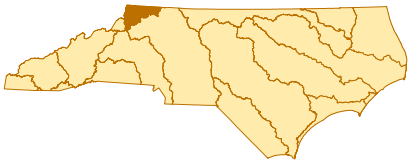
Executive Summary

for the New River Basin Plan



River Basin Description

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 basin is located within the Blue Ridge Province of the Appalachian Mountains in the northwest corner of the state in Watauga, Ashe and Alleghany counties (Figure ES-2). It is the state's fourth smallest river basin, encompassing a 765 square-mile watershed drained by approximately 825 miles of streams.

The New River originates at the confluence of the North Fork New River and South Fork New River in northeastern Ashe County, flowing northeast into Virginia before eventually flowing into the Kanawha River (Figure ES-1). The New River meanders across the North Carolina-Virginia state line four times before its confluence with the Little River, the only other major tributary originating in North Carolina, which also flows north into Virginia. Eventually, waters in this basin flow to the Gulf of Mexico via the Ohio and Mississippi Rivers.

The New River is in the Kanawh River basin, which has nine 8-digit (subbasin) Hydrologic Units (HUs). Of those, only the lower portion of the Upper New River subbasin is located in North Carolina (Figure ES-1). For this reason, this basin plan is segmented by 10-digit Watersheds. There are five 10-digit HUs within the North Carolina portion of the basin (Figure ES-2). The South Fork New River and the Fox Creek watersheds are combined into one chapter, as are the Little River and the Chestnut Creek watersheds.

This plan includes detailed water quality information for each watershed in New River Basin in Chapters 1 through 3. Other topics concerning water quality in the North Carolina portion of the basin are discussed in Chapters 4 through 7.

Throughout this Executive Summary are little blue boxes containing success stories from the Winston-Salem Regional Office (WSRO) which occurred during this planning cycle (2005-2010). These success stories represent only a small portion of what the WSRO has accomplished in its efforts to restore and protect water quality in this basin.

Basin at a Glance

Counties

Alleghany, Ashe & Watauga

Municipalities

Blowing Rock, Boone, Jefferson, Lansing, Sparta, & West Jefferson

Ecoregions

Amphibolite Mountains, New River Plateau, Southern Crystaline Ridges and Mountains, Southern Metasedimentary Mountains & Southern Sedimentary Ridges

Permitted Facilities

NPDES WWTP: 23
- Major: 3
- Minor: 20

Non-Discharge Facilities: 13

Stormwater: 10
- General: 10
- Individual: 0

Animal Operations: 9

Population

2000: 61,713
2010: ..... Coming Soon

Land Cover

Developed:.....6.8%
Forest: 66.4%
Agriculture:.....26.8%

FIGURE ES-1: THE ENTIRE NEW RIVER - KANAWH RIVER BASIN (HYDROLOGIC UNIT CODE 050500)

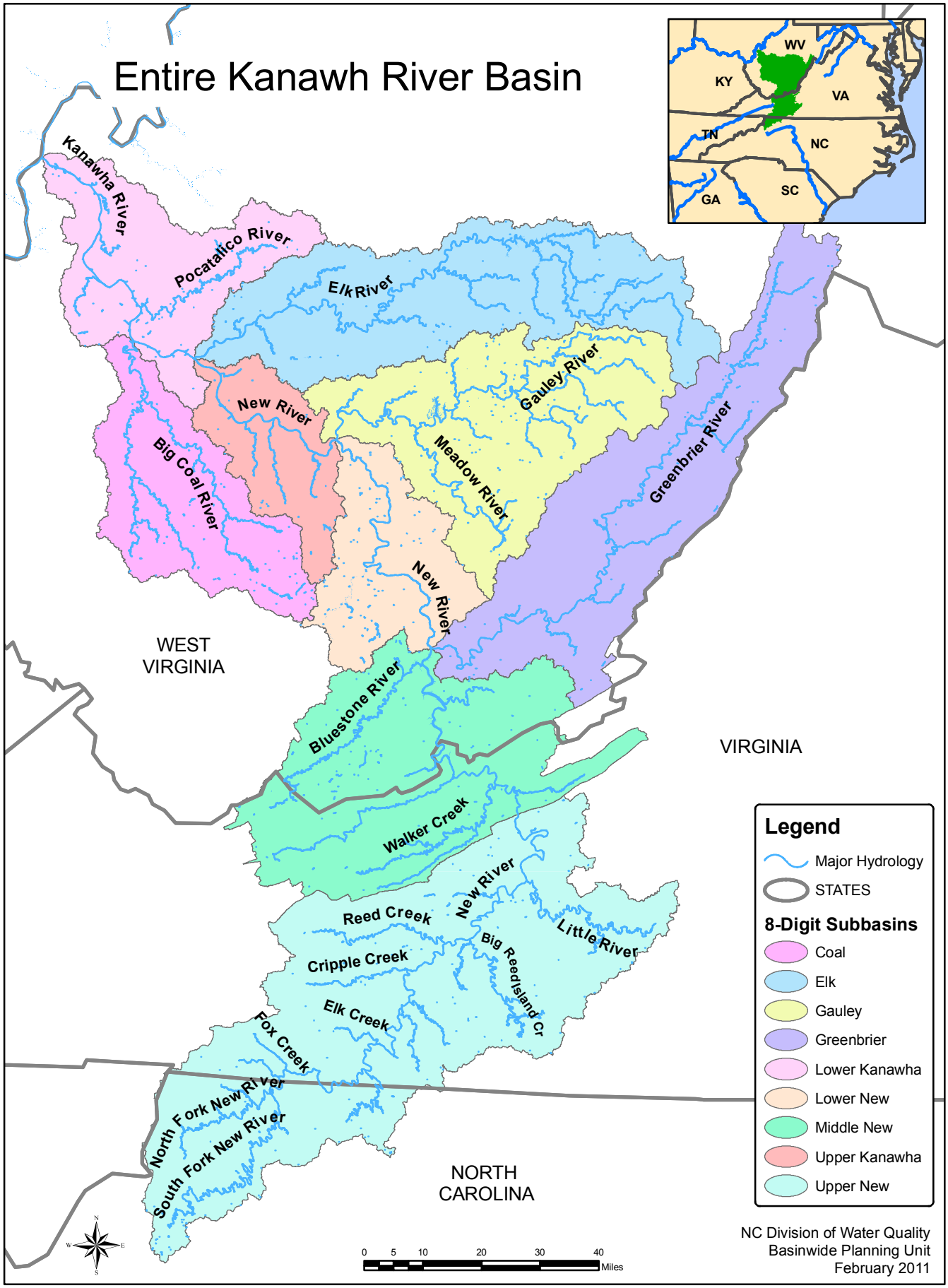
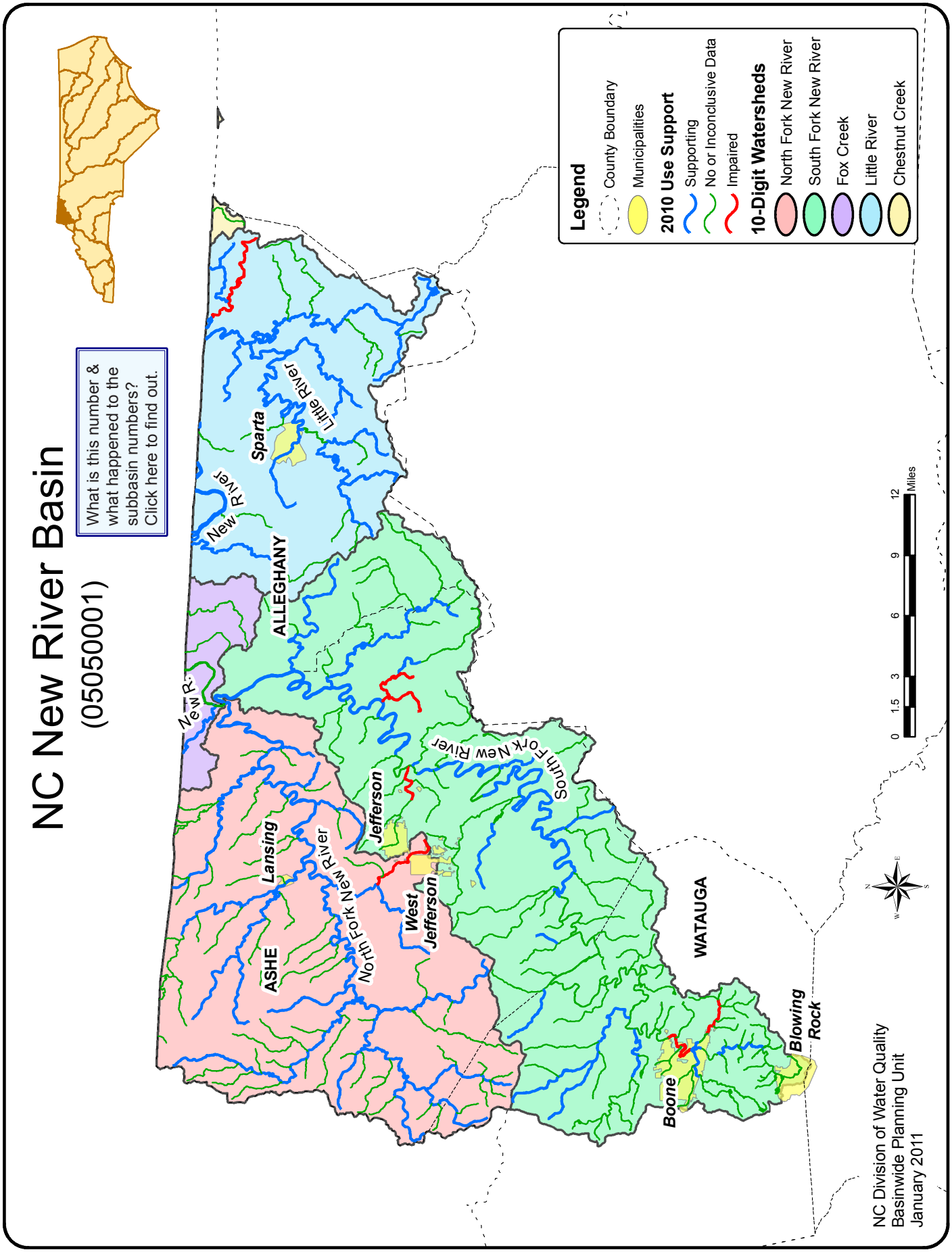


Figure ES-2: North Carolina Portion of the New River Basin



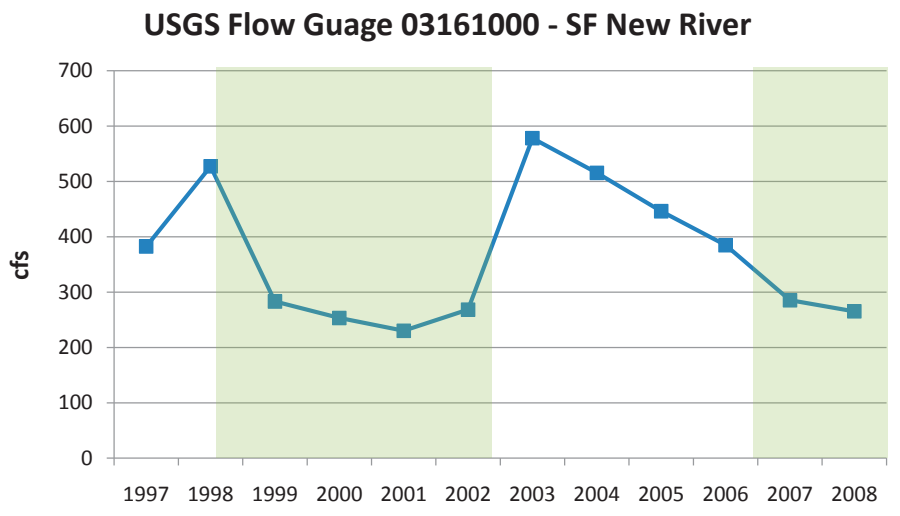
Water Quality Data Overview

Monitoring stream flow, aquatic biology and chemical/physical parameters are a large part of the basinwide planning process. More detailed information about DWQ monitoring and the effects each parameter has on water quality is discussed in Chapters 2 and 3 of the Supplemental Guide to North Carolina's Basinwide Planning document.

Stream Flow

During the past 10 years, the basin experienced prolonged droughts, in 1998-2002 and 2007-2008, and exceptionally high flows resulting from the remnants of hurricanes (Figure ES-3). During a three week period in September 2004, the tropical storm remnants of Hurricanes Frances, Ivan, and Jeanne lead to wide-spread flooding throughout the central and northern mountains in the Catawba, French Broad, New, and Watauga River basins. Rainfall estimates for the combined three storms totaled more than 20-30 inches in certain watersheds.

Figure ES-3: Yearly Average Flow Rates of the USGS Gage Station in the New River Basin, 1997-2008



Biological Data

Biological samples were collected during the spring and summer months of 2004 and 2008 by DWQ-Environmental Sciences Section as part of the five year cycle basinwide sampling efforts and for special studies. Overall, 93 biological sampling sites were monitored and rated within the New River Basin. Each site is given a rating/bioclassification which is then used to determine the streams aquatic life use support category (Figure ES-4). That category is listed on the Integrated Report.

Figure ES-4: Use Support Category Chart for Biological Ratings

Biological Ratings	Aquatic Life Use Support
Excellent	Supporting (Categories 1-2)
Good	
Good-Fair	
Not Impaired	
Not Rated	Not Rated (Category 3)
Fair	Impaired (Categories 4-5)
Poor	

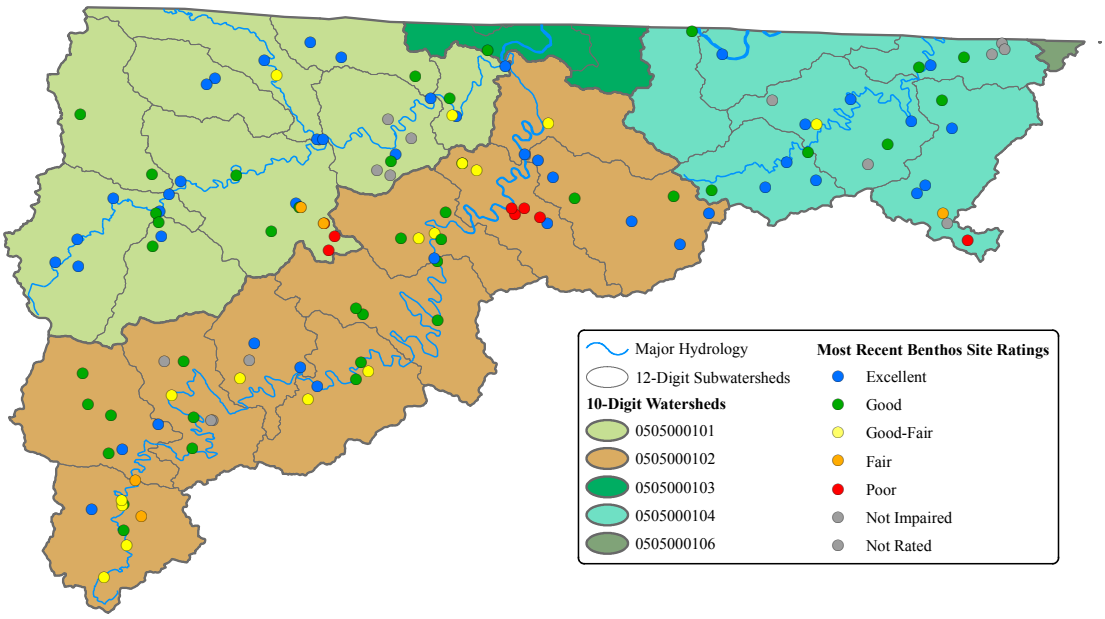
Benthic Macroinvertebrate Sampling

Each benthic station monitored during the current cycle is shown in Figure ES-5 and color coded based on its current rating. As seen in the map, the majority of samples taken in the basin received an Excellent or Good rating. The few Fair or Poor ratings are found around urban areas. These sites and their corresponding ratings are discussed in further detail in the watershed chapters.

Benthic Sampling Summary

- Total Stations Monitored 71
- Total Samples Taken.....82
- Stations Monitored Twice....10
- Number of New Stations.....32

Figure ES-5: Benthic Stations Color Coded by Current Rating in the New River Basin



As seen in Figure ES-6, 78% of the 82 benthic sampling events received a Supporting rating (See Figure ES-4) and only 5% received an Impaired rating. These ratings are similar to the previous sampling cycle. Figure ES-7 is a comparison of benthic site ratings sampled during the last two cycles to determine if there are any overall basinwide shifts in ratings. Thirteen percent of the samples improved their rating from the previous cycle and 11% declined in rating. Majority of the stations (not including new stations) showed no change, indicating a somewhat stable community throughout the basin over the past ten years.

Figure ES-6: Percents of Current Benthic Ratings in the New River Basin

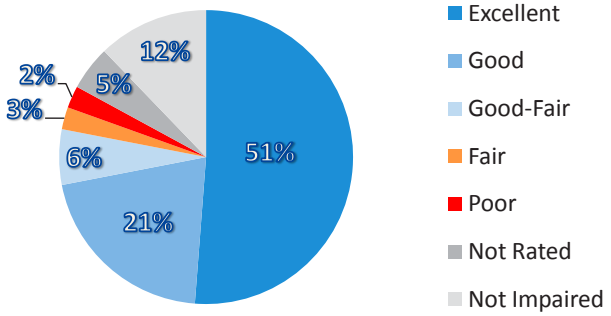
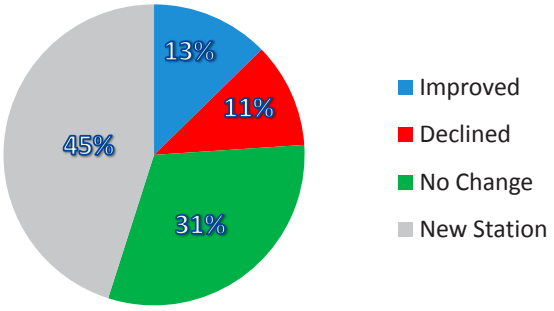


Figure ES-7: Percent Change in Benthic Ratings in the New River Basin



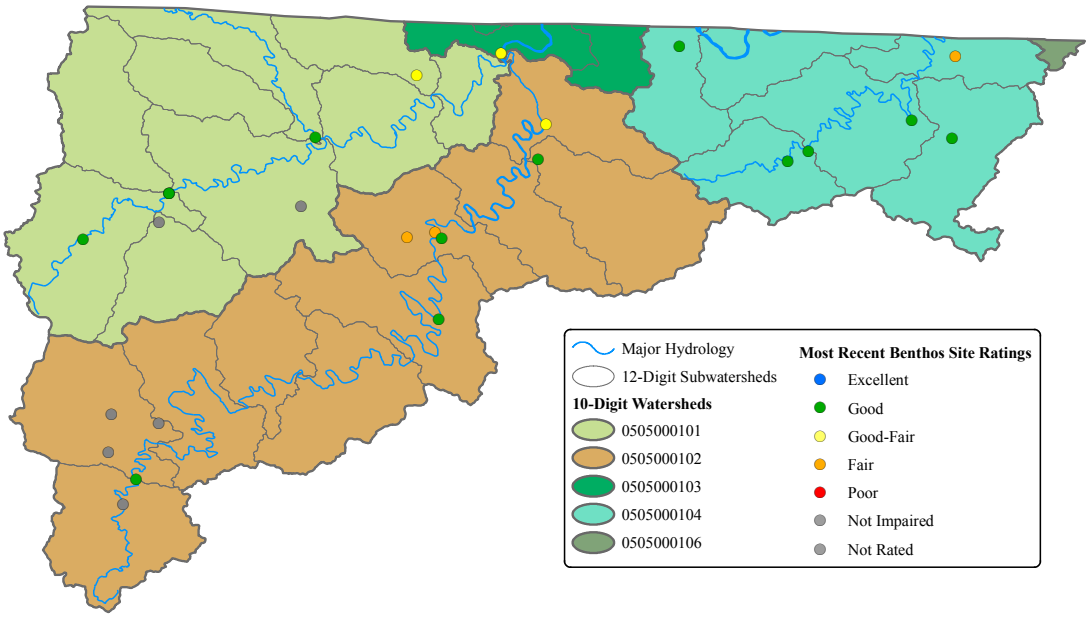
Fish Community Sampling

Each fish community station monitored during the current cycle is shown in Figure ES-8 and color coded based on its current rating. Ten of the sites were new monitoring sites located in rural watersheds with no NPDES dischargers. These sites were selected to determine their potential for becoming fish community regional reference sites.

FISH COM. SAMPLING SUMMARY

- Total Stations Monitored 22
- Total Samples Taken.....22
- Number of New Stations.....10

FIGURE ES-8: FISH COMMUNITY STATIONS COLOR CODED BY CURRENT RATING IN THE NEW RIVER BASIN



As shown in Figure ES-9, 64% of the 22 fish community sampling events received a Supporting rating (See Figure ES-4). Six of the samples were Not Rated; therefore, the segments are neither Impaired nor Supporting. Figure ES-10 is a comparison of fish community site ratings sampled during the last two cycles to determine if there are any overall basinwide shifts in ratings. The fish community in this basin has remained stable with nearly no change in ratings between the last sampling cycle and the current cycle.

FIGURE ES-9: PERCENTS OF CURRENT FISH COMMUNITY RATINGS IN THE NEW RIVER BASIN

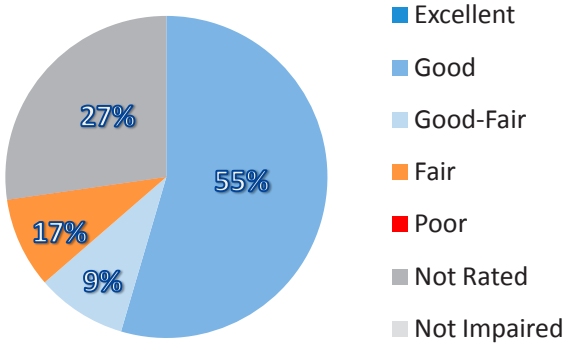
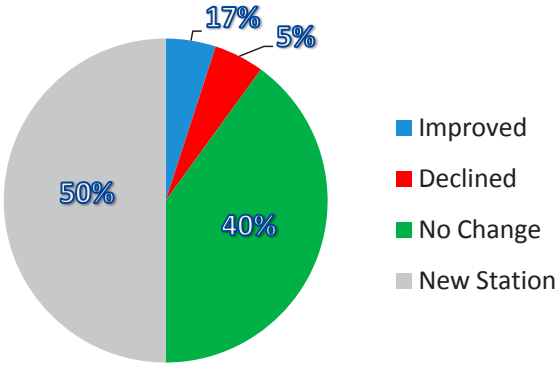


FIGURE ES-10: PERCENT CHANGE IN FISH COMMUNITY RATINGS IN THE NEW RIVER BASIN



For more information about biological data in this basin, see the **2009 New River Basinwide Assessment Report**. Detailed data sheets for each sampling site can be found in the corresponding Watershed Chapter Appendix.

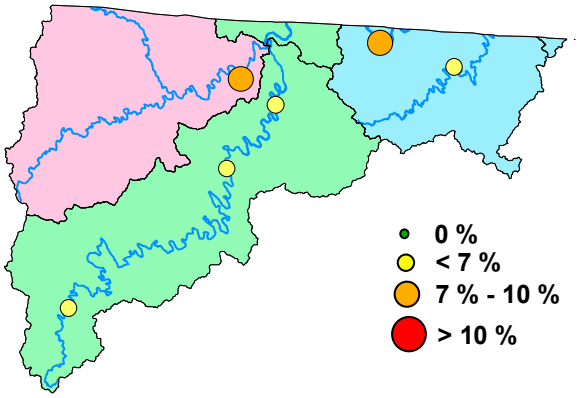
Ambient Data

During the 2004-2008 sampling cycle, DWQ collected samples at six Ambient Monitoring System (AMS) stations with ten or more samples to be used for use support assessment. None of these stations were exceeding the state standards and are Supporting for all parameters sampled. However, there are a few parameters of concern within the New River Basin, including turbidity, pH, fecal coliform bacteria and copper, which are discussed below.

Turbidity

All six stations had at least a small percent of samples that exceeded the state standard of 50 NTUs. As seen in Figure ES-11, the North Fork New River station and the New River station both had between 7 and 10% of samples exceeding the standard.

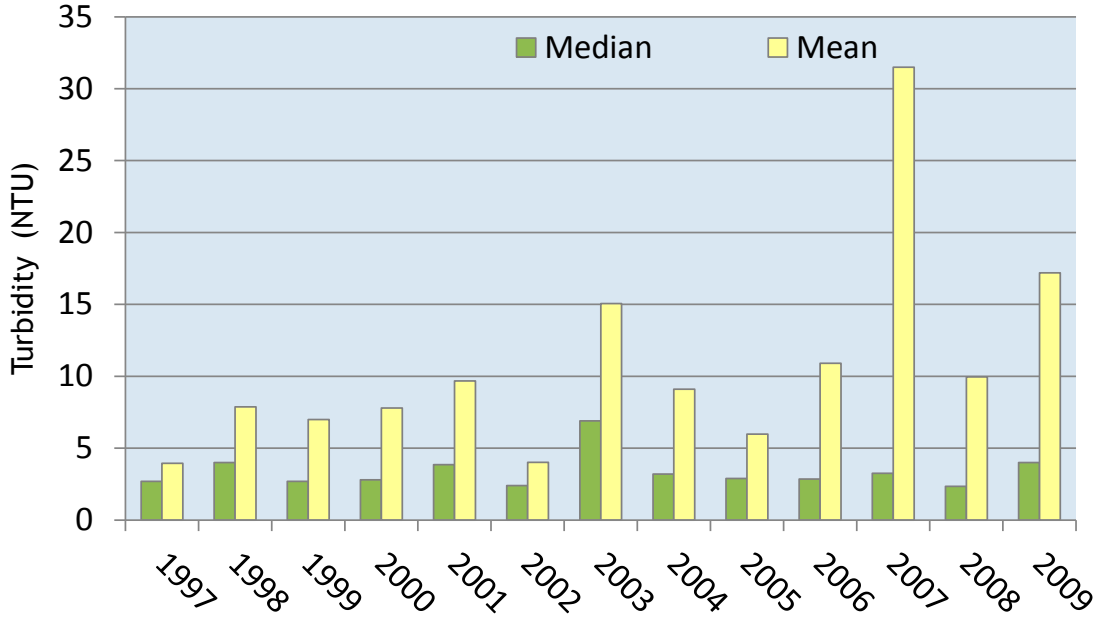
Figure ES-11: Percentage of Samples Exceeding the Turbidity Standard (2004-2008)



Overall, turbidity exceedances in the basin have not increased or declined in number of occurrences; however, the value of those exceedances did increase. This indicates either an increase in land disturbances, insufficient sediment and erosion control measures, or a combination of both.

Construction sites, mining operations, agricultural operations, logging operations and excessive stormwater flow off impervious surfaces are all potential sources. Turbidity violations demonstrates the importance of **protecting and conserving stream buffers and natural areas.**

Figure ES-12: Turbidity Mean & Median of Stations within the New River Basin



pH

Three of the six stations in the basin had between 1 and 7% of samples exceeding the high end of the state's pH standard of 9 (Figure ES-13). Even though there were minimal exceedances during this cycle, the basinwide pH level is increasing. Figure ES-14 shows the average pH levels in 1998 around 6.7 and increasing to above 7.7 by 2008.

Possible causes of this steady increase in pH levels are discussed later in this Chapter under Basinwide Water Quality Issues and Other Information.

FIGURE ES-13: PERCENTAGE OF SAMPLES EXCEEDING THE pH STANDARD (2004-2008)

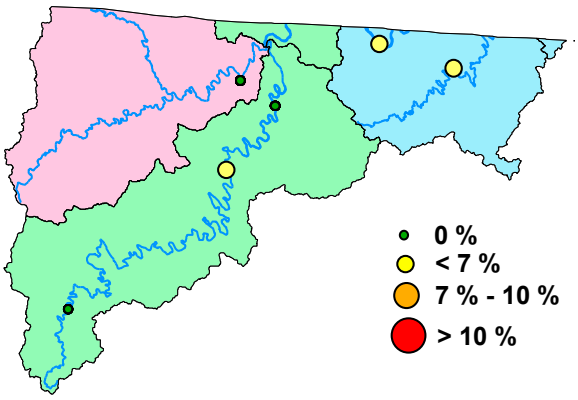
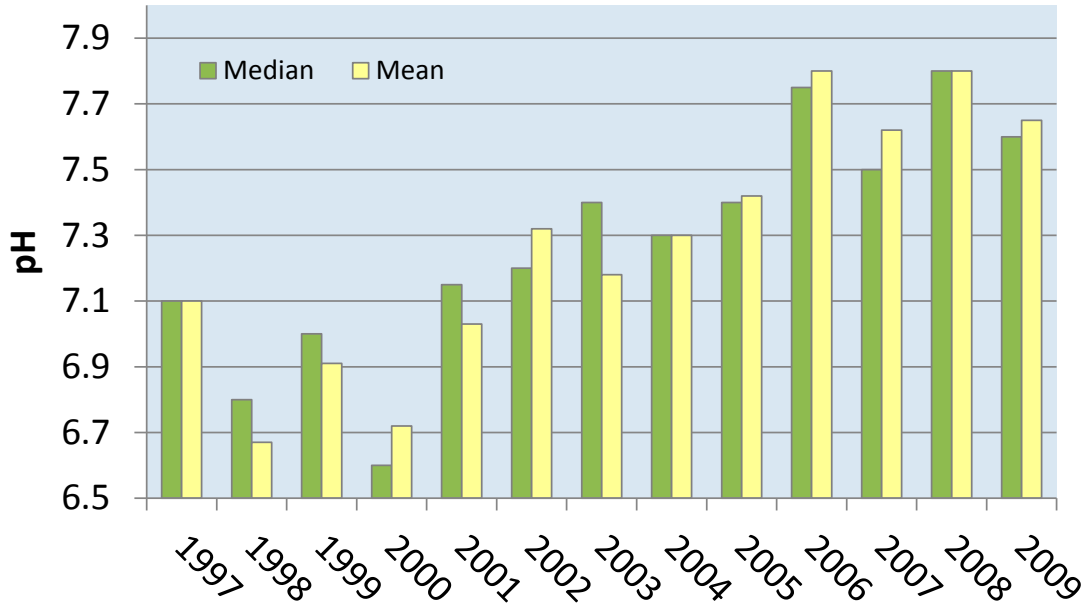


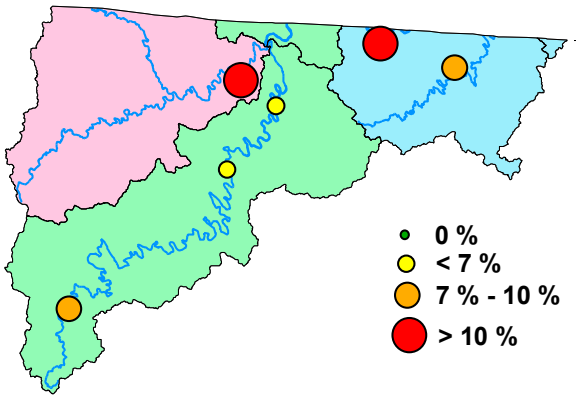
FIGURE ES-14: pH MEAN & MEDIAN OF STATIONS WITHIN THE NEW RIVER BASIN



Fecal Coliform Bacteria (FCB)

The FCB standard for freshwater streams is not to exceed the geometric mean of 200 colonies/100 ml or 400 colonies/100 ml in 20% of the samples where five samples have been taken in a span of 30 days (5-in-30). Only results from a 5-in-30 study are to be used to indicate whether the stream is Impaired or Supporting. Waters with a use classification of B (primary recreational waters) receive priority for 5-in-30 studies. Other waters are studied as resources permit.

FIGURE ES-15: PERCENTAGE OF SAMPLES EXCEEDING THE FCB SCREENING CRITERIA (2004-2008)

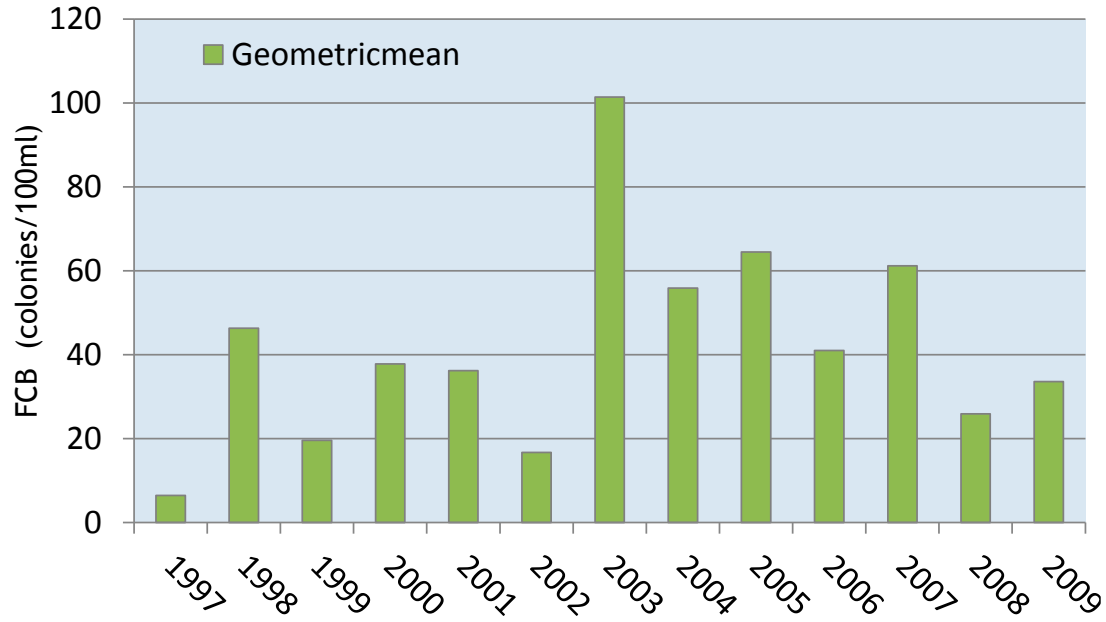


DWQ uses a screening criteria of 400 colonies/100 ml to determine the need for a 5-in-30 study. Figure ES-15 shows the percentage of samples at each station that exceeded this screening criteria. Stations with over 20% of samples exceeding this criteria that are also recreational waters are placed on the priority list. None of the stations in the New River Basin exceeded the 20%. While the North Fork New River station had exactly 20%, it is not a recreational water and therefore will not be placed on the priority list.

The geometric mean is used to calculate the average of FCB values. This average for the basin between 1997 and 2009 can be seen in Figure ES-16. The chart shows that even though there were fewer number of screening criteria exceedances, the overall geometric mean is slightly higher during this sampling cycle than the previous cycle.

This could be due to a number of reasons including an increase in animal operations with stream access, sanitary sewer overflows, failing septic systems, or straight pipes as noted in the **Water Quantity Chapter**. However, the specific reasons for the increase during this cycle is unknown at this time.

Figure ES-16: Yearly Geometric Mean of All FCB Samples in the New River Basin



Specific information about ambient monitoring methodology, seasonal variation and data sheets for ambient stations in this basin can be found in the **New River Basin Ambient Monitoring System Report**. Each ambient parameter and its potential effects on water quality and aquatic life are discussed in Chapter 3 of the **Supplemental Guide to North Carolina's Basinwide Planning.**

Population & Land Cover

Urbanization poses one of the greatest threats to aquatic resources. Small towns and communities are usually not considered urban centers, but even small concentrations of urbanization can have significant impacts on local waterways. For example, a one-acre parking lot produces 16 times more runoff than a one-acre meadow (Schueler and Holland, 2000). A wide variety of studies over the past decade converge on a central point: when more than 10 percent of the acreage in a watershed is covered in roads, parking lots, rooftops, and other impervious surfaces, the rivers and streams within the watershed become seriously degraded. Studies show that if urbanized areas cover more than 25 percent of a watershed, the decline in the health of the ecosystem is irreversible (Beach, 2002; Galli, 1991).

Population

The 2000 census evaluated the population of the North Carolina portion of the New River basin is 61,713. This is an increase of roughly 5,000 from the 1990 census. The figures shows how the population is distributed throughout the basin by 10-digit watersheds in 2000 and 2010. All three counties in the basin (Alleghany, Ashe and Watauga) are estimated to grow by 7 to 8 percent by 2010, based on the 2000 census. This section will be updated when the 2010 census data becomes available.

Figure ES-17: 2000 Population Per Square Mile by 10-Digit HUCs

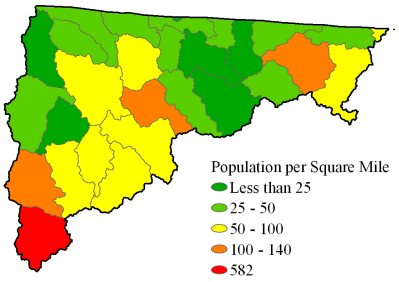


Figure ES-18: 2010 Population Per Square Mile by 10-Digit HUCs

Coming Soon

Hydrologic Unit Codes (HUC):

DWQ has recently made a change from the State-designated subbasin lines (e.g., 05-07-02) to the nationally recognized HUC lines. This Plan is organized by HUCs to provide, not only a detailed look at a particular waterbody, but also how that waterbody fits into the larger watershed picture. Table ES-1 provides a brief description of the different HUCs. There are five 10-digit watersheds within the New River Basin (0505000101, 0505000102, 0505000103, 0505000104 & 0505000106). Watersheds 0505000102 and 0505000103 are grouped together into one chapter because of the small size of 0505000103. This is done for 0505000104 & 0505000106, as well. Each chapter is then broken down even further into 12-digit subwatersheds, providing a more local water quality analysis. A comparison map of the State designated subbasin lines used in the past verses the new nationally recognized HUC lines is included in the Maps Chapter.

Table ES-1: HUC Quick Reference

HUC Digit	HUC Name	Average Size[1]
2-digit	Region	177,560
4-digit	Subregion	16,800
6-digit	Basin	10,596
8-digit	Subbasin	700
10-digit	Watershed	227
12-digit	Subwatershed	40

[1] In approximate square miles

Land Cover

A large portion of land cover in the basin is forested (Figure ES-19). The North Fork New River watershed has the largest percent of forested area, as well as the largest amount of land conservation acreage (16,000 ac.). Moving east across the basin, the forested areas begin to transition into agriculture. The Little River watershed has the highest percent of agriculture, which is largely Christmas tree production, and contains all nine animal operation permits. Majority of developed land in this basin is in the South Fork New River watershed (8%). Figure ES-20 shows the percentage of each land cover category and Figure ES-19 displays the location of those categories.

Figure ES-19: 2001 Land Cover in the New River Basin

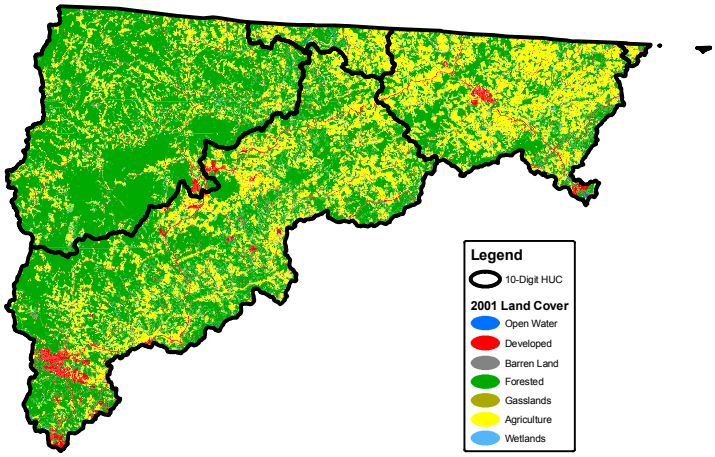
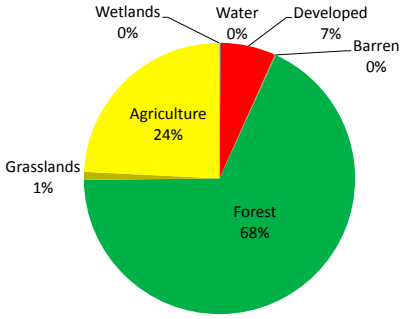


Figure ES-20: Land Cover Percentage in the New River Basin



Watershed Water Quality Summaries

North Fork New River Watershed (0505000101)

The North Fork New River watershed has some of the best water quality in the basin and has had little change between the last planning cycle and the current cycle. The large areas of forest, minimal agriculture and minimal developed areas have produced a minimal human impact to water quality. In efforts to protect the pristine nature of this watershed, a watershed-wide study was conducted to determine if these waters could be reclassified as High Quality Waters (HQW) or Outstanding Resource Waters (ORW) (BF-20090316). As a result, almost the entire watershed was reclassified as ORW. For a map of the affected area and a more detailed discussion see the Additional Studies section in the North Fork New River Watershed Chapter. Only one stream in this watershed is on the Impaired Waters list. The Little Buffalo Creek was originally listed in 2000.

Success Story #1

Five hundred feet of a UT to the North Fork, which is a class C+ water, was being impacted by sedimentation. The WSRO's DWQ staff worked closely with their Land Quality Section counterparts to ensure proper measures were taken to bring the site back into compliance with sites permits. The sediment was removed from the stream and all 500 feet of the UT were properly restored.

South Fork New River/Fox Creek Watersheds (0505000102 & 03)

The South Fork New River/Fox Creek watershed contains seven out of the nine Impaired stream segments within the New River basin. Four of those segments include Naked Creek, Ore Knob Branch, Peak and Little Peak Creeks

which have been on the Impaired Waters list for several years. The remaining three Impaired segments (two segments of the South Fork New River and the East Fork South Fork New River) were added to the 2008 Impaired Waters list.

These two watersheds have the largest population of the five watersheds in the New River basin and contain more of an urban and agriculture land cover mix. Several waterbodies in the watershed currently have pristine water quality conditions and are in need of protection to maintain that level of quality as land cover changes from forest to urban or agriculture areas.

Success Story #2

It was brought to the attention of the WSRO DWQ staff that a 2,000 foot stretch of a UT to Three Top Creek, which is classified as Trout Waters, was being impacted by sedimentation. DWQ and Land Quality Section staff in the WSRO worked closely to ensure all erosion control measures were properly installed and adequate vegetation was in place. After those efforts were made, the 2,000 feet of stream began recovering.

Little River/Chestnut Creek Watersheds (0505000104 & 06)

The Little River & Chestnut Creek Watersheds combined are the smallest watersheds in the New River basin. The only municipality is the Town of Sparta. It has the highest percent of agricultural land cover of any watershed in the basin and contains all nine animal operation permits within the basin. Waters in these watersheds are slightly impacted by human activities, but are of relatively good quality.

Crab Creek [AU#: 10-9-12] is the only Impaired water in these watersheds and was added to the Impaired Waters list in 2010. This is the first Impaired water in these watersheds since Laurel Branch [AU#: 10-9-10-2] appeared on the 1998 list but was removed from the 2000 list. Crab Creek's impairment and other information is discussed in the Crab Creek-Little River 12-digit section in Little River & Chestnut Creek Watershed Chapter.

Basinwide Water Quality Issues & Other Information

Rising pH Levels Throughout the Basin

Data collected between 1997 and 2009 at the six AMS stations within the basin all showed a similar increases in pH levels. pH levels in surface water are influenced by many different natural factors: drought; heavy rains; algae or other aquatic plant growth; and decomposition of organic material among others. These levels are also affected by human influences such as discharging acidic effluent; atmospheric deposition; and stormwater runoff containing excessive nutrients. Monthly data at each of the six site were averaged per year and graphed in Figure ES-14 where this increase can clearly be seen.

The presence of periphyton was noted several times during this sampling cycle. This algae-like growth flourishes in water columns with elevated nutrient levels and ample sunlight. These conditions during periods of drought can greatly accelerate aquatic plant growth. The photosynthesis process uses CO_2 within the water column, which can cause pH levels to increase. Some areas within the basin have recorded somewhat elevated nutrient levels and many of the basin's streams are exposed to full sunlight. This may be one possible cause of the increasing pH levels.

Other possible causes of the increasing levels in the basin could be atmospheric deposition, groundwater influences or precipitation influences. However, the exact reasons for this basinwide increase is unknown at this time.

Proper riparian buffers are recommended throughout the basin to reduce the impact of stormwater runoff, which can include nutrients from farm or lawn fertilizers, as well as impacts from acid rain. Trees planted within the riparian buffers are also beneficial for shading streams and reducing water temperatures. It is recommended to continue monitoring pH levels within the basin and investigate possible causes.

Formation of the New River Coalition

In June 2010, DWQ met with stakeholders in the basin to promote and discuss the Coalition Program. Since that time, several more meetings have occurred with a core group of environmental stewards emerging to discuss the possibilities and details of developing a monitoring coalition. This group is continuing to work with DWQ and taking the initiative to form a successful monitoring coalition that will be specific to the members interests and watershed specific issues.

Additional information about DWQ's **Monitoring Coalition Program** and current coalitions can be found on the **Environmental Science Section** web pages.

Christmas Tree Farming

North Carolina leads the nation in Fraser fir production and is second in Christmas tree production behind the Pacific Northwest. An estimated 50 million trees were grown on 25,000 acres in 2006. The Christmas tree industry is estimated to produce $100 million in cash receipts and $12 million from value-added products such as wreaths, roping and greenery. Fraser fir is native to the highest elevation mountains in western NC, southwestern Virginia and eastern Tennessee. Ashe, Alleghany and Watauga counties are among the top five counties in the state, producing 88% of all Christmas trees within NC. The trees are grown at an elevation of at least 3,000 feet and on steep slopes. An average six to seven foot tall tree is harvested usually at 10 to 15 years of age.

Majority of the trees are fertilized by hand once or twice a year, though some are fertilized by airplane. Mountain soils are typically low in phosphorus and calcium and often below the optimal pH range of 5.5 to 5.8. Therefore, farmers add nutrients, chemicals and other agents to adjust the soil to more favorable conditions.

One of the largest impacts these farms can have on water quality happens shortly after harvesting the trees as the harvest exposes acres of disturbed soil on steep slopes. The first rain fall event often causes major sedimentation and degradation of streams if proper measures are not taken. An example of this can be seen in the Little Phoenix Creek section of the **South Fork & Fox Creek Watershed Chapter.** However, extensive efforts have been made by local Soil & Water Conservation Districts, NC State University, local watershed groups, and others to produce educational materials and provide funding and BMP installation assistance to reduce those impacts.

Success Story #3

DWQs WSRO was informed of a small amount of sediment impacting 3,000 feet of two UTs to Helton Creek, which are classified as Trout Waters. The WSRO and the Division of Forest Resources (Lenoir Office) staffs worked with the landowner to implement proper forestry and water quality best management practices to stabilize the site. Once these practices were in place, the sensitive trout waters began recovering.

In 2003, the NC Agricultural Cost Share Program (ACSP)adopted a new best management practice, Christmas Tree Conservation Cover BMP. The purpose of this practice is to plant ground cover between and under trees. This not only keeps soil in place during growth and harvesting of the trees but also help prevent tall and obnoxious weed growth. A large number of farms are now using this ground cover technic.

It is recommended that farmers continue to work with the ACSP to apply ground cover as well as taking advantage of the soil testing that is provided free-of-charge by the state. Having the soil tested will help farmers determine the appropriate amount of nutrients and other agents to apply to the soil, reducing excess amounts from running off the land during a storm event and into streams.

The agricultural community has developed several educational materials specific to environmentally safe Christmas tree farming practices that are available to the public online.

Primary & Supplemental Freshwater Classifications

All surface waters in the state are assigned at least one primary classification and may also be assigned one or more supplemental classifications. A list of classifications with a description of requirements can be found in Chapter 2 of the Supplemental Guide to North Carolina's Basinwide Planning. Table ES-1 provides a summary of waterbody classifications for named streams in the New River basin as of March 2011. Maps locating High Quality Waters, Outstanding Resource Waters, and Water Supply Watersheds, as well as, streams classified as Trout Waters within the basin are in the Maps Chapter. For the most up-to-date classifications visit DWQ's Classifications and Standards Unit webpage.

Table ES-1: Summary of Waterbody Classifications in the New River Basin

	Primary					Supplemental			
	C	B	WS-II	WS-IV	WS-V	HQW	ORW	Tr	'+'[1]
Named Stream Miles	175.6	102.9	29.8	64.1	21.8	122.8	315.7	626	360.2

1 - The '+' symbol indicates the waters subject to the New River basin special management strategy.

Approval of North Fork New River Watershed Reclassification:

The reclassification was presented to the EMC in September 2010, and the rule went into effect December 1, 2010. The details of the reclassifications are discussed in the North Fork New River Watershed Chapter. The majority of the North Fork New River Watershed received the Outstanding Resource Waters supplemental classification.

On-Site Wastewater Treatment Systems (Septic Systems)

A North Carolina Agricultural Research Service report completed in 2007 provided information on potential nitrogen contributions from on-site wastewater systems for each river basin. In 1990, the New River basin had a septic system density of 24 systems/mi^2, less than the EPA threshold of 40 systems/mi^2. These results based on 1990 census data of 36,905 people using septic systems yield a maximum nitrogen (N) loading of 369,049 lbs/yr and N loading rate of 491 lbs/mi^2/yr. These numbers reflect the total N discharged to the soil from the septic system use and does not account for N removed because of soil processes and plant uptake (Pradhan et al. 2007). The full study can be viewed at Potential Nitrogen Contributions from On-site Wastewater Treatment Systems to North Carolina's River Basins and Sub-basins.

Success Story #4

The DWQ WSRO noticed 200 feet of a UT to Cranberry Creek was being impacted by sedimentation. After the appropriate steps were taken by the WSRO, the sediment was removed from the stream. The 200 feet of C+ classified waters began recovery once restoration efforts were completed.

DWQ Basinwide Recommendations & Priorities

Basinwide Recommendations

Update of 7Q10 Flows in NPDES Permits

It is important that 7Q10 flow values be updated to include changing climatic conditions and water withdrawals that impact stream flow conditions. All NPDES permitted facilities use 7Q10s as critical flow in determining permit limits for toxicants. These critical flow values determine permit limits for all NPDES facilities and need to be reviewed as the permits come up for renewal. Currently, a 7Q10 is only evaluated in the initial application of the permit and upon expansion. Low flow conditions induced by drought impact the health of aquatic life, as demonstrated in this basin for roughly five years between 1997 and 2008 (see Figure ES-3). Droughts, as well as the demand on water resources, are very likely to increase; therefore, the reevaluation of stream flow will become more critical to water quality within the next decade or so. DWQ will work with DWR, USGS and other agencies to discuss the need and resource availability to update 7Q10 values.

Conduct Study to Determine the Source of Increasing pH Levels

Across the New River basin, pH levels have been gradually rising since about 2001. Possible reasons for this occurrence are discussed above. It is recommended that a multi-agency group, consisting of state and local level stakeholders, be formed to determine the most effective and efficient way to conduct this study.

Elimination of Straight Pipes & Failing Septic Systems

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, in partnership with DENRs Wastewater Discharge Elimination (WaDE) Program and NC Clean Water Management Trust Fund (CWMTF), inspected nearly 2,800 homes. Of those households, 625 had either a failing septic system or a straight pipe. Forty-five percent of those homes have been corrected. DWQ supports the need for additional funding assistance to complete the remaining 55% of failing septic systems and straight pipe corrections.

Success Story #5

An 1,100 foot UT of Call Creek, which is Class Trout and ORW waters, received impacts from sedimentation after land clearing. The WSRO DWQ staff worked with the local Soil & Water Conservation District and others to determine the best way to stabilize the site. The turbidity in the Outstanding Resource and sediment sensitive waters cleared up immediately upon proper placement of vegetation and other stabilization measures.

Basinwide Riparian & Trout Water Buffer Educational Efforts

One of the most effective ways of reducing pollutants in stormwater runoff in a non-urban setting is through riparian buffers. Many of these buffers are removed for aesthetics, farming needs, or recreational purposes. Educational efforts to promote the usefulness of riparian buffers have proven successful among some agricultural communities and should be extended to the general public and local businesses.

There are over 600 miles of designated Trout Waters in the New River basin. Educational efforts are recommended to inform the general public of the location of the Trout Waters in the basin, the importance of protecting those waters, and what actions are not allowed along these streams. A map of designated Trout Waters can be found in the **Maps Chapter**.

The Clean Water Act 205(j) Grant is a possible funding source for local Council of Governments to explore for the production of these educational materials and for local stakeholders to discuss.

Basinwide Stream Priorities

Table ES-2 lists waters in the New River basin that DWQ has prioritized for restoration/protection needs of a particular streams water quality and aquatic habitat. The order of priority is not based solely on the severity of the steams impairment or impacts, but rather by the need for particular actions to be taken. A stream that is currently supporting its designated uses may be prioritized higher within this table than a stream that is currently Impaired. This is based on the level of active restoration/protection work being preformed in those drainage areas. Some Supporting streams may have a more urgent need for protection than an Impaired stream with restoration needs already being implemented.

The third and fourth columns of this table list **potential** stressors and sources that may be impacting a stream based on in-field observations, monitoring data, historical evidence, permit or other violations, and other staff and public input. In many cases, additional study is needed to determine exact source(s) of the impact(s). The last column includes a list recommended actions to be taken by DWQ and/or other environmental groups to ensure good water quality.

Detailed information on each of these streams can be found in the corresponding watershed chapter. A stream's watershed is identified Stream Name & HUC # column by the last four digits of its 10-Digit HUC number.

- Chapter 1: North Fork New River Watershed (HUC: 050500**0101**);
- Chapter 2: South Fork New River (HUC: 050500**0102**) & Fox Creek (HUC: 050500**0103**) Watersheds; and
- Chapter 3: Little River (HUC: 050500**0104**) & Chestnut Creek (HUC: 050500**0106**) Watersheds.

Table ES-2: Prioritization of Waters in the New River Basin (Highest to Lowest Priority)

Stream Name & (HUC #)	AU#	Class.	Stressor	Source	Status	Actions Needed
South Fork New R. (SFNR) (0102)	10-1-(1), 10-1-(3.5)a & 10-1-(3.5)b	WS-IV;CA;+ C;+ C;+	Habitat Degradation, Nutrients, pH	Construction, WWTP	**Impaired**	SS, SEC, NMC, P (Hellbender Salamander)
Boone Cr. (Kraut Cr.) (0104)	10-1-4-4	C;Tr;+	Habitat Degradation, Temperature, Turbidity, DO, Copper	ASU Steam Station, Urban Impacts, Construction, Piped Streams	**Impacted**	DS, RBR, SC, E
Little Buffalo Cr. (0101)	10-2-20-1	C;Tr:+	Habitat Degradation (Riparian Zones), Elevated Nutrients	WWTP, Urban Runoff, Piped Streams, Agriculture	**Impaired**	RBR, WRP, DS, E, Ag, NMC
Crab Cr. (0104)	10-9-12	C;Tr	Habitat Degradation, Nutrients, Flow	Agriculture, Golf Course, Construction, Beaver Dams, Volume & Velocity	**Impaired**	R, SEC, Ag, NMC, RBR
Bledsoe Cr. (0104)	10-9-7	C;Tr	Habitat Degradation (Riparian Buffers), Toxins, FCB, Nutrients, Turbidity	Urban Impacts	**Impacted**	R, SC, SEC BMPs, RBR
SFNR (0102)	10-1-(33.5)	B;ORW	Habitat Degradation, Turbidity, pH, Nutrients, Copper	Agriculture, Abandoned Mine	Supporting	RBR, Ag, NMC
Naked Cr. (0102)	10-1-32	C;+	Habitat Degradation (Riparian Buffers) Turbidity, Toxins	Construction, Golf Course, Urban Impacts	**Impaired**	SC, RBR, E, WRP, DS, SEC
Middle Fork SFNR (0102)	10-1-2-(1), 10-1-2-(6), 10-1-2-(14) & 10-1-2-(15)	WS-IV;+ WS-IV;Tr;+ WS-IV;+ WS-IV;CA;+		Urban Impacts, Blowing Rock WTP	**Impacted**	M
East Fork SFNR (0102)	10-1-3-(1), 10-1-3-(7) & 10-1-3-(8)	WS-IV;Tr;+ WS-IV;+ WS-IV;CA;+	Habitat Degradation (Riparian Buffers)	Urban Impacts, Blowing Rock WTP	**Impaired**	RBR, M
Obids Cr. (0102)	10-1-27-(1) 10-1-27-(2)	C;Tr;+ WS-IV;Tr;+	Habitat Degradation (Riparian Buffers)	Agriculture (Livestock access)	Supporting	Ag, RBR, E
Pine Swamp Cr. (0102)	10-1-24	C;+	Turbidity	Stormwater Volume & Velocity	Supporting	RBR, Ag, E
Cranberry Cr. (Mulberry Cr.) (0102)	10-1-37	B;Tr;+	Habitat Degradation (Riparian Buffers) Nutrients	Straight Channels, Agriculture	Supporting	R, Ag, RBR, E
Prathers Cr. (0102)	10-1-38	B;Tr;+	Habitat Degradation (Riparian Buffers) Nutrients	Agriculture	**Impacted**	RBR, Ag, NMC

Class.: Classification (e.g., C, S, B, WS-I, WS-II, WS-III, WS-IV, WS-V, Tr, HQW, ORW, SW, UWL)

Stressor: Chemical parameters or physical conditions that at certain levels prevent waterbodies from meeting the standards for their designated use (e.g., low/high DO, nutrients, toxicity, habitat degradation, etc.).

Source: The cause of the stressor. (Volume & Velocity: when a stream receives stormwater runoff at a much higher volume and velocity than it would naturally receive due to ditching, impervious surfaces, etc.)

Status: Impaired, Impacted, Supporting, Improving

Actions Needed: Restoration (**R**), Protection (**P**), Stormwater Controls (**SC**), Stressor Study (**SS**), Education (**E**), Local Ordinance (**LO**), Best Management Practices (**BMPs**), Sediment and Erosion Control BMPs (**SEC**), Species Protection Plan (**SPP**), Forestry BMPs (**F**), Agriculture BMPs (**Ag**), Nutrient Mgnt Controls (**NMC**), Riparian Buffer Restoration (**RBR**), Daylight Stream (**DS**), Monitoring (**M**), Watershed Restoration Plan (**WRP**).

Stream Name & (HUC #)	AU#	Class.	Stressor	Source	Status	Actions Needed
Norris Fork (0102)	10-1-10-2	C;Tr;+	Turbidity	Construction	Supporting	SEC BMPs
Helton Cr. (0101)	10-2-27	C;ORW;Tr	Sediment, Elevated Nutrients, Over Stocking	Agriculture, Logging	**Impacted**	SS, Protection (Hellbender Sal.)
SFNR (0102)	10-1-(20.5) & 10-1-(26)a	WS-V;HQW WS-IV;HQW			Supporting	RBR, E
Roan Cr (0102)	10-1-31-(1) 10-1-31-(1.5) 10-1-31-(2)	C;Tr;+ WS-IV;Tr;+ WS-IV;CA;Tr;+	Sedimentation	Agriculture	Supporting	Ag, E, RBR
Winkler Cr. (0102)	10-1-4-(1), 10-1-4-(2), 10-1-4-(3.5)a & 10-1-4-(3.5)b	WS-II;HQW,Tr WS-II;HQW;Tr;CA C;Tr;+ C;Tr;+		Urban Impacts, Pipped Streams	Supporting	DS, M
Elk Cr. (0104)	10-6-(1) & 10-6-(2)	C;Tr;+ C;+	Nutrients	Agriculture	Supporting	Ag, E, NMC, SS
Laurel Br. (0104)	10-9-10-2	C;Tr	Habitat Degradation (Riparian Buffers)	Golf Course Communities	Supporting	RBR, E, SC
Grassy Cr. (0102)	10-3	C;Tr;+	Nutrients, pH	Agriculture, Straight Channels	**Impacted**	Ag, RBR
Nathans Cr. (0102)	10-1-36	B;Tr;+	Habitat Degradation		**Impacted**	M
Pine Swamp Cr. (0104)	10-9-5	C;Tr	Habitat Degradation (Riparian Buffers)		Supporting	RBR, Ag
Three Top Cr. (0101)	10-2-13	C;ORW;Tr	Turbidity		Supporting	SEC, RBR, Protection (Hellbender Sal.)
Little Horse Cr. (0101)	10-2-21-8	C;ORW;Tr	Habitat Degradation	Upstream Erosion	Supporting	Ag, RBR
SFNR (0102)	10-1-(3.5)c & 10-1-(14.5)	C;+ C;+	Habitat Degradation, Turbidity, pH	Poor Riparian Buffers	**Impacted**	M
SFNR (0102)	10-1-(26)b & 10-1-(30)	WS-IV;HQW WS-IV;HQW;CA	pH, Turbidity, Nutrients		Supporting	SS
Little Peak Cr. (0102)	10-1-35-4	B;Tr;+	Toxins	Abandoned Mine	**Impaired**	R - Currently Underway
Ore Knob Br. (0102)	10-1-35-3	B;Tr;+	Toxins	Abandoned Mine	**Impaired**	R - Currently Underway
Peak Cr. (0102)	10-1-35-(1), 10-1-35-(2)a & 10-1-35-(2) b	C;Tr;+ B;Tr;+ B;Tr;+	Toxins	Abandoned Mine	**Impaired**	R - Currently Underway
New R. (0104)	10b	C;ORW	Turbidity, Copper, Zinc		**Impacted**	RBR
Waterfalls Cr. (0104)	10-9-4	C;Tr	Habitat Degradation	Agriculture	Supporting	RBR

Class.: Classification (e.g., C, S, B, WS-I, WS-II, WS-III, WS-IV, WS-V, Tr, HQW, ORW, SW, UWL)

Stressor: Chemical parameters or physical conditions that at certain levels prevent waterbodies from meeting the standards for their designated use (e.g., low/high DO, nutrients, toxicity, habitat degradation, etc.).

Source: The cause of the stressor. (Volume & Velocity: when a stream receives stormwater runoff at a much higher volume and velocity than it would naturally receive due to ditching, impervious surfaces, etc.)

Status: Impaired, Impacted, Supporting, Improving

Actions Needed: Restoration (**R**), Protection (**P**), Stormwater Controls (**SC**), Stressor Study (**SS**), Education (**E**), Local Ordinance (**LO**), Best Management Practices (**BMPs**), Sediment and Erosion Control BMPs (**SEC**), Species Protection Plan (**SPP**), Forestry BMPs (**F**), Agriculture BMPs (**Ag**), Nutrient Mgnt Controls (**NMC**), Riparian Buffer Restoration (**RBR**), Daylight Stream (**DS**), Monitoring (**M**), Watershed Restoration Plan (**WRP**).

Stream Name & (HUC #)	AU#	Class.	Stressor	Source	Status	Actions Needed
Moccasin Cr. (0104)	10-9-11	C	Nutrients, Low DO	Agriculture	Supporting	Ag, NMC
Middle Fork Little Horse Cr. (0101)	10-2-21-8-1	C;ORW;Tr	Habitat Degradation (Bank Erosion)		Supporting	RBR
Long Shoals Cr. (0101)	10-2-25	C;ORW;Tr			Supporting	M
Little R. (0104)	10-9-(1)a	C;Tr	Habitat Degradation, pH		Supporting	RBR
Brush Cr. (0104)	10-9-10	C;Tr	Habitat Degradation (Riparian Buffers), Nutrients	Agriculture	Supporting	RBR, Ag
Big Horse Cr. (0101)	10-2-21-(7), 10-2-21-(4.5) & 10-2-21-(1.5)	C;ORW C;ORW;Tr C;ORW;Tr	Habitat Degradation (Riparian Zones)		Supporting	RBR
North Fork New R. (NFNR) (0101)	10-2-(12)	C;ORW	Habitat Degradation, Turbidity		Supporting	Protection (Hellbender Sal.)
Pine Orchard Cr. (0102)	10-1-15-1	C;Tr;+	Turbidity		Supporting	RBR
South Beaver Cr. (0102)	10-1-25-2	C;Tr;+	Habitat Degradation (Riparian Buffers)		Supporting	RBR
UT to Crab Cr. (0104)	10-9-12ut8	C;Tr	Habitat Degradation (Riparian Buffers)	Straight Channels	Supporting	R - Currently Underway
NFNR (0101)	10-2-(1)	C;ORW;Tr			Supporting	P
Big Laurel Cr. (0101)	10-2-14	C;ORW;Tr			Supporting	Protection (Hellbender Sal.)
Piney Fork (0102)	10-1-37-3	B;Tr;+			Improving	M
Hoskin Fork (0101)	10-2-7	C;ORW;Tr			Supporting	None

Class.: Classification (e.g., C, S, B, WS-I, WS-II, WS-III, WS-IV, WS-V, Tr, HQW, ORW, SW, UWL)

Stressor: Chemical parameters or physical conditions that at certain levels prevent waterbodies from meeting the standards for their designated use (e.g., low/high DO, nutrients, toxicity, habitat degradation, etc.).

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Note: URL addresses for hyperlinks found in this plan are listed in the Acronyms & Definitions Chapter.