

Executive Summary

Basinwide water quality planning is a watershed-based approach to restoring and protecting the quality of North Carolina's surface waters. Basinwide water quality plans are prepared by the North Carolina Division of Water Quality (DWQ) for each of the 17 major river basins in the state. Each basinwide plan is revised at five-year intervals. While these plans are prepared by DWQ, their implementation and the protection of water quality entail the coordinated efforts of many agencies, local governments and stakeholders throughout the state.

The goals of basinwide planning are to:

- Identify water quality problems and restore full use to Impaired waters.
- Identify and protect high value resource waters.
- Protect unimpaired waters while allowing for reasonable economic growth.

DWQ accomplishes these goals through the following objectives:

- Collaborate with regional and local agencies to develop appropriate management strategies. This includes providing agencies information related to financial and funding opportunities.
- Assure equitable distribution of waste assimilative capacity.
- Evaluate cumulative effects of pollution.
- Improve public awareness and involvement.
- Regulate point and nonpoint sources of pollution where other approaches are not successful.

This document is the third five-year update of the *New River Basinwide Water Quality Plan*. The first basinwide plan for the New River basin was completed in 1995 and the second in 2000. The format of this plan was revised in response to comments received during the first and second planning cycles. DWQ replaced much of the general information in the first two plans with more detailed information specific to the New River basin. For this plan, a greater emphasis was placed on identifying water quality concerns on the watershed level in order to facilitate protection and restoration efforts.

DWQ considered comments from one public workshop held in the basin and subsequent discussions with local resource agency staff and citizens during draft plan development. This input will help guide continuing water quality management activities throughout the river basin over the next five years.

Basin Overview

Despite its name, the New River is part of the oldest river system in North America and flows through rugged terrain containing metamorphic rocks that are 1.1 billion years old. The New River originates at the confluence of the North Fork and the South Fork New Rivers in Ashe County, North Carolina. It flows north-northeast into Virginia and West Virginia where it

joins with the Gauley River to form the Kanawha River. Eventually, waters flow to the Gulf of Mexico via the Ohio and Mississippi Rivers (Figure 1).

The North Carolina portion of the New River is located in the Blue Ridge Province of the Appalachian Mountains. Within North Carolina, the North Fork New River, South Fork New River and Little River all drain to the New River, and three counties (Alleghany, Ashe and Watauga) are entirely or partially contained within the basin. DWQ subdivides all river basins into subbasins. In the New River basin, there are three subbasins (Figure 2).

Information presented in this basinwide water quality plan is based on data collected from September 1998 to August 2003. Maps of each subbasin are included in each of the subbasin chapters. Each subbasin has its own characteristics and water quality concerns. These are discussed in Chapters 1 through 3.

DWQ identifies the stressors of water quality impact as specifically as possible depending on the amount of information available in a watershed. Most often, the source of the stressor is based on the predominant land use in a watershed. In the New River basin, new development/construction activities, land clearing, agriculture and one point source were all identified as possible stressors. Water quality decline can often be attributed to a combination of many stressors that lead to habitat and water quality degradation. In some way, every person, industry, landowner and municipality in the basin impacts water quality. Therefore, every resident of the basin should play a role in management strategies designed to protect and restore the streams, lakes and rivers of the basin.

Water Quality Standards and Classifications

Throughout the New River basin, water quality is generally good and excellent in most of the monitored stream segments. Chapter 4 discusses water quality standards and classifications and includes maps showing the designated Water Supply (WS) watersheds, High Quality Waters (HQW) and Outstanding Resource Waters (ORW).

In the New River basin, several municipalities and smaller outlying communities are being pressured to expand. This often involves construction and/or development in areas of pristine waters along several tributaries of the North Fork New River, South Fork New River and the New River. HQW and ORW are supplemental classifications to the primary freshwater classification placed on a waterbody. Special management strategies are often associated with the supplemental HQW and ORW classification and are intended to prevent degradation of water quality below present levels from point and nonpoint sources of pollution. A brief summary of these strategies and the administrative code under which the strategies are found are included in Chapter 1.

Water Quality Stressors

Water quality stressors are identified when impacts have been noted to biological (fish and benthic) communities or water quality standards have been violated. Whenever possible, water quality stressors are identified for Impaired waters as well as waters with notable impacts.

One of the most noted water quality stressors is instream habitat degradation. Instream habitat degradation is identified where there is a notable reduction in habitat diversity or a negative change in habitat. Sedimentation, streambank erosion, channelization, lack of riparian

vegetation, loss of pools or riffles, loss of woody habitat, and streambed scour are all associated with habitat degradation. These stressors are typically a result of increased flow of stormwater runoff due to land use changes or to sediment runoff from land-disturbing activities. Streams with noted habitat degradation are discussed in the subbasin chapters (Chapters 1-3).

Other chemical and biological factors can also impact water quality. These include excess algal growth, low dissolved oxygen, nitrogen and phosphorus levels, pH, and fecal coliform bacteria. Chapter 5 provides definitions and recommendations for reducing impacts associated with physical, chemical and biological factors.

Population Growth and Changes in Land Use

The New River basin encompasses all or portions of three counties and six municipalities. In 2000, the overall population in the basin (based on the percent of the county land area in the basin) was 49,653. The most populated areas are located in and around the towns of Boone, Blowing Rock, Jefferson and Sparta.

New River Basin Statistics (North Carolina Portion)

Total Area: 752 sq. miles
Freshwater Stream Miles: 918.1 mi
No. of Counties: 3
No. of Municipalities: 6
No. of Subbasins: 3
Population (2000): 49,653*
Pop. Density (2000): 66 persons/sq. mile*

Water Quality Statistics

Aquatic Life

Percent Monitored Streams: 39.7%
Percent Supporting: 95.0%
Percent Impaired: 3.0%
Percent Not Rated: 2.0%

Recreation

Percent Monitored Streams: 11.8%
Percent Supporting: 75.6%
Percent Not Rated: 24.4%

Identified Water Quality Stressors

Habitat Degradation: 142.2 miles
Fecal Coliform Bacteria: 21.4 miles
Toxic Impacts and/or Low pH: 13.4 miles

* Estimated based on % of county land area that is partially or entirely within the basin, not the entire county population.

Between 1990 and 2000, county populations increased by nearly 10,000 people. The fastest growing county was Watauga (17.2 percent increase), followed by Alleghany (12.1 percent increase). County populations are expected to grow by another 14,000 people (14.6 percent) by 2020. This would result in a total population of over 91,000 people in the three counties partially or entirely contained within the New River basin. Population growth trends and the accompanying impacts to water quality are discussed in Chapters 5 and 6.

Expanding populations are typically characterized by a loss of natural areas and an increase in impervious surface. Based on the current land cover information provided by the National Resources Inventory (USDA-NRCS, 2001), there was a 58.9 percent decrease (8,600 acres) in cultivated cropland in the New River basin from 1982 to 1997. Uncultivated cropland and pastureland also decreased by nearly 18,500 acres (58.5 percent and 4.2 percent, respectively). Urban and built-up areas increased by nearly 9,800 acres (46 percent). Much of this land cover change is accounted for in the areas around Blowing Rock and Jefferson, where population increased by 12.3 percent and 9.4 percent, respectively, from 1990 to 2000. Land use cover tables and statistics are included in Appendix III.

Growing populations not only require more water, but they also lead to the discharge and runoff of greater quantities of waste and pollutants into the state's streams and groundwater. The impacts on rivers, lakes and streams can be significant and permanent if stormwater runoff is not controlled. Just as demand and use increases, some of the potential water supply is also lost (Orr and Stuart, 2000).

Impacts from Stormwater Runoff

Stormwater runoff is rainfall or snowmelt that runs off the ground or impervious surface (i.e., buildings, roads, parking lots, etc.) instead of absorbing into the soil. In some cases, stormwater runoff drains directly into streams, rivers, lakes and oceans. In other cases, particularly urbanized areas, stormwater drains into streets and manmade drainage systems consisting of inlets and underground pipes, commonly referred to as a storm sewer system. Stormwater runoff is a primary carrier of nonpoint source pollution in both urbanized and rural areas. The impact of stormwater runoff is particularly severe in developing areas where recently graded lands are highly susceptible to erosion. Water quality impacts are also evident in urbanized areas where stormwater runoff is increased by impervious surfaces and is rapidly channeled through ditches or curb and gutter systems into nearby streams. For more information on stormwater as it relates to growth and development, refer to Chapter 6.

There are several different stormwater programs administered by DWQ. One or more of these programs may affect communities in the New River basin. The goal of DWQ stormwater discharge permitting regulations and programs is to prevent pollution from entering the waters of the state via stormwater runoff. These programs accomplish this goal by controlling the source(s) of pollution. Chapter 7 includes more information on the statewide stormwater programs.

Septic Systems and Straight Pipes

In the New River basin, wastewater from many households is not treated at a wastewater treatment plant (WWTP). Instead, it is treated on-site through the use of permitted septic systems. However, wastewater from some homes illegally discharges directly into streams through what is known as a "straight pipe". In some cases, wastewater can also enter streams through failing septic systems. In highly susceptible areas, wastewater from failing septic systems or straight pipes can contaminate a drinking water supply or recreational waters with nutrients, disease pathogens and endocrine disturbing chemicals.

From 2000 to 2003, the Appalachian District Health Department took the lead in a straight pipe elimination project in Ashe and Alleghany counties. The DENR Wastewater Discharge Elimination (WaDE) Program provided technical assistance. Funds totaling \$1.2 million was provided by the North Carolina Clean Water Management Trust Fund (CWMTF), the North Carolina Department of Commerce – Division of Community Assistance, and the Appalachian Regional Commission. Nearly 2,800 homes were inspected. Out of these, 625 homes had either a failing septic system or a straight pipe. To date, over 45 percent of the homes (323 homes) have been corrected. More information on DWQ wastewater programs can be found in Chapter 7.

Agriculture and Water Quality

Excess nutrient loading, pesticide and/or herbicide contamination, bacterial contamination and sedimentation are often associated with agricultural activities, and all can impact water quality.

Chapter 8 provides information related to agricultural activities in the New River basin and also identifies funding opportunities for best management practices (BMP). During this assessment period, the North Carolina Agricultural Cost Share Program (NCACSP) funded BMPs totaling more than \$900,000. BMPs include planned systems for reducing soil erosion and nutrient runoff, planned systems for protecting streams and streambanks, and the installation of planned systems to manage liquid and solid waste to prevent or minimize degradation of soil and water resources.

In several streams throughout the basin, DWQ noted evidence and observed several areas where livestock had direct, easy access to the streams. Fencing, or livestock exclusion, 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). Of the \$910,336 of NCACSP funds spent on BMPs in the New River basin, over 9.5 percent (\$86,437) was spent on 71,430 feet of fence for livestock exclusion. An additional 18,000 feet of fence was installed using funds provided through the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Environmental Improvement Program (EQIP). For more information on either of these agricultural funding opportunities, see Chapter 8.

Besides pasturelands and row crops, Christmas tree production also has a significant presence in the New River basin. Most of the tree plantations in western North Carolina are above 3,000 feet in elevation and are often located on steep, highly erodible slopes (NCSU Cooperative Extension Service, April 2005). From 1999 to 2003, 76 acres of Christmas Tree Conservation Cover were installed in the New River basin. NCACSP funding totaled \$7,320 with landowners and/or Christmas tree plantation operators contributing an additional \$2,440. Chapter 1 contains more information related to Christmas tree production in the New River basin.

Forestry and Water Quality

Based on land cover information provided by the North Carolina Corporate Geographic Database (CGIA) and the USDA-NRCS, 75 percent (267,700 acres) of land in the New River basin consists of forestland. No streams were identified as Impaired or impacted by stressors associated with land clearing or forestry activities. Where forest harvesting is identified as a potential source of water quality impact, DWQ will notify the Division of Forest Resources (DFR) to investigate potential violations and the enforcement of management strategies. Chapter 9 presents more information related to the impacts of forestry on water quality.

Water Resources

Chapter 10 presents information related to minimum streamflow requirements, interbasin transfers, water quality during drought conditions, and source water protection. The chapter also includes the federal cataloging units (commonly referred to as hydrologic units) as they relate to the state subbasin boundaries.

Natural 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. Many of these species, and ecological communities in which they exist, are found nowhere else in the State. Chapter 11 presents information related to the ecological significance of the basin and identifies

endangered and threatened species, significant natural areas and aquatic habitats and public lands that are locally significant.

Local Involvement

Local organizations and agencies are able to combine professional expertise and local knowledge not present at the state and federal level. This allows groups to holistically understand the challenges and opportunities of local water quality concerns. Involving a wide array of people in water quality projects also brings together a wide range of knowledge and interests and encourages others to become involved and invested in these projects. Working in cooperation across jurisdictional boundaries and agency lines opens the door to additional funding opportunities and eases the difficulty of generating matching or leveraged funds. This could potentially allow local entities to do more work and be involved in more activities because funding sources are diversified. The most important aspect of these local endeavors is that the more localized the project, the better the chances for success.

The collaboration of local efforts is key to water quality improvements, and DWQ applauds the foresight and proactive response by locally based organizations and agencies to protect water quality. There are many excellent examples of local agencies and groups using these cooperative strategies throughout the state. Several local watershed projects are highlighted throughout the subbasin chapters (Chapters 1-3). Chapter 12 also examines the local and federal initiatives underway in the New River basin.

Use Support Summary

Use support assessments based on surface water classifications form the foundation of this basinwide plan. Surface waters are classified according to their best-intended use. Determining how well a waterbody supports its use (*use support* rating) is an important method of interpreting water quality data and assessing water quality.

Biological, chemical and physical monitoring data collected between September 1998 and August 2003 were used to assign use support ratings in the New River basin. Based on monitored data, a total of 10.9 stream miles (3.0 percent) are Impaired in the New River basin. The impairments are associated with habitat degradation from nonpoint source runoff, acid mine drainage and one point source. Table 1 presents a summary of the Impaired waters and the associated stressors. Current status and recommendations for restoration of water quality for each Impaired water are discussed in the subbasin chapters (Chapters 1-3). Maps showing the current use support rating are also presented in each subbasin chapter.

Use support methodology has changed significantly since the 2000 revision of the *New River Basinwide Water Quality Plan*. In the previous plan, surface waters were rated fully supporting (FS), partially supporting (PS), not supporting (NS) and not rated (NR). FS was used to identify waters that were meeting their designated use. Impaired waters were rated PS and NS, depending on the degree of degradation. NR was used to identify waters with no data or those that had inconclusive data.

Table 1 Summary of Impaired Waters in the New River Basin

Stream/ River Name*	Assessment Unit Number (AU#)	Subbasin	Class	Miles	Category	Water Quality Stressor/Source
Little Peak Creek	10-1-35-4	05-07-01	B Tr +	2.8	Aquatic Life	Habitat degradation and toxic impacts associated with acid mine drainage
Ore Knob Branch	10-1-35-3	05-07-01	B Tr +	0.9	Aquatic Life	Habitat degradation and toxic impacts associated with acid mine drainage
Peak Creek	10-1-35-(2)b	05-07-01	B Tr +	2.9	Aquatic Life	Habitat degradation and toxic impacts associated with acid mine drainage
Little Buffalo Creek	10-2-20-1	05-07-02	C Tr +	4.4	Aquatic Life	Habitat degradation associated with nonpoint runoff, impervious surface and one minor discharge

Use Support Category	Units	Total Impaired Length/Acres	Percent of Impaired Monitored Waters
Aquatic Life	Freshwater miles	10.9 mi	3.0
Recreation	Freshwater miles	0.0	0.0
Fish Consumption	Freshwater miles	0.0	0.0
Water Supply	Freshwater miles	0.0	0.0

The 2002 *Integrated Water Quality Monitoring and Assessment Report Guidance* issued by the U.S. Environmental Protection Agency (EPA) requests that states no longer subdivide the Impaired category. In agreement with this guidance, North Carolina no longer subdivides the Impaired category and rates waters as Supporting (S), Impaired (I), Not Rated (NR) or No Data (ND). These ratings refer to whether the classified uses of the water (i.e., water supply, aquatic life, primary/secondary recreation) are being met. Detailed information on use support methodology is provided in Appendix IX.

Use support methods were developed to assess ecosystem health and human health risk through the development of use support ratings for five categories: aquatic life; fish consumption; recreation; shellfish harvesting; and water supply. These categories are tied to the uses associated with the primary classifications applied to North Carolina rivers, streams and lakes. A full description of the classifications is available in the DWQ document titled *Classifications and Water Quality Standards Applicable to Surface Waters and Wetlands of North Carolina*. This document is available on-line at <http://h2o.enr.state.nc.us/csu/>.

Recommended Management Strategies for Restoring Impaired Waters

The Impaired streams in the New River basin are impacted by a combination of nonpoint and point source runoff. Three of the Impaired streams (Peak Creek, Little Peak Creek and Ore Knob Branch) receive runoff from an abandoned copper and lead mining facility. Precipitates, pH and dissolved copper, iron, and zinc all affect the aquatic community. Remediation has shown little in the way of long-term water quality improvements. Two distinct problem areas were identified by the U.S. Army Corps of Engineers (USACE) and include the former processing area and the tailings (waste) area. The USACE published the *Ore Knob Aquatic Restoration Project: Draft Detailed Project Report and Environmental Assessment* in March 2003. The report identified the best option for restoration activities and expects to restore 6.9 miles of stream and 14.3 acres of aquatic and terrestrial habitat once funding is available. DWQ will continue to work with the USACE and interact with a multiagency partnership to pursue additional restoration options in the Ore Knob area.

The fourth Impaired stream (Little Buffalo Creek) is impacted by runoff from impervious surface and one minor municipal discharger. Using funds provide by several state agencies, improvements have been made to the permitted discharge facility. DWQ will work with the local watershed groups, county and town officials to raise community awareness of the importance of riparian zones and the impacts associated with stormwater runoff.

The task of quantifying nonpoint source runoff and developing management strategies for these Impaired waters is very resource intense. This task is overwhelming, given the current limited resources of DWQ, other agencies (i.e., Division of Land Resources, Division of Soil and Water Conservation, NC Cooperative Extension Service, etc.) and local governments. DWQ will collaborate with other agencies and watershed groups that deal with nonpoint source pollution issues to develop management strategies for the Impaired and notable waters for the next *New River Basinwide Water Quality Plan* scheduled for 2010.

Waters on the North Carolina 303(d) List

For the next several years, addressing water quality impairment in waters that are on the state's 303(d) list will be a DWQ priority. Section 303(d) of the federal Clean Water Act requires states to develop a list of waters not meeting water quality standards or which have Impaired uses. The waters in the New River basin that are on this list are discussed in the individual subbasin chapters (Chapters 1-3). States are also required to develop Total Maximum Daily Loads (TMDLs) or management strategies for 303(d) listed waters to address impairment. EPA issued guidance in August 1997 that called for states to develop schedules for developing TMDLs for all waters on the 303(d) list within 8 to 13 years. Information regarding 303(d) listing and reporting methodology can be found in Appendix VII.

In North Carolina, there are nearly 2,400 Impaired stream miles on the 2000 303(d) list. The rigorous and demanding task of developing TMDLs for each listed water during a 13-year time frame will require the focus of many resources. It will be a priority for North Carolina's water quality programs over the next several years to develop TMDLs for 303(d) listed waters.

Challenges Related to Achieving Water Quality Improvements

To achieve the goal of restoring Impaired waters throughout the basin, DWQ will need to work closely with other state agencies and stakeholders to identify and control pollutants. The costs of restoration can be high, but several programs exist to provide funding for restoration efforts. These programs include the NC Clean Water Management Trust Fund (CWMTF), the NC Agricultural Cost Share Program (NCACSP) and the Ecosystem Enhancement Program (NCEEP).

Balancing economic growth and water quality protection will be a tremendous challenge. Point source impacts on surface waters can be measured and addressed through the basinwide planning process. Nonpoint source pollution can be identified through the basinwide plan, but actions to address these impacts must be taken at the local level. Such actions should include: development and enforcement of local erosion control ordinances; requirement of stormwater BMPs for existing and new development; development and enforcement of buffer ordinances; and land use planning that assesses impacts on natural resources. This basinwide plan presents many water quality initiatives and accomplishments that are underway throughout the New River basin. These actions provide a foundation on which future initiatives can be built.

Figure 1 General Map of the Entire New River Basin



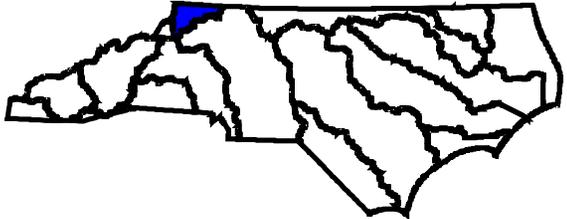
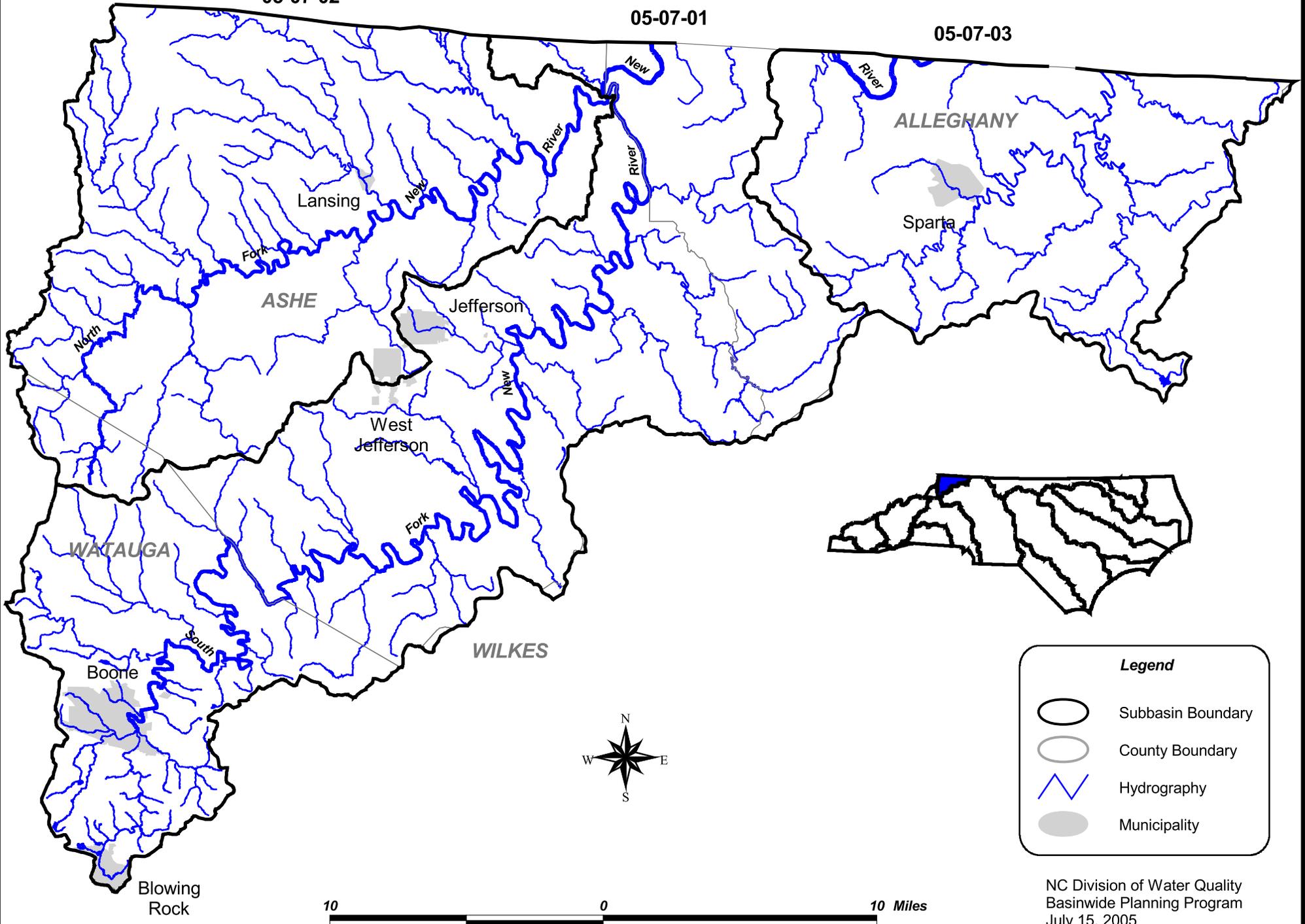
Map published by the National Committee for the New River (NCNR). Map used with permission from NCNR. For more information about NCNR, visit www.ncnr.org.

Figure 2 General Map of the New River Basin in North Carolina

05-07-02

05-07-01

05-07-03



Legend

- Subbasin Boundary
- County Boundary
- Hydrography
- Municipality

NC Division of Water Quality
Basinwide Planning Program
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