



# Chapter 4

## Waccamaw Subbasin

Part of Hydrologic Unit Code: 03040206

### General Description

This subbasin contains some of the most unique environments in the state. Lake Waccamaw, the largest Carolina bay lake and the second largest natural lake in the state, can be found here (Figure 4-1). The lake contains three species of endemic fish and four species of endemic mollusk as well as many other rare species. The eastern and southern shore of the lake have been protected by the Lake Waccamaw State Park since 1976. Lake Waccamaw has been designated as an ORW and all waters draining to it are part of the ORW management strategy area [15 NCAC 02B.0225 (c) (10)]. A portion of the Green Swamp, a large natural pine wetlands preserve with many carnivorous plants, is partially located in this subbasin.

### Current Status and Significant Issues

All of the waters in the subbasin are supplementally classified as Swamp Waters. Swamp waters have lower pH and dissolved oxygen standards than other waterbodies. In addition to the chemical/physical differences, swamp waters are also evaluated for biological communities using modified criteria. For more information on swamp water standards visit the Classification and Standards Unit website at <http://h2o.enr.state.nc.us/cs/index.html>.

The portion of the subbasin east of the Waccamaw River and south of Juniper Swamp will now be subject to new coastal stormwater rules because it is in Brunswick County. Brunswick County is one of twenty coastal counties affected by Session Law 2008-211 that became effective on October 1, 2008. For more information about Session Law 2008-211 see Chapter 5 of the *Supplemental Guide to Basinwide Planning*.

### Population and Land Use

Population for this subbasin is estimated at 59,901 or 57 people per square mile based on the 2000 census. Whiteville is the only municipality in this subbasin with a population greater than 5,000. It is the least densely populated subbasin in the Lumber River basin and is not expected to increase in population as fast as neighboring Long Bay Subbasin. The southeastern corner of the subbasin is expected to be the fastest growing area as coastal development extends further inland.

This is the least developed subbasin in the Lumber River basin. It has the highest percentage of wetlands at over 31 percent and the highest amount of forest land at over 27 percent. When taking into account the amount of wooded wetlands the percent of the subbasin covered by forest increases to just over 58 percent (Figure 4-2).

#### Watershed at a Glance

##### COUNTIES

Bladen, Brunswick, Columbus

##### MUNICIPALITIES

Bolton, Brunswick, Calabash, Carolina Shores, Chadbourn, Clarkton, Lake Waccamaw, Shallotte, Tabor City, Whiteville

##### PERMITTED FACILITIES

##### **NPDES Wastewater Discharge**

Major: 3

Minor: 8

**NPDES Nondischarge:** 3

##### **NPDES Stormwater**

General: 18

State: 21

**Animal Operations:** 64

##### AQUATIC LIFE SUMMARY

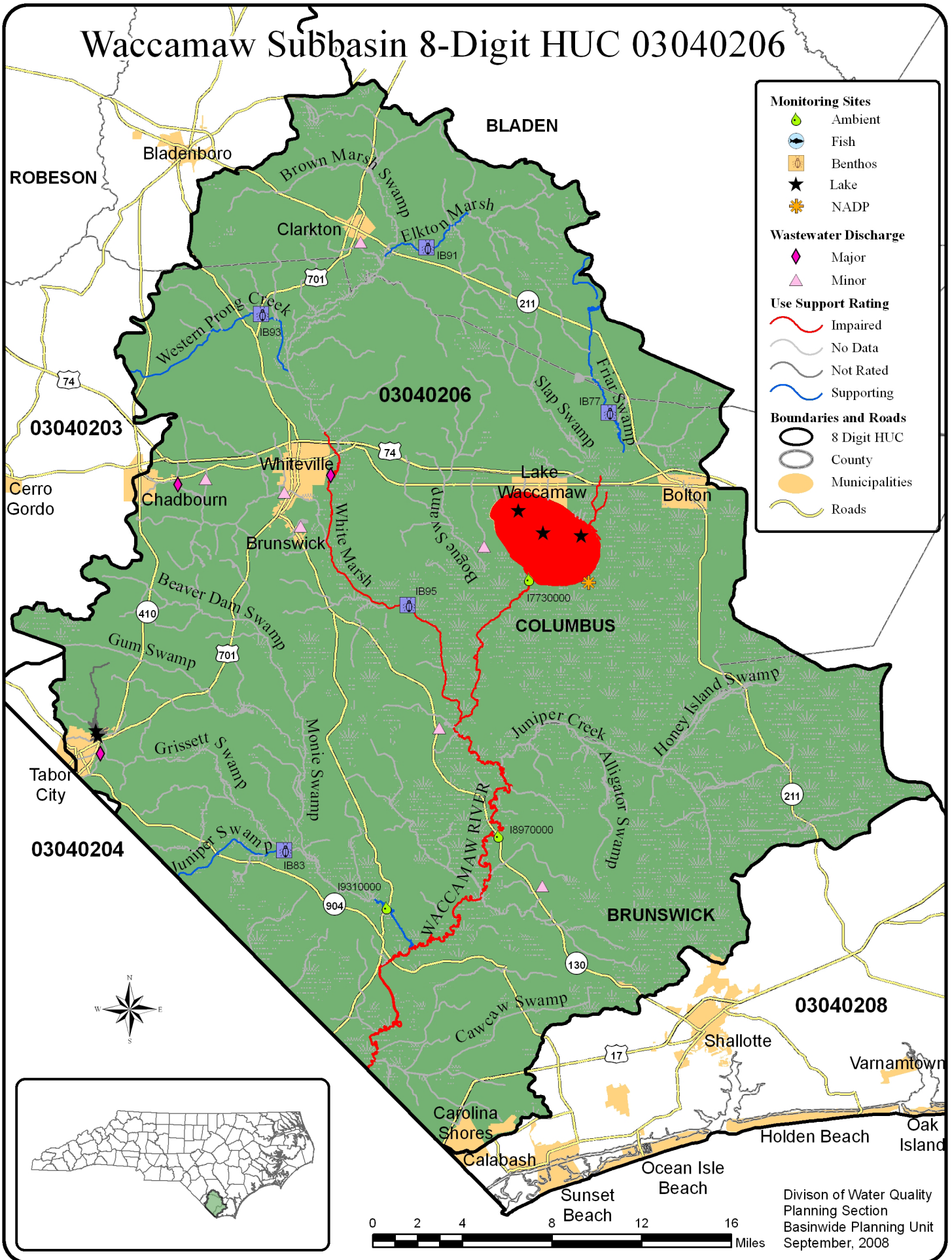
Monitored: 95 Miles  
8966 Acres

Total Supporting: 92 Miles  
8840 Acres

Total Impaired: 0 Miles  
0 Acres

Total Not Rated: 3 Miles  
126 Acres

FIGURE 4-1: WACCAMAW SUBBASIN (03040206)



## Ambient Water Quality

DWQ monitored ambient water quality in the subbasin at four different locations but one of those sites was in South Carolina. The South Carolina site was dropped from sampling in September of 2003. The only standard to be exceeded in more than 10 percent of the samples was iron. Both the Waccamaw River site and the Seven Creeks site exceeded the standard for iron in 50 percent or more of the samples. However, these waterbodies were not impaired for iron because it is believed to be natural. Total Kjeldahl Nitrogen was found to be elevated at three of the four ambient sites with the only exception being the site located just below the spillway of the Lake Waccamaw dam.

## General Biological Health

Five benthic macroinvertebrate sites were sampled from 2002 through 2006, two of which were part of a special study. Of the 4 permanent sites none of them changed in their bioclassification from the 2001 field season. All sites were rated Moderate except one that was rated as Natural. Three sites on the Waccamaw River, normally sampled, were not sampled due to high flow conditions but are expected to be visited during the 2011 field season.

## Local Water Quality

Table 4-1 list the number of benthic and ambient monitoring sites that were sampled for the 2002-2006 assessment period by watershed (10-digit HUC). Figure 4-3 shows the seven watersheds (10-digit HUCs) and the thirty-five subwatersheds (12-digit HUCs) within the Waccamaw River subbasin. They are labeled with the last 2 digits of the 10-digit HUC.

**TABLE 4-1: NUMBER OF BENTHIC AND AMBIENT SITE IN THE WACCAMAW SUBBASIN BY 10-DIGIT WATERSHED**

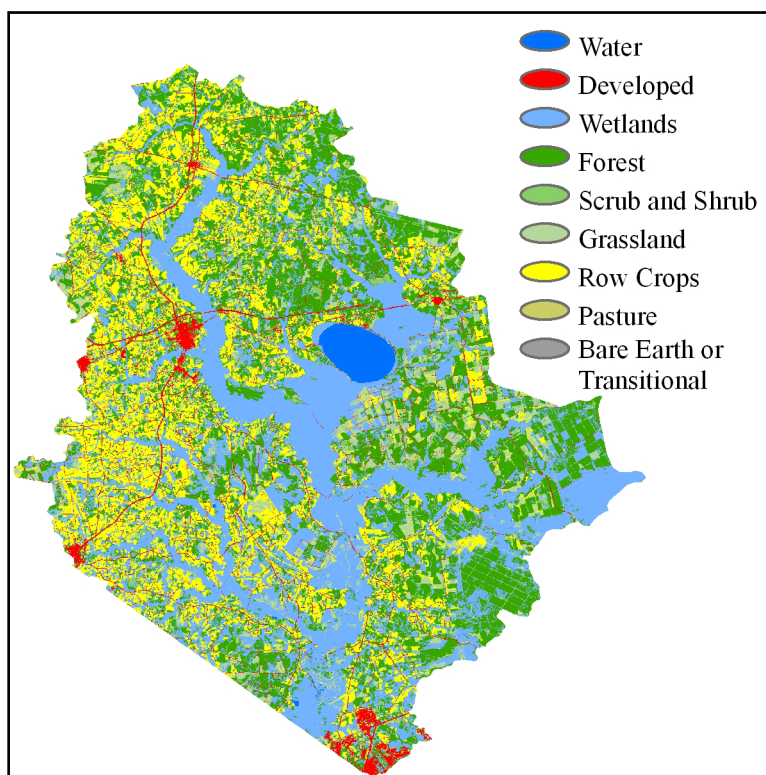
10-DIGIT HUC	NAME	SQUARE MILES	BENTHIC SITES	AMBIENT SITES
0304020601	Red Hill Swamp	172.0	2	0
0304020602	White Marsh	134.0	1	0
0304020603	Waccamaw River Headwaters	120.4	1	1
0304020604	Juniper Creek-Waccamaw River	167.5	0	0
0304020605	Seven Creeks	*167.6	1	1
0304020606	Gore Branch	113.4	0	1
0304020607	Buck Creek	*95.7	0	1

\*Denotes HUC is only partially in North Carolina and the area was only calculated for that portion.

### Red Hill Swamp (0304020601)

Red Hill Swamp watershed, with 38 Animal Operation Permits, has the second highest concentration of animal operation permits of all 10-digit watersheds in the Lumber Basin. It has 1 animal operation permit for about every 4.5 square miles. This watershed is very rural with only one municipality, the Town of Clarkton (Figure 4-4). The Town of Clarkton's WWTP is the only permitted NPDES discharger in the watershed with a maximum daily flow of 0.24 MGD. There are five subwatersheds in the Red Hill Swamp watershed.

**FIGURE 4-2: WACCAMAW SUBBASIN LAND USE BASED ON THE 2001 NATIONAL LAND COVER DATASET**



A special study was conducted in this watershed by the Environmental Science Section of DWQ on two assessment units, Elkton Marsh (AU # 15-4-1-1-2) and Western Prong Creek (AU # 15-4-2), to gain knowledge about an area that previously lacked data to make an assessment.

No samples were collected in *Whites Creek subwatershed* (030402060101), or *Brown Marsh Swamp subwatershed* (030402060102).

#### *Elkton Swamp (030402060103)*

The Elkton Swamp subwatershed has a higher density of animal operation permits than any other subwatershed in the Lumber River basin with 16 Animal Operation Permits or approximately 1 for every 2.6 square miles.

Benthic macroinvertebrate sampling site IB91, located at State Road 1710 on Elkton Marsh AU #15-4-1-1-2, has consistently been rated Moderate. Intolerant taxa have remained steady but low at this location; however, the number of overall species increased considerable for this assessment. Some of the new species indicate that low dissolved oxygen levels are becoming more frequent even though dissolved oxygen was normal at the time of sampling.

#### *Western Prong Red Hill Swamp (030402060104)*

Benthic macroinvertebrate sampling site IB93, located at US Highway 701 on Western Prong Creek AU# 15-4-2, was sampled as part of a special study in 2006 to gain some knowledge about an area that lacked any biological or chemical data. The types of species at this site often inhabit water that has low dissolved oxygen level and low flow rates that exist in such ephemeral streams as Western Prong Creek. Three taxon of rare marcoinvertebrates that had not previously been collected in the Lumber Basin were found here. *Telebasis byersi* collected at this site was only the seventh such collection by DWQ in the state. Also for only the second time being collected in the state was *Planorbella scalare*. While only two intolerant taxa were collected, the site was rated Moderate because of high overall diversity of species.

An animal operation permit owner was in violation in 2007 for a discharge of 180,000 gallons to Browders Branch AU # 15-4-2-3. Browders Branch flows into Western Prong Creek just before sampling site IB93. The owner was assessed a penalty of \$16,448.45 for this violation.

No samples were collected in *Slades Swamp-Red Hill Swamp subwatershed* (030402060105).

#### **White Marsh (0304020602)**

This watershed contains part of the Town of Chadbourn plus all of Whiteville and Brunswick (Figure 4-5). It has been estimated that this is the most populated watershed in the Waccamaw subbasin. There are 5 permitted NPDES wastewater dischargers with a total maximum daily flow of 4.03 MGD. It has four subwatersheds.

A large portion of this watershed is made up of forested wetlands known as White Marsh Swamp and Bouge Swamp. These wooded swamps have mainly two types of trees, Tupelo (Black Gum) and Cypress. These bottomland hardwood swamps have not been as hydrologically altered as have the pine stands because they are

**FIGURE 4-3: 10 DIGIT HUCs IN THE WACCAMAW SUBBASIN**

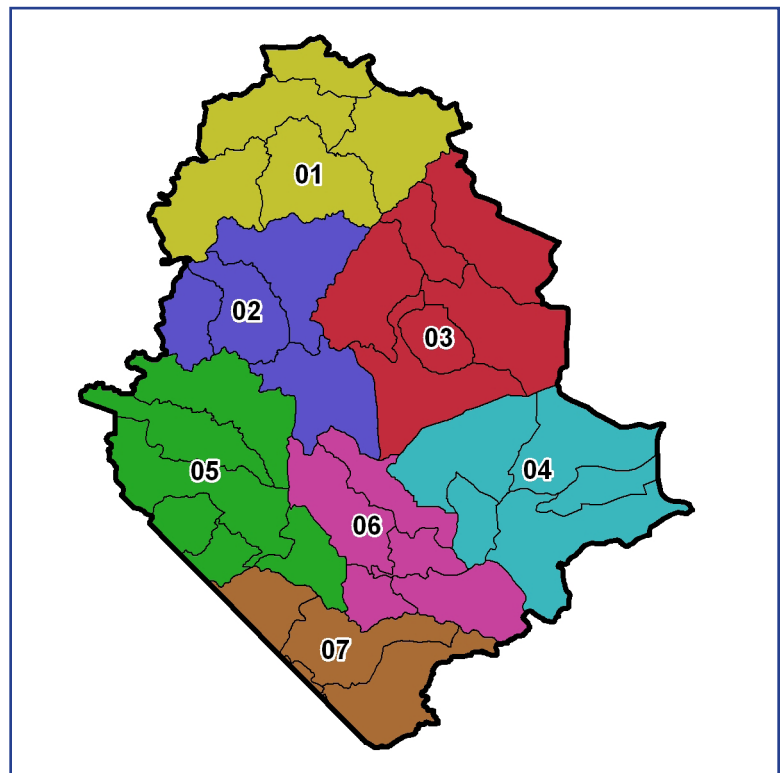
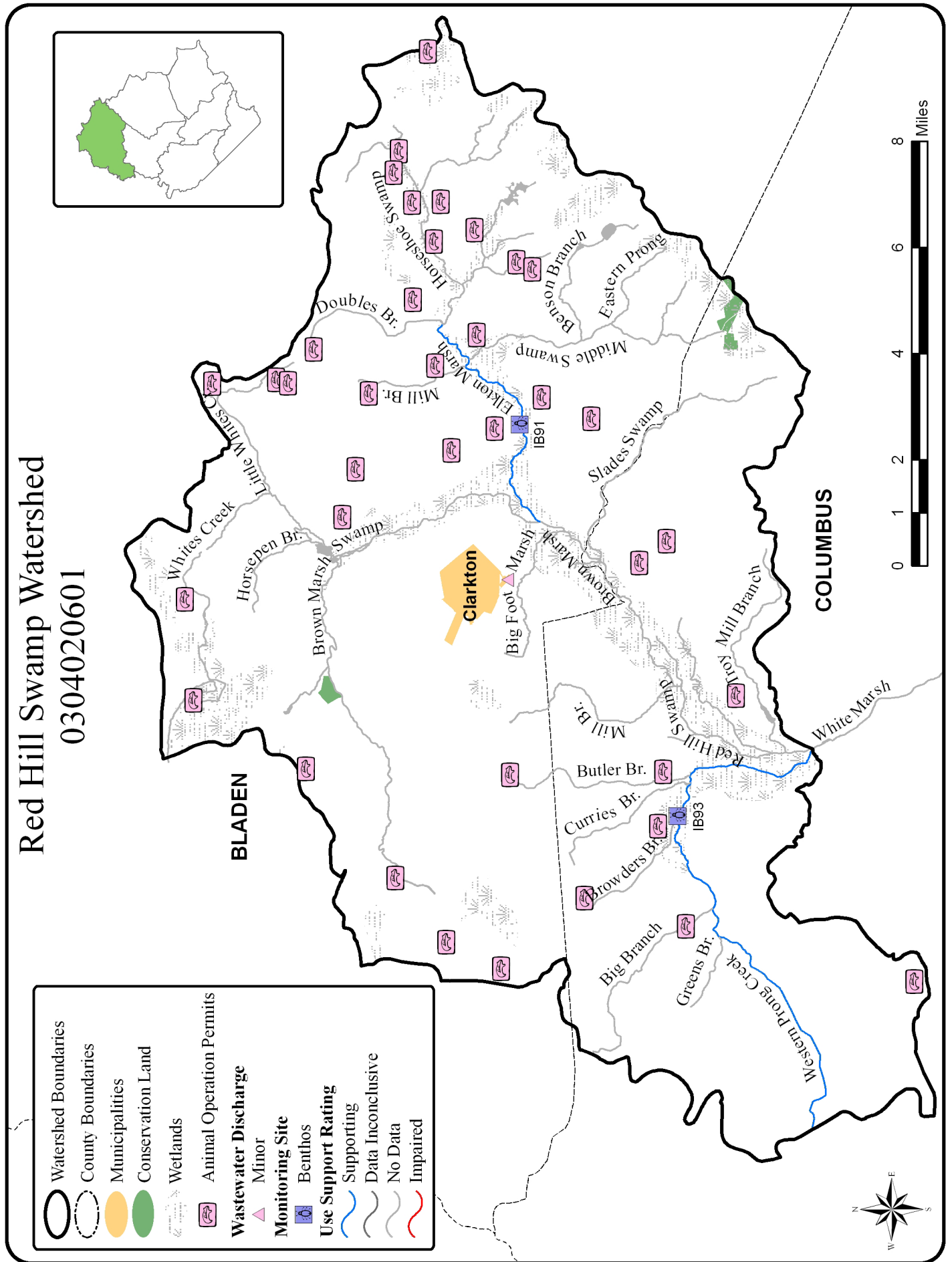


FIGURE 4-4: RED HILL SWAMP WATERSHED (0304020601)



harvested during periods of drought. During the recent droughts of 2007 and 2008 many areas throughout White Marsh Swamp and Bouge Swamp were clear-cut. It is unsure what impacts this will have on water quality in these areas. The Division of Forestry has been delegated the responsibility of monitoring forestry activities; however, no water samples are taken and land owners are not required to make notification of before logging begins. Some studies have found that nitrogen and phosphorous increase for a period of one to two years after clear-cutting (Ensign and Mallin, 2001).

No samples were collected in *Upper Soules Swamp subwatershed (030402060201)*.

#### *Lower Soules Swamp (030402060202)*

The Town of Chadbourn was awarded \$606,246 by the Construction Grants and Loan Section of DWQ from the State Revolving Fund to repair and replace 4,100 feet of wastewater collection lines near Soules Swamp (AU# 15-4-8). These funds were made available through the American Recovery and Reinvestment Act of 2009.

#### *Town of Whiteville-White Marsh (030402060203)*

In 2004, the White Marsh WWTP that services the Town of Whiteville and some of the surrounding area was awarded a grant by the CWMTF to upgrade the plant. The plant has experienced several problems over the past few year but upgrade to the facility were completed in 2009. The plant is still allowed to discharge small amounts of mercury to a waterbody that is already impaired for mercury but the limits are strict. The municipalities of Bolton and Lake Waccamaw are currently in the process of being connected to the White Marsh WWTP.

#### *Cypress Creek-White Marsh (030402060204)*

Benthic macroinvertebrate sampling site IB95, located at State Road 1001 on White Marsh AU# 15-4b, was given a bioclassification of Moderate. The 2006 biological sampling produced an increase of seven new intolerant species as well as an increase in the overall number of species. A likely cause for this improvement is due to improvements at the Whiteville WWTP.

### **Waccamaw River Headwaters (0304020603)**

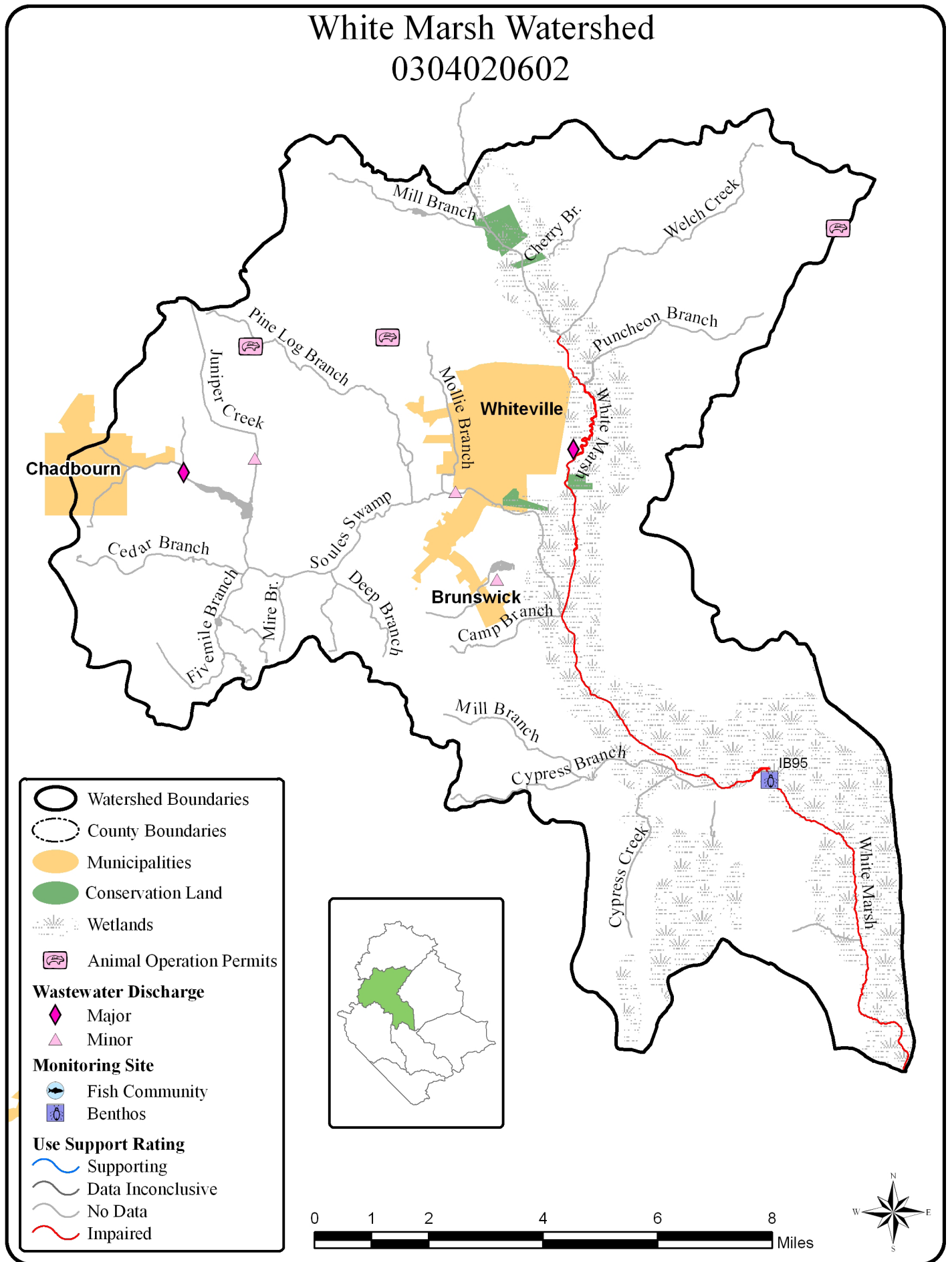
All of the subwatersheds within the Waccamaw River Headwaters watershed are either partially or completely within the Lake Waccamaw ORW Special Management Strategy Area. The Lake Waccamaw State Park and parts of the Columbus County Gameland are located in the Waccamaw River Headwater watershed. This watershed contains three endemic species of fish and two other significantly rare species of fish. In addition, there are four endemic species of mollusk that inhabit the watershed and many other rare species. It has six subwatersheds with two municipalites, Lake Waccamaw and Bolton (Figure 4-7).

#### *Sassapan Branch-Boggy Swamp (030402060301)*

This entire watershed is part of the Lake Waccamaw ORW Special Management Strategy Area. The Lake Waccamaw ORW Special Management Strategy states that all waters that drain to Lake Waccamaw be treated as though they are classified as ORW in order the protect the lake. These waterbodies were not classified as ORW because they have not been rated Excellent for bioclassification, which is required by the state of North Carolina to be reclassified as HQW or ORW.

Benthic macroinvertebrate sampling site IB77, located at State Road 1740 on Friar Swamp AU# 15-2-6-3, has been sampled six times in the past thirteen years. It was sampled four times between 1996 and 1999 to serve as a reference site in the creation of the Swamp Waters sampling criteria for Swamp Region S. All six samples taken from Friar Swamp dating back to 1996 were rated Natural suggesting that water quality is very stable here. Downstream from this point water flows into the Columbus County Gameland which is under the management of the North Carolina Wildlife Resources Commission.

FIGURE 4-5: WHITE MARSH WATERSHED (0304020310)



*Slap Swamp (030402060302)*

This entire subwatershed is part of the Lake Waccamaw ORW Special Management Strategy Area. Slap Swamp AU # 15-2-6-4 is partially buffered by the Columbus County Gameland.

*Green Swamp-Big Creek (030402060303)*

This subwatershed contains both the Town of Bolton and Town of Lake Waccamaw. It is part of the Ecosystem Enhancement Program's Targeted Local Watershed (03040206020040). Almost 8 square miles of this subwatershed are preserved by the Columbus County Gameland. This entire subwatershed is in the Lake Waccamaw ORW Management Strategy Area.

Big Creek AU # 15-2-6 is impaired for excessive level of mercury discovered in fish tissue samples, but is not on the 303(d) list because a TMDL for mercury has been completed.

*Lake Waccamaw (030402060304)*

This subwatershed is covered mainly by Lake Waccamaw and the only part outside of the lake is in the Lake Waccamaw State Park on the southeastern shore of the lake. The entire subwatershed is part of the EEP Targeted Local Watershed (030402060040) and is considered by the North Carolina Natural Heritage Program to be of national significance.

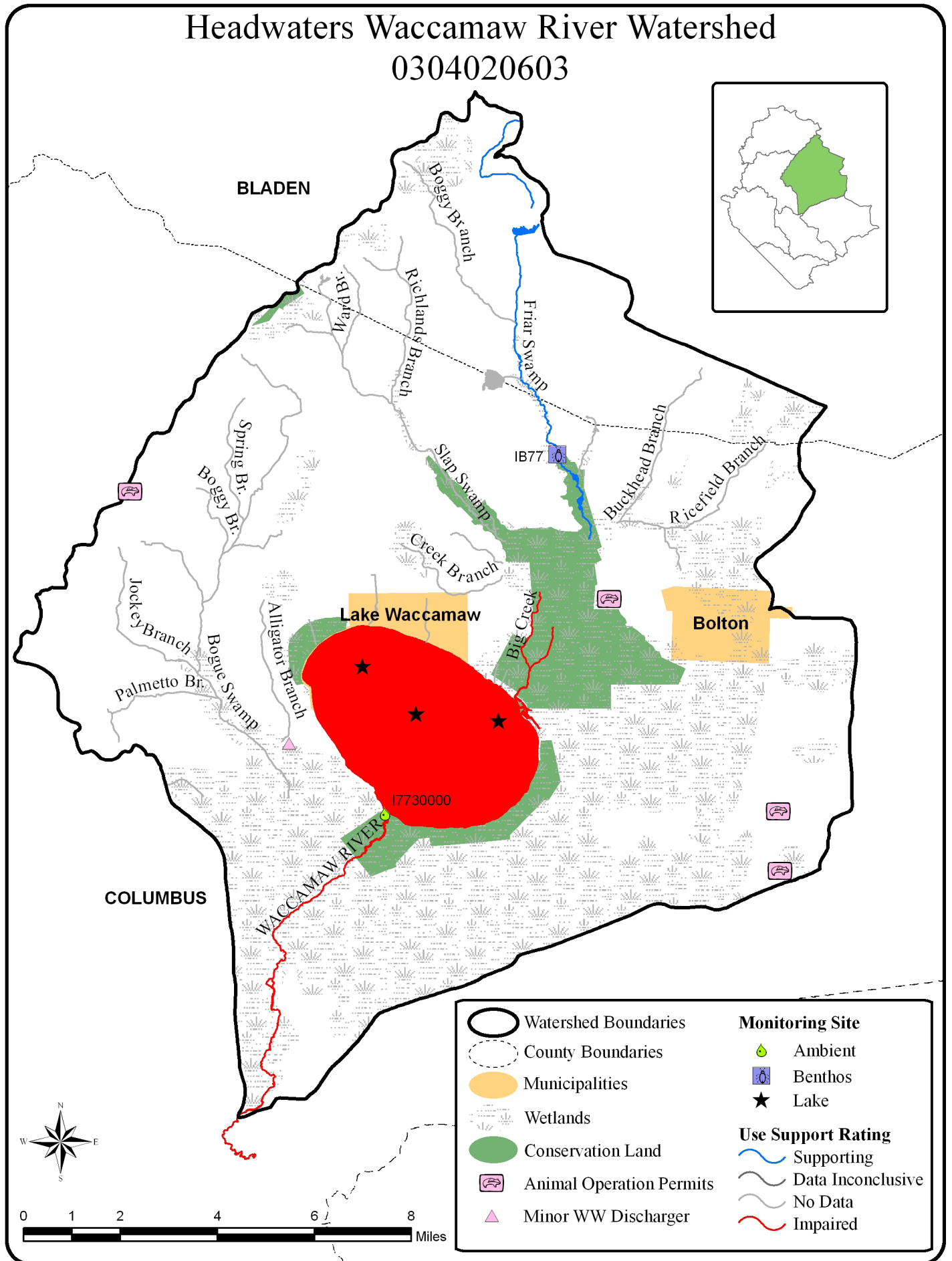
Lake Waccamaw AU# 15-2 is supplementally classified as an ORW due to high water quality, high recreational value, and because it provides habitat for many rare and endemic species. The shoreline along the Lake Waccamaw State Park is supplementally classified as a Unique Wetland. There are three species of fish, the Waccamaw Silverside, Waccamaw Darter, and Waccamaw Killfish which are endemic to Lake Waccamaw. The Waccamaw Silverside is currently on the Federal Threatened Species list. Two species of significantly rare fish, the Carolina Pygmy Sunfish and Broadtail Madtom, also inhabit the lake. At least twenty-six species of mollusk live in the lake including four endemic species, the Waccamaw Spike, Waccamaw Fatmucket, Waccamaw Amnicola, and Waccamaw Siltsnail. Most Carolina bays have very low pH levels brought on by tannic acid

**FIGURE 4-6: PHOTOGRAPH OF LAKE WACCAMAW**





FIGURE 4-7: HEADWATERS WACCAMAW RIVER WATERSHED (0304020603)



leaching from organic matter and slow flows, however, Lake Waccamaw has a neutral pH because it receives groundwater from the Pee Dee Aquifer and shallow groundwater filtered through a limestone bluff (Riggs, et al, 2000).

The lake was placed on the 303(d) list in 2006 due to fish tissue samples that showed excessive levels of mercury. Mercury levels are a significant problem throughout the entire Lumber River Basin and is not reflective of a point source. There is an EPA National Atmospheric Deposition Program (NADP) monitoring site located at the Lake Waccamaw State Park that records mercury deposition levels next to the lake. Since the closure of a chlor-alkali plant near Regielwood in October 2000, there has been a decrease in atmospheric deposition at the NADP site. For more information on Mercury see Appendix G.

#### *Bogue Swamp (030402060305)*

Almost this entire subwatershed is one big forested swamp that is harvested by the timber industry. The western half of the subwatershed was hydrologically altered beginning in the 1930's in order to plant pine stands.

#### *Boggy Swamp-Waccamaw River (030402060306)*

Cove Swamp is a 440 acre crescent shaped wetland on the northeast side of Lake Waccamaw, which was once part of the lake before an artificial canal and ridge were constructed in 1946. This swamp includes an Unnamed Tributary near Artesia AU# 15-2-1 and is still connected at some locations to the lake. In 2007, a grant of \$350,000 was awarded by the CWMTF to the NC Division of Parks and Recreation to help fund the purchase of this swamp. The Parks and Recreation Trust Fund supplied \$300,000 and the remaining \$50,000 needed to purchase Cove Swamp was raised by the Nature Conservancy through private donations. The swamp will be added to the Lake Waccamaw State Park.

The Cove Swamp Canal has been experiencing chronic problems with aquatic weeds. This canal was treated for Alligatorweed, Duckweed, and Parrotfeather in 2009 as part of the Division of Water Resources Aquatic Weed Control Program.

Boggy Swamp-Waccamaw River subwatershed is part of the Ecosystem Enhancement Program's Targeted Local Watershed (03040206020040).

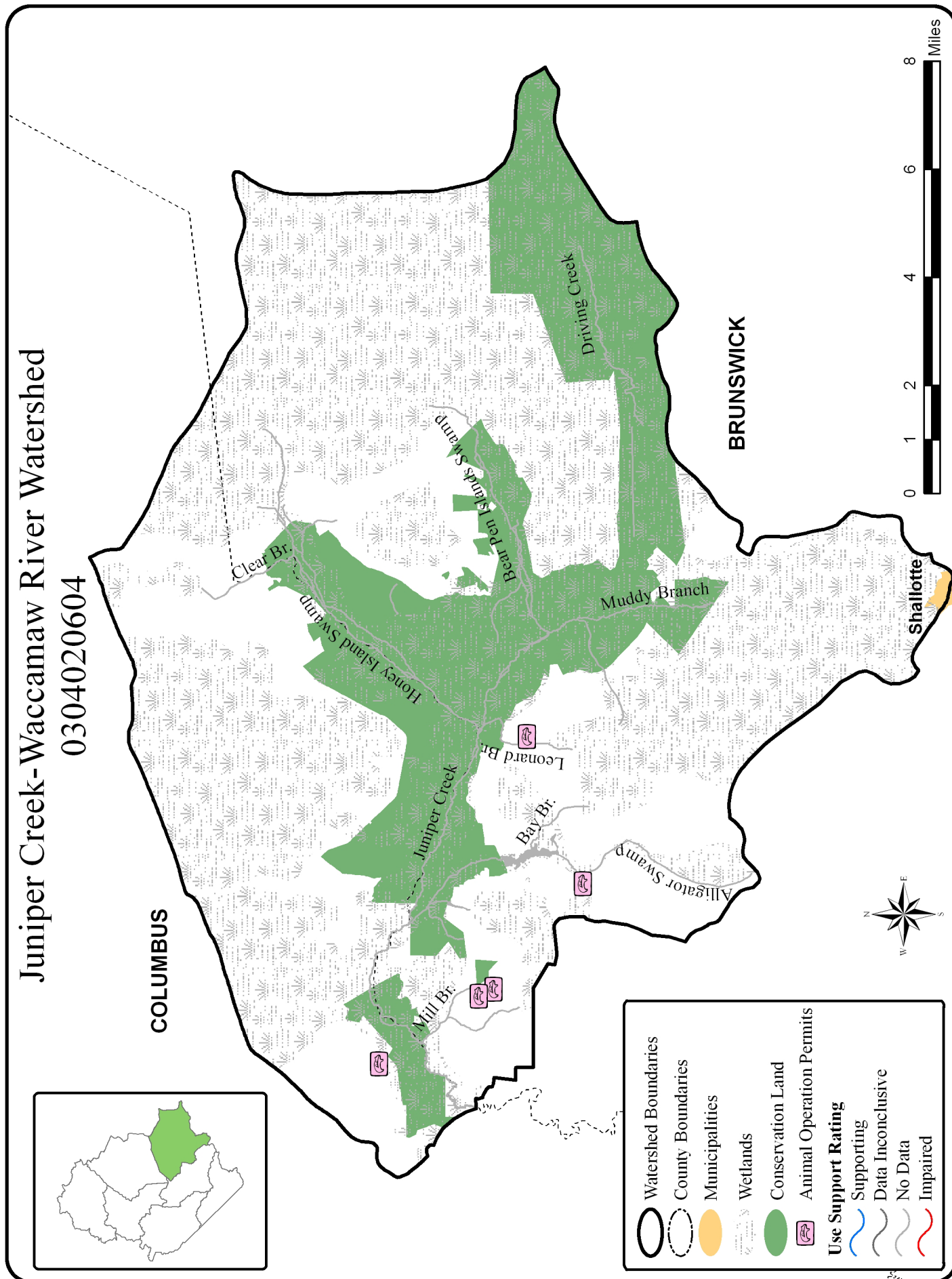
#### **Juniper Creek-Waccamaw River (0304020604)**

This entire watershed was selected as a Targeted Local Watershed (03040206030010) by Ecosystem Enhancement Program in 2003. It was chosen because of its extensive area of rare plant and animal habitats. This watershed is over 37 percent wetlands, over 38 percent forested, and almost 13 percent grasslands according the 2001 National Land Cover Dataset. Less than 10 percent of the watershed is dedicated to agricultural use and there is very little developed area. This watershed is important to the timber industry, as well as, wildlife.

Recently, the Nature Conservancy purchased lands along Driving Creek, Muddy Branch, Little Muddy Branch, Bear Pen Island Swamp, Honey Island Swamp, Leonard Branch, Alligator Swamp, and Juniper Creek. This purchase, which was transferred to the NC Wildlife Resource Commission, added over 29 square miles of conservation land to this watershed. The Nature Conservancy now manages over 10 square miles of the watershed and the NC Wildlife Resource Commission manages another 31.37 square miles. Over 25 percent of this watershed is in conservation and with the exception of about 2 miles of Juniper Creek there is a continuous preserve from the Green Swamp to the Waccamaw River (Figure 4-8). The remainder of this watershed is mainly used by the forestry industry.

No samples were collected in *Bear Pen Island Swamp subwatershed (030402060401)*, *Honey Island Swamp subwatershed (030402060402)*, *Upper Juniper Creek subwatershed (030402060403)*, or *Alligator Swamp subwatershed (030402060404)*.

FIGURE 4-8: JUNIPER CREEK-WACCAMAW RIVER WATERSHED (0304020604)



#### *Lower Juniper Creek (030402060405)*

Myrtle Head Savanna, which is owned by The Nature Conservancy, is supplementally classified as a Unique Wetland. This longleaf pine savanna supports the largest and one of the few remaining populations of Cooley's Meadowrue, a federally listed endangered plant species. This Unique Wetland also supports many other rare plant species.

#### *Seven Creeks (0304020605)*

There are 10 permitted animal operations throughout the six subwatersheds of Seven Creeks watershed. This watershed encompasses most of Tabor City including its WWTP which has a maximum daily flow of 1.1 MGD (Figure 4-9). The Tabor City WWTP has had numerous violations in the past few years for mercury, chlorine, BOD, and dissolved oxygen. During a recent inspection, problems with the operation of this plant were noted and DWQ is currently working with the WWTP operators to correct these problems. This is the only permitted wastewater discharger in the watershed.

No data was collected in *Gum Swamp subwatershed (030402060501)*.

#### *Monie Swamp Headwaters (030402060502)*

In 2005 and 2007, the planning and construction phases of the Ecosystem Enhancement Program's Mill Branch Project were completed. The project restored 3,500 feet of and preserved 1,750 feet of an Unnamed Tributary of Mill Branch AU # 15-17-1-12-1-6-1. In addition, 37.3 acres of wetlands were preserved along the drainage.

No data was collected in *Toms Fork subwatershed (030402060501)*.

#### *Juniper Swamp (030402060504)*

Benthic macroinvertebrate sampling site IB83, located at State Road 1141 on Juniper Creek AU# 15-17-1-11 near the confluence with Grissett Swamp AU# 15-17-1-(5), changed only slightly since first sampled in 2001. This is a highly braided stream with very low flows in the summer months. The low flows and corollary low DO results in a high proportion of organisms that can tolerate low dissolved oxygen levels.

#### *Monie Swamp-Grissett Swamp (030402060505)*

Lake Tabor AU# 15-17-(1)b, a man-made lake, was built in 1952. Its dam was breached in 1996 during Hurricane Fran and was rebuilt in 2000. Lake Tabor is a small shallow lake covering approximately 126 acres. Most of the lake is unbuffered with 50 to 75 percent of the shoreline developed as residential housing. The lake was last sampled in 2006 as part of the Lake and Reservoir Assessment and was found to be experiencing eutrophication throughout the lake. Chlorophyll a samples taken in July and August of 2006 exceeded the state water quality standard of 40 ug/l. The lake has been plagued by aquatic weeds which are currently being controlled using multiple methods including chemical herbicides, mechanical harvesting, and stocking the lake with Grass Carp.

In April of 2003, the Environmental Science Section of DWQ reported a fish kill of 400 fish including bluegill, warmouth, flier, and chubsuckers in Lake Tabor. Low dissolved oxygen levels were detected below the lake surface possibly brought on by decomposing vegetation. Again in April of 2005, a fish kill of 300 fish including sunfish, crappie, catfish, and bass was reported. Subsequent water quality sampling detected Chlorpyrifos (Dursban), an organophosphorus pesticide banned for most residential use in 2000, in the lake. This chemical is known to be toxic to fish, aquatic invertebrates, small mammals, birds, and bees. The label states that, "Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas." Dursban is now approved only for specific agricultural uses, but still poses a threat to aquatic organisms and human health.

#### *Grissett Swamp-Seven Creeks (030402060506)*

Total Kjeldahl Nitrogen levels in samples taken from ambient monitoring site I9310000, located on Seven Creeks AU # 15-17, ranged from 0.46 to 2.8 mg/L with a median of 0.94 mg/L. However, ammonia levels are normal so most of this is organic nitrogen which is not readily bioavailable.

FIGURE 4-9: SEVEN CREEKS WATERSHED (0304020605)

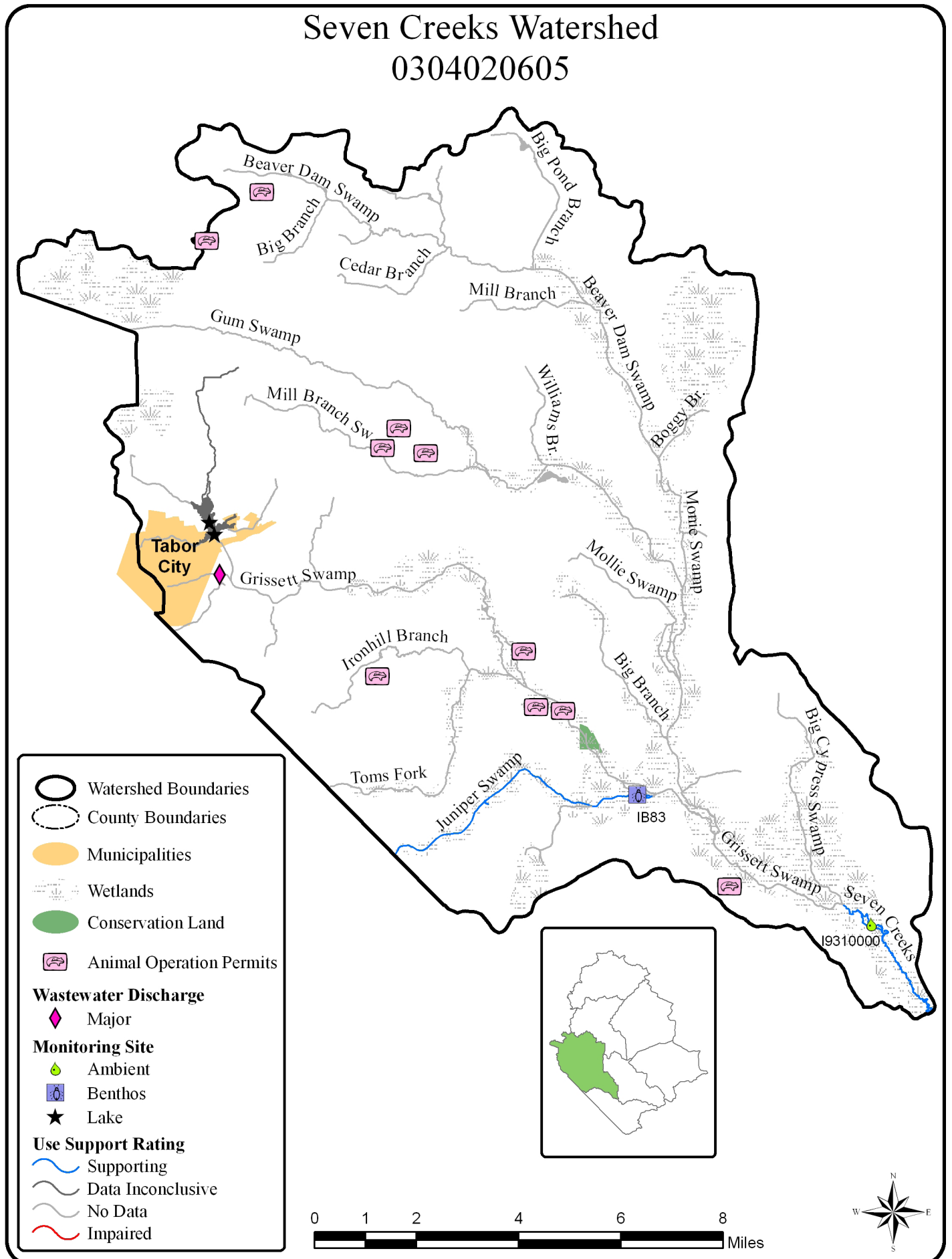
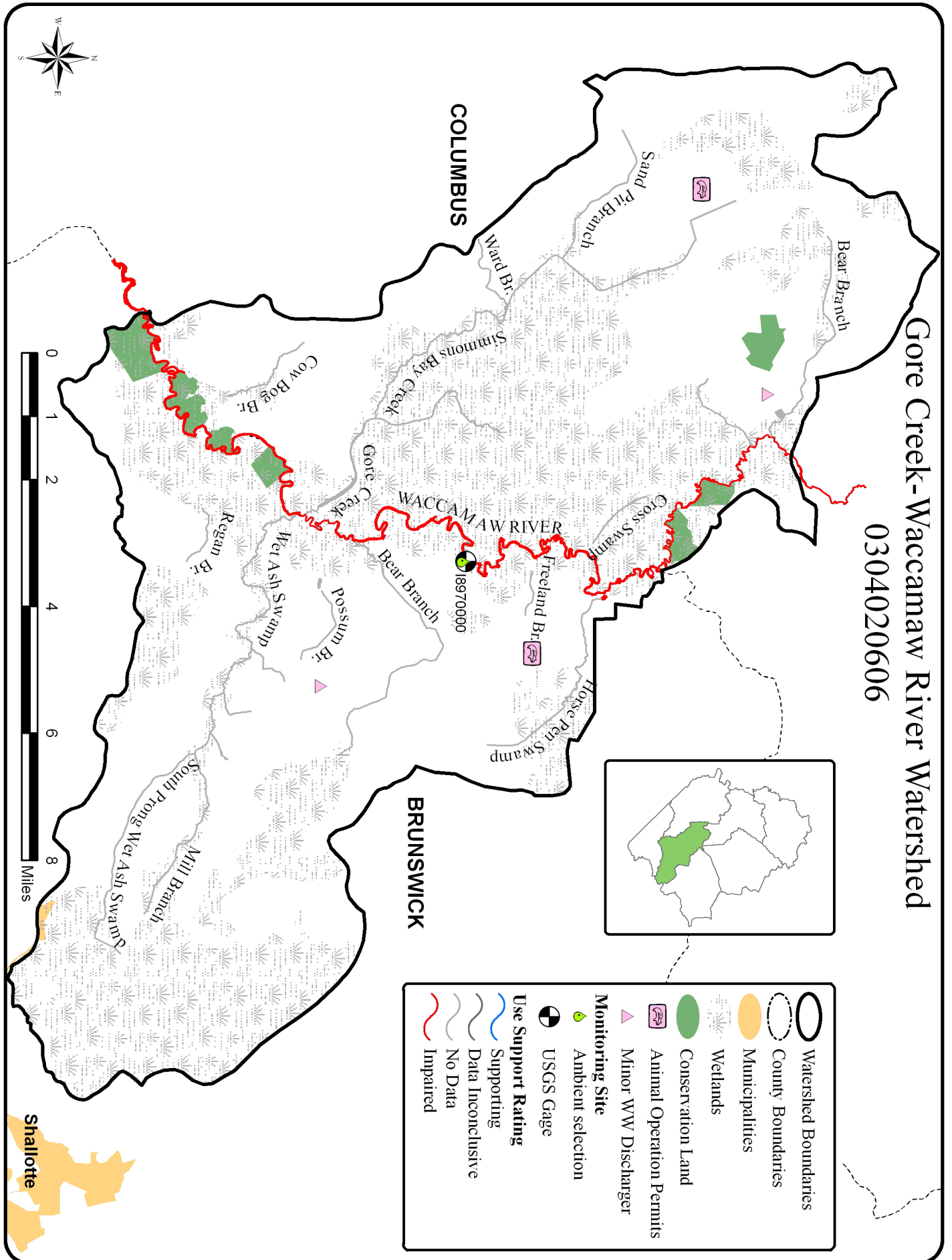


FIGURE 4-10: GORE CREEK-WACCAMAW RIVER WATERSHED (0304020606)



### **Gore Creek (0304020606)**

This rural watershed has 2 minor NPDES wastewater dischargers that have a combined permitted maximum daily flow of 0.0107 MGD (Figure 4-10). There are also 2 animal operation permits in the watershed. There are four separate Columbus County Gameland tracts that provide buffers along portions of the Waccamaw River.

#### *Horse Pen Swamp-Waccamaw River (030402060601)*

The portion of this subwatershed to west of the Waccamaw River is the EEP's TLW (03040206010070) the portion to the east of the river is in EEP TLW(03040206030010).

Old Dock Savanna, which is owned by The Nature Conservancy, is supplementally classified as a Unique Wetland. Old Dock Savanna is underlain with limestone. Typical pine savannas have a low pH and are very acidic, whereas limestone-influenced savannas like Old Dock have a higher pH. Called marl savannas, these rich plant areas have an infusion of nutrients not available in more acidic habitats. The savanna at Old Dock is dominated by pond pine, with an open shrub layer of titi, black gum, myrtle-leaf holly, and bayberry. Scattered among the shrubs are dense patches of herbs, including a diverse assemblage of carnivorous plants, grasses, sedges, and wildflowers.

#### *Gore Lake-Gore Creek (030402060602)*

This subwatershed is part of EEP's Targeted Local Watershed (03040206060010).

#### *Wet Ash Swamp (030402060603)*

Wet Ash Swamp AU # 15-14 has been selected as a random ambient monitoring site for the 2009-2010 cycle. There is one NPDES wastewater discharger in this watershed with a permitted maximum daily flow of 5,700 gallons/day.

#### *Bear Branch-Waccamaw River (030402060604)*

Total Kjeldahl Nitrogen (TKN) levels in samples taken from ambient monitoring site I8970000, from the Waccamaw River AU # 15-(1)d, ranged from 0.51 to 2.1 mg/L with a median of 1 mg/L. This is much higher than the TKN found upstream at ambient monitoring site I7730000, which ranged from 0.2 to 0.78 mg/L. However, the median 1 mg/L is less than the 1.25 mg/L median reported for downstream ambient monitoring site I9350000. Since ammonia levels at this site are normal it suggest that most of the nitrogen is organic and therefore not readily bioavailable.

#### *Regan Branch-Waccamaw River (030402060605)*

The portion of this subwatershed to the west of the river is part TLW(03040206060010) and the portion to the east of the river is part of TLW(03040206050010). On September 9, 2008 the NC Coastal Land Trust purchased 296 acres in Columbus County along four miles of the Waccamaw River AU # 15-(1)e.

### **Buck Creek (0304020607)**

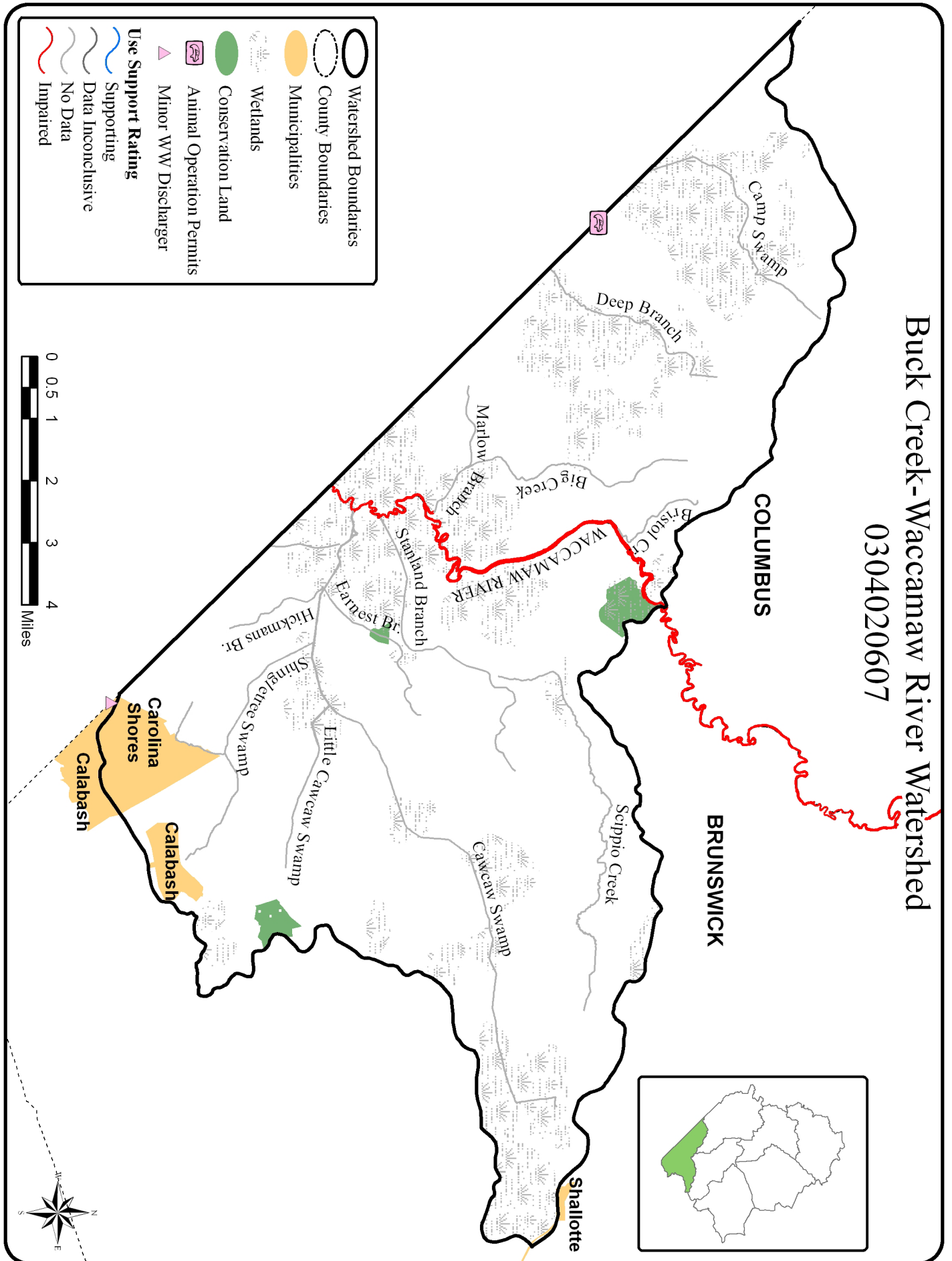
Buck Creek watershed contains part of the municipalities of Carolina Shores and Calabash (Figure 4-11). There is one permitted NPDES wastewater discharger with a maximum daily flow of 0.53 MGD and one animal operation permit.

#### *Cawcaw Swamp (030402060701)*

Persimmons Swamp AU # 15-23-2-1 is the receiving stream for the Carolina Shores WWTP. Eventually this discharger should be merged with another facility within the southwestern Brunswick County wastewater district.

The North American Land Trust manages an 82 acre conservation easement near the headwaters of Little Cawcaw Swamp AU # 15-23-1. This easement protects natural communities such as Longleaf Pine-Wiregrass, Pine Flatwoods, and significant wetland areas supporting good populations of yellow and purple pitcher plants.

FIGURE 4-11: BUCK CREEK-WACCAMAW RIVER WATERSHED (0304020607)





### *Big Creek-Waccamaw River (030402060702)*

Part of the portion of this subwatershed to the east of the river is part of the EEP's TLW (03040206050010) and the entire western portion is in TLW (03040206090010).

### *Buck Creek subwatershed (030402060703)*

Most of this subwatershed is in South Carolina; just under 2 square miles are in North Carolina. DWQ collected ambient water samples from this subwatershed in South Carolina until September 2003 when it was discontinued.

### *Bellamy Branch-Waccamaw River (030402060704)*

The portion of this subwatershed to the west of the Waccamaw River is part of Targeted Local Watershed (03040206090010).

## Incentive Programs

### Clean Water Management Trust Fund

Created in 1996, the Clean Water Management Trust Fund (CWMTF) makes grants to local governments, state agencies and conservation non-profits to help finance projects that specifically address water pollution problems. These projects include land acquisitions, capital improvements to wastewater and stormwater infrastructure, and stream restorations. A list of CWMTF Grants that have been funded through 2007 is provided in Table 4-2.

**TABLE 4-2: CWMTF GRANTS FUNDED FROM 1997 THROUGH 2007 IN THE WACCAMAW WATERSHED\***

PROJECT ID	APPLICANT	PURPOSE	AMOUNT FUNDED	TOTAL COST
1997A-117	Town of Tabor City	Wastewater	\$570,000	\$600,000
1998A-508	Town of Chadbourn	Wastewater	\$1,312,000	\$1,640,750
2000B-007	The Nature Conservancy	Buffer Acquisition	\$84,000	\$1,549,450
2000B-705	Town of Lake Waccamaw	Stormwater	\$4,500,000	\$4,836,000
2001B-022	The Nature Conservancy	Buffer Acquisition	\$290,000	\$365,250
2001B-040	NC WRC	Buffer Acquisition	\$900,000	\$1,312,950
2003A-503	Town of Clarkton	Wastewater	\$185,000	\$210,000
2004A-506	Town of Lake Waccamaw	Wastewater	\$145,000	\$605,800
2004A-513	City of Whiteville	Wastewater	\$2,625,000	\$6,300,000
2006A-018	The Nature Conservancy	Buffer Acquisition	\$8,324,584	\$20,758,495
2006A-601	Town of Bolton	Wastewater	\$2,065,600	\$5,339,000
2006A-532	Town of Tabor City	Wastewater	\$420,000	\$1,050,000
2006S-004	Town of Tabor City	Minigrant - Stormwater	\$50,000	\$55,000
2007-025	NC Coastal Land Trust	Buffer Acquisition	\$486,000	\$729,304
2007-039	NC Div. of Parks and Recreation	Buffer Acquisition	\$350,000	\$700,000
<b>TOTAL</b>	--	--	\$22,257,184	\$39,751,999

\*Does not include statewide or regional grants.

### North Carolina Agriculture Cost Share Program

Nonpoint source pollution is a significant source of stressors that lead to stream degradation. The approach taken in North Carolina for addressing agriculture's contribution to the nonpoint source water pollution problem is to primarily encourage voluntary participation by the agricultural community. This approach is supported by financial incentives, technical and educational assistance, research, and regulatory programs.

**TABLE 4-3: BMP INSTALLED THROUGH NCACSP BETWEEN 2002 AND 2006**

<b>BMP IMPLEMENTED</b>	<b>AMOUNT</b>	<b>UNITS</b>	<b>COST</b>
Long Term No-Till	470	Acres	\$58,009
Sod-Based Rotation	50	Acres	\$4,770
Cropland Conversion - Grass	612	Acres	\$130,752
Cropland Conversion - Trees	349	Acres	\$30,456
Field Border	28	Acres	\$26,660
Trough or Tank	6	Units	\$8,090
Livestock Exclusion	27,420	Feet	\$15,032
Stream Crossing	32	Units	\$2,457
Incinerater	6	Units	\$23,422
<b>TOTAL</b>	--	--	\$299,648

Financial incentives are provided through North Carolina's Agriculture Cost Share Program. The Division of Soil and Water Conservation within the DENR administers this program. It has been applauded by the U.S. Environmental Protection Agency and has received wide support from the general public as well as the state's agricultural community. Table 4-3 shows the number of projects implemented and in the Waccamaw Subbasin and the dollar amount invested. Table 4-4 shows the water quality benefits realized from that investment.

**TABLE 4-4: BENEFITS RESULTING FROM BMPs INSTALLED THROUGH NCACSP BETWEEN 2002 AND 2006**

<b>BENEFITS</b>	<b>AMOUNT</b>	<b>UNITS</b>
Acres Affected	2,146	Acres
Soil Saved	5,356	Tons
Nitrogen Saved	88,405	Pounds
Phosphorous Saved	30,624	Pounds
Waste - Nitrogen Managed	158,948	Pounds
Waste - Phosphorus Mananged	138,450	Pounds

## Recommendations

Stormwater regulation is essential to preventing pollution from reaching waterbodies. It is more expensive to retrofit developed areas with stormwater controls than to install them during the initial development. It is recommended that local governments consider developing and implementing stormwater management regulations as soon as possible.

Since the last basinwide plan there have been many achievements in conserving lands that protect water quality and provide habitat. There remain many unprotected areas with nationally significant ecosystems and good water quality in need of conservation. The continued purchase of easements and preserves is encouraged especially in the White Marsh and Waccamaw River floodplains.

There is a need for increased water quality monitoring in this subbasin. There are many areas for which there is no recent, reliable data to make an assessment. This may be achieved in part through the implementation of citizen water quality monitoring programs such as the Muddy Water Watch Program and the Waccamaw River Volunteer Monitoring Program.

Further studies on evaluating water quality of streams classified as Swamp Waters are needed to better assess this subbasin. Since 100 percent of the waters in the subbasin are classified as Swamp Waters, more information on their characteristics will allow for better evaluation of the subbasin's health.