

Chapter 5

French Broad River Subbasin 04-03-05

Including the: Pigeon River, West and East Fork Pigeon River, Richland Creek, Fines Creek, Crabtree Creek, Hyatt Creek, Plott Creek, Raccoon Branch, Hurricane Creek, Lake Junaluska and Walters Lake

5.1 Subbasin Overview

Subbasin 04-03-05 at a Glance

Land and Water Area

Total area:	532 mi ²
Land area:	531 mi ²
Water area:	1 mi ²

Population Statistics

2000 Est. Pop.:	52,212 people
Pop. Density:	98 persons/mi ²

Land Cover (percent)

Forest/Wetland:	84%
Surface Water:	<1%
Urban:	1%
Cultivated Crop:	<1%
Pasture/ Managed Herbaceous:	14%

Counties

Haywood

Municipalities

Canton, Clyde, Maggie Valley and Waynesville

This subbasin includes undeveloped land within the Great Smoky Mountains National Park, Pisgah National Forest, Pisgah Game Lands and the Shining Rock Wilderness Area. The largest urban areas are Waynesville, Lake Junaluska, Clyde, Maggie Valley and Canton. By the year 2020, population throughout Haywood County is expected to increase by 15.9%. For more information regarding population growth and trends, refer to Appendix I.

There are 16 NPDES wastewater discharge permits in this subbasin with a total permitted flow of 37.1 MGD. The largest are Blue Ridge Paper Products, Inc. (BRPP) (29.9 MGD), the Town of Waynesville WWTP (6.0 MGD), and the Town of Maggie Valley WWTP (1.0 MGD). Significant issues related to compliance with NPDES permit conditions are discussed below. Currently, there are two individual NPDES stormwater permits in this subbasin. Canton, Clyde, Waynesville, as well as Haywood County, will be required to develop stormwater programs under Phase II. Refer to Appendix VI for identification and more information on individual NPDES permit holders and to Section 13.2 for information related to stormwater programs. There are eight registered animal operations in this subbasin.

A map including the locations of NPDES discharges and water quality monitoring stations is presented in Figure 9. Table 12 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 19 fish community samples (Figure 9 and Table 12) collected during this assessment period. Data were collected from eight ambient monitoring stations and two lakes assessments. 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.

Figure 9 French Broad River Subbasin 04-03-05

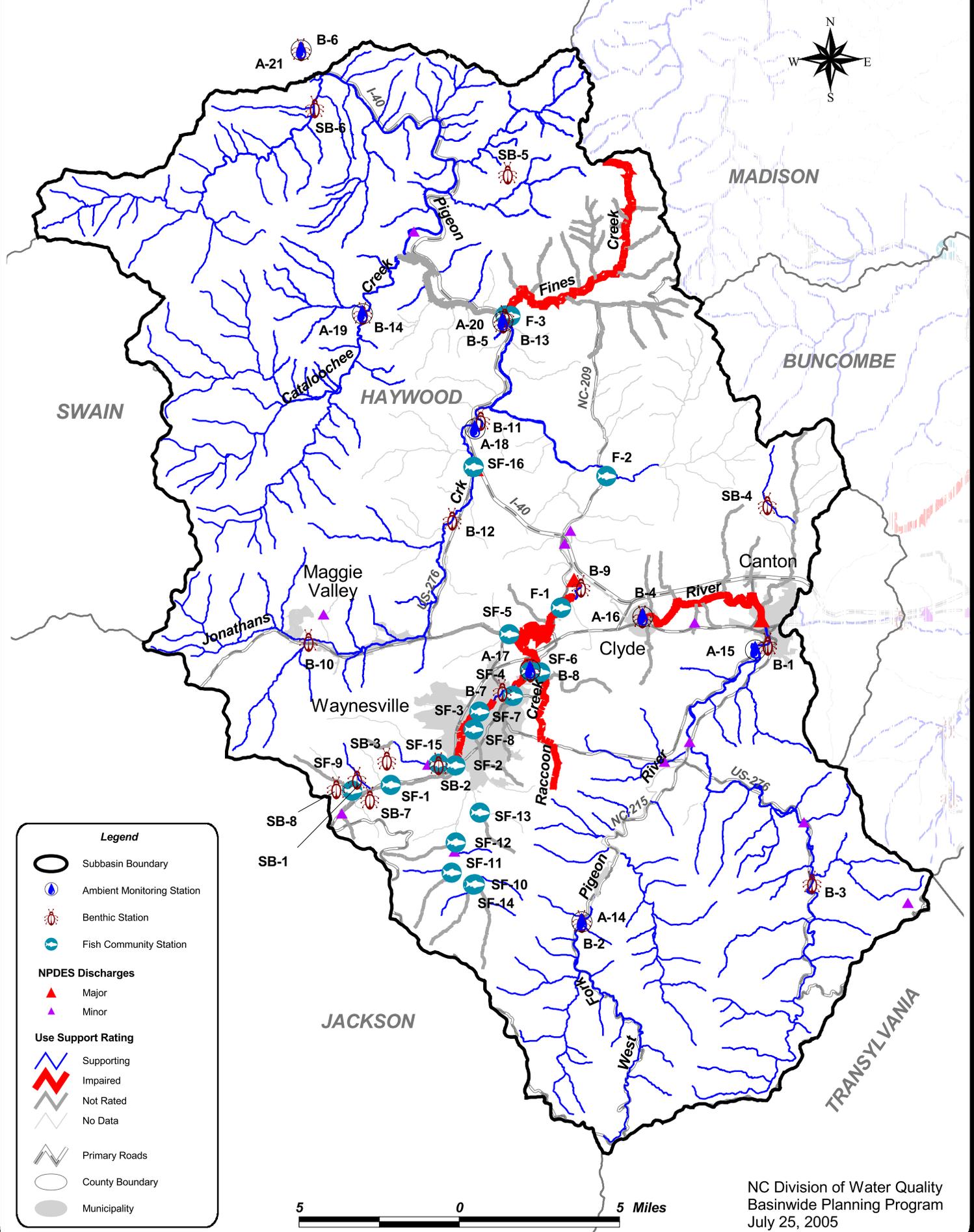


Table 12 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 040305

Assessment Unit #	Name	Length/Area		AL	REC	Benthic Community			Fish Community			Ambient Data	
5-(1)	PIGEON RIVER	4.8	Miles	S	S							A-15	nce
5-(6.5)	PIGEON RIVER	0.8	Miles	S	S	B-1	GF	2002				A-15	nce
5-(7)a	PIGEON RIVER (Waterville Lake below elevation 2258)	0.5	Miles	S	ND	B-1	GF	2002					
5-(7)b	PIGEON RIVER (Waterville Lake below elevation 2258)	6.4	Miles	I	S	B-4	P	2002				A-16	nce
5-(7)d	PIGEON RIVER (Waterville Lake below elevation 2258)	7.2	Miles	S	S	B-5	GF	2002				A-20	nce
5-(7)e	PIGEON RIVER (Waterville Lake below elevation 2258)	773.1	Acres	NR	ND							Lake Monitoring	nce
5-(7)f	PIGEON RIVER (Waterville Lake below elevation 2258)	12.0	Miles	S	S	B-6	G	2002				A-21	nce
5-16-(1)a	Richland Creek (Lake Junaluska)	8.0	Miles	NR	I				SF-1	NR	2001	A-17	Bacteria
	Richland Creek (Lake Junaluska)	8.0	Miles	NR	I				SF-2	NR	2001	A-17	Bacteria
5-16-(1)b	Richland Creek (Lake Junaluska)	2.3	Miles	I	I				SF-3	P	2001	A-17	Bacteria
5-16-(1)c	Richland Creek (Lake Junaluska)	0.7	Miles	I	I				SF-3	P	2001	A-17	Bacteria
5-16-(1)d	Richland Creek (Lake Junaluska)	0.9	Miles	S	I	B-7	G	2002				A-17	Bacteria
5-16-(1)e	Richland Creek (Lake Junaluska)	2.0	Miles	I	I	B-8	F	2002	SF-4	P	2001	A-17	Bacteria
5-16-(1)f	Richland Creek (Lake Junaluska)	200.0	Acres	I	ND							Lake Monitoring	pH
5-16-(16)a	Richland Creek	1.6	Miles	I	ND				F-1	P	2002		
5-16-(16)b	Richland Creek	0.7	Miles	S	ND	B-9	GF	2002					
5-16-11	Farmer Branch	2.9	Miles	NR	ND				SF-8	NR	2001		
5-16-13	Shelton Branch	2.7	Miles	NR	ND				SF-7	NR	2001		
5-16-14	Raccoon Creek	4.7	Miles	I	ND				SF-6	F	2001		
5-16-15	Factory Branch	2.4	Miles	NR	ND				SF-5	NR	2001		
5-16-3	Winchester Creek	2.5	Miles	NR	ND				SF-9	NR	2001		
5-16-4	Nolen Creek	1.8	Miles	S	ND	SB-1	NI	2002					
5-16-6a	Hyatt Creek	0.9	Miles	NR	ND	SB-3	NR	2002					
5-16-6b	Hyatt Creek	2.6	Miles	S	ND	SB-2	NI	2002	SF-15	NR	2001		
5-16-7-2	Cherry Cove Creek	2.5	Miles	NR	ND				SF-10	NR	2001		

Table 12 DWQ Assessment and Use Support Ratings Summary for Monitored Waters in Subbasin 040305

Assessment Unit #	Name	Length/Area		AL	REC	Benthic Community			Fish Community			Ambient Data	
5-16-7-3	Shiny Creek	2.9	Miles	NR	ND				SF-14	NR	2001		
5-16-7-6	Old Bald Creek	2.4	Miles	NR	ND				SF-11	NR	2001		
5-16-7-9-(1)	Rocky Branch	2.2	Miles	NR	ND				SF-12	NR	2001		
5-16-7-9-(2)	Rocky Branch	0.2	Miles	NR	ND				SF-12	NR	2001		
5-16-8-1	Medford Branch	1.8	Miles	NR	ND				SF-13	NR	2001		
5-22	Crabtree Creek	3.3	Miles	S	ND				F-2	GF	2002		
5-26-(7)	Jonathans Creek	14.6	Miles	S	S	B-11	G	2002	SF-16	GF	1997	A-18	nce
	Jonathans Creek	14.6	Miles	S	S	B-12	E	2002	SF-16	GF	1997	A-18	nce
	Jonathans Creek	14.6	Miles	S	S	B-10	E	2002	SF-16	GF	1997	A-18	nce
5-2a	West Fork Pigeon River (Lake Logan)	7.8	Miles	S	S	B-2	E	2002				A-14	nce
5-3-(6.5)	East Fork Pigeon River	13.0	Miles	S	ND	B-3	E	2002					
5-32	Fines Creek	9.7	Miles	I	ND	B-13	GF	2002	F-3	F	2002		
5-41	Cataloochee Creek	8.1	Miles	S	S	B-14	E	2002				A-19	nce
5-44	Hurricane Creek	5.4	Miles	S	ND	SB-5	G	2002					
5-59-22	Chestnut Branch	3.3	Miles	S	ND	SB-6	E	2002					
5-8-4-(2)	Rough Creek	1.2	Miles	S	ND	SB-4	E	1997					

Assessment Unit # - Portion of DWQ Classified Index where monitoring is applied to assign a use support rating.

Use Categories:
 AL - Aquatic Life
 REC - Recreation

Monitoring data type:
 F - Fish Community Survey
 B - Benthic Community Survey
 SF - Special Fish Community Study
 SB - Special Benthic Community Study
 A - Ambient Monitoring Site

Bioclassifications:
 E - Excellent
 G - Good
 GF - Good-Fair
 F - Fair
 P - Poor
 NI - Not Impaired

Use Support Ratings 2004:
 S - Supporting
 I - Impaired
 NR - Not Rated
 ND - No Data

Ambient Data
 nce - no criteria
 ce - criteria exce

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 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 04-03-05 are summarized in Section 5.2. Recommendations, current status and future recommendations for previously or newly Impaired waters are discussed in Section 5.3. Waters with noted water quality impacts are discussed in Section 5.4. Water quality issues related to the entire subbasin are discussed in Section 5.5. Refer to Appendix X for a complete list of monitored waters and more information on Supporting monitored waters.

5.2 Use Support Assessment Summary

Use support ratings were assigned for waters in subbasin 04-03-05 in the aquatic life, recreation, fish consumption and water supply categories. A fish consumption advisory is in effect for Waterville (Walters) Lake. Women of childbearing age and children under the age of 15 are advised not to eat common carp caught in the lake. For all others, a limited-consumption advisory applies and advises that common carp be limited to one meal per month. No other fish advisories have been issued. 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 146.8 stream miles (19.9 percent) and 973.1 acres (87.2 percent) monitored during this assessment period in the aquatic life category. There are 27.4 stream miles (3.7 percent) Impaired in this same category. In addition, nearly 14 stream miles (2.0 percent) are Impaired for recreational use. Refer to Table 13 for a summary of use support ratings for waters in subbasin 04-03-05.

5.3 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.

Table 13 Summary of Use Support Ratings by Category in Subbasin 04-03-05

Use Support Rating	Aquatic Life	Fish Consumption	Recreation	Water Supply
Monitored Waters				
Supporting	88.0 mi	0.0	61.6 mi	0.0
Impaired	27.4 mi 200.0 ac	773.1 ac	13.8 mi	0.0
Not Rated	31.4 mi 773.1 ac	0.0	0.0	0.0
Total	146.8 mi 973.1 ac	0.0 mi 773.1 ac	75.4mi 0.0 ac	0.0
Unmonitored Waters				
Supporting	393.5 mi	0.0	0.0	264.5 mi 91.9 ac
Impaired	0.0	0.0	0.0	0.0
Not Rated	53.8 mi	0.0	0.0	0.0
No Data	143.3 mi 142.8 ac	737.4 mi 342.8 ac	662.0 mi 1,115.9 ac	0.0
Total	590.6 mi 142.8 ac	737.8 mi 342.8 ac	662.0 mi 1,115.9 ac	264.5 mi 91.9 ac
Totals				
All Waters*	737.4 mi 1,115.9 ac	737.4 mi 1,115.9 ac	737.4 mi 1,115.9 ac	264.5 mi 91.9 ac

* Total Monitored + Total Unmonitored = Total All Waters.

5.3.1 Pigeon River [AU# 5-(7)b]

2000 Recommendations

Seven miles of the Pigeon River was Impaired due to point and nonpoint source pollution. Blue Ridge Paper Products (BRPP) had improved its manufacturing process to eliminate the release of the chemical dioxin, a by-product of the paper making process. DWQ will participate in a Joint Watershed Advisory Group and continue to monitor the river as additional improvements are made. Local initiatives are needed to address the nonpoint source impacts to the river from the towns of Canton and Clyde and outlying nonurban areas.

Current Status

Pigeon River [AU# 5-(1), 5-(6.5) and 5-(7)a], from source to 0.15 miles downstream of West Park Street in Canton (6.1 miles), is Supporting due to a Good-Fair bioclassification at site B-1. This site has been sampled 13 times since 1983, and the bioclassification has varied between Good-Fair and Excellent due to year-to-year differences in flow and habitat. Much of the nearby land is used for agricultural purposes, but an increasing number of vacation homes are being built in the upper reaches of the watershed.

Pigeon River [AU# 5-(7)b], from 0.15 miles downstream of West Park Street in Canton to SR 1642 (Main Street in Clyde) (6.4 miles), is currently Impaired in the aquatic life category due to a Poor bioclassification at site B-4. The sampling site is located approximately 5 miles downstream of Blue Ridge Paper Products, Inc. (BRPP) and has been sampled 12 times since 1984. Historically, this site has received Fair and Poor bioclassifications, but improvements in BRPP's processes were evident in samples collected in 1992 (improvement from Poor to Fair) and 1997 (improvement from Fair to Good-Fair). In 2002, however, the bioclassification decreased to Poor. This decrease is likely associated with drought conditions during the time of sampling. Pools were absent; riffles were minimal, and aquatic weeds were abundant. These factors, along with low flow conditions and the subsequent lack of dilution of the BRPP effluent likely impacted the benthic community. Conductivity was also high at the time of sampling. A review of data from the DWQ ambient monitoring station (A-16) showed that the mean conductivity has been steadily increasing at the site since 1998. This site also receives nonpoint urban and stormwater runoff from the towns of Canton and Clyde. This nonpoint runoff could also impact the benthic community in this stretch of the river.

In addition to DWQ sampling, EA Engineering, Science and Technology, Inc. (EA) collected fish and macroinvertebrate samples along the Pigeon River and three major tributaries (Jonathan Creek, Fines Creek and Richland Creek) in the summer of 2000. The study was prepared for BRPP following NCDENR protocols and examined the overall fish and macroinvertebrate communities in the watershed. The EA survey was compared to a 1995 survey and found that: 1) the number of smallmouth bass had increased 10 fold; 2) darters were found where they were absent in 1995; and 3) species richness had improved downstream of the BRPP discharge. Macroinvertebrate communities ranged from Fair, Good-Fair, and Good with a Good bioclassification on both Jonathan Creek and Fines Creek and a Fair bioclassification on Richland Creek (EA, May 2001). DWQ sampling and use support ratings for Jonathan Creek, Fines Creek and Richland Creek are presented below.

A Settlement Agreement was reached in 1997 on a modified color variance and NPDES permit for BRPP. The following agencies participated in the agreement: the U.S. Environmental Protection Agency (EPA); the states of North Carolina and Tennessee; Cocke County and the City of Newport, TN; the Tennessee Environmental Council; the American Canoe Association; and BRPP. The intent of the agreement was to address the Pigeon River color issue without litigation. The goal was to reach an annual average color loading of 48,000-52,000 lbs/day by May 1, 2001. This goal was met. All of the BMP projects as required in the agreement are complete and operational. Additional color reduction measures were completed and others are ongoing. Contingency plans for low flow periods were in place and operational.

Pursuant to the agreement, North Carolina and Tennessee were required to establish a Joint Watershed Advisory Group to foster joint planning and public input on decisions affecting the Pigeon River. This group has been meeting since 2000. BRPP has also been working with a Community Advisory Committee composed of community leaders in Haywood County (North Carolina), Cocke County (Tennessee), and the State of North Carolina.

Overall, the water quality in the Pigeon River has improved dramatically over the last 15 years. Annual fish tissue monitoring for dioxin in the Pigeon River is conducted by BRPP and Carolina Power and Light Company (CP&L). This monitoring is required as part of the BRPP discharge

permit issued by DWQ and as a condition of the Federal Energy Regulatory Commission (FERC) license for CP&L. In the past, there has been a limited-consumption advisory for common carp in effect for the Pigeon River from the Town of Canton to the North Carolina-Tennessee state line (approximately 26 miles, including Waterville Lake). In 2001, the NC Department of Health and Human Services (NCDHHS) revised this advisory due to declining dioxin concentrations in fish. The advisory was removed from common carp caught in the river, but remains in effect for Waterville (Walters) Lake. NCDHHS suggests that women of childbearing age and children under the age of 15 avoid eating carp caught from the lake. For all others, consumption of carp should be limited to no more than one meal per month. Swimming, boating and other recreational activities are not affected by this advisory. Visit the NCDHHS website for more information at www.epi.state.nc.us/epi/fish.

In addition, the State of Tennessee had a historical limited-consumption advisory for common carp, catfish species, and redbreast sunfish in effect for the Pigeon River within the State of Tennessee downstream to the confluence with the French Broad River. Due to monitoring conducted from 1996 to 2002, the Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control (DWPC) recommended that the Fish Consumption Advisory be removed (TDEC-DWPC, October 2002). This advisory has been lifted; however, the Pigeon River (5 miles) remains on the Tennessee 303(d) list for color.

2005 Recommendations

DWQ will continue to monitor the Pigeon River to study the sources and impact of increasing conductivity. DWQ will continue to work closely with BRPP to minimize the impact of its discharge and continue its involvement in the Joint Watershed Advisory Group. Additional provisions during times of drought should be reviewed and perhaps revised in the next permit cycle for BRPP to protect water quality in Pigeon River. In addition, DWQ recommends erosion and sedimentation control measures be taken in areas of the watershed that are under development.

Water Quality Initiatives

Haywood Waterways Association (HWA) is a nonprofit organization dedicated to maintaining and improving the water quality of the Pigeon River. It focuses on reducing nonpoint source pollution by offering education and outreach programs and working through a variety of voluntary initiatives, concentrating on individual landowners. HWA partnered with TVA to conduct a nonpoint source inventory (IPSI) of Haywood County using low-elevation infrared photography and interpretation. TVA digitized multiple layers of GIS information obtained from the photo interpretation. Nonpoint sources such as septic systems, illegal dumps sites, eroding roads and streambanks, pastureland and animal access to streams were identified. This information was used by TVA to apply a nutrient loading model to calculate a nutrient budget for the Haywood County portion of the Pigeon River watershed. HWA and the Haywood County Soil and Water Conservation District (SWCD) then used the TVA model and IPSI data to develop and implement strategies for water quality improvements. A Watershed Action Plan (HWA, 2002) was written detailing the inventory results and 19 strategies were recommended to improve water quality in the watershed.

Using the IPSI data, TVA and HWA were able to identify the most heavily impacted subwatersheds, identify and rank the nonpoint sources, and identify landowners where the nonpoint sources were located. EPA 319 and Clean Water Management Trust Fund (CWMTF)

grants were secured for sediment and water quality monitoring, educational publications, and a variety of best management practices (BMPs) projects on lands with participating landowners. BMP projects include: fencing livestock from streams; improving high-use areas and stock trails adjacent to the streams; streambank stabilization; improving riparian buffers; and a stormwater management project in a rural subdivision. Financial incentives in the form of reduced cost or no-cost BMP work are offered to the landowners in return for long-term management agreements or conservation easements. For more information on HWA and to review the Watershed Action Plan, visit www.haywoodwaterways.org.

5.3.2 Waterville (Walters) Lake [AU # 5-(7)e]

2000 Recommendations

Waterville (Walters) Lake was Impaired due to eutrophic conditions (i.e., algal blooms, chlorophyll *a*, dissolved oxygen violations, and nutrients). Support methodology changed since the 303(d) listing for Waterville Lake, and based on previous results, the lake is Supporting for its uses. Despite this change, however, a fish advisory remains in effect for catfish and carp, and the lake remains on the 303(d) list of Impaired waters.

Current Status

Waterville (Walters) Lake, from White Oak Road to Waterville Reservoir Dam (773.1 acres), is currently Not Rated in the aquatic life category. Waterville Lake receives runoff from urban and agricultural areas, which includes the Richland Creek, Jonathans Creek and Fines Creek watersheds. Samples collected from Waterville Lake showed evidence of eutrophication. Parameters of concern include chlorophyll *a*, elevated surface dissolved oxygen, and pH. There was also increased algae growth, specifically blue-green algae in the reservoir, during the summer of 2002. The elevated levels of chlorophyll *a*, conductivity and dissolved gasses may be attributed to drought conditions during the time of sampling. Low flow combined with limited dilution of upstream discharge effluents and nonpoint sources may also be contributing to the eutrophic conditions.

Waterville Lake remains under a fish consumption advisory for common carp. NCDHHS revised the advisory in 2001 and suggests that women of childbearing age and children under the age of 15 avoid eating carp caught from the lake. For all others, consumption of carp should be limited to no more than one meal per month. Swimming, boating and other recreational activities are not affected by this advisory. Sampling by DWQ and CP&L shows that dioxin concentrations in all species of fish collected from the lake have decreased since the early 1990s. Dioxin levels in common carp, however, remain above the North Carolina limit. Waterville Lake is on the state's 303(d) list of Impaired waters due to the fish consumption advisory. See Section 5.3.1 for more information.

2005 Recommendations

DWQ will continue to monitor water quality in Waterville (Walters) Lake. In addition, DWQ will work with Progress Energy (CP&L) and BRPP to develop a Quality Assurance and Project Plan (QAPP) so that their data can be used by DWQ in determining use support ratings in the future.

Water Quality Initiatives

Local efforts to reduce nonpoint source pollution are being led through a partnership between Haywood County SWCD, the Southwestern NC Resource Conservation & Development (RC&D) Council, and HWA. Since 2000, BMPs have been installed throughout the Pigeon River watershed including areas around Waterville (Walters) Lake. In addition, the Pigeon River Fund has also been a major contributor to water quality projects since 1996. Progress Energy provides capital for the fund, which was created during the relicensing of the Waterville (Walters) Lake Dam. The fund provides grants for projects that improve water quality, restore fish and wildlife habitat, create public access, and promote water quality awareness.

5.3.3 Richland Creek [AU # 5-16-(1)a, b, c, d and e; 5-16-(16)a]

2000 Recommendations

Richland Creek, from below the Lake Junaluska Dam to the Pigeon River (2.4 miles), was Impaired in the aquatic life category due to a Fair bioclassification. Impacts were associated with both point and nonpoint sources, including runoff from urban and agricultural areas, road development, and eroding streambanks. Biological impairment and habitat degradation continue to be primary concerns throughout the Richland Creek watershed. DWQ will continue to monitor the creek and Lake Junaluska and work with local initiatives to restore water quality.

Current Status

Richland Creek, from source to the backwaters of Lake Junaluska (13.9 miles), is currently Impaired in the recreation category based on elevated fecal coliform bacteria levels. Richland Creek, from US Route 23 to Depot Street (3.0 miles) and from Shelton Branch to the backwaters of Lake Junaluska (2.0 miles), is also Impaired in the aquatic life category due to a Poor bioclassification at site SF-3 and SF-4 and a Fair bioclassification at site B-8, respectively. The segment of Richland Creek from Lake Junaluska Dam to Jones Cove Branch (1.6 miles) is also Impaired in the aquatic life category because of a Poor bioclassification at site F-1. DWQ monitoring data and information presented in a special study indicates that there are long-term water quality impacts from nonpoint source pollution associated with urbanization, sedimentation, and erosion (NCDENR-DWQ, September 2001). Richland Creek is located in one of the most heavily developed areas of Haywood County and the Pigeon River watershed.

2005 Recommendations

DWQ will continue to monitor Richland Creek. DWQ will also work with the DWQ regional staff, the Town of Waynesville, and Haywood County to identify the source of the elevated fecal coliform bacteria levels. DWQ also encourages the Town of Waynesville to complete source tracking and sewer system mapping to identify damaged or leaking sewer lines.

Water Quality Initiatives

HWA has developed five-year goals for the Richland Creek subwatershed of the Pigeon River as part of their Watershed Action Plan (2002). These include: stabilizing 23,000 feet of eroding streambank and 26 miles of eroding road banks; improving 921 acres of pasture thus removing 10 animal access points to streams; and improving 10 miles of riparian corridors. These goals would theoretically result in a 37 percent reduction of sediment entering Richland Creek and eventually Lake Junaluska. The Haywood County SWCD, the Southwestern NC RC&D Council, and HWA have secured CWMTF grant money to implement the watershed action plan in Richland Creek. DWQ encourages the efforts of HWA and will partner with them as they

implement management strategies throughout the watershed. Refer to Section 5.3.1 for more information regarding HWA.

Because of the water quality impairment noted above, Richland 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.

5.3.4 Lake Junaluska [AU # 5-16-(1)f]

2000 Recommendations

A progressive program to implement nonpoint source pollution controls was recommended to reduce the nutrient and sediment loading and the need for future dredging. An initiative by the HWA was underway to inventory nonpoint source pollution in the watershed. Local support of the recommendations produced by this study is critical to correcting the water quality of Lake Junaluska.

Current Status and 2005 Recommendations

Lake Junaluska (200 acres) has had chronic problems with sediment inputs from the surrounding watershed and is considered Impaired in the aquatic life category due to eutrophication (pH standards violation). As a result of the sediment inputs, significant funds have been spent periodically dredging the lake. DWQ assessed an enforcement action against the Lake Junaluska Assembly in November 1998 after the lake was mistakenly drained lower than was intended. A plume of sediment from the lake bottom flowed down the entire length of lower Richland Creek to the Pigeon River, burying fish and habitat. The reservoir continues to suffer from sedimentation problems.

Lake Junaluska also had elevated surface dissolved oxygen and pH values. Both of these may have contributed to increased algae growth in 2002. The local Watershed Action Plan by HWA (2002) suggests reducing the sediment loading to a rate that can be managed over time. It is recommended those BMPs that emphasis sediment and erosion control be installed in this watershed. As Lake Junaluska is part of the Richland Creek watershed, refer to Richland Creek 2005 Recommendations and *Water Quality Initiatives* (Section 5.3.3) for more information.

5.3.5 Fines Creek [AU # 5-32]

2000 Recommendations

Fines Creek was experiencing notable impacts from agricultural activities, as well as runoff from nonurban development. The Volunteer Water Information Network (VWIN) has also noted sediment and nutrient impacts (Maas et al., November 1999). This watershed could benefit from implementation of BMPs directed towards these inputs. DWQ will notify local agencies of water quality concerns in Fines Creek. DWQ will also work with local agencies to conduct additional monitoring and assist agency personnel with locating sources of water quality protection funding.

Current Status

Fines Creek, from the source to the Pigeon River (9.7 miles), is currently Impaired in the aquatic life category because of a Fair bioclassification at site F-3. This site also received a Good-Fair bioclassification at site B-13. This creek has some high quality aquatic habitat, but the fish community suffers from chronic impairment. Fines Creek drains primarily agricultural land (much of which is used for pasture) and exhibits nutrient enrichment and high conductivity.

VWIN monthly chemistry data corroborated many of the DWQ biological data conclusions (Maas *et al.*, January 2004). This watershed has very high nutrient and turbidity values, some of the highest in a seven-county VWIN monitoring area. VWIN and HWA identified habitat degradation and sedimentation as major concerns for Fines Creek. According to the Watershed Action Plan (HWA, 2002), many of the streams in the watershed have been channelized and have little to no riparian vegetation.

2005 Recommendations

DWQ will continue to monitor water quality in Fines Creek and potentially add a monitoring site in Rush Fork Creek during the next sampling cycle. DWQ will work with local agencies, including HWA and VWIN, to address the nutrient and turbidity issues in this watershed and assist in identifying additional funding sources for water quality protection. In addition, DWQ recommends that local agencies work with landowners to install BMPs to improve the riparian zone and limit livestock access to streams.

Water Quality Initiatives

HWA, Haywood County SWCD, and the Southwestern NC RC&D Council have secured EPA 319 grant money for BMP projects along Fines Creek. HWA has set a goal of reducing nonpoint source pollution by 35 percent over the next five years throughout the Fines Creek watershed. These funds will also be used to restore streambanks, improve pasture conditions, and address animal access points. Fines Creek is part of the Watershed Action Plan (2002) developed by HWA. Refer to Section 5.3.1 for more information.

Because of the water quality impairments noted above, Fines Creek has been identified by NCEEP 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.

5.3.6 Raccoon Creek [AU # 5-16-14]

Current Status and 2005 Recommendations

Raccoon Creek, from source to Richland Creek (4.7 miles), is currently Impaired in the aquatic life category because of a Fair bioclassification at site SF-6. This stream drains an area of suburban and commercially developed land, as well as some agricultural lands. Raccoon Branch suffers from habitat degradation, which includes steep, eroding banks. HWA has been continually monitoring sedimentation rates in Raccoon Creek for the last two years; however, the results are inconclusive. It is recommended that local agencies and HWA work with landowners to install BMPs to improve the riparian zone and conduct stream restoration activities.

5.3.7 Hyatt Creek [AU # 5-16-6a and b]

2000 Recommendations

Hyatt Creek was previously Impaired and placed on the 303(d) list based on evaluated information. Use support methodology has been improved, and only monitored data are now used in use support determinations (see Appendix X). However, this stream was required to remain on the 303(d) list until sampling was conducted to assess current water quality conditions. Refer to Appendix IV for more information on the state's 303(d) methodology and listing requirements.

Current Status and 2005 Recommendations

Hyatt Creek, from source to Richland Creek (3.5 miles), is currently Not Rated in the aquatic life category because of a Not Rated bioclassification at sites SB-3 and SF-15. Another site (SB-2) received a Not Impaired bioclassification. Due to its small size, Hyatt Creek did not receive a use support rating. The small size of the stream is likely due to drought conditions during the time of sampling. Several impacts were noted, however, and include lack of pools and instream habitat, high sediment loadings, and minimal riparian vegetation. It is recommended that local agencies work with landowners to install BMPs to improve the riparian zone and limit livestock access to streams.

Water Quality Initiatives

HWA, Haywood County SWCD, and the Southwestern NC RC&D Council have secured CWMTF grant money for BMP projects along Hyatt Creek. Since Hyatt Creek is part of the Richland Creek watershed, refer to the Richland Creek *Water Quality Initiatives* (Section 5.3.3) for more information.

Because of the water quality impairment noted above, Hyatt Creek has been identified by NCEEP 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.

5.4 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.

5.4.1 Plott Creek [AU # 5-16-9]

Current Status and 2005 Recommendations

Plott Creek, from source to Richland Creek (4.7 miles), has not been monitored by DWQ. However, HWA believes that Plott Creek may encounter problems associated with planned

development activities in the surrounding area (HWA, 2002). Currently, 76 percent of this watershed is forested; however, road data indicate that 60 percent of the land will be developed as low density residential in the coming years. This change in the amount of impervious surface could have potential negative water quality impacts. It is recommended that Haywood County continue programs to minimize water quality impacts during development activities in order to reduce the amount of sediment that is entering the watershed. In addition, the existing forested areas adjacent to Plott Creek and its tributaries should remain for water quality protection.

Water Quality Initiatives

Because of the potential water quality problems noted above, Plott Creek has been identified by NCEEP 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. NCEEP will partner with the Haywood Waterways Association when working in this watershed.

5.4.2 Jonathan Creek [AU # 5-26-(7)]

Current Status and 2005 Recommendations

Jonathan Creek, from 0.4 miles downstream of Fines Creek to the Pigeon River (14.6 miles), is currently Supporting in the aquatic life category due to Excellent bioclassifications at sites B-10 and B-12, a Good bioclassification at site B-11, and a Good-Fair bioclassification at SF-16. This creek has been sampled since 1992, and monitoring data continually indicate excellent water quality. The site assigned the Good bioclassification receives the discharge of the Maggie Valley Wastewater Treatment Plant (WWTP). The discharge may have had an effect on water quality during this assessment period due to the low flow conditions caused by a four-year drought (1998 to 2002).

Jonathan Creek drains through the Town of Maggie Valley, which includes both commercial and residential areas, as well as agricultural land. It is recommended that local agencies work with landowners to install BMPs to improve the riparian zone, targeting the residential areas of the watershed, as well as the agricultural areas. Protecting the riparian corridor and minimizing the impact of development in this watershed are other recommendations discussed in the local Watershed Action Plan (HWA, 2002).

Water Quality Initiatives

Because of the excellent water quality noted above, Jonathan Creek has been identified by NCEEP as one of 28 local watersheds in the basin with the greatest need and opportunity for stream and wetland restoration projects in order to protect the existing ecosystem. This watershed will be given higher priority than nontargeted watersheds for implementation of NCEEP restoration projects.

5.4.3 Crabtree Creek [AU# 5-22]

Current Status and 2005 Recommendations

Crabtree Creek, from the source to the Pigeon River (3.3 miles), is currently Supporting in the aquatic life category because of a Good-Fair bioclassification at site F-2. During the time of sampling, a few habitat concerns were noted in Crabtree Creek, including narrow riparian zones and eroding banks. There are also places where cattle have direct access to the stream. It is

recommended that local agencies continue to work with landowners on the importance of water quality protection and continue assisting with BMP installation to improve the riparian zone and limit livestock access to streams.

5.5 Additional Water Quality Issues within Subbasin 04-03-05

This section 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.

5.5.1 Surface Waters Identified for Potential Reclassification

Jonathan Creek [AU# 5-26-(7)]

Jonathan Creek, from 0.4 miles downstream of Fines Creek to the Pigeon River (14.6miles) is currently Supporting due to Excellent and Good bioclassifications at sites B-10, B12, and B-11. The current DWQ classification is C Tr. Refer to section 5.4.2 for more information.

West Fork Pigeon River (AU# 5-2a)

The West Fork Pigeon River, from source to the backwaters of Lake Logan (7.8 miles), is Supporting due to an Excellent bioclassification at site B-2. The current DWQ classification is WS-III, Tr.

East Fork Pigeon River [AU# 5-3-(6.5)]

The East Fork Pigeon River, from a point 0.5 miles upstream of Bee Branch to the Pigeon River (13.0 miles), is Supporting due to an Excellent bioclassification at site B-3. The current DWQ classification is WS-III, Tr.