

## Chapter 4

### French Broad River Subbasin 04-03-04

Including the: French Broad River, Little Ivy Creek (River), Ivy Creek, California Creek and Bull Creek

#### 4.1 Subbasin Overview

##### *Subbasin 04-03-04 at a Glance*

###### **Land and Water Area**

Total area:	496 mi <sup>2</sup>
Land area:	494 mi <sup>2</sup>
Water area:	2 mi <sup>2</sup>

###### **Population Statistics**

2000 Est. Pop.:	40,490 people
Pop. Density:	81 persons/mi <sup>2</sup>

###### **Land Cover (percent)**

Forest/Wetland:	85%
Surface Water:	<1%
Urban:	<1%
Cultivated Cropland:	<1%
Pasture/ Managed Herbaceous:	14%

###### **Counties**

Buncombe and Madison

###### **Municipalities**

Hot Springs, Mars Hill and Marshall

The north and western portions of this subbasin are located in Pisgah National Forest and consistently have good or excellent water quality. The rest of the subbasin is rural and includes the municipalities of Hot Springs, Mars Hill and Marshall. The impacts of nonpoint source pollution are evident in many of the streams outside of the National Forest. Local efforts are underway to address these water quality concerns. By the year 2020, population in Buncombe and Madison counties is expected to increase by 22.3 and 19.3 percent, respectively.

Currently, there are 11 NPDES wastewater discharge permits in this subbasin with a total permitted flow of 0.98 MGD; none are major dischargers. Refer to Appendix VI for identification and more information on individual NPDES permit holders. Refer to Appendix I for more information regarding population growth and trends. There are no animal operations listed in this subbasin.

A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure 8. Table 10 contains a summary of assessment units and lengths, streams monitored, monitoring data types,

locations and results, along with use support ratings for waters in this subbasin. Refer to Appendix X for a complete listing of monitored waters and more information about use support ratings.

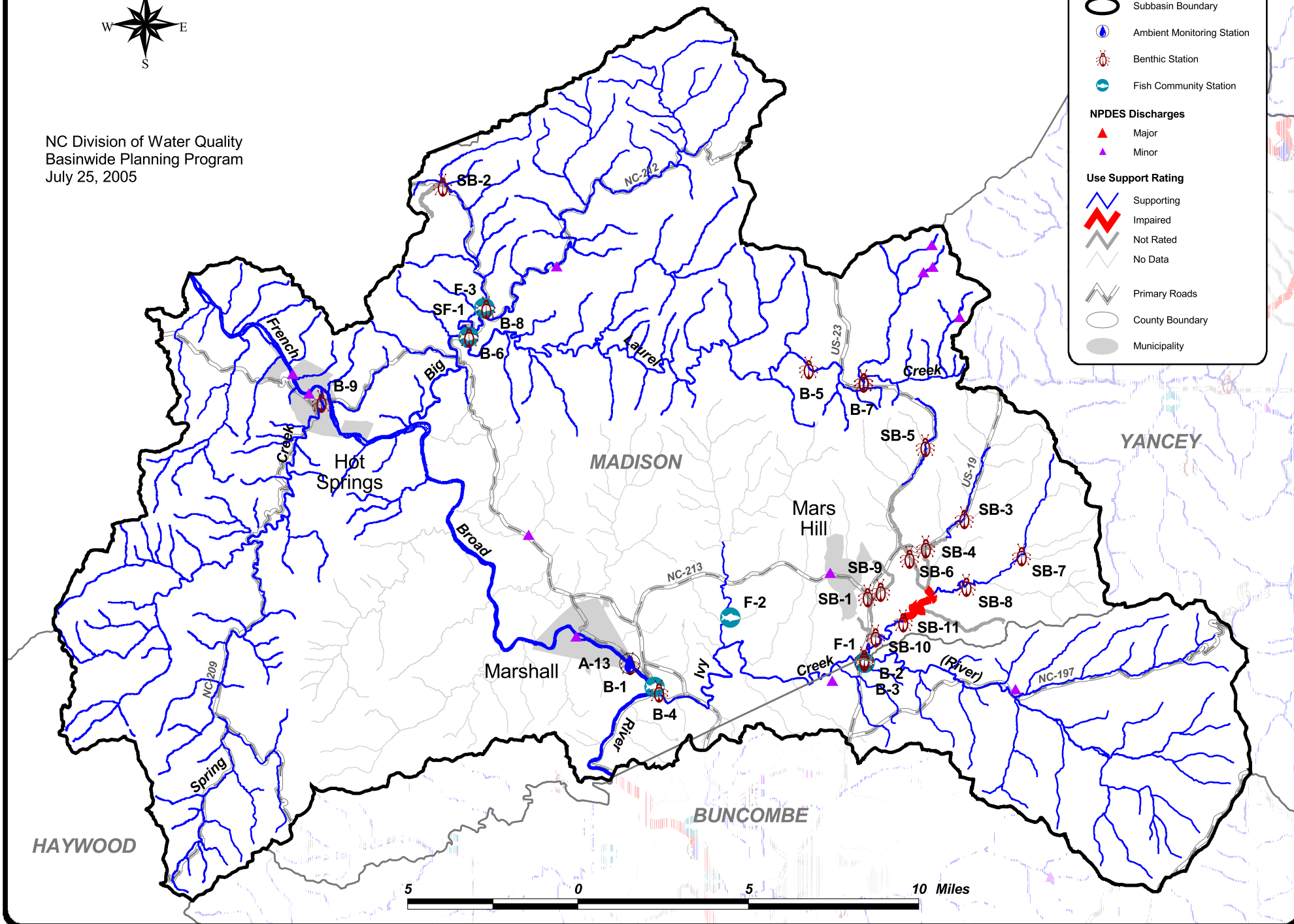
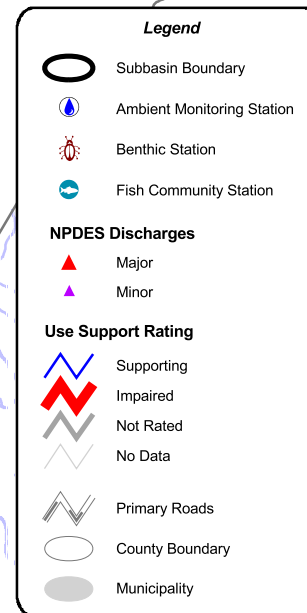
There were 19 benthic macroinvertebrate community samples and four fish community samples (Figure 8 and Table 10) collected during this assessment period. Data were also collected from one ambient monitoring station. Refer to the *2003 French Broad River Basinwide Assessment Report* at <http://www.esb.enr.state.nc.us/bar.html> and Appendix IV for more information on monitoring.

Waters in the following sections are identified by assessment unit number (AU#). This number is used to track defined segments in the water quality assessment database, 303(d) Impaired waters list and the various tables in this basin plan. The assessment unit number is a subset of the DWQ index number (classification identification number). A letter attached to the end of the

Figure 8 French Broad River Subbasin 04-03-04



NC Division of Water Quality  
Basinwide Planning Program  
July 25, 2005



**Table 10 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 040304**

<b>Assessment Unit #</b>	<b>Name</b>	<b>Length/Area</b>		<b>AL</b>	<b>REC</b>	<b>Benthic Community</b>			<b>Fish Community</b>			<b>Ambient Data</b>	
6-(54.5)f	FRENCH BROAD RIVER	33.1	Miles	S	S	B-1	GF	2002				A-13	nce
6-112	Big Laurel Creek	30.8	Miles	S	ND	B-5	E	2002	SF-1	GF	1997		
	Big Laurel Creek	30.8	Miles	S	ND	B-6	G	2002	SF-1	GF	1997		
6-112-26	Shelton Laurel Creek	14.8	Miles	S	ND	B-8	G	2002	F-3	E	2002		
6-112-26-13-1-1	Cold Spring Branch	1.4	Miles	NR	ND	SB-2	NR	2002					
6-112-5	Puncheon Fork	5.2	Miles	S	ND	B-7	E	2002					
6-118-(1)	Spring Creek	20.3	Miles	S	ND	B-9	E	2002					
6-118-(27)	Spring Creek	1.7	Miles	S	ND	B-9	E	2002					
6-96-(0.5)	Ivy Creek (River)	7.4	Miles	S	ND	B-2	G	2002	F-1	E	2002		
6-96-(11.3)	Ivy Creek (River)	0.5	Miles	S	ND	B-4	GF	2002					
6-96-(11.7)	Ivy Creek (River)	10.5	Miles	S	ND	B-4	GF	2002					
6-96-10-1a	Middle Fork Little Ivy Creek	3.5	Miles	S	ND	SB-3	NI	2002					
6-96-10-1b	Middle Fork Little Ivy Creek	2.1	Miles	NR	ND	SB-4	NR	2002					
6-96-10-2a	California Creek	3.6	Miles	S	ND	SB-5	NI	2002					
6-96-10-2b	California Creek	3.8	Miles	NR	ND	SB-6	NR	2002					
6-96-10-3	Paint Fork	7.1	Miles	S	ND	SB-8	NI	2002					
	Paint Fork	7.1	Miles	S	ND	SB-7	NI	2002					
6-96-10-5	Big Branch	2.9	Miles	NR	ND	SB-10	NR	2002					
	Big Branch	2.9	Miles	NR	ND	SB-9	NR	2002					
6-96-10a	Little Ivy Creek (River)	2.6	Miles	I	ND	SB-11	F	2002					
6-96-10b	Little Ivy Creek (River)	2.1	Miles	S	ND	B-3	GF	2002					
6-96-16	Bull Creek	3.8	Miles	S	ND				F-2	GF	2002		

**Table 10                      DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 040304**

Assessment						
Unit #	Name	Length/Area	AL	REC	Benthic Community	Fish Community
Ambient Data						
Assessment Unit # - Portion of DWQ Classified Index where monitoring is applied to assign a use support rating.						
Use Categories:	Monitoring data type:	Bioclassifications:	Use Support Ratings 2004:		Ambient Data	
AL - Aquatic Life	F - Fish Community Survey	E - Excellent	S - Supporting		nce - no criteria	
REC - Recreation	B - Benthic Community Survey	G - Good	I - Impaired		ce - criteria exce	
	SF - Special Fish Community Study	GF - Good-Fair	NR - Not Rated			
	SB - Special Benthic Community Study	F - Fair	ND - No Data			
	A - Ambient Monitoring Site	P - Poor				
		NI - Not Impaired				

AU# indicates that the assessment is smaller than the DWQ index segment. No letter indicates that the assessment unit and the DWQ index segment are the same.

Use support ratings for all waters in subbasin 04-03-04 are summarized in Section 4.2. Recommendations, current status and future recommendations for previously and newly Impaired waters are discussed in Section 4.3. Waters with noted water quality impacts are discussed in Section 4.4. Water quality issues related to the entire subbasin are discussed in Section 4.5. Refer to Appendix III for a complete list of monitored waters and more information on use support ratings.

## **4.2 Use Support Assessment Summary**

Use support ratings were assigned for waters in subbasin 04-03-04 in the aquatic life, recreation, fish consumption and water supply categories. There are no fish consumption advisories in this subbasin; therefore, all waters are No Data in the fish consumption category. In the water supply category, all waters are Supporting on an evaluated basis based on reports from DEH regional water treatment plant consultants.

There were 157.3 stream miles (20.8 percent) monitored during this assessment period in the aquatic life category. Of these, 2.6 miles (<0.5 percent) are Impaired. Refer to Table 11 for a summary of use support rating by category for waters in subbasin 04-03-04.

## **4.3 Status and Recommendations of Previously and Newly Impaired Waters**

The following waters were either identified as Impaired in the previous basin plan (2000) or are newly Impaired based on recent data. If previously identified as Impaired, the water will either remain on the state's 303(d) list or will be delisted based on recent data showing water quality improvements. If the water is newly Impaired, it will likely be placed on the 2006 303(d) list. The current status and recommendations for addressing these waters are presented below, and each is identified by an assessment unit number (AU#). Information regarding 303(d) listing and reporting methodology is presented in Appendix VII.

### **4.3.1 Little Ivy Creek (River) [AU # 6-96-10a]**

#### 2000 Recommendations

Little Ivy Creek, from SR 1547 to Ivy Creek (2.6 miles), was Impaired due to nonpoint source pollution associated with agricultural and residential land use. Several projects are underway to address fecal coliform bacteria and erosion in the watershed. DWQ will continue to monitor the creek to better identify sources of pollution.

#### Current Status

Little Ivy Creek, from California Creek to SR 1547 (2.6 miles), is Impaired due to a Fair bioclassification at site SB-11. Downstream, from SR 1547 to Ivy Creek (2.1 miles), Little Ivy Creek is Supporting due to a Good-Fair bioclassification at B-3.

Table 11 Summary of Use Support Ratings by Category in Subbasin 04-03-04

Use Support Rating	Aquatic Life	Fish Consumption	Recreation	Water Supply
<b>Monitored Waters</b>				
Supporting	144.4 mi	0.0	33.1 mi	0.0
Impaired	2.6 mi	0.0	0.0	0.0
Not Rated	10.3 mi	0.0	0.0	0.0
<b>Total</b>	<b>157.3mi 0.0 ac</b>	<b>0.0</b>	<b>33.1 mi</b>	<b>0.0</b>
<b>Unmonitored Waters</b>				
Supporting	370.1 mi	0.0	0.0	157.5 mi
Impaired	0.0	0.0	0.0	0.0
Not Rated	2.7 mi	0.0	0.0	0.0
No Data	225.9 mi	756.0 mi	722.9 mi	0.0
<b>Total</b>	<b>598.7 mi 0.0 ac</b>	<b>756.0 mi 0.0 ac</b>	<b>722.9 mi 0.0 ac</b>	<b>157.5 mi 0.0 ac</b>
<b>Totals</b>				
<b>All Waters*</b>	<b>756.0 mi 0.0 ac</b>	<b>756.0 mi 0.0 ac</b>	<b>756.0 mi 0.0 ac</b>	<b>157.5 mi 0.0 ac</b>

\* Total Monitored + Total Unmonitored = Total All Waters.

An intense monitoring effort was undertaken in the Little Ivy Creek watershed as part of a special study. The study found that the biological impairment of the creek is likely attributed to nutrient loading, sediment and non-urban development (NCDENR-DWQ, May 2003). Eleven sites were monitored throughout the watershed in May 2002; however, only two of these sites (B-3 and SB-11 on Figure 8) were large enough to receive a bioclassification. Several of the other sites could not be rated due to low stream flows as a result of drought conditions during the time of sampling. Sedimentation and narrow riparian zones are widespread concerns throughout the entire watershed, and many of the problem areas are located near roadways and residential land.

The monthly chemistry data from the Volunteer Water Information Network (VWIN) corroborated many of the DWQ benthic data conclusions in the Ivy Creek and Little Ivy Creek watersheds (Maas et al., June 2002; Maas et al., May 2003). The Ivy Creek watershed exhibited the highest pH and alkalinity values of any watershed in the seven county VWIN program; conductivity and nutrient levels were also elevated. Water quality deteriorated below the confluence of Ivy Creek and Little Ivy Creek, indicating that Little Ivy Creek and its tributaries were significant contributors of pollutants to Ivy Creek (River). Since 1992, DWQ data indicate overall declining benthic communities in the Ivy Creek watershed.

### 2005 Recommendations

DWQ will continue to monitor the Little Ivy Creek watershed to document the effects of land use changes and development in the surrounding area. It is recommended that local governments develop programs to reduce water quality impacts due to construction activities to reduce the amount of sediment that is entering the watershed. BMPs need to be installed and monitored during and post-construction activities. Implementation of both urban and agricultural best management practices (BMPs) are also encouraged.

### Water Quality Initiatives

Madison County Soil and Water Conservation District (SWCD), the Natural Resources Conservation Service (NRCS), the Madison County Health Department, and the NCDENR Division of Environmental Health (DEH) are participating in the Little Ivy River Watershed BMP Implementation Project. The project identified fecal coliform bacteria, nutrients and sediment as potential water quality concerns throughout the watershed. Nonpoint sources include runoff from agricultural areas, including cropland and small animal operations, and straight pipes (wastewater discharged directly into streams without treatment). Using CWMTF grant money, the county identified several straight pipes and failing septic systems in need of repair. CWMTF and Section 319 grant money has also been used to establish a series of controlled grazing demonstrations, accompanied with an educational program. Controlled grazing allows for alternative watering systems and better distribution of livestock away from the streams. Vegetative areas have also been installed or improved and have included the establishment of riparian buffers, easements, livestock exclusion, cropland conversion, critical area stabilization, and livestock facilities. In the last five years, 123 watering tanks have been installed, 21 feed and waste structures were built, and 32,280 feet of streambank were protected from livestock. Total funding for these projects was \$470,000 and the county has an additional \$300,000 to continue installing BMPs.

Madison County SWCD also received \$75,000 from the CWMTF to conduct an Integrated Pollutant Source Identification (IPSI) survey through the Tennessee Valley Authority (TVA) for the entire Madison County area. Information obtained from this project will assist in identifying nonpoint source locations and priority areas for restoration. Data analysis should be complete by December 2004. In addition, grant proposals are being reviewed by the U.S. Environmental Protection Agency (EPA) to address sedimentation and erosion problems. The district also hopes to encourage the county to adopt sedimentation and erosion control ordinances. For more information on the BMP Implementation Project in the Ivy Creek watershed, contact the Madison County SWCD.

Because of the water quality impairment noted above, Little Ivy Creek has been identified by the NC Ecosystem Enhancement Program (EEP) as one of 28 local watersheds in the basin with the greatest need and opportunity for stream and wetland restoration efforts. This watershed will be given higher priority than nontargeted watersheds for implementation of NCEEP restoration projects.

## **4.4 Status and Recommendations for Waters with Noted Impacts**

The surface waters discussed in this section are not Impaired. However, notable water quality problems and concerns were documented for these waters during this assessment. Attention and resources should be focused on these waters to prevent additional degradation and facilitate water quality improvements. DWQ will notify local agencies of these water quality concerns and work with them to conduct further assessments and to locate sources of water quality protection funding. Additionally, education on local water quality issues and voluntary actions are useful tools to prevent water quality problems and to promote restoration efforts. Nonpoint source program agency contacts are listed in Appendix VIII.

### **4.4.1 California Creek [AU# 6-96-2a and b]**

#### *Current Status and 2005 Recommendations*

California Creek, from source to Little Ivy Creek (7.4 miles), was sampled by DWQ pre- and post-construction of I-26 in Madison County. The sample taken prior to construction was used as a baseline of water quality in the creek. California Creek, from Sprinkle Creek to Little Ivy Creek (3.8 miles), is currently Not Rated in the aquatic life category at site SB-6. This segment was too small to rate according to DWQ sampling methodologies. The upstream site (SB-5), from source to Sprinkle Creek (3.6 miles), however, supported a good, diverse biological community. Sedimentation is a concern for the entire creek, and riparian habitat should to be monitored at the downstream site (SB-6). The VWIN program also monitors California Creek, and their findings corroborate DWQ data (see Appendix V). California Creek is part of the Little Ivy Creek watershed. For more information, refer to the Little Ivy Creek 2005 Recommendations listed above.

### **4.4.2 French Broad River [AU# 6-(54.5)f]**

#### *Current Status and 2005 Recommendations*

This portion of the French Broad River, from Sandymush Creek to the NC/TN state line (33.1 miles), flows through the Town of Marshall and is directly downstream of Progress Energy's Hydroelectric Plant in Marshall. This segment is Supporting in the aquatic life category due to a Good-Fair bioclassification at site B-1. This site has consistently received a Good-Fair bioclassification. In 2002, the aquatic plants were abundant, and algae were observed.

DWQ will continue to monitor water quality in this segment of the river. It is recommended that local agencies work with landowners to install BMPs to improve the riparian zones along this portion of the French Broad River.

### **4.4.3 Ivy Creek (River) [AU# 6-96-(11.3) and 6-96-(11.7)]**

#### *Current Status and 2005 Recommendations*

Ivy Creek, from source to the French Broad River (18.4 miles), is currently Supporting because of a Good bioclassification at site B-2 and a Good-Fair bioclassification at site B-4. It also received an Excellent bioclassification at site F-1. Site B-4 is in close proximity to the confluence with the French Broad River and has a wider riparian zone. This portion of Ivy Creek consistently receives a Good-Fair bioclassification. However, it is important to note that



the 2002 monitoring found fewer species and a less diverse biological community. Turbidity was also a noted concern. Ivy Creek has the potential to continue to degrade in the next monitoring cycle if these downward trends continue. It is important that the recommendations outlined in the Little Ivy Creek watershed be implemented here as well (refer to Little Ivy Creek 2005 Recommendations listed above). The development and implementation of a local sediment and erosion control program should help protect water quality at this site.

#### **4.4.4 Bull Creek [AU# 6-96-16]**

##### *Current Status and 2005 Recommendations*

Bull Creek, from source to Ivy Creek (3.8 miles), is currently Supporting because of a Good-Fair bioclassification at site F-2. This site was sampled for the first time in 2002, and while the greatest number of fish in the basin was collected at this site, the diversity was only moderate. There were indications of excess periphyton communities due to an elevated pH, and conductivity was relatively high. VWIN also monitors this creek and their information corroborates with DWQ data (see Appendix V). DWQ will continue to monitor this site and work with others to determine the source of the high conductivity. It is recommended that local agencies work with landowners to install BMPs to improve the riparian area along Bull Creek.

### **4.5 Additional Water Quality Issues within Subbasin 04-03-04**

The following 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.

This section also identifies those surface waters given an Excellent bioclassification, and therefore, may be eligible for reclassification to a High Quality Water (HQW) or an Outstanding Resource Water (ORW). It should be noted that these are streams that were sampled by DWQ during this basinwide cycle. There may be other tributaries eligible for reclassification in addition to the ones listed below. For more information regarding water quality standards and classifications, refer to Chapter 8.

#### **4.5.1 Subbasin Concerns and Priorities**

In addition to the Little Ivy and Ivy Creek (River) watersheds, several other initiatives are underway by the Madison County SWCD and NRCS to control and reduce the impacts from agricultural activities. Over the last basinwide cycle (1998 to 2003), the county has installed 76 watering tanks, built one feed and waste structure, constructed 1,300 feet of stock trails, and excluded livestock along several tributaries using 20,000 feet of fence. These projects were funded by grants from the NC Agriculture Cost Share Program (NCASCP). In addition, 30 acres have been converted from cropland to pasture, and crops are being rotated on two acres of land to reduce the amount of pesticide and fertilizer use. Thirty-one watering tanks, four feed and waste structures, and one stream crossing have also been constructed using EQIP grant money totaling \$150,000. The Madison County SWCD and NRCS are also working to promote community awareness, stewardship and involvement in protecting the local watersheds.

Within this subbasin, Madison County is expected to increase in population by 19.3% over the next 15 years. Increases in population often lead to new construction sites and additional sources of NPS from impervious surfaces. Local officials are currently working to establish sedimentation and erosion control ordinances throughout the county and identifying those areas most susceptible to growth and development activities. DWQ will work with the county SWCD and NRCS staff to identify new biological monitoring sites to assess impacts to additional watersheds within this subbasin.

#### **4.5.2 Surface Waters Identified for Potential Reclassification**

##### *Big Laurel Creek (AU# 6-112)*

Big Laurel Creek, from source to the French Broad River (30.8 miles), is Supporting due to an Excellent bioclassification at site B-5 and a Good-Fair bioclassification at site SF-1. The current DWQ classification is C Tr. Big Laurel Creek is located in a forested area of the subbasin, and there is little development opportunity due to steep gradient slopes.

##### *Shelton Laurel Creek (AU# 6-112-26)*

Shelton Laurel Creek, from source to Big Laurel Creek (14.8 miles), is Supporting due to an Excellent bioclassification at site F-3 and a Good bioclassification at site B-8. The current DWQ classification is C Tr.

##### *Puncheon Fork (AU# 6-112-5)*

Puncheon Fork, from source to Big Laurel Creek (5.2 miles), is Supporting due to an Excellent bioclassification at site B-7. The current DWQ classification is C Tr.

##### *Spring Creek [AU# 6-118-(1) and 6-118-(27)]*

Spring Creek, from source to the French Broad River (22.0 miles), is Supporting due to an Excellent bioclassification at site B-9 and a Good-Fair bioclassification at site SF-1. The current DWQ classification for AU# 6-118-(1) is C Tr. The current DWQ classification for AU# 6-118-(27) is C.