

Chapter 3

New River Subbasin 05-07-03

Including the: New River, Little River, Pine Swamp Creek, Bledsoe Creek, Brush Creek and Laurel Branch

3.1 Subbasin Overview

Subbasin 05-07-03 at a Glance

Land and Water Area

Total area:	156 mi ²
Land area:	155 mi ²
Water area:	<1 mi ²

Population Statistics

2000 Est. Pop.:	9,716 people
Pop. Density:	62 persons/mi ²

Land Cover (percent)

Forest/Wetland:	53%
Surface Water:	<1%
Urban:	<1%
Cultivated Crop:	<2%
Pasture/ Managed Herbaceous:	45%

Counties

Alleghany

Municipalities

Sparta

Aquatic Life

Monitored Streams Statistics

Total Streams:	90.7 mi
Total Supporting:	90.7 mi
Total Impaired:	0 mi
Total Not Rated:	0 mi

Portions of the New River and the entire Little River watershed are found in this subbasin. Flowing northeast, the Little River and its tributaries drain the Town of Sparta in Alleghany County. High, hilly plateaus can be found in this subbasin from North Carolina into the Virginia Blue Ridge Mountains.

Compared to the other subbasins, subbasin 05-07-03 contains less dense woodlands and forest cover. Instead, more land (47 percent) is devoted to agricultural activities including pasture, orchards, cultivated cropland, livestock, dairy farms and Christmas tree production. Developed areas are limited to the Town of Sparta, which has actually decreased in population by 7.2 percent over the last ten years (1990 to 2000). Additional information regarding population and land use changes throughout the entire basin can be found in Appendix I and III, respectively.

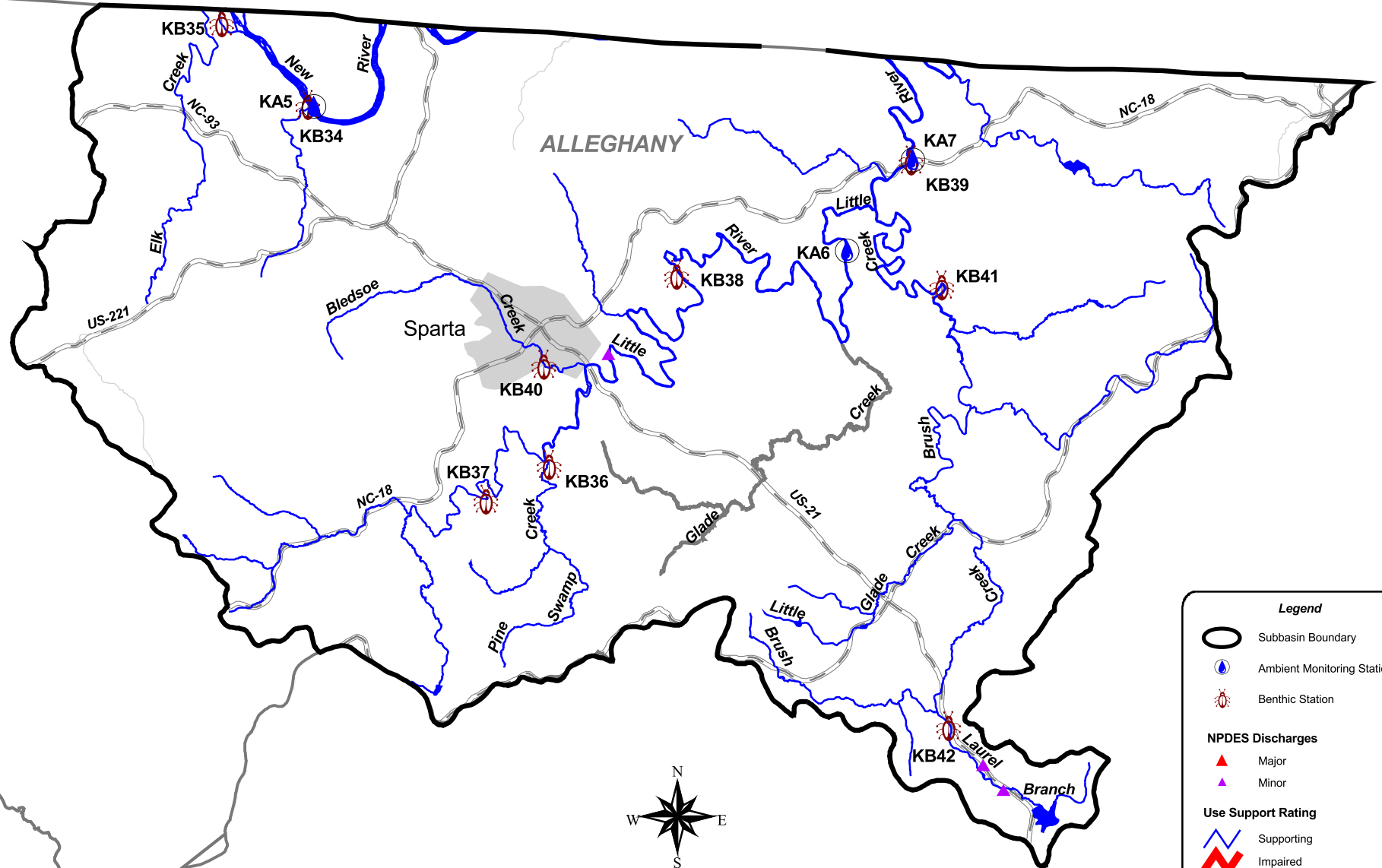
There are three individual NPDES wastewater discharge permits in this subbasin with a total permitted flow of 0.65 MGD. All three are located in the Little River watershed. The Sparta Wastewater Treatment Plant (WWTP) holds the largest permit with a total permitted discharge of 0.60 MGD. No violations have been reported. Refer to Appendix VI for the listing of NPDES permit holders.

A map including the locations of the NPDES facilities and water quality monitoring stations is presented in Figure 7. Table 8 contains a summary of assessment unit

numbers (AU#) and lengths, streams monitored, monitoring data types, locations and results, along with use support for waters in the subbasin. Refer to Appendix IX for a complete listing of monitored waters and more information about use support methodology.

There were 9 benthic macroinvertebrate community samples collected during this assessment period. Data were also collected from three ambient monitoring stations. Data collected from the ambient stations has historically indicated good water quality with no violations in water quality standards. Refer to the *2004 New River Basinwide Assessment Report* at

Figure 7 New River Basin Subbasin 05-07-03



Legend

- Subbasin Boundary
- Ambient Monitoring Station
- Benthic Station
- NPDES Discharges**
 - Major
 - Minor
- Use Support Rating**
 - Supporting
 - Impaired
 - Not Rated
 - No Data
- Primary Roads
- County Boundary
- Municipality



Table 8 Use Support New River Subbasin: 05-07-03

AU#	Classification	Length/Area		Aquatic Life Assessment				Recreation Assessment			Stressors	Sources
				AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result		
Bledsoe Creek												
10-9-7	C Tr	5.9	FW Miles	S					ND		Habitat Degradation	Impervious Surface
	From source to Little River				KB40	G	2003					
Brush Creek												
10-9-10	C Tr	27.8	FW Miles	S					ND		Habitat Degradation	Pasture
	From source to Little River				KB41	E	2003					
Elk Creek (North Carolina Portion)												
10-6-(2)	C +	7.4	FW Miles	S					ND		Habitat Degradation	Pasture
	From U.S. Hwy. 221 to New River				KB35	G	2003					
Laurel Branch (Laurel Creek)												
10-9-10-2	C Tr	5.2	FW Miles	S					ND			
	From source to Brush Creek				KB42	G	2003					
Little River												
10-9-(6)	C	17.5	FW Miles	S	KA6	NCE		NR*	KA6	NCE	Fecal Coliform Bacteria	Pasture
	From dam at Sparta Lake to NC 18 (Blevins Crossroads)				KB38	E	2003				Habitat Degradation	Unknown
Little River (North Carolina Portion)												
10-9-(11.5)	C HQW	3.6	FW Miles	S	KA7	NCE		NR*	KA7	NCE	Fecal Coliform Bacteria	Pasture
	From NC 18 (Blevins Crossroads) to New River (state line)				KB39	E	2003					
Little River (Sparta Lake)												
10-9-(1)a	C Tr	11.6	FW Miles	S					ND			
	From source to Sparta Lake at Pine Swamp Creek				KB37	G	2003					
New River (North Carolina Portion)												
10b	C ORW	6.4	FW Miles	S	KA5	NCE		S	KA5	NCE		
	From first point of crossing state line to last point of crossing state line				KB34	E	2003					
Pine Swamp Creek												
10-9-5	C Tr	5.2	FW Miles	S					ND		Habitat Degradation	Pasture
	From source to Little River				KB36	GF	2003					

Table 8 Use Support New River Subbasin: 05-07-03

AU#	Classification	Length/Area	Aquatic Life Assessment				Recreation Assessment			
			AL Rating	Station	Result	Year/ Parameter % Exc	REC Rating	Station	Result	Stressors
AL - Aquatic Life	KF - Fish Community Survey				E - Excellent				S - Supporting	
REC - Recreation	KB - Benthic Community Survey				G - Good				I - Impaired	
	KA - Ambient Monitoring Site				GF - Good-Fair				NR - Not Rated	
	KL- Lake Monitoring				F - Fair				NR*- Not Rated for Recreation (screening criteria exceeded)	
					P - Poor				ND - No Data Collected to make assessment	
					NI - Not Impaired				Results	
	Miles/Acres								CE - Criteria Exceeded > 10% and more than 10 samples	
	FW - Fresh Water								NCE - No Criteria Exceeded	

Aquatic Life Rating Summary

S m	90.7	FW Miles
S e	48.3	FW Miles
NR e	11.1	FW Miles
ND	8.4	FW Miles

Recreation Rating Summary

S m	6.4	FW Miles
NR* m	21.1	FW Miles
ND	130.9	FW Miles

Fish Consumption Rating Summary

NR e	158.4	FW Miles
------	-------	----------

<http://www.esb.enr.state.nc.us/Basinwide/New%20River%20Basin%20Aug%202004.pdf> and Appendix IV for more information on monitoring.

Waters in the following sections and in Table 8 are identified by an assessment unit number (AU#). This number is used to track defined segments in the water quality assessment database, list 303(d) Impaired waters and identify waters throughout the basin plan. The AU# 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 AU# and the DWQ index segment are the same.

3.2 Use Support Assessment Summary

All surface waters in the state are assigned a classification appropriate to the best-intended use of that water. Waters are regularly assessed by DWQ to determine how well they are meeting their best-intended use. For aquatic life, an Excellent, Good, Good-Fair, Fair or Poor bioclassification is assigned to a stream based on the biological data collected by DWQ. For more information about bioclassification and use support assessment, refer to Appendices IV and IX, respectively. Appendix X provides definitions of the terms used throughout this basin plan.

Use support ratings were assigned for waters in subbasin 05-07-03 in the aquatic life, recreation, fish consumption, and water supply categories. No fish consumption advisories or advice have been issued for this subbasin and all waters are Not Rated on an evaluated basis in the fish consumption category. There are no designated water supply waters within this subbasin.

There were 90.7 stream miles (57.2 percent) monitored during this assessment period in the aquatic life category. No stream miles were Impaired. Refer to Table 7 for a summary of use support ratings for waters in subbasin 05-07-03.

3.3 Status and Recommendations of Previously and Newly Impaired Waters

No previously or newly impaired waters were identified in subbasin 05-07-03.

3.4 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 in locating 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. The current status and recommendations for addressing these waters are presented below, and each is identified by an AU#. Nonpoint source program agency contacts are listed in Appendix VIII.

Table 9 Summary of Use Support Ratings by Use Category in Subbasin 05-07-03

Use Support Rating	Aquatic Life	Fish Consumption	Recreation	Water Supply
Monitored Waters				
Supporting	90.7 mi	0.0	6.4 mi	0.0
Impaired	0.0	0.0	0.0	0.0
Not Rated	0.0	0.0	21.2 mi	0.0
Total	90.7 mi	0.0	27.6 mi	0.0
Unmonitored Waters				
Supporting	48.3 mi	0.0	0.0	0.0
Impaired	0.0	0.0	0.0	0.0
Not Rated	11.1 mi	158.5 mi	0.0	0.0
No Data	8.4 mi	0.0	130.9 mi	0.0
Total	67.8 mi	158.5 mi	130.9 mi	0.0
Totals				
All Waters*	158.5 mi	158.5 mi	158.4 mi	0.0

* Total Monitored + Total Unmonitored = Total All Waters.

3.4.1 Elk Creek [AU# 10-6-(2)]

Current Status

Elk Creek, from US Highway 221 to New River (7.4 miles), is Supporting due to a Good bioclassification at site KB35. In this sampling reach, the substrate consisted of a good mix of boulders, cobble and gravel; riffles and instream habitats were abundant; and streambanks were stable. The stream supports a diverse and pollution intolerant benthic community, but there is evidence of nutrient enrichment. Livestock have direct, easy access to upstream sections of the sampling reach.

2005 Recommendations

DWQ will continue to monitor Elk Creek. It is recommended that local agencies work to install best management practices (BMPs) and implement a conservation plan related to agricultural land use. In addition, DWQ will assist agency personnel in locating sources of water quality protection funding for BMPs and community education related to agricultural impacts and the importance of maintaining riparian zones.

Water Quality Initiatives

Several agricultural BMPs have been implemented along Elk Creek. These include: thirteen springs, 18,982 feet of fence, five stock trails, fourteen watering tanks, one stream crossing, and nine acres of converted cropland. Funding was provided by the NCASCP for a total of \$199,169 and was administered by the Allegheny County SWCD. For more information on the NCASCP, see Chapter 8.

3.4.2 Little River [AU# 10-9-(6) and 10-9-(11.5)]

Current Status

Little River, from source to the New River (32.8 miles), is Supporting in the aquatic life category due to one Good and two Excellent bioclassifications at sites KB37, KB38 and KB39, respectively. At the most upstream sampling site (KB37), instream habitats were plentiful; riffles were frequent; streambanks were stable; and the riparian area was intact and extensive.

The second sampling site (KB38) is located 4.0 miles downstream of the Sparta WWTP. The water quality and benthic communities in this section of the river have been steadily increasing since 1990, but substrate was embedded, and riffles were limited.

Total drainage area at the most downstream site (KB39) is 99.2 square miles. Substrate was a mix of boulder, bedrock and sand with some cobble and gravel in the riffles. Near both downstream sampling sites (KB38 and KB39), livestock have direct, easy access to the river, and streambank erosion was observed.

Over 20 percent of the samples collected at ambient stations KA6 and KA7 exceeded 400 colonies of fecal coliform bacteria/100 milliliters (ml) of water. Therefore, Little River is Not Rated for recreational use due to elevated fecal coliform bacteria. Samples were collected from site KA7 from September 1998 to June 2000, and 23.8 percent of the collected samples exceeded 400 colonies/100 ml. Due to safety concerns for personnel, a new ambient station (KA6) was established near State Route #1433 (Edwards Crossroads), approximately 3.0 miles upstream of site KA7. Samples were collected from this site (KA6) from July 2000 to August 2003. Here, bacteria levels exceeded 400 colonies/100 milliliters in 22.9 percent of the collected samples.

Current methodology requires additional bacteriological sampling for streams with a geometric mean greater than 200 colonies/100 ml or when concentrations exceed 400 colonies/100 ml in more than 20 percent of the samples. These additional assessments are prioritized such that, as monitoring resources become available, the highest priority is given to those streams where the likelihood of full-body contact recreation is greatest. No portion of the Little River is classified for primary recreation (Class B). Therefore, it was not prioritized for additional sampling during this basinwide cycle. Potential sources of elevated bacteria levels include failing septic systems, straight pipes, and nonpoint source runoff from pasturelands. Refer to Appendix IX for more information related to recreational use support methodology and fecal coliform bacteria.

2005 Recommendations

DWQ will continue to monitor water quality in Little River and work with local agencies to identify possible sources of the elevated fecal coliform bacteria levels. Community outreach and awareness is encouraged to educate the local citizens on the importance of good riparian zones and the use of BMPs to reduce sediment and erosion along the streambanks. Cattle should also

be excluded from the river and its tributaries in order to reduce streambank erosion. DWQ will work with local officials to identify funding sources for water quality protection and provide technical guidance for the development of a stormwater management plan for the Town of Sparta and a county sedimentation and erosion control ordinance.

Special Studies

Seven tributaries and the main stem of the Little River were chosen for a special biological assessment to support the local watershed planning efforts of the Watershed Restoration Program (WRP), now the NC Ecosystem Enhancement Program (NCEEP). The majority of the selected sites were basinwide monitoring sites and samples were collected in August and November 2003. The information collected in the Little River watershed was incorporated into a report entitled *Phase I – Watershed Characterization, Preliminary Findings and Recommendations Report* produced by W.K. Dickson & Co., Inc. for the NCEEP (NCDENR-EEP, 2004).

The characterization study area covers nearly 80 square miles (51,270 acres) within Alleghany County and includes the Town of Sparta. The three permitted dischargers in this subbasin are located in the watershed and include the Sparta WWTP and two domestic dischargers on Laurel Branch (Section 3.4.6). The Laurel Branch subwatershed of Brush Creek was added to the study area due to its history of nonpoint source runoff from construction activities associated with a local golf course (Section 3.4.6). Over half of the land area consists of forest, predominantly mixed hardwoods, with the remaining area consisting of pasture and/or cultivated crops. Most of the larger forested tracts are on hilltops in areas too unproductive for grazing or too difficult to access. The Town of Sparta is situated in the north-central part of the watershed and is the only area in the watershed considered urban. Government offices, a downtown commercial district, a few manufacturing and warehouse facilities, and shopping complexes are found in Sparta. Outside the commercial areas, several small- and medium-sized family farms can be found.

Based on office and field interpretations, sediment, poor riparian habitats and stormwater runoff were identified as the three major factors affecting water quality in the Little River watershed. The two most significant (sediment and poor riparian habitats) are in areas that are heavily grazed and along unforested buffers. In these areas, there is tremendous potential for cattle exclusion and riparian buffer enhancements. Throughout the watershed, there are several opportunities for stream and wetland restoration projects. The third factor, unmanaged stormwater in and around the Town of Sparta, can be reduced through the creation and implementation of a stormwater management plan and a county sedimentation and erosion control ordinance.

Eleven subwatersheds were identified as focus areas for a more detailed study and include: Pine Swamp Creek; Upper and Lower Bledsoe Creek; Wolf Branch; Middle and Lower Glade Creek; Moccasin Creek; Laurel Branch; and three unnamed tributaries. Poor riparian habitats and straightened channel segments were found in almost all of these subwatersheds. Several of these subwatersheds are discussed in the following sections.

Water Quality Initiatives

Several agricultural BMPs have been installed along Little River and include: six springs; installation of 4,393 feet of fence for livestock exclusion; two stock trails; eight watering tanks; three stream crossings; and converted cropland. Funding was provided by the NCASCP for a

total of \$24,694 and was administered by the Allegheny County SWCD. For more information on the NCASCP, see Chapter 8.

3.4.3 Pine Swamp Creek [AU# 10-9-5]

Current Status

Pine Swamp Creek, from source to Little River (5.2 miles), is Supporting due to a Good-Fair bioclassification at site KB36. Pine Swamp Creek is a small tributary to Little River and has declined from a Good bioclassification (1998) to the most recent Good-Fair (2003). The decline is most likely due to the two-year drought (2001 to 2002) and subsequent low flow conditions. Pine Swamp Creek runs through pasturelands for much of its length, and livestock have direct, easy access to the stream.

2005 Recommendations

DWQ will continue to monitor water quality in Pine Swamp Creek. It is recommended that local agencies work with landowners to install appropriate BMPs to limit cattle access to the stream. In addition, DWQ will assist agency personnel in locating sources of water quality protection funding for BMPs and community education related to nonpoint source runoff and the importance of riparian zones.

Special Studies

Pine Swamp Creek was one of seven tributaries sampled in the Little River watershed to support the local watershed planning efforts of NCEEP (Section 3.4.2). In the *Phase I – Watershed Characterization, Preliminary Findings and Recommendations Report*, Pine Swamp Creek was identified as one of eleven subwatersheds recommended for a more detailed study due to land use (i.e., Christmas tree farms, dirt and gravel roads), unforested buffers and wetland and bog turtle aquatic habitats (NCDENR-EEP, 2004).

The habitat score along Pine Swamp Creek and several other tributaries (including Bledsoe Creek, Glade Creek and Crab Creek) were low. Low habitat scores indicate that the streams are suffering from inadequate riparian zones, which often leads to streambank instability, erosion and elevated temperatures if the stream is not shaded. Habitat scores and degrading water quality can improve, however, if riparian areas are restored and livestock are excluded from the stream. It is recommended that DWQ and local agencies work with landowners to install appropriate BMPs to maintain the current and/or improve overall water quality conditions.

3.4.4 Bledsoe Creek [AU# 10-9-7]

Current Status

Bledsoe Creek, from source to Little River (5.9 miles), is Supporting due to a Good bioclassification at site KB40. Bledsoe Creek has historically received Good and/or Good-Fair bioclassifications. Sections of the stream that flow through the Town of Sparta receive very little shade; streambank erosion and sedimentation are evident; and riparian zones are limited.

2005 Recommendations

DWQ will continue to monitor water quality in Bledsoe Creek. It is recommended that DWQ and local agencies work with landowners to install appropriate BMPs to maintain the current and/or improve overall water quality conditions. DWQ also encourages the development of a

stormwater management plan for the Town of Sparta and a county sedimentation and erosion control plan.

Special Studies

Bledsoe Creek was one of seven tributaries sampled in the Little River watershed to support the local watershed planning efforts of NCEEP (Section 3.4.2). Bledsoe Creek flows through the Town of Sparta, and is unique in that there are distinct land use changes from the source to its confluence with the Little River. The headwaters are used intensely for agriculture and forestry, the middle reach consists of residential property, and the lower segment is densely urbanized. The combination of these changes could create a unique accumulative effect on the stream's overall water quality.

In the *Phase I – Watershed Characterization, Preliminary Findings and Recommendations Report*, upper and lower Bledsoe Creek were identified as two of eleven subwatersheds recommended for a more detailed study due to the changes in land use. Upper Bledsoe Creek contains unforested buffers, animal operations and potential wetland restoration sites. Lower Bledsoe Creek contains unforested buffers, areas where the stream has been straightened, potential bog habitat areas and urban stormwater issues (NCDENR-EEP, 2004).

The DWQ Surface Water Protection Section also conducted ambient water quality monitoring from January to June 2004 to support their local watershed planning effort. These data were collected outside the data window for this basinwide plan. The study determined that the geometric mean for baseflow fecal coliform bacteria counts were 1,199 colonies/100 milliliters (ml) of water. The source of the elevated bacteria levels is not known. More investigation is needed to determine if livestock or other sources (i.e., sewer line leaks, straight pipes, and/or failing septic systems) are responsible for the elevated levels. Refer to Appendix IX for more information related to use support and fecal coliform bacteria.

Water Quality Initiatives

In 2000, the Alleghany County Commissioners approved a Land Development and Growth Management Resource Manual, which lists goals, objectives, and suggested policies for land development planning and water quality management. The manual recognizes the importance of watershed planning and the need to work with both local and state agencies to preserve the county's water quality and natural resources. Local stormwater management regulations are suggested for the Town of Sparta and future ordinances should encourage the use of practices associated with low impact development (NCDENR-EEP, 2004).

Several agricultural BMPs have been installed along Bledsoe Creek and include: two springs; installation of 400 feet of fence for livestock exclusion; one stock trail; one watering tank; one waste system; and converted cropland. Funding was provided by the NCASCP for a total of \$25,802 and was administered by the Alleghany County SWCD. For more information on the NCASCP, see Chapter 8.

3.4.5 Brush Creek [AU# 10-9-10]

Current Status

Brush Creek, from source to Little River (27.9 miles), is Supporting due to an Excellent bioclassification at site KB41. This is an improvement from the Good bioclassification during the last basinwide cycle (1998). Instream habitat was good, but riffles were embedded, and there was no functional riparian area. Grass, weeds and open pasture lined both sides of the stream, and livestock have direct, easy access.

2005 Recommendations

In order to maintain the Excellent benthic community, DWQ will work with local agencies in locating sources of water quality protection funding for BMPs. DWQ also encourages community education related to impacts from nonpoint source runoff and the importance of maintaining riparian zones.

Special Studies

Brush Creek was one of seven tributaries sampled in the Little River watershed to support the local watershed planning efforts of NCEEP. Refer to Section 3.4.2 for more information related to the watershed characterization report.

Water Quality Initiatives

Nearly 4,000 feet of Brush Creek and one of its tributaries (Little Pine Creek) were restored in the summer of 2001. The project area was heavily impacted by livestock access, with little in the way of riparian areas. Construction activities included new channels, reconfiguring the dimension and profiles of the existing channels, and alternate watering sources for the livestock. Livestock were also fenced from the stream. All of these activities have reduced sediment and nutrient loads, improved stream and riparian habitats and stabilized streambanks. The project was funded by NCEEP. For more information on the Brush Creek restoration project, contact the Alleghany Soil and Water Conservation District (SWCD).

In addition to the NCEEP project, several agricultural BMPs have been installed along Brush Creek and include: six springs; installation of 2,260 feet of fence for livestock exclusion; one stock trail; eight watering tanks; and two stream crossings. Funding was provided by the NCASCP for a total of \$17,176 and was administered by the Alleghany County SWCD. For more information on the NCASCP, see Chapter 8.

3.4.6 Laurel Branch [AU# 10-9-10-2]

2000 Recommendations

Laurel Branch was considered Supporting due to a Good bioclassification and removed from the 2000 303(d) list of impaired waters. Improvements were likely the result of decreased sediment loads and a gradual seven-year recovery from restoration activities. Restoration activities were enforced by DWQ after construction associated with the Olde Beau Golf Club released large amounts of sediment into the stream. Restoration efforts included removing sediment from the stream, stabilizing streambanks and adding more natural stream substrate.

Current Status

Laurel Branch, from source to Brush Creek (5.2 miles), is Supporting due to a Good bioclassification at site KB42. Laurel Branch receives runoff from the Old Beau Golf Club, but has maintained its Good bioclassification during the last two sampling cycles (1998 and 2003). Instream habitats are good; streambanks were stable; and riparian zones were adequate.

2005 Recommendations

DWQ will continue to monitor water quality in Laurel Branch. In addition, DWQ will work with local officials to educate the community on the importance of riparian areas and the impacts associated with nonpoint source and stormwater runoff.

Special Studies

Laurel Branch was included in the study area of the Little River watershed characterization report because of its history of nonpoint source runoff from construction activities associated with the golf club. The watershed characterization was done to support the local watershed planning efforts of NCEEP (Section 3.4.2). Within the sampling reach, the instream habitat was good; the banks were stable; and the riparian zones were adequate. The upstream portion of Laurel Branch, however, was identified as one of eleven subwatersheds recommended for a more detailed study in the Phase I report. Reasons for this decision are based on office and field interpretations, which include unforested buffers, its history of sedimentation, and the potential to restore wetland and bog turtle habitats (NCDENR-EEP, 2004).

3.4.7 Glade Creek [AU# 10-9-9]

Special Studies

Glade Creek was sampled in November 2003 in two locations for a special study conducted in the Little River watershed to support the local watershed planning efforts of NCEEP (Section 3.4.2). Samples collected in Glade Creek show that the stream is Supporting due to Good bioclassifications at each site (sample locations are not mapped). Even though the biological community was good in both locations, the upstream sample reach (SR #1422) lacks riparian areas. Land use in the immediate area is a mix of forest and fallow fields, with grass and weeds lining either streambank. There was no shading, and the streambanks were severely eroded and falling into the stream.

Both sampling site were identified in the Phase I report as two of eleven subwatersheds recommended for a more detailed study. The upstream site (SR #1422) has unforested buffers, straightened channel segments and several opportunities for wetland and stream restoration activities. The downstream site (also sampled along SR #1422) can support viable trout populations and also provide opportunities for wetland and bog turtle habitat restoration projects (NCDENR-EEP, 2004).

DWQ will work with agency personnel in locating sources of water quality protection funding for the installation of appropriate BMPs and community education related to impacts associated with nonpoint source runoff and the importance of maintaining riparian zones.

Water Quality Initiatives

Several agricultural BMPs have been installed along Glade Creek and include: two springs; installation of 3,040 feet of fence for livestock exclusion; two stock trails; four watering tanks;

and one waste system. Funding was provided by the NCACSP for a total of \$16,067 and was administered by the Alleghany County SWCD. For more information on the NCACSP, see Chapter 8.

3.5 Additional Water Quality Issues within Subbasin 05-07-03

The following section discusses general 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). For more information about water quality standards and reclassification, see Chapter 4. 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 those listed below in Section 3.5.4.

3.5.1 Livestock Exclusion

In several streams throughout this subbasin, DWQ noted evidence and observed several areas where livestock had direct, easy access to the streams. These included Elk Creek, Brush Creek, Pine Swamp Creek and sections of Little River. Fencing prevents livestock from entering a stream and provides an area of vegetative cover, which can secure streambanks, lower stream velocities, trap suspended sediments and decrease downgradient erosion. Livestock exclusion is also effective in reducing nutrient, bacteria and sediment loads in a stream (Line and Jennings, 2002).

On the local level, the Alleghany Soil and Water Conservation District (SWCD) was able to assist numerous farms in protecting water quality through the NC Agricultural Cost Share Program (NCACSP). From 1998 to 2003, the following best management practices (BMPs) were installed in subbasin 05-07-03: 65 troughs (alternate watering sources); 24,550 feet of fence (livestock exclusion); 25 stream crossings; four stock trails; four springs; and four wells were drilled. NCACSP funding totaled \$234,483, with landowners and/or beef or dairy operators contributing an additional \$78,161. For more information on the NCACSP, see Chapter 8.

Through the 2002 Farm Bill, the Natural Resources Conservation Service (NRCS) has also been implementing BMPs throughout the subbasin. Using funds provided through the Environmental Quality Incentive Program (EQIP), 10,500 feet of fence have been installed and 1,250 feet of access roads have been stabilized. For more information on EQIP, see Chapter 8.

The SWCD and the NRCS encourage the use of feed and waste structures on pasturelands. Feed and waste structures are roofed with a concrete pad that provides protection for feed, livestock and consequently, water quality. The structures are sized for individual farms, hold five to seven days worth of feed, store waste for 90 to 120 days, and include watering facilities inside the structure. Heavy use area protection surrounds the structure to reduce erosion and sedimentation

that are usually associated with feeding operations. Where possible, feed and waste structures are located on low ridgelines with good access. Such locations provide the greatest buffer to nearby streams and tributaries. Feed and waste structures are just one part of a comprehensive management system encouraged by the U.S. Department of Agriculture (USDA) and the SWCD to protect land and water resources. Five feed and waste structures have been built in Alleghany County using funds provided by EQIP. Three more are expected to be complete within the next year. For more information of feed and waste structures, contact the Alleghany SWCD (336) 372-7777.

3.5.2 Management Strategies for Trout Water Protection

Many of the streams in this subbasin are also classified as trout (Tr) waters, and therefore, are protected for natural trout propagation and maintenance of stocked trout. There are no watershed development restrictions associated with the trout classification; however, the NC Division of Land Resources (DLR), under the NC Sedimentation and Pollution Control Act (SPCA), has requirements to protect trout streams from land-disturbing activities. Under General Statute 113A-57(1), “waters that have been classified as trout waters by the Environmental Management Commission (EMC) shall have an undisturbed buffer zone 25 feet wide or of sufficient width to confine visible siltation within the twenty-five percent of the buffer zone nearest the land-disturbing activity, whichever is greater.” The Sedimentation Control Commission, however, can approve land-disturbing activities along trout waters when the duration of the disturbance is temporary and the extent of the disturbance is minimal. This rule also applies to unnamed tributaries flowing to the affected trout water stream. Further clarification on classifications of unnamed tributaries can be found under Administration Code 15A NCAC 02B .0301(i)(1). For more information regarding land-disturbing activities along designated trout streams, see the DLR website at <http://www.dlr.enr.state.nc.us/>.

3.5.3 Special Aquatic Resources

Not only is the New River basin renowned for the oldest existing rivers in North America, but it is also noted for the number of rare and endemic aquatic species that it supports. One of these species, the bog turtle, is the smallest and rarest freshwater turtle in the country. Bog turtles live in spring-fed, mountain wetlands called bogs or fens and will use stream and river floodplain corridors to move between bogs and to disperse across the landscape. Because they are usually spring-fed, most bogs have a consistent hydrological regime, although some sites can dry significantly during certain times of the year. Other characteristics of typical bogs include: flowing rivulets of water; wetland vegetation such as sedges, bulrushes, rushes and mosses; and soft, loamy, organic soil that provides a thick mud substrate with pockets of deeper mud. Woody vegetation may be scattered throughout the bog, but the best sites have an open canopy. Other than habitat destruction, one other major threat to bog turtle habitat is succession of woody vegetation. In an unmanaged bog, maples and other hardwoods can grow to dominate the canopy, shading out the site and reducing the water table so that the bog becomes dry. Grazing provides one of the most efficient means of managing these habitats.

To date, a total of 118 bog turtles have been found in area bogs with the largest documented population of 36 turtles in one bog. Eighty-nine of the 118 turtles have been tagged and will be used for identification purposes during on-going investigations and surveys by the NC Wildlife

Resources Commission (WRC). Several rare plant species have also been identified in Alleghany bogs.

In North Carolina, the bog turtle is listed as a threatened species. It is also a federally threatened species due to similarity in appearance to the northern (New York, Massachusetts and south to Maryland) species where it is also threatened. Most of the turtle's habitat is on privately owned land, and the WRC is currently conducting surveys and interviews to identify bogs in Alleghany County. In order to preserve bog habitat, WRC, the SWCD and other conservation groups will need to work cooperatively with private landowners to make them aware of the unique characteristics of a bog and its significance to both the natural environment and water quality. For more information on the bog turtle survey, contact the WRC headquarters at (919) 707-0050.

3.5.4 Surface Waters Identified for Potential Reclassification

Brush Creek [AU# 10-9-10]

Brush Creek, from source to Little River (27.8 miles), is Supporting due to an Excellent bioclassification at site KB41. Instream habitat was good, but riffles were embedded. Current DWQ classification is C Tr. If supported and petitioned by the local community, DWQ may pursue reclassifying this stream to include a supplemental classification of HQW. Refer to Section 4.1.4 for more information.

Little River [AU# 10-9-(6)]

Little River, from the Sparta Lake dam to NC #18 (17.5 miles), is Supporting due to an Excellent bioclassification at site KB38. Instream habitats were plentiful; riffles were frequent; and the streambanks were stable. Current DWQ classification is C. If supported and petitioned by the local community, DWQ may pursue reclassifying this stream to include a supplemental classification of HQW or ORW. Refer to Section 4.1.4 for more information.