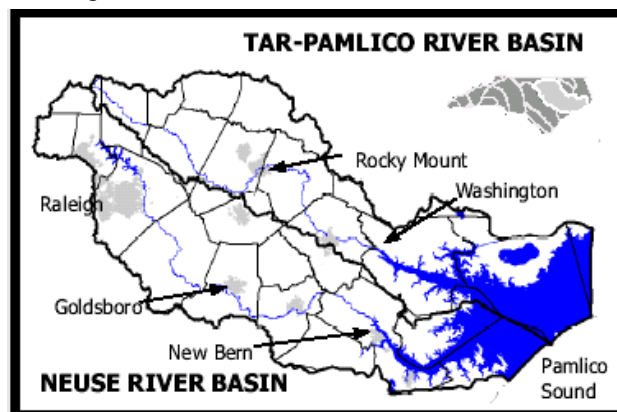
The availability of potable water is one of the most important factors in determining the possibilities for growth within an area. Sources of potable water in the Rocky Mount area include surface waters (lakes and rivers) and groundwater.

The quantity of natural and manmade pollutants draining into these systems directly affects the quality of both ground and surface water. For this reason, it is important to insure that development occurs in a manner that preserves the vital function of these waters. In some instances this means that better control of storm water runoff is needed, while in others the density development must be limited so that functional capacity of the water is not compromised.

### 1. Drainage

The City of Rocky Mount is located near the center of the Tar River Drainage Basin, which extends 180 miles from Person County in the Piedmont, across the Coastal Plain to the Pamlico Sound. The entire basin contains 4,302 square miles. Rocky Mount, Greenville and Tarboro all use the Tar River as a source of drinking water.

Figure 9-1: Tar-Pamlico and Neuse River Basin



Source: NCDENR, Division of Water Quality, Riparian Buffer Protection Rules for the Neuse and Tar-Pamlico River Basins

Averaging a fall of 3.9 feet per mile, the Tar River flows approximately 11 miles through the Study Area. Where the Fall Zone crosses the Tar River, a natural stream fall occurs and the streambed drops 10 feet (vertically) in about 1,000 feet. A masonry dam was constructed on the falls at the turn of the century for the Rocky Mount Mills textile plant. That dam has an average height of 10 feet. In addition, the natural falls account for another 10 feet fall of the river at that point. Thus, within the Study Area, approximately half the decrease in the river elevation occurs at or immediately below the dam.

The major water impoundment in the Tar River Basin is the Tar River Reservoir, located five miles southwest of Rocky Mount. The reservoir has approximately 1,650 acres of water surface at an elevation of 125 feet. The reservoir backs upstream for some seven miles. In addition to serving as the source of potable water for the Rocky Mount system, the reservoir is the site for numerous recreational activities. The reservoir was not designed as, nor does it function as, a significant flood control facility.

The Tar River and its tributaries drain virtually all of the land within the City. Some areas drain directly into the Tar River, while other areas drain into numerous tributaries that flow into the river within the Study Area. The largest of these tributaries is Stony Creek. Others include Compass and Maple Creeks, Hornbeam, Goose, Grape and Cowlick Branches.

The only streams in the area that do not enter the Tar River within the Study Area are Cokey Swamp and Beech Branch. Cokey Swamp is located in the southeastern portion of the planning area; it drains to the southeast and empties into the Tar River approximately 14 miles east of Rocky Mount's extraterritorial jurisdiction (ETJ) boundary. Beech Branch, located in the northeastern part of the planning area, also drains to the southeast, but joins the Tar River about two miles east of the ETJ boundary.

The type of soils present at specific locations causes seasonally a high ground water table in numerous locations in the Study Area. It is related to, in these locations, drainage and the provision of municipal water and sewer services may be necessary to overcome the associated deterrents to urban development. In some instances, specially designed foundations may be necessary, and the construction of a basement may not be feasible.

## 2. Floodplain

Flooding is one of the most severe constraints affecting future development patterns. Threats to life and property from floods can be severe. Since 1908, several damaging floods have been recorded in Rocky Mount, the most recent being the extensive flooding resulting from Hurricane Floyd in 1999.

Most of these floods have occurred in low-lying areas along the Tar River and its tributary streams, commonly known as floodplains. Areas having the most severe flooding lie within the Tar River and Stony Creek floodplains. In the Study Area, the floodplain of the Tar River varies in width from approximately 900 to 13,000 feet. Variation in width of the Stony Creek floodplain is from 50 feet at the upper end of its drainage area to 2,800 feet where Stony Creek merges with the Tar River.

In order to protect the lives and property of its residents, the

City participates in the National Flood Insurance Program. This is a federally sponsored program offering flood insurance for properties located within eligible communities. Premiums are based upon the location of the insured property in relation to mapped floodways and floodplains in the area. Boundaries of mapped floodplains (both 100 and 500 year) are shown on the Flood Insurance Rate Maps (FIRM). A second set of maps delineates the boundaries of the Floodways (stream channels) within the floodplains.

The generalized floodplain areas in the Rocky Mount region are shown on Map 9-1. They are based on the official FIRM and Floodway maps obtained from the Federal Emergency Management Agency. One hundred and 500 year floodplains are indicated on the map. The land area covered with water during a 100 year flood (one that occurs once every 100 years on the average) is called the 100 year floodplain and the land area covered with water during a 500 year floodplain (one that occurs once every 500 years on the average) is called the 500 year floodplain.

Hurricane Floyd revealed flood hazard data and map limitations. The State's vulnerability to hurricanes and flooding make it crucial that communities and property owners have accurate, up-to-date information about the flood risk. The updated Digital Flood Insurance Rate Maps (DFIRMs) produced through this project will help to protect lives and property and will contribute to the general well being of North Carolina citizens. The City will be updating two major regulatory tools to manage flood-related development impacts.

- **Floodplain Mapping:** The State of North Carolina, through the Federal Emergency Management Agency's (FEMA) Cooperating Technical Community partnership initiative, has been designated as the first Cooperating Technical State (CTS). As a CTS, the State will assume primary ownership and responsibility of the Flood Insurance Rate Maps (FIRMs) for all North Carolina communities as part of the National Flood Insurance Program (NFIP). This project will include conducting flood hazard analysis and producing updated, digital FIRMs (DFIRMs). The City has as of May 13, 2003, received preliminary maps and is the process of implementing them as they receive final approval. The updated mapping will replace the current NFIP/FEMA maps, which were prepared in 1979.
- **Floodplain Regulations:** The City updated the floodplain regulations at the end of 2000 and again May of 2003 in response to the publication of preliminary FIRM maps. This provides stronger tools to manage development in the 100 and 500 year floodplains, as well as the floodways.





Together, these two tools could help minimize the impact of future floods on development and redevelopment located along the Tar River and its tributaries. The use of the updated flood hazard data by communities for floodplain management will dramatically reduce long-term flood losses in the State of North Carolina.

### 3. Groundwater

While most City residents receive water from the City system, the major source of drinking water for areas outside of Rocky Mount's municipal limits is groundwater. Wells that tap the groundwater have yields that vary widely throughout the Study Area. Groundwater quality in Nash and Edgecombe Counties is generally acceptable for domestic and industrial needs. Some of the minor problems associated with the groundwater in certain locations include high levels of iron, hardness and unpleasant odor/taste. These problems can usually be treated inexpensively and without great difficulty.

In some areas the groundwater is unfit for consumption. The sources of contamination are both natural and man-made. The most significant and widespread of these is radon/radium contamination. Radon is a naturally occurring element. Both of these elements are radioactive and can be hazardous to humans. Some areas north of the City have experienced high enough levels that the groundwater cannot be used.

Other sources of groundwater contamination, which to this point have only affected localized areas, are leaking underground petroleum storage tanks and spills of hazardous materials, including fuels and pesticides.

### 4. Surface Water And Quality

The Tar River is the sole source of Rocky Mount's municipal

water supply. The City operates two water treatment plants. The southernmost plant is located at the Tar River Reservoir, which is outside the Study Area, five miles southwest of Rocky Mount. It is the major water impoundment in the Tar River basin and contains 4.3 billion gallons of water. The reservoir backs upstream for about seven miles and has approximately 1,650 acres of water surface. The second water treatment plant was the original municipal treatment facility. It is located on Sunset Avenue across from the City Lake Park and draws directly from the river.

Rocky Mount treats and distributes approximately 14 million gallons of water per day to customers in the City and surrounding municipalities. Nearby communities receiving potable water from the City as wholesale customers include Whitakers, Dortches, Sharpsburg, Nashville and the Edgecombe County water system. Discussions are underway regarding a possible expansion of service to the Town of Pinetops as well.

In order to protect the different uses or special characteristics of a water body, state and federal agencies are charged with the responsibility of assigning a surface water classification to each body of water. These classifications and their associated rules give the regulatory agencies tools needed to protect water quality, fish and wildlife, the free flowing nature of a stream, or some other special characteristic. In North Carolina this responsibility falls upon the Division of Water Quality within the Department of Environment and Natural Resources (NCDENR).

Table 9-1 lists the current water quality classifications for the Tar River and area streams that are monitored and classified by the Division of Water Quality.

According to this data, all streams in the Study Area are identified as being Nutrient Sensitive Waters (NSW), which means that the levels of nutrients (generally nitrogen and phosphorus) are excessive and discharge of additional nutrients must be limited.



The upper and lower portions of the Tar River have a WS-IV rating, indicating that they are waters located in moderately to highly developed watersheds that function as potable water supplies. Those areas adjacent to the water supply intakes (either Sunset or Reservoir) are designated as CA, indicating that the risk associated with pollution is greater than from the remaining portions of the watershed.

Almost all other streams in the area were assigned a “C” classification, which is suitable for “fish and wildlife propagation, secondary recreation, agriculture, and other uses requiring waters of lower quality.” The upper portion of Beech Branch was the only exception with a “B” classification, which is suitable for “primary recreation.”

**Table 9-1: River And Stream Classifications In The Study Area**

Name	Description/ Location	Class*	Date
Tar River	From source to SR 1933, including upper portion of City reservoir	WS-IV & V NSW CA	Aug '92
Tar River	From SR 1933 to a point 4000 ft. upstream from City reservoir dam	WS-IV & B NSW CA	Aug '92
Tar River	From 4000 ft upstream form City reservoir dam to reservoir dam	WS-IV NSW CA	Aug '92
Tar River	From City reservoir dam to Maple Creek	WS-IV NSW	Aug '92
Tar River	From Maple Creek to a point 100 ft downstream of Rocky Mount Water Intake (Sunset)	WS-IV NSW CA	Aug '92
Tar River	From a point 100 ft downstream of Rocky Mount Water Intake (Sunset) to dam at Rocky Mount Mills	B NSW	Aug '92
Tar River	From dam at Rocky Mount Mills to a point .9 miles downstream of Buck Swamp	C NSW	Jan '90
Grape Branch	From source to Tar River	WS-IV NSW	Aug '92
Maple Creek/ Swamp	From source to Tar River	WS-IV NSW	Aug '92
Stony Creek	From source to Tar River	C NSW	Jan '90
Goose Branch	From source to Tar River	C NSW	Jan '90
Cowlick Creek/ Branch	From source to Tar River	C NSW	Jan '90
Compass Creek	From source to Tar River	C NSW	Jan '90
Hornbeam Branch	From source to Compass Creek	C NSW	Jan '90
Beech Branch	From source to US 301	B NSW	Jan '90
Beech Branch	From US 301 to Falling Run	C NSW	Jan '90
Beech Branch	From Falling Run to Tar River	WS-IV NSW	Jan '90
Cokey Swamp	From source to Town Creek	C NSW	Jan '90
Little Cokey Swamp	From source to Cokey Swamp	C NSW	Jan '90

Source: NCDENR, Division of Water Quality, 2002

- \* • B Primary Recreation, Fresh Water
- C Aquatic Life, Secondary Recreation, Fresh Water
- CA Critical Areas
- NSW Nutrient Sensitive Waters
- WS-IV Water Supply IV—Highly Developed
- WS-V Water Supply V—Upstream

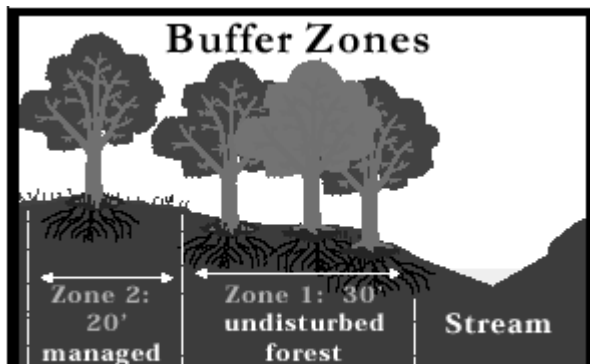
**Watershed Protection Area**

Since the Tar River is the only body of surface water that is currently available to be used as the City's drinking water supply source, it is extremely important that its quality be protected. For this reason, the City has adopted watershed protection measures to help protect both private and public water sources and to preserve the Tar-Pamlico Watershed. These regulations limit the size and intensity of new construction and establish buffer requirements for new developments located along perennial streams. Nash County also imposes restrictions on the Tar River Watershed. These restrictions are intended to help protect the water quality in the river upstream from the Rocky Mount water plant intake points from pollution.

Map 9-1 illustrates the Water shed Protection Area which is comprised of two distinct categories per city ordinance. The Critical Area is defined as extending one-half mile upstream from the intake located directly in the Tar River, or the ridge line of the watershed (whichever comes first and represents the most sensitive area in the system. The Protected Area is the area adjoining and upstream to the Critical Area in which protection measures are required. The boundaries of the protected area extend five (5) miles upstream from the critical area, or to the boundary of the city's extraterritorial jurisdiction (whichever comes first). The protected area also extends to the ridge line of the watershed. The controls for these areas are intended to lower impervious surface in order to minimize polluting runoff into the Tar River system at that point and limit land uses to those developments that are not likely to cause significant water quality problems. For example, toxic and hazardous materials are controlled as is high density development.

Prior to the late 1980's, increases in algae blooms and fish kills in the upper Pamlico estuary were linked to excessive nutrient levels in the River. In response, the NC Environmental Management Commission designated the entire

**Figure 9-2: Functions Of Riparian Buffers**



Source: NCDENR, Division of Water Quality, Riparian Buffer Protection Rules for the Neuse and Tar-Pamlico River Basins

Tar-Pamlico Rive Basin as Nutrient Sensitive Waters (NSW). As a result, the State was forced to develop a nutrient management strategy for the basin.

The State developed a two-phase strategy aimed at reducing pollutants entering the Tar-Pamlico system from both "point" (industry and wastewater treatment) and "non-point" (runoff) contributors. The strategy's first phase ran from 1990-1994. It produced an innovative point source/non-point source trading program that allows point sources to achieve reductions in nutrient loading in more cost-effective ways. The second phase runs through 2004 and calls on non-point sources to contribute to the goal of a 30% reduction in nitrogen loading (from 1991 levels) and maintenance of phosphorus loading at 1991 levels. In December 1999, the NC Environmental Management Commission adopted buffer protection rules, which require that up to 50 feet of riparian area be protected and maintained on the banks of intermittent and perennial streams, lakes, ponds and estuarine waters in the basin, as shown on the United States Department of Agriculture Natural Resources Conservation Service (NRCS) county soil survey map or United States Geological Survey (USGS) topographic map. The application of these requirements is illustrated in Figure 9-2: Function of Riparian Buffers.

The purpose of these buffers is to remove nitrogen, phosphorus and other pollutants from rainwater that flows into the basin's waterways, thus protecting the waterways from the surrounding uses.

Another component of the second phase regulations is a requirement that six municipalities and five counties in the Tar-Pamlico Basin develop and implement stormwater programs within two-and-a-half years. The local governments subject to these requirements include: Greenville, Henderson, Oxford, Rocky Mount, Tarboro and Washington, as well as Beaufort, Edgecombe, Franklin, Nash and Pitt Counties. Discussion of the City's development of this stormwater program is included in the Community Facilities chapter of this document.

**D. GEOLOGY**

**1. Bedrock And Mineral Resources**

The geology of the study area consists of sedimentary rock situated over a crystalline granite base rock. The base rock slopes gently to east at a rate of 25 feet per mile. The only exposure of the bedrock occurs in several outcroppings in the fall zone along the Tar River. Such granite outcropping is only found in a few location in the area, but where it occurs, it can be a deterrent to extensive development.

Lying on the irregular, sloping surface of the granite base rock are sedimentary rocks consisting of gravels, sands, clays, limestones, and marls. These formations become



thicker as one moves to the east at a rate of about 20 feet per mile. The most prominent sedimentary formation within the area is the Yorktown, which is exposed along the Tar River. This formation is an average of about 50 feet thick in the Rocky Mount area.

At the present time, the most valued mineral resources in the area are sand, gravel and crushed granite. These minerals are primarily used for construction purposes. Historical accounts indicate that iron was mined during colonial times and later, gold was mined in Nash County.

Other mineral resources that may be of value in the future include clays that may be used in the ceramic industry and sands, which, in addition to their current uses, may be used in the manufacture of transit pipes and glass.

## 2. Soils

Soil characteristics and locations are significant factors in the physical and economic growth of an area because they greatly influence land development patterns. Drainage permeability, structural conditions and depth of bedrock affect the feasibility of developing urban areas. Agricultural uses are primarily affected by drainage, fertility and erosion. In areas not connected to the Rocky Mount wastewater treatment system, soil permeability is a critically important characteristic because it determines whether septic tanks can be utilized for sewage disposal in new development. Soil that is not capable of supporting septic tanks usually becomes polluted and discharges waste into the water supply.

Other characteristics of soils that adversely affect new development include shrink-swell potential, risk of corrosion on uncoated steel and concrete, potential frequency and duration of flooding and seasonal water table levels. Another limiting factor is present in all soils where slopes occur. A septic tank filter field, for example, may perform well in certain soils where the land is level, but its performance will be severely limited if placed in that same soil on a slope of 10% or greater. Most locations in the Rocky Mount area with slopes over 10% are found in areas subject to flooding.

According to the United States Department of Agriculture (USDA) Soils Maps, there are more than 25 kinds of soils in the Study Area. Map 9-2: Generalized Soils of Edgecombe and Nash Counties, shows the location and description of general soil categories within both counties. More specific information regarding the various kinds of soils located in the Study Area can be found on the 23 detailed soils maps prepared for both Nash and Edgecombe Counties. The USDA Soil Conservation Service (SCS) developed these detailed soil maps.

## E. Topography

The Rocky Mount area is generally flat with occasional moderate slopes. Steep inclines exist only near the Tar River and certain streams.

The elevation of the area averages 115 feet above sea level. In the municipal limits, elevation extremes range from about 70 feet above sea level along the Tar River in the northeast to about 160 feet in the west. Beyond the municipal limits in the extraterritorial planning jurisdiction (ETJ), the elevation varies from about 50 feet above sea level in the northeast to over 160 feet in the west.

Topographic maps of the Rocky Mount area are produced by the United States Geological Service (USGS). This information has been added to the City's GIS system and an example is shown on Map 9-3, Topography.

## F. SPECIES HABITAT

Rocky Mount's greenways and wetland areas are crucial ecosystems in the environment providing natural habitat for many different species. The Rocky Mount area contains a significant portion of Nash County's 21 species of flora and fauna that are classified as endangered or rare. While the locations of habitats of these ecological resources are not specifically delineated, their presence should be of concern in major land development projects.

According to records of the US Fish and Wildlife Service, five endangered species of plants and animals are found in the two county area. These species are:

- *Picoides borealis* Red-cockaded woodpecker
- *Elliptio steinstansana* Tar River spiny mussel
- *Alasmidonta heterodon* Dwarf wedge mussel
- *Lasmigona subviridis* Green Floater
- *Trillium pusillum* Carolina least trillium
- *Var pusillum*

There are also several species that are significantly rare or of special concern that may become threatened or endan-



gered in the future and should be looked at in subsequent planning studies.

In addition to the identified list of threatened or endangered species, there are also several areas designated as Registered Heritage Areas by the Natural Heritage Program of the NCDENR and include the three locations within the Study Area listed below:

- Tar River Aquatic Habitat (Edgecombe County)
- Swift Creek Aquatic Habitat (Nash and Edgecombe Counties)
- Fishing Creek Aquatic Habitat (Nash County)

These areas currently carry no protective legislation, but they are typically home to many of the endangered species in the State and may secure protective legislation in the future.

## G. VEGETATION

### 1. Woodlands

The original vegetation in the Rocky Mount area prior to urban development was primarily of Loblolly Pine forests. Where these forests still exist, Loblolly Pines generally make up 50% or more of the trees, with Sweet gums being commonly associated. On well-drained sites, Short Leaf Pine, Southern Red Oak, Post Oak and Black Jack Oak are also found. On poorly drained sites additional species usually include Black gum, Water Oak, Yellow Poplar and Pond Pine.

As development has occurred, significant portions of these originally forested areas have been removed. Removal of all or most of the natural vegetation in certain areas, without any replanting, has resulted in several negative conditions. Among these are a significantly lower capacity for groundwater recharge, an increase in the rate and volume of stormwater runoff which increases the potential for flooding along nearby creeks and rivers, an increase in soil erosion which degrades water quality in creeks and rivers; and an increase in locally extreme weather conditions (temperatures). These negative attributes can be expected to become worse in the future unless measures are taken to provide for the protection of existing vegetation and the addition of landscape plantings where existing vegetation cannot be preserved.

### 2. Wetlands

Wetlands are important elements of a watershed because they serve as the link between land and water resources. Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation and other factors, including human disturbance. Indeed, wetlands are found from the tundra to the tropics and on every continent except Antarctica. In many areas with high ground water tables and flood hazards,

areas known as wetlands exist.

Nationally, the amount of wetland areas has been declining steadily since 1799. These losses, as well as degradation, have greatly diminished our nation's wetlands resources; as a result, we no longer have the benefits they provided. The increase in flood damages, drought damages and the declining bird populations are, in part, the result of wetlands degradation and destruction.

Since 1972, the US Army Corps of Engineers (USACE) has been required to protect wetlands with a national goal of no net reduction of wetlands. The existence of wetlands is determined on a case-by-case basis by the USACE or authorized representative. Before any filling or land disturbance can occur in wetlands, the federal government requires that the necessary permits be obtained from the USACE.

The definition of wetlands used by the USACE is taken from the Clean Water Act of 1972. According to this law, wetlands are defined as "areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated hydric soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Wetlands protection programs are most effective when coordinated with other surface and ground-water protection programs and with other resource management programs, such as flood control, water supply, protection of fish and wildlife, recreation, control of stormwater and non-profit source pollution. In the latest report of Congress, the USACE indicated that the loss of wetlands areas has slowed considerably in the past decade; there was an 80% reduction in the number of wetlands areas lost.

## H. CRITICAL AND SENSITIVE AREAS

According to the American Planning Association's Legislative handbook, critical and sensitive areas are defined as "lands and/or water bodies that provide protection to or habitat for natural resources, or are themselves natural resources requiring identification and protection from inappropriate or excessive development."

While a majority of the land within the Rocky Mount area is generally suitable for urban-type development, there are some factors that will limit the development potential of certain properties. The three main factors with broad implications for future development within the Study Area are: the watershed protection rules, the Tar-Pamlico buffers and related stormwater management requirements and the location and size of the 100 and 500 year floodplains. Together, these rules affect between 25 and 30% of the entire land within the Study Area.





### SMART GROWTH PRINCIPLE RETAIN OPEN SPACES

This fact is more clearly illustrated by Map 9-1, Critical and Sensitive Areas, which shows the 100 and 500 year floodplains, the Floodways, the watershed protection boundary, and the perennial streams located within the Study Area.

Flooding is one of the key constraints affecting future development patterns. According to the City's GIS system, about 3,632 acres within the City-as well as 7,573 acres within the ETJ-are located in the 100 year floodplain. Within the City, about 63% of the floodplain is developed, representing about 15,215 acres.

Hurricane Floyd flooded about 22% of the City in 1999. Nearly 684 acres of residential land use; 400 acres of commercial, office and religious land use; 177 acres of industrial land use and around 315 acres of parkland were flooded. More specifically, between 2,000 and 3,000 residential dwellings were damaged by the floodwaters. Eight hundred to 1,000 of these dwelling units will be demolished because of the severity of damage sustained.

North Carolina's economic vitality is encouraging unprecedented growth—another 2 million people will be added to the state's current population of 7 Million by 2020. Our state needs a green infrastructure of protected open space and farmland to complement this growth and development and to maintain our high quality of life.

In recognition of this fact, Governor Hunt challenged North Carolina to increase the current assemblage of permanently conserved open space and farmland by the end of 2009. In June 2000, the North Carolina General Assembly turned this goal into law. It requires the State to protect an additional million acres of farmland, open space and other conservation land by December 31, 2009, under the direction of the Secretary of NCDENR.

The NC Million Acre Initiative is a collaborative, state-led endeavor to accelerate the rate that land is protected in North Carolina and to permanently preserve an additional one million acres of land by the end of 2009. These goals involve:

- Fostering partnerships among private and public land protection partners
- Promoting regional open space planning
- Providing information about the importance of open space protection

To complement the Million Acre Initiative, the NC Smart Growth Commission was asked to explore policies to retain open spaces in North Carolina in addition to the permanent strategies outlined in the Million Acre Plan.

Protection of local critical and sensitive areas will require a combination of diligent administration of established laws and use of programs like the Million Acre Initiative to insure that these areas remain protected and allowed to perform their vital part in keeping the local environment in balance.

## II. Goals

A city that builds and develops in a way that preserves and protects natural features and systems and enjoys the beauty, open space and recreational opportunities provided by the natural environment

## III. OBJECTIVES AND STRATEGIES

### A. FOCUS OPEN SPACE PRESERVATION EFFORTS ALONG THE TAR RIVER AND ITS TRIBUTARIES

The Tar River and its associated stream system form one of the City's most critical natural resources. The river and tributaries fulfill important hydrologic functions, e. g. maintaining stream flow, recharging groundwater and minimizing flood peaks. It serves as the primary source of potable water for the City. The channels create riparian corridors that are places for scenic beauty, recreation and education about the natural world. Finally, the river ecosystem harbors plants and wildlife that are an important part of the City's natural heritage. The City should establish environmental quality as a priority in public and private land use decisions. These strategies recommend ways to protect and preserve the open space that help this system to function.

#### 1. Focus Open Space Acquisition To Preserve The Floodway

The floodway is an important part of the Tar River's floodplains because of the functions it serves in times of flooding. The floodway conveys the greatest amount of floodwaters and also offers significant water storage capacity. Targeting open space acquisition to these areas, in conjunction with adopting stronger regulatory standards, will allow the floodways to provide these important hydrologic benefits to the



City. The City's buyout program, relative to Hurricane Floyd, provides a means for assembling flood-prone ground that is required to be set aside as permanent open space.

## **2. Create Linear Public Open Space That Links Parks, Recreation Facilities, Schools And Natural Areas**

Rocky Mount's river and stream system forms corridors that spread throughout the City and region and are ideal lands to include in the City's public open space system. Riparian corridors can link existing parks and natural spaces, recreation facilities, schools and other destinations within the community. The City should identify ways to include the land along riparian corridors in its existing open space system. Where ecologically appropriate, the City should improve public access to and create riverfront parks and trails along these areas. The focus should be the Tar River greenway and extensions along secondary tributaries.

## **3. Promote The Use Of Conservation Easements And Other Alternatives To Public Acquisition Of Land**

Rocky Mount should consider ways to encourage the public to protect and enhance riverfront land. This can include offering programs to support conservation easements, providing information and technical assistance to citizens or businesses that own property on or adjacent to the river or streams, incentives to practice environmental stewardship and other techniques. Conservation easements offer an additional, voluntary way for property owners to engage in environmental protection for the good of the community while continuing in their role as stewards of their own land. The City should target conservation easements to rivers, streams, ravines and floodplains. Goals of the program should include mitigation of flood hazards, expansion of the City's linear open space system, preservation of vegetation and protection of habitat. The geographic focus of this strategy should be the City's stream system. Property owners can receive tax benefits from contributing easements.

## **B. PROMOTE THE PRESERVATION OF NATURAL FEATURES ON PRIVATE LAND**

Significant portions of Rocky Mount's private property abut rivers and streams or contain other important natural features. Land management practices in these areas greatly affect the quality of the natural environment. These strategies recommend ways for the City to foster the use of environmentally-friendly land management practices on private property.

### **1. Update Development Regulations To Pro-**

### **vide For Standards That Address Critical Natural Features And That Require Usable Open Space**

Development regulations should establish clear, understandable, consistent and implementable standards for protecting natural features. The City has updated its floodplain regulations and will be addressing the zoning code and subdivision regulations after the Comprehensive Plan is adopted. A comprehensive stormwater management ordinance will be prepared over the next two years. Updates should address buffers, siting, setbacks, density, retrofitting, flood proofing, impervious surfaces, drainage, erosion and other details of development. The City should make every effort to educate property owners and developers about any changes in the regulations that address natural features and open space.

### **2. Promote Best Management Practices To Property Owners Located Adjacent To Critical Natural Features**

Best management practices (BMP) are an ideal companion to development regulations, because they reinforce them with voluntary actions that property owners can take to further protect the natural environment on their property. BMP's should address buffer management, wetland restoration, vegetation enhancement, riparian forestry, habitat maintenance and other practices. The geographic focus on this strategy should be the City's stream system. Developer incentives should be established in conjunction with new requirements.



## **C. PUBLICIZE THE BENEFITS OF THE NATURAL ENVIRONMENT**

Raising public awareness is one of the most effective ways to preserve and enhance the natural environment. When residents, businesses, and other stakeholders are educated, they become powerful advocates for and participants in environmental protection policies. The City should publicize the benefits provided by the natural environment to the community and increase public understanding of why rivers, streams, floodplains and other natural features should

be protected. These strategies recommend ways for the City to raise public awareness about these benefits.

### **1. Provide Promotional Material About Natural Areas, Systems, And Features To The Public**

Brochures, displays, maps and other educational materials can improve public awareness of and access to the natural environment. The City should support the production and review of information provided at parks, other natural places and the Children's Museum to ensure that complete, current and accurate information is disseminated to the public.

### **2. Create Educational Spaces In Public Parks**

Parks provide opportunities to educate the community about ecosystems, natural features and processes and other aspects of the environment. Parks are also small-scale opportunities to explore and experience nature close to home. The City should enhance the park system to maximize its educational and recreational value for the whole community. Techniques to consider include viewpoints and trails, kiosks, interactive exhibits, newsletters, field trips and field posts where residents can volunteer to monitor certain environmental conditions.

### **3. Educate Property Owners About Property Maintenance Practices To Protect The Natural Environment**

A Buffer Management Program (BMP) offers a unique opportunity to educate property owners, because promoting it results in greater public awareness of the natural environment, of the benefits it provides and of how the community can protect and enhance those benefits. The City should make every effort to establish and educate property owners about BMP's. Examples include brochures on mosquito abatement and habitat displays for school children. It should emphasize how buffer management, wetland restoration, vegetation enhancement, riparian forestry, habitat maintenance, and other practices reinforce regulations and protect the natural environment.

## **D. CONTINUE EFFORTS TO MITIGATE FLOOD HAZARDS**

Portions of the City are at risk of flood hazards. Flood hazards have the potential to become disasters, most recently in 1999, as a result of Hurricanes Dennis and Floyd. Flood hazards should be carefully considered when making decisions about land management and development. To the greatest extent possible, development should occur in areas that are not flood-prone. Where development must occur in flood-prone areas, every effort should be made to

mitigate flood hazards. These strategies recommend ways for the City to mitigate these hazards.

### **1. Strengthen Floodplain Regulations, Update Floodplain Maps And Ensure Development In The Floodplain Meets National Flood Insurance Program (NFIP) Requirements**

The City should maximize the floodplain management program as the linchpin of its strategy to mitigate flood hazards. The City should complete its update of the floodplain regulations, revise the zoning code and subdivision regulations in line with the Comprehensive Plan and participate in the state's update of floodplain mapping.

### **2. Require Tar-Pamlico Buffer Improvements And Encourage Reforestation Of Stream Corridors And Slopes**

Riparian corridors convey the greatest amount of floodwaters and also offer significant water storage capacity. The Tar River and its upland tributaries serve these important functions for the Rocky Mount community. The City's Watershed Protection Regulations establish buffers along the Tar River. Improving these buffers, such as removing obstructions from them, enhances their ability to convey floodwaters. Reforesting stream corridors and steep slopes, especially upstream from the Tar River in Nash County, improves their ability to store water and minimizes downstream flood peaks.

### **3. Preserve Or Restore Wetlands**

Wetlands provide tremendous water storage capacity. They are important components of flood hazard mitigation, as well as groundwater recharge and habitat protection. The City should strategically promote the preservation and restoration of wetlands as part of its overall stormwater management program. The City should establish a working relationship with Nash County to preserve upstream wetlands in order to retain and detain water that would otherwise overwhelm the Tar River floodplain. However, habitat protection considerations should be taken, especially with regard to fluctuating water levels and non-point source water pollution. Efforts to preserve and restore wetlands should coordinate with mosquito control programs and strategies.

## **E. ENHANCE THE NATURAL LANDSCAPE**

Rocky Mount's natural landscape is one of its most important resources. The Tar River system, wooded ravines, wildlife habitat areas, areas of abundant native pine trees and even street trees contribute greatly to the physical environment of the community. The landscape is both public and private, and land management practices by public land



managers and private property owners greatly affect the quality of the natural environment and the City's appearance. These strategies describe ways for the City to enhance the natural landscape through the actions of all of these players.

### **1. Protect Woodlands And Stream Corridors Through Tree Preservation During Construction And Replanting, Including Continued Enforcement Of Silt Fencing**

In developable areas, the natural environment is most at-risk during the construction phase. Best management practices (BMP's) should be established and required to guard against inadequate sediment control methods, unnecessary tree removal, stripping of valuable topsoil and other undesirable practices that result in erosion, loss of vegetation and other forms of environmental degradation. The City should promote the value of BMP's such as the Tar-Pamlico and watershed requirements, encourage the training of developers in the use of these methods and enhance enforcement of development codes that call for these practices. The City's landscaping ordinance should also be strengthened.

### **2. Promote Quality Landscaping Of Commercial, Industrial, Institutional And Multi-family Properties; Conduct An Annual Beautification Recognition Program And Continue To Support The Local Keep America Beautiful (KAB) Committee**

Significant portions of Rocky Mount's private property abut rivers and streams or contain other important natural features. Development and maintenance practices in these areas greatly affect the quality of the natural environment. Best management practices that should be promoted through an education program that includes preservation of vegetation, soil stabilization, pollution reduction, habitat maintenance, litter removal and the Tar-Pamlico watershed requirements. The City should recognize property owners and managers who undertake enhancement efforts through an annual awards program. The City should continue to staff the KAB Committee, which serves all areas of Nash and Edgecombe Counties. Improving the built environment, vis-à-vis enhancements to the natural landscape, is critical to strengthening community pride, which will make the City stronger on many fronts, including in the area of business attraction.

### **3. Enhance The Landscaping Of Public Spaces**

A significant amount of the natural landscape is owned and managed publicly. This can include parks and trails, as

well as more "small scale" spaces like planting strips, utility right-of-ways, substations and landscaping on schools and other institutional property. The City should continue setting an example for outstanding landscape enhancement (its efforts to minimize the impacts of utility line installation on Winstead Avenue). Other environmental initiatives to consider are tree planting, stream buffer management, training in tree trimming/pruning, roadside native vegetation programs, "backyard wilderness" program, environmental stewardship activities and conservation of critical areas such as wetlands and forests.

