Upper Catawba River Basin Restoration Priorities 2009

Amended July 2018

TABLE OF CONTENTS

Cover Photo: Lower Creek, Caldwell County

Introduction

The Catawba River Basin Watershed Restoration Plan was originally developed in 2004 for the entire Catawba River Basin (USGS Catalog Units 03050101, 03050102, and 03050103). In 2009, a separate document was developed for the *upper* portion of the Catawba River Basin, the portion of USGS Catalog Unit 03050101 that drains to Lookout Shoals Dam. The 2009 plan added four new Targeted Local Watersheds (TLWs) for stream, wetland and riparian buffer restoration and protection efforts to the original 18 established for the upper Catawba in the 2004 plan. The 2009 plan also 'de-listed' two of the original 18 local watersheds identified as TLWs in the 2004 plan (Upper Catawba River and Warrior Fork HUs), resulting in a total of 20 TLWs in the new RBRP for the upper Catawba.

As an update to the *Catawba River Basin Watershed Restoration Plan* (2004) and a supplement to *Catawba River Basin Restoration Priorities* (2007), this document draws information from various sources, especially from the detailed document, *September 2004 Catawba River Basinwide Water Quality Plan* (DWR, 2004). This updated RBRP does not provide the level of detail nor the broad geographic scope of information found in the DWR Basinwide Plan. Rather, it provides a quick overview of DMS, the criteria DMS uses to select new Targeted Local Watersheds and then describes the newly selected Targeted Local Watersheds.

In past DMS and DWR documents, watersheds were delineated by the NC DWR "subbasin" units and the smaller DMS Targeted Local Watersheds were defined by USGS 14-digit hydrologic unit (HU). In this document, the regional watersheds that make up river basins are defined by the USGS 8-digit cataloging units (CUs) and the Targeted Local Watersheds continue to be defined by the USGS 14-digit hydrologic unit.

North Carolina General Statute 143-214.10 charges DMS to pursue wetland and riparian restoration activities in the context of basin restoration plans, one for each of the 17 major river basins in the State, with the goal of protecting and enhancing water quality, fisheries, wildlife habitat, recreational opportunities and preventing floods.

What is a River Basin Restoration Priority?

DMS develops River Basin Restoration Priorities (RBRPs) to guide its mitigation activities within each of the major river basins. The RBRPs identify specific local watersheds within the basin's 8-digit CUs that exhibit a need for restoration and protection of wetlands, streams and riparian buffers. These priority watersheds (TLWs) are 14-digit hydrologic units which receive priority for DMS planning and project funds. The designation may also benefit stakeholders writing watershed improvement grants (e.g., Section 319 or Clean Water Management Trust Fund) by giving added weight to their proposals.

Criteria for selecting Targeted Local Watersheds

DMS evaluates a variety of GIS data and resource and planning documents on water quality and habitat conditions in each river basin to select TLWs. Public comment and the professional judgment of local resource agency staff also play a critical role in targeting local watersheds. TLWs are chosen based on an evaluation of three factors—*problems*, *assets*, and *opportunities*. *Problems* reflect the need for restoration, *assets* reflect the ability for a watershed to recover from degradation and the need for land conservation, and *opportunity* indicates the potential for local partnerships in restoration and conservation work.

Problems: DMS evaluates DWR use support ratings, the presence of impaired /303(d)-listed streams, and DWR basinwide documents (Basinwide Water Quality Plans and Basinswide Assessment Reports) to identify streams with known problems. DMS also assesses the potential for degradation by evaluating land cover data, riparian buffer condition, impervious cover, and population statistics.

Assets: In order to gauge the natural resource value of each watershed, DMS considers various factors, including the amount of forested land, land in public or private conservation, riparian buffer condition, high quality resource waters, and natural heritage elements.

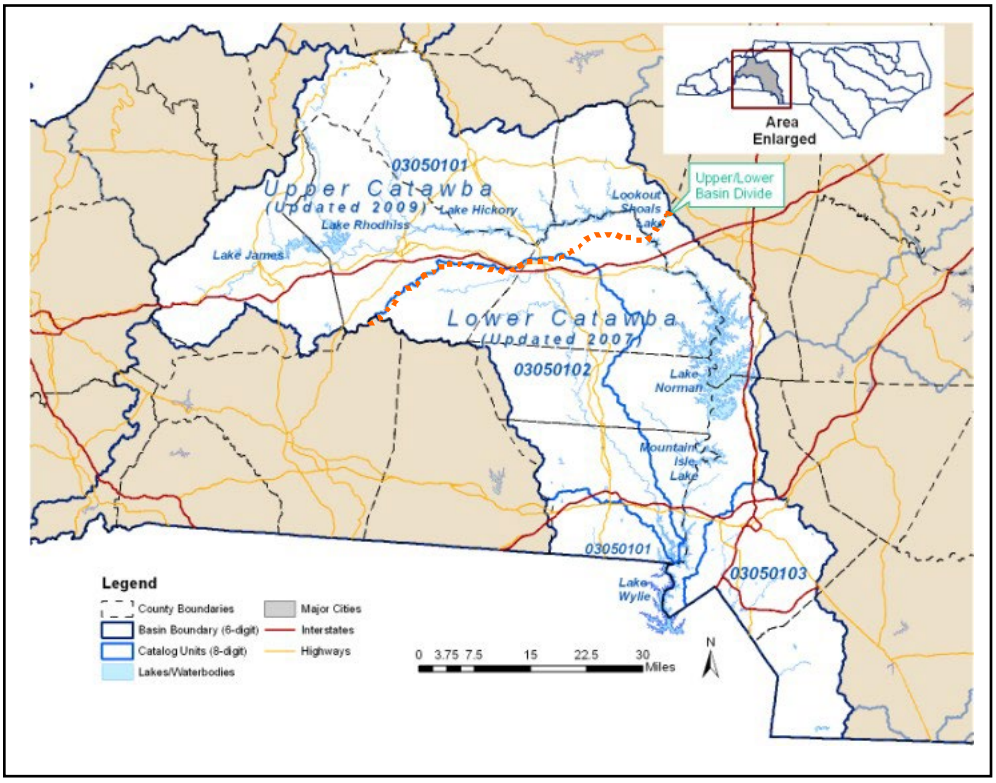
Opportunity: DMS reviews restoration and protection projects that are already on the ground, such as Clean Water Management Trust Fund projects, US Clean Water Act Section 319 projects, and land conservation projects. DMS also considers the potential for partnership opportunities by consulting with local, state, and federal resource agencies and conservation organizations, identifying their priority areas.

Local Resource Professional Comments/Recommendations: The comments and recommendations of local resource agency professionals, including staff with Soil & Water Conservation districts, the Natural Resources Conservation Service (NRCS), county planning staff, NCDEQ regional staff (e.g., Wildlife Resources Commission), and local/regional land trusts and watershed organizations are considered heavily in the selection of Targeted Local Watersheds. Local resource

professionals often have specific and up-to-date information regarding the condition of local streams and wetlands. Furthermore, local resource professionals may be involved in local water resource protection initiatives that provide good partnership opportunities for DMS restoration and preservation projects and Local Watershed Planning (LWP) initiatives.

Upper Catawba River Basin Overview

The map below illustrates the boundary between the *lower* portion of the Catawba and the *upper* portion, for which TLWs were updated in the 2009 document. This document focuses on the upper (northern and western) portion of Cataloging Unit 03050101. This area comprises the headwaters, major tributary streams and main stem of the upper Catawba River as far downstream as Lookout Shoals Lake on the Alexander-Catawba County border.



The total area of this uppermost portion of the Catawba River basin amounts to 1,450 square miles and includes 46 fourteen-digit Hydrologic Units (HUs). The Catawba River headwaters begin along the eastern flanks of the Blue Ridge escarpment in western McDowell County above the town of Old Fort. Major tributary streams to the Catawba -- including the North Fork Catawba River, the Linville River and Wilson Creek -- flow off the Blue Ridge and through its foothills in McDowell, Burke, Avery and Caldwell counties. As the Catawba River and its relatively steep tributaries flow southeastward from the Blue Ridge, they encounter

the more agricultural, less forested and more populated landscape of the western Piedmont in North Carolina (the Northern Inner Piedmont ecoregion). The upper Catawba River basin includes several significant urban centers in the western Piedmont, including the municipalities of Marion, Morganton, Lenoir and Hickory.

Upper Catawba River Basin 2011 Land Use/Land Cover Data

Class	Percentage
Water	1.5
Developed	13.6
Barren	0.0
Forest	66.7
Shrubland	3.4
Herbaceous	2.6
Planted/Cultivated	11.9
Wetlands	0.3

Population data for the five counties comprising the bulk of the focus area (upper portion of CU 03050101) are summarized below (EEP, 2007).

County	% in Basin	2006 Pop.	Estim. 2030 Pop.	Change, 2006-2030
Alexander	68%	36,296	47,997	+ 32%
Avery	35%	18,174	20,819	+15%
Burke	100%	88,664	99,765	+13%
Caldwell	75%	79,297	84,762	+7 %
McDowell	86%	43,636	52,521	+20%

Although the population statistics and projected growth in the counties and municipalities in the upper Catawba basin are relatively modest compared to those in the lower portion of the basin (Charlotte metro area), there will be inevitable development pressures and infrastructure demands accompanying the population increases projected for these five counties. Increasing population translates to more roads, more housing, more commercial development, and greater amounts of impervious cover replacing natural vegetation. DWR (2004) reported statistics from 1982 to 1997 (for the entire Catawba River Basin) showing a net loss of 10 percent forest and 35 percent agricultural cover over that time period, and a net gain of approximately 50 percent in urban and built-up area. The loss of farmlands and forests to urban/developed land cover, especially around the expanding urban and suburban centers of the western Piedmont, will mean greater challenges to resource managers and planners seeking to maintain or restore the functions of streams, wetlands and riparian buffers within the upper Catawba region.

Based on an assessment of existing watershed characteristics and resource information, DMS has developed several broad restoration goals for local watersheds within the upper Catawba River Basin. The goals reflect DMS's focus on working cooperatively to restore wetland and stream functions, such as maintaining and enhancing water quality, restoring hydrology, and protecting fish and wildlife habitat.

Upper Catawba River Basin Restoration Priorities 2009

Upper Catawba River Basin Restoration Goals

-Restoration of nutrient- and sediment-impaired waters (including tributary streams) of the Catawba River mainstem lakes (water supply reservoirs), including Lake James, Lake Rodhiss, Lake Hickory and Lookout Shoals Lake.

-Protection of riparian buffers and aquatic habitat within the headwater reaches of asset-rich watersheds of the upper Catawba River basin, including the upper Linville River, North Fork Catawba River, Wilson Creek, Mulberry Creek, Johns River and Lower Little River.

- Implementation of stormwater assessment and management efforts, including stormwater BMP projects, within urban and suburban sub-watersheds in the Linville, Marion, Lenoir, Morganton, Hickory and Taylorsville areas.

- Increased implementation of agricultural BMPs within heavily agricultural sub-watersheds of TLWs, including North and South Muddy Creeks, Silver Creek, lower Lower Creek, Lower Little River, Jumping Run Creek and Elk Shoal Creek.

- Continuation of the collaborative watershed assessment, planning and restoration efforts that are integral to three existing LWP initiatives in the upper Catawba River basin: Lower Creek (DMS and LCAT), Muddy Creek (Muddy Creek Restoration Partnership) and Lake Rodhiss (WPCOG).

In 2003, DMS initiated a Local Watershed Planning (LWP) effort in the 99-square mile Lower Creek watershed in Caldwell and Burke counties. Focusing on two TLWs (03050101 080010 and 080020), this LWP culminated in the development of a *Watershed Assessment Report, Watershed Management Plan* and *Project Atlas* in 2006. Many of the recommendations contained in the final Plan have been officially endorsed by the two counties and by the municipalities of Lenoir and Gamewell. DMS is currently working with local resource professionals and landowners to implement stream restoration projects in the watershed. For more information on the Lower Creek LWP, go to https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Catawba_River_Basin/Lower_Creek/Lower%20Crk%20LWP%20Fact%20Sheet.pdf .

Upper Catawba River Basin and Targeted Local Watershed Map

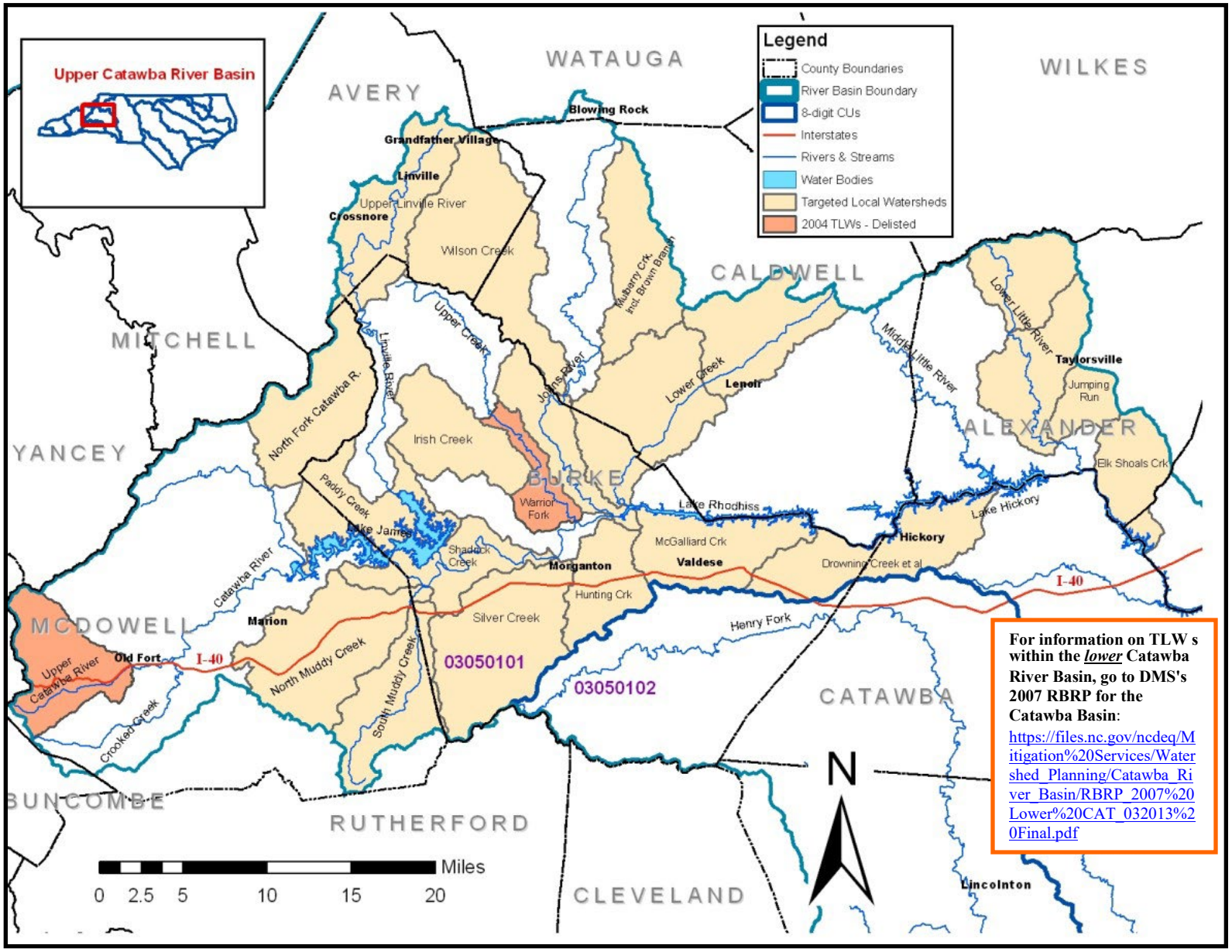


Table 1. Targeted Local Watershed Summary for the Upper Catawba River Basin

Hydrologic Unit (HU) Code	Major Stream(s)	Area (sq. miles)	% Imperv.	% Agric. Area	% 303D Miles (2006)	% Non-forest Buffer	Animal Ops	% Forest-Wetland Area	% HQW - ORW Miles	% Tr Miles	% WSW Miles	% SNHA	# NHEOs	% Land in Conser-vation	# non-DMS Projs	WRC Priority Area?	# DMS Projs (Oct '18)	DMS LWP?	2004 TLW?
Upper Catawba 03050101																			
03050101020010	North Fork Catawba River	44.6	0.4	5.4	3.0	14.3	2	89.9	0.0	99.8	0.0	5.9	34	39.1	13		1		no
03050101030010	Upper Linville River	44.3	1.0	10.5	0.0	32.4	0	73.8	1.7	82.5	0.0	7.7	80	13.6	3	yes			Y
03050101030030	Paddy Creek	34.2	0.2	6.2	0.0	5.3	1	88.5	1.2	26.8	0.0	0.4	8	58.0	1		1		Y
03050101030060	Shadrick Creek - Catawba River	27.7	2.0	19.1	0.0	21.5	2	64.0	0.0	0.0	47.9	0.0	4	3.3	2		1		no
03050101040010	North Muddy Creek (incl. Youngs Fork, Jacktown Crk.)	58.6	2.1	21.2	4.0	32.2	5	66.1	0.0	0.0	0.0	1.6	21	0.1	0		5		Y
03050101040020	South Muddy Creek	40.0	0.5	18.5	0.0	20.2	14	75.2	0.0	0.0	0.0	0.9	29	0.4	1		6		Y
03050101050050	Silver Creek	60.9	2.9	23.2	0.0	31.3	28	58.5	4.9	0.0	9.1	10.2	72	13.2	4		5		Y
03050101060030	Irish Creek	34.4	0.3	10.2	4.1	19.2	2	85.5	0.0	47.4	100.0	0.2	17	37.9	0	yes	1		Y
03050101060050	Hunting Creek	25.5	8.0	19.3	15.4	40.6	3	43.4	0.0	0.0	77.8	1.6	3	4.5	1				Y
03050101070020	Mulberry Creek (incl. Brown Branch)	41.5	0.2	7.4	0.0	19.9	2	89.7	69.0	20.0	0.0	0.1	5	46.1	0	yes	1		Y
03050101070030	Wilson Creek	69.0	0.1	1.9	5.7	5.5	0	95.6	100.0	100.0	0.0	9.2	85	83.9	1	yes			no
03050101070040	lower Johns River	26.9	0.2	13.2	6.5	13.1	2	82.6	62.0	16.8	1.9	1.1	13	20.6	12	yes			Y
03050101080010	upper Lower Creek (incl. Spainhour Creek)	40.6	5.9	14.4	23.5	49.7	2	58.5	0.0	0.0	0.0	0.0	5	0.3	1		1	Y	Y
03050101080020	lower Lower Creek (incl. Bristol Creek)	57.6	2.2	23.6	21.2	36.3	12	62.6	0.0	0.0	38.4	0.0	3	0.8	13			Y	Y
03050101090010	McGalliard Creek	38.0	5.3	15.4	25.1	25.3	8	52.2	0.0	0.0	100.0	2.5	8	0.1	1				Y
03050101090020	Drowning Creek, Horseford Creek, Falling Creek	44.7	13.8	16.3	0.4	48.4	6	26.0	0.0	0.0	71.3	0.8	6	0.7	1				Y
03050101120010	Lower Little R., Grassy Creek	27.8	0.5	22.3	11.6	29.5	26	72.6	0.0	0.0	0.0	0.4	9	0.0	2		1		no
03050101120030	Lower Little R., Muddy Fork	36.8	2.4	40.6	8.8	30.0	50	46.8	0.0	0.0	21.9	0.0	0	0.1	0		1		Y
03050101120040	Jumping Run Creek	13.3	3.9	51.4	0.0	38.8	13	34.7	0.0	0.0	81.0	0.0	0	0.5	0		1		Y
03050101130010	Elk Shoal Creek	26.3	1.0	45.4	0.0	26.3	19	46.7	0.0	0.0	100.0	0.5	1	0.0	0		2		Y

Abbreviations and Acronyms: Imperv. = percent impervious cover. Ag = agricultural land cover. Animal Operations = NPDES-permitted concentrated animal feeding operations. DWR classifications: HQW = high quality waters; ORW = outstanding resource waters; Tr = trout streams; WSW = water supply watersheds. Natural Heritage Program (NHP) designations: % SNHA = percent of watershed area that is NHP -designated Significant Natural Heritage Area; NHEO = natural heritage element occurrence. Non-DMS projects = funded by 319, Clean Water Management Trust Fund (CWMTF) and local/regional Land Trusts. WRC = NC Wildlife Resources Commission. DMS = NC Division of Mitigation Services. LWP = DMS local watershed plan. TLW = DMS targeted local watershed. See also the **Definitions** section at the end of this document.

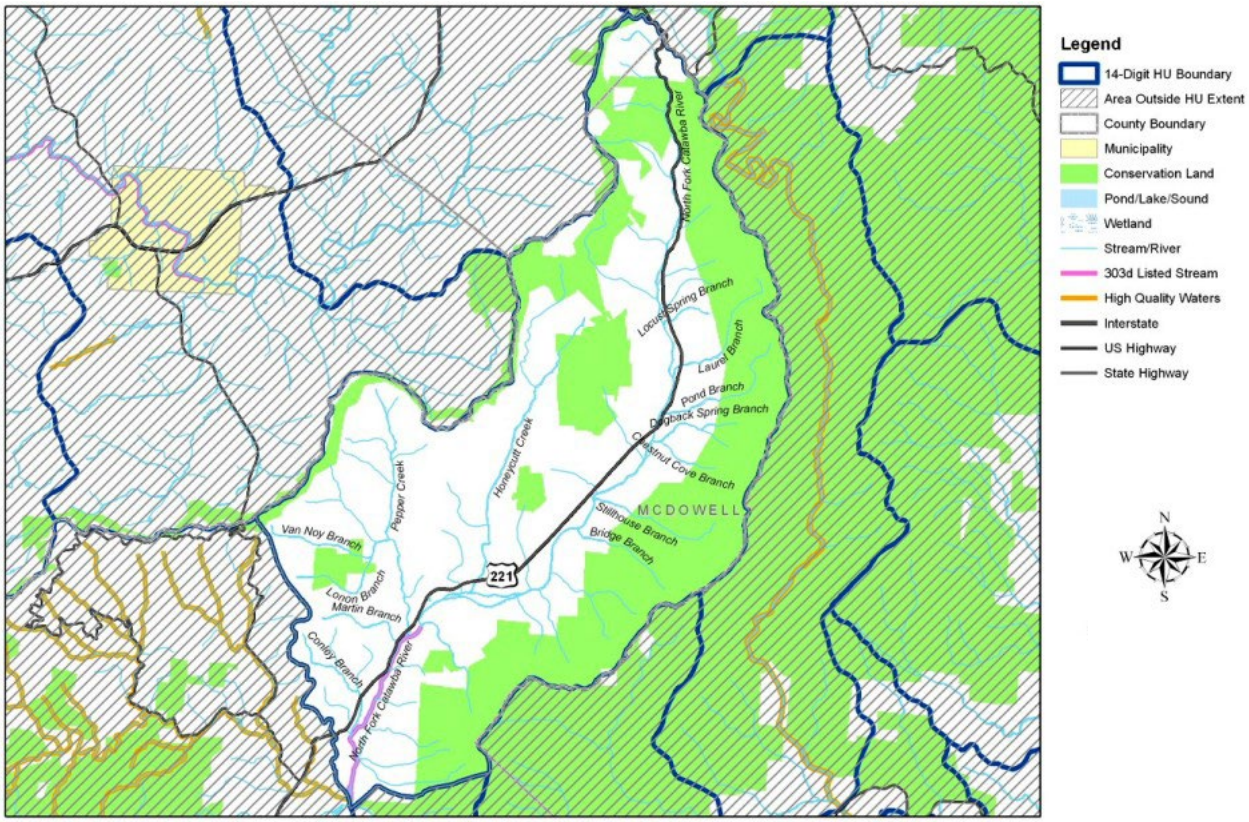
Table 2. 14-Digit HUCs Land Use/Land Cover Changes from 2001-2011				
	Increased Impervious Surface (acres)	**Forest Converted to Developed (acres)**	**Forest Converted to Agriculture (acres)**	**Loss of Wetland (acres)**
Catalog Unit 03050101				
03050101020010	16.24	4.89	24.02	--
03050101030010	22.02	23.80	31.14	--
03050101030030	4.67	220.17	132.77	--
03050101030060	30.25	20.91	115.42	0.44
03050101040010	160.12	47.59	63.16	--
03050101040020	7.34	25.35	143.68	--
03050101050050	121.65	14.01	193.93	3.56
03050101060030	0.44		196.60	--
03050101060050	163.24	38.70	25.35	--
03050101070020	--	3.11	6.00	--
03050101070030	--	--	--	--
03050101070040	--	6.23	10.90	--
03050101080010	272.43	153.90	6.45	--
03050101080020	86.07	44.26	94.30	--
03050101090010	88.74	35.58	56.71	--
03050101090020	203.05	130.10	24.46	0.22
03050101120010	0.44	7.34	31.80	--
03050101120030	42.26	31.36	83.84	--
03050101120040	9.56	0.44	1.56	--
03050101130010	--	9.56	43.81	--

Discussion of Targeted Local Watersheds in upper Catawba River Basin

Upper Catawba 03050101

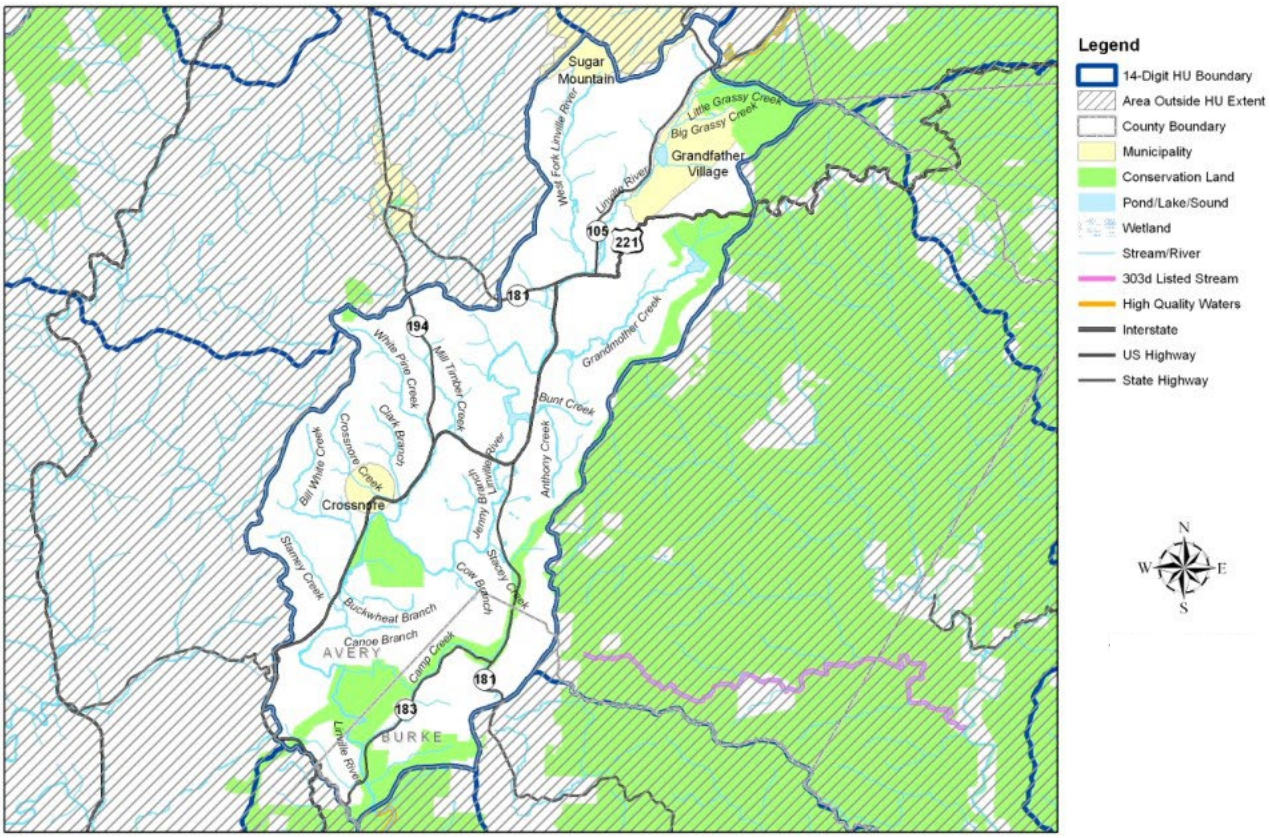
North Fork Catawba River: 03050101020010

This 45-square mile watershed spans the southeastern flank of the Blue Ridge, flowing southward from the headwaters of the North Fork Catawba River near the community of Linville Falls. It is rich in natural resource assets, characterized by 100 percent DWR-classified trout streams, 90 percent forest cover, 39 percent conserved lands (Pisgah National Forest and Game Land), 34 Natural Heritage Element Occurrences (NHEOs) and 5.9 percent Significant Natural Heritage Area (SNHA). It contains only 5.4 percent agricultural land and two permitted animal operations, concentrated primarily in the lower reaches of the watershed. Thirteen non-DMS watershed projects and one DMS project occur within this HU. In 2004, three miles of the lower reach of North Fork Catawba River in this watershed were rated as impaired by the N.C. Division of Water Resources (DWR) due to declining benthic bioclassification scores; however, this impairment may have been due primarily to drought conditions (DWR, 2004). In 2007, both of the benthic sampling sites on the North Fork Catawba showed no declines in bioclassification from the 2002 sampling (DWR, 2008). This watershed is worthy of preservation efforts, but also contains opportunities for stream restoration and best management practices (BMP) projects – especially along its lower, more agricultural reaches.



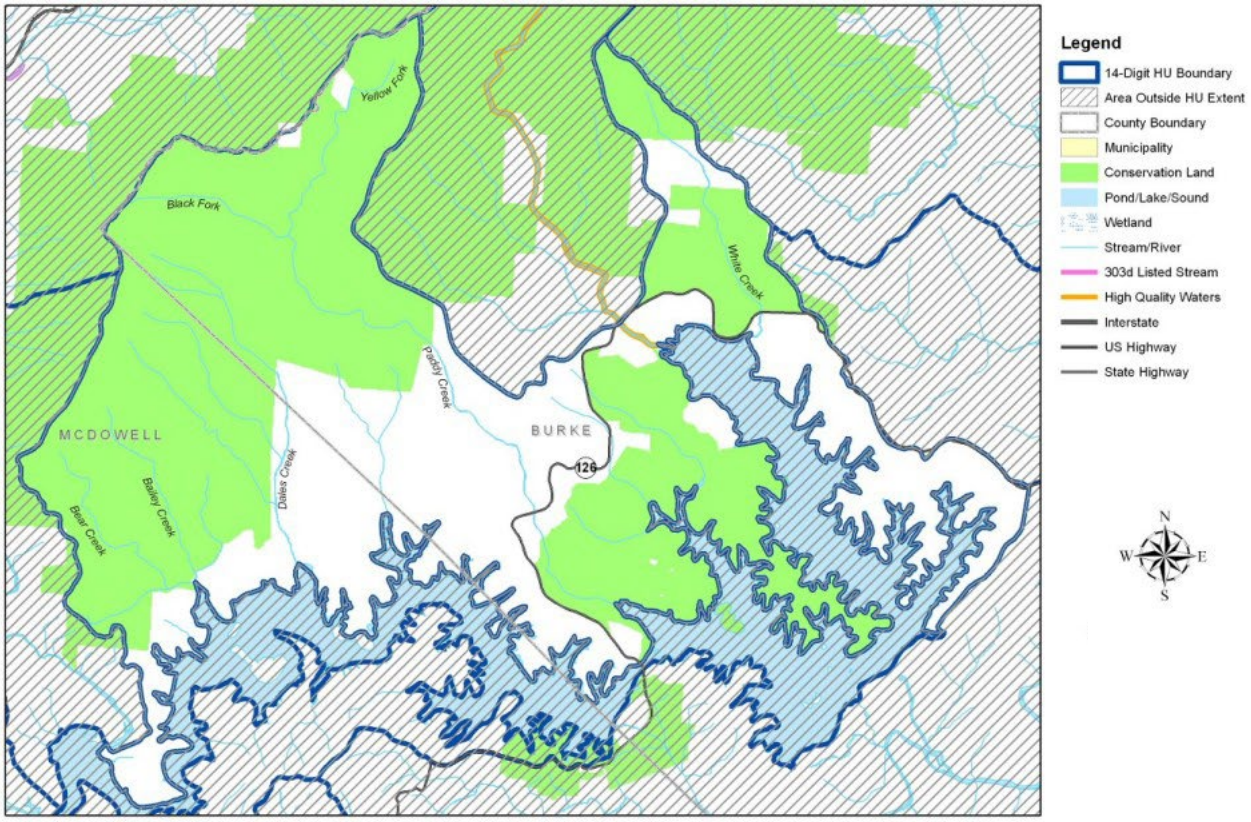
Upper Linville River: 03050101030010

The headwaters of this 44-square mile watershed begin along the flanks of Grandfather Mountain and Sugar Mountain in Avery County. Within this watershed, the upper Linville River flows along the U.S. 221 highway corridor for much of its course and cascades into the federally designated Linville Gorge Wilderness Area at the lower end of the HU (at Linville Falls). Although 74 percent forested, with 80 NHEOs and 14 percent lands in conservation, this watershed contains 11 percent agricultural land cover and 32 percent degraded (non-forested) riparian buffers. Degraded buffers are likely associated with highway rights-of-way, construction of new homes and retail centers, golf course communities and agriculture (e.g., Christmas tree farms). Impoundments to create lakes on private land have likely contributed to aquatic habitat degradation within this watershed. The watershed includes a NC Wildlife Resources Commission (WRC)-designated priority aquatic habitat (Wildlife Action Plan, 2005). A primary goal of watershed restoration activities in this HU would be the protection of rare/threatened aquatic species through the restoration of degraded buffers and the preservation of high-quality habitat areas (including rare high-elevation bogs), especially along tributary streams to the upper Linville River. Improved stormwater management and sediment/erosion control practices within the numerous small communities and commercial developments along highways U.S. 221 and NC 183 would also contribute significantly to such restoration efforts.



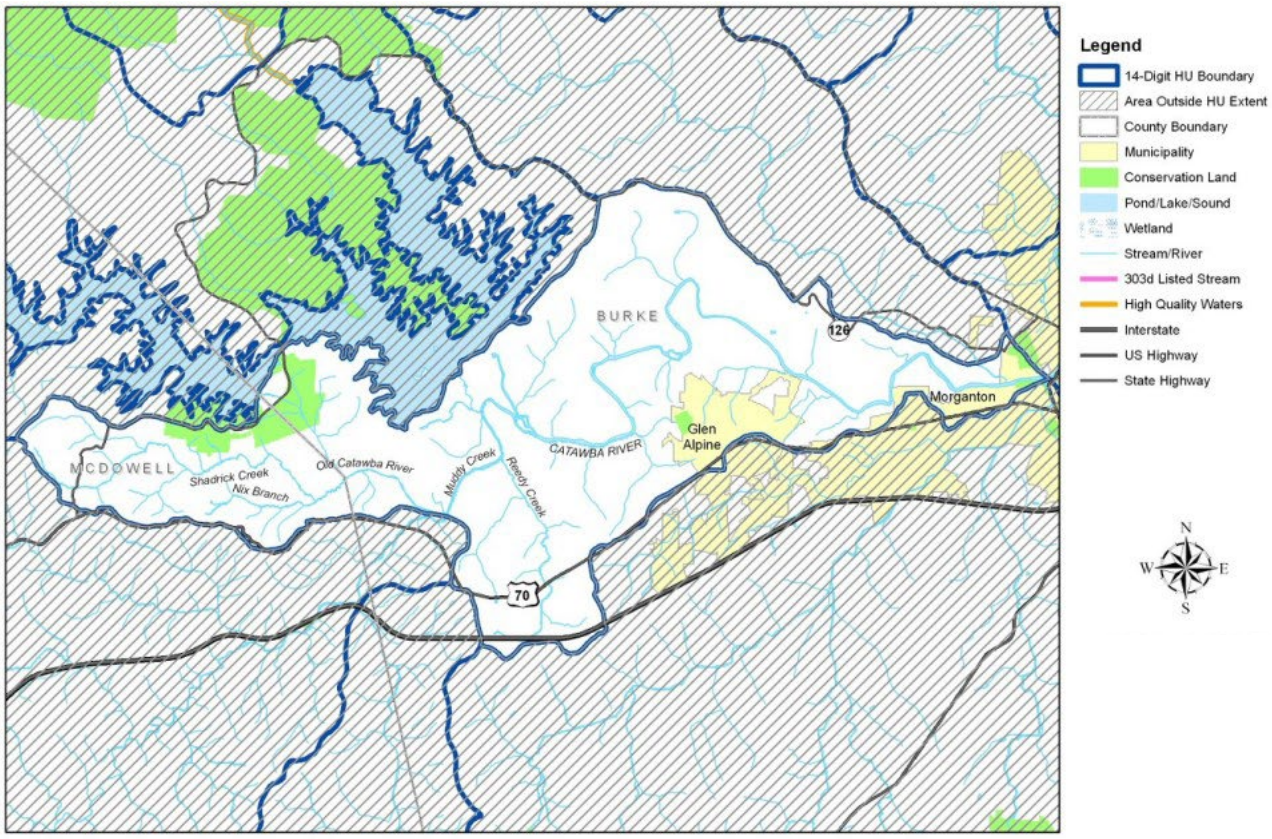
Paddy Creek: 03050101030030

This 34-square mile watershed includes several relatively small tributary streams that flow directly into Lake James, which straddles the McDowell-Burke County line. Paddy Creek is the largest of these direct tributaries to Lake James. The watershed is nearly 90 percent forested, including 58 percent land in conservation (Pisgah Game Lands; Lake James State Park), and suffers from only 5.3 percent degraded (non-forested) riparian buffers. There is very little agriculture (6.2 percent of land cover) in the watershed. Stream and buffer preservation sites are likely to be abundant within this watershed, and its proximity to Lake James State Park could afford partnership opportunities with the NC Division of Parks.



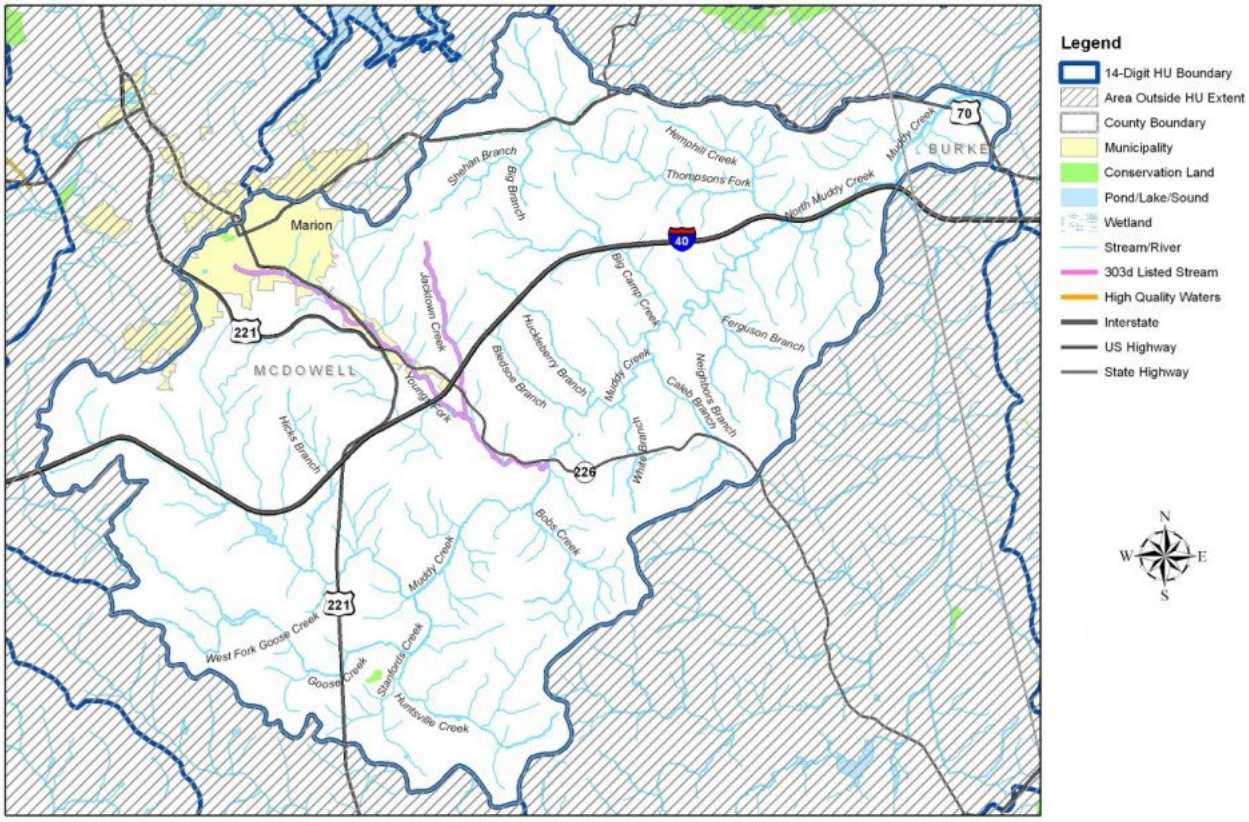
Shadrick Creek – Catawba River: 03050101030060

This 28-square mile watershed includes Shadrick Creek, lower Muddy Creek and a portion of the mainstem Catawba River immediately below the dam at Lake James (and immediately upstream of the City of Morganton). It is 64 percent forested, 19 percent agricultural land, two percent impervious cover, with just over 21 percent degraded (non-forested) riparian buffers and two permitted animal operations. Forty-eight percent of its stream miles are classified by DWR as water supply watershed (WSW) waters and only 3.3 percent of its lands are conserved. It includes four NHEOs. The DMS stream projects provide a foundation upon which additional watershed restoration and protection efforts could build, and the watershed's proximity to Morganton presents municipal partnership opportunities for the initiation of such efforts, including possible stormwater BMP projects. It is one of four watersheds added to the list of TLWs in the upper Catawba in the 2009 RBRP update.



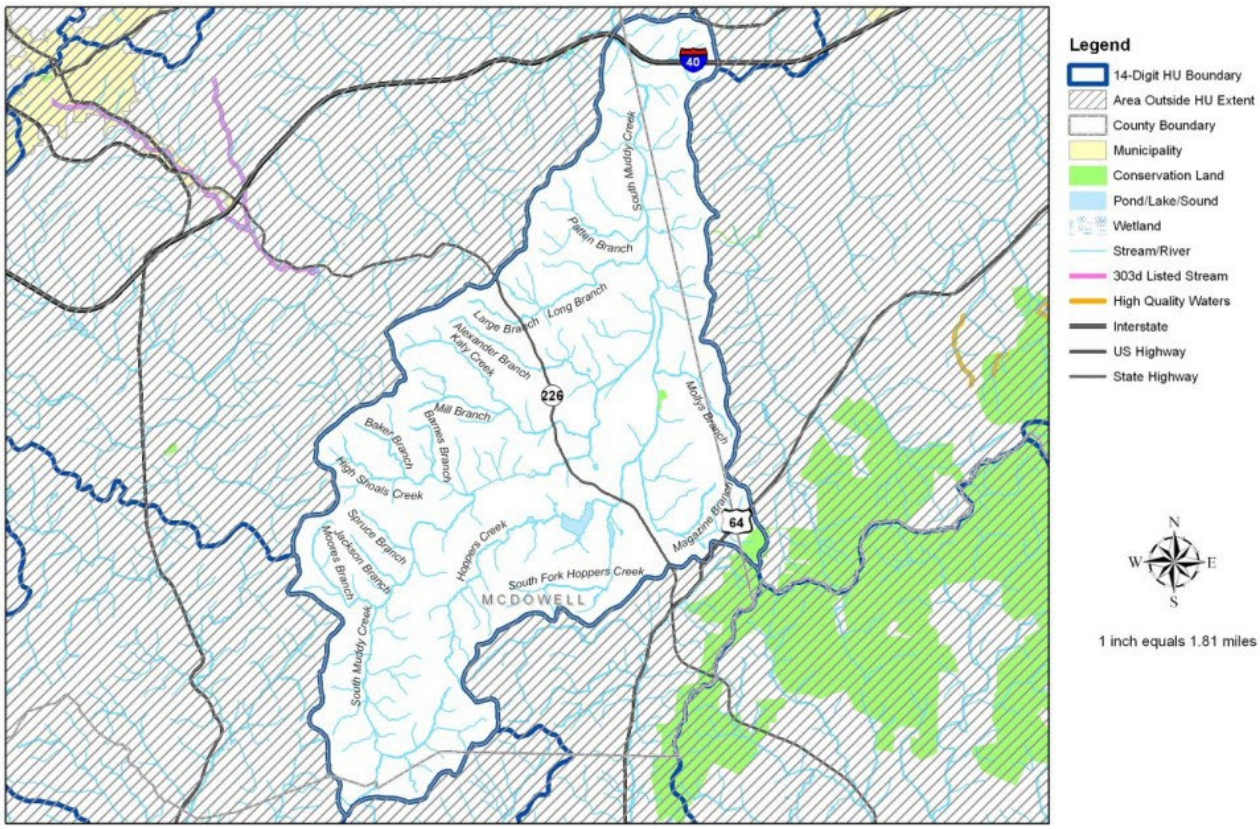
North Muddy Creek (including Youngs Fork, Jacktown Creek): 03050101040010

This 59-square mile watershed in southeastern McDowell County is characterized by 66 percent forest and 21 percent agricultural land cover, with five permitted animal operations and 32 percent degraded (non-forested) riparian buffers. It includes 2.1 percent impervious cover, concentrated primarily within the town of Marion along its northwestern divide. It contains 21 NHEOs, but less than one percent of its area is in conserved status. Youngs Fork (Corpening Creek) and its tributary Jacktown Creek flow out of the Marion area, and both were considered to have impaired biological integrity (fish and benthos) by DWR in 2004 and were placed on the 2006 303(d) list. Multiple stressors, including sedimentation and nutrient enrichment, contribute to the water quality impairment and habitat degradation within this sub-watershed (DWR, 2004). This watershed, along with the adjacent South Muddy Creek HU, has been the subject of watershed assessment and restoration efforts by the *Muddy Creek Restoration Partnership* over the past several years.



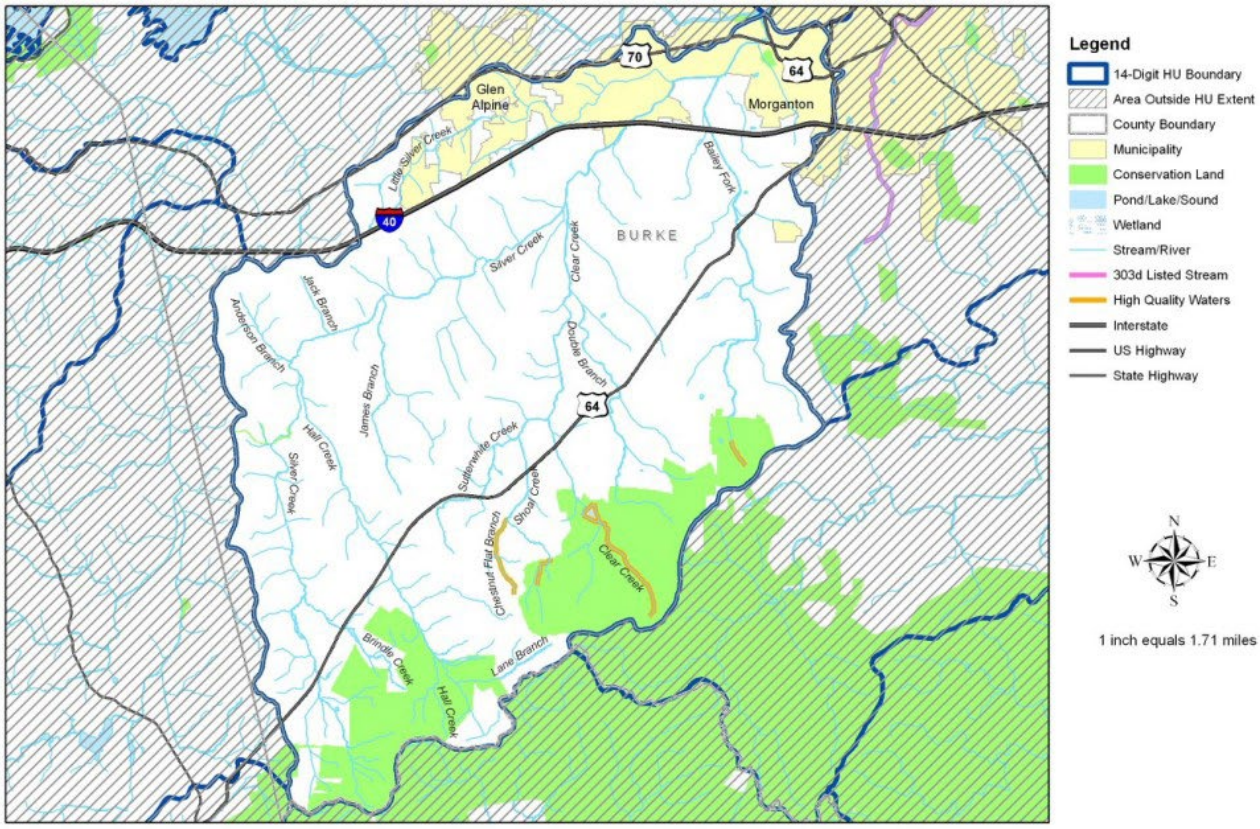
South Muddy Creek: 03050101040020

South Muddy Creek and its tributaries drain 40 square miles of forest and agricultural lands in southeastern McDowell and southwestern Burke counties. It joins North Muddy Creek to form Muddy Creek, which in turn flows into the Catawba River (Morganton's primary drinking water source) just below Lake James in western Burke County. This watershed's land use is 75 percent forested, 19 percent agricultural, and includes 14 animal operations and 20 percent degraded riparian buffers. It contains 29 NHEOs but has less than one percent conserved lands. It is a focus of the assessment and restoration efforts being undertaken by the *Muddy Creek Restoration Partnership* noted above for North Muddy Creek.



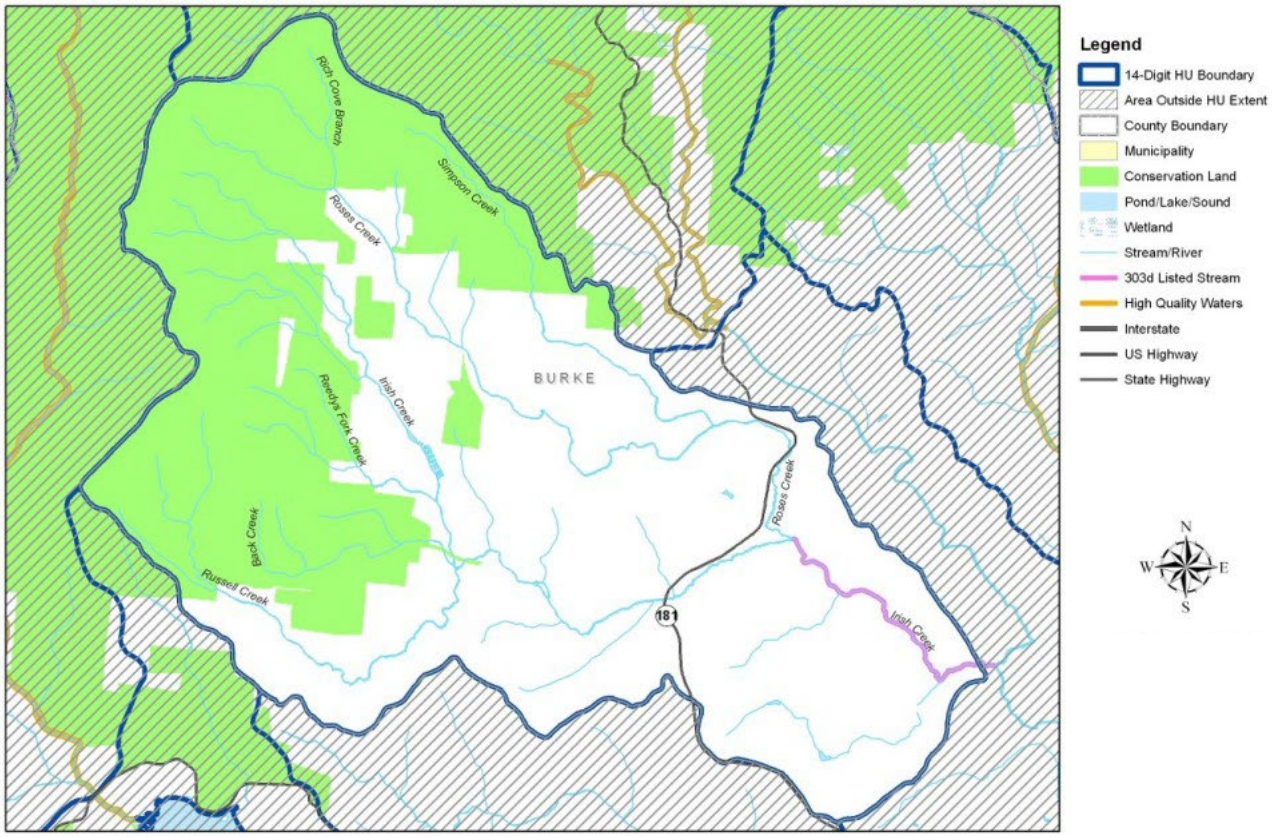
Silver Creek: 03050101050050

At 61 square miles, this is the second largest of the targeted watersheds (TLWs) selected within the upper Catawba River basin. The headwaters of Silver Creek and its major tributary, Clear Creek, flow out of the South Mountains in extreme southwestern Burke County. Silver Creek eventually flows into the Catawba River on the western margins of the City of Morganton. The watershed includes 59 percent forest, 23 percent agriculture and 2.9 percent impervious cover. With 28 permitted animal operations and 31 percent degraded (non-forested) riparian buffers, there are likely to be numerous stream and buffer restoration/enhancement opportunities. The watershed is also asset-rich, with 4.9 percent HQW-classified waters, 10.2 percent significant natural heritage area (SNHA), 13 percent conserved lands and 72 NHEOs. The lowermost portion of this watershed falls under NPDES Phase II requirements for stormwater management. Protection of the WSW-classified Catawba River through Morganton is a primary goal of any restoration efforts in this HU.



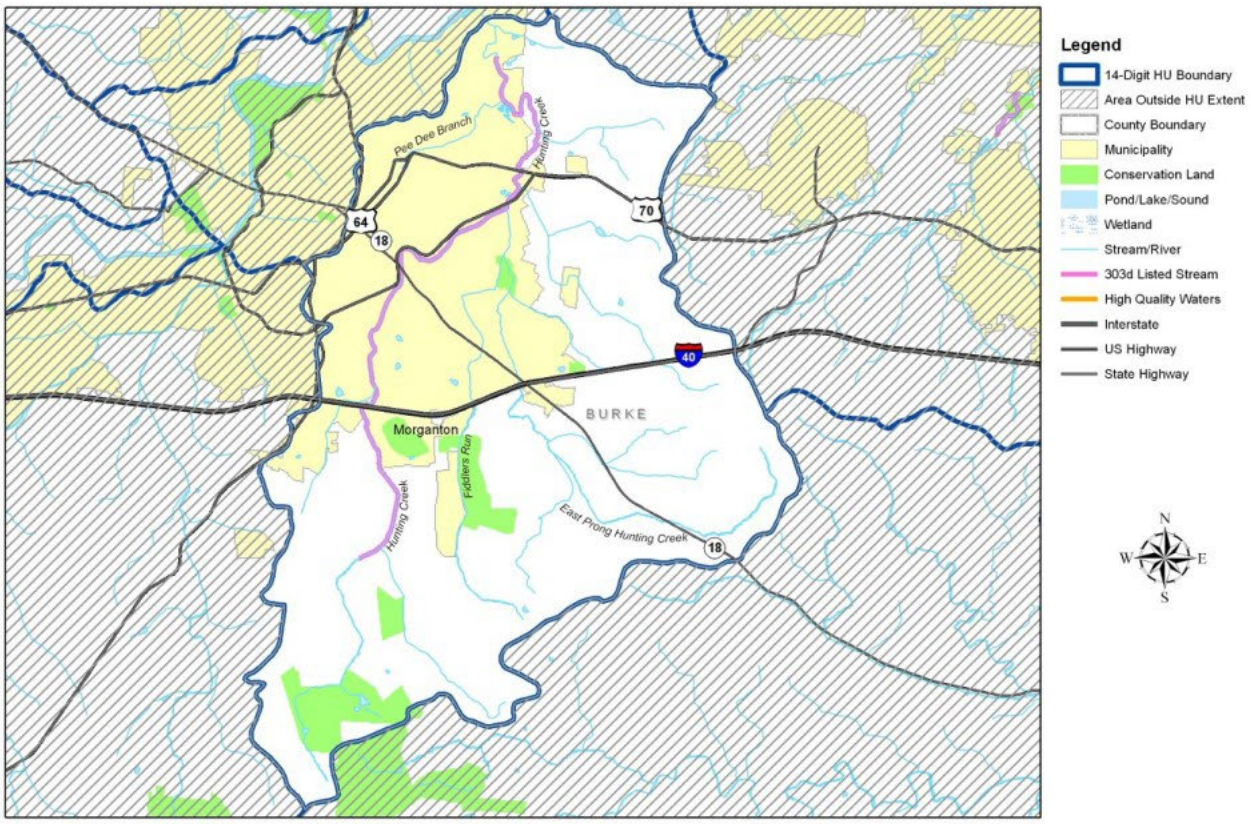
Irish Creek: 03050101060030

The upper reaches of this 34-square mile watershed lie within Pisgah National Forest, while the lower reaches flow through land used extensively for tree farming (plant nurseries). It is 86 percent forested, 10 percent agricultural land cover, has 10 percent non-forested riparian buffers, 38 percent lands in conservation, 17 NHEOs and is a WRC (2005) priority aquatic habitat. The lower three miles of Irish Creek were considered impaired on the basis of fish sampling in 2003 (DWR, 2004); however, the May 2007 fish community assessment yielded a dramatic improvement in bioclassification (DWR, 2008). With the extensive nursery tree propagation in its lower reaches, there are excellent opportunities for the implementation of agricultural BMPs, a primary goal within this watershed.



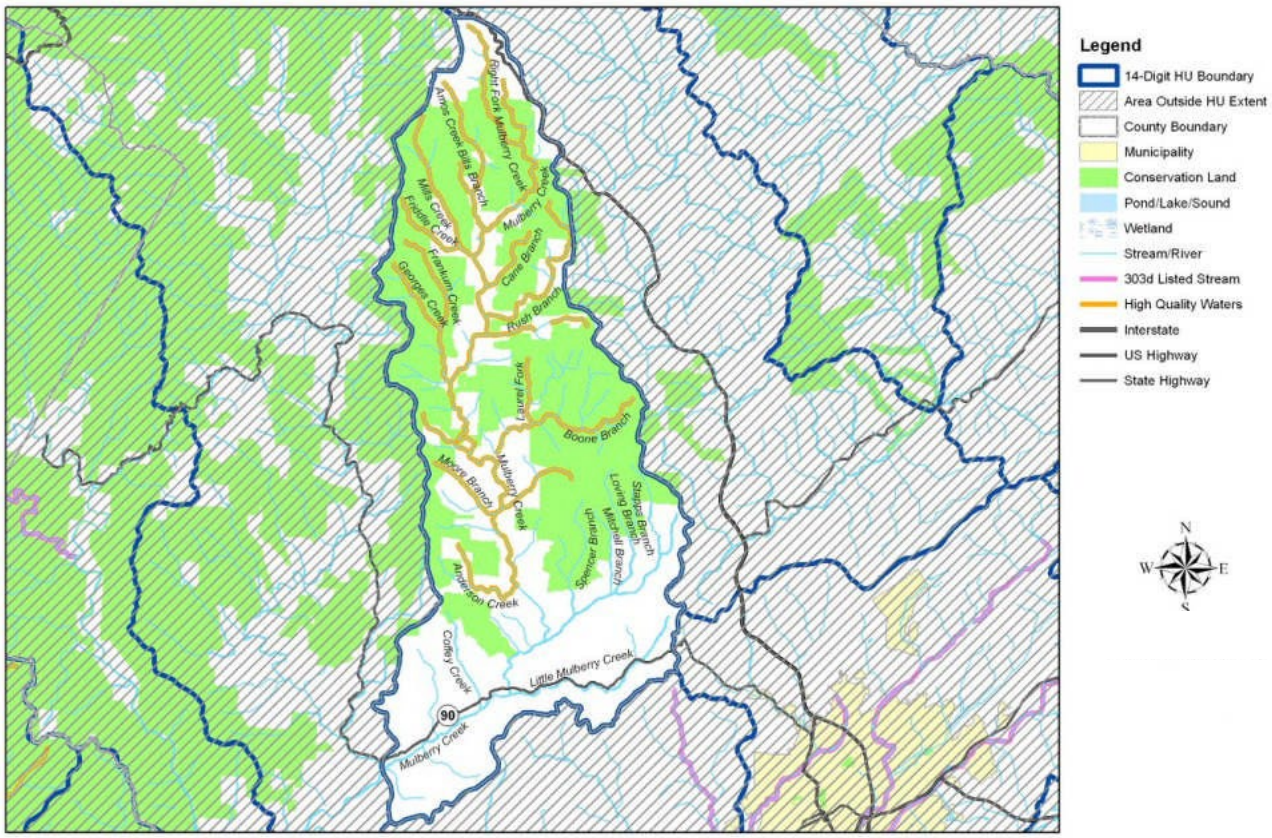
Hunting Creek: 03050101060050

This 26-square mile watershed stretches through the eastern half of the City of Morganton in central Burke County. Hunting Creek eventually flows into the Catawba River just above Lake Rodhiss (a water supply reservoir considered impaired by DWR since 2004). Hunting Creek itself has been considered impaired for aquatic life since fish community sampling in 2003 (DWR, 2004). With eight percent impervious cover and 41 percent degraded (non-forested) riparian buffers, the negative effects of urbanization on stream health within this watershed are apparent. As Morganton begins to implement Phase II stormwater regulations, there should be numerous opportunities for stormwater BM Ps/retrofits and education/outreach efforts within this HU.



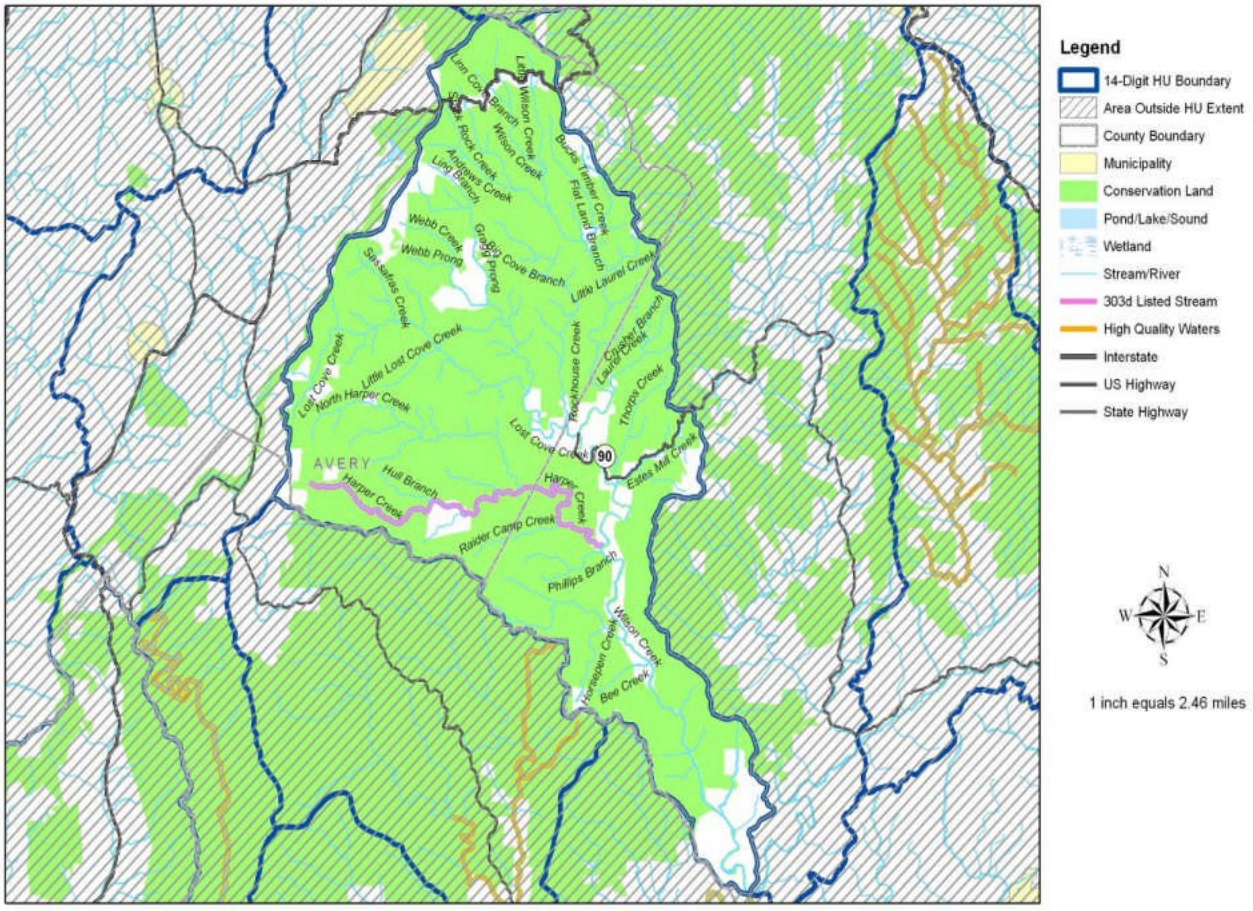
Mulberry Creek (incl. Brown Branch): 03050101070020

Mulberry Creek flows out of a largely forested landscape in northwestern Caldwell County and enters the Johns River near the community of Collettsville. This 42-square mile watershed is 90 percent forested and includes 46 percent conserved lands (primarily in Pisgah National Forest and Game Lands). Only 7.4 percent of land use is agriculture; there are two animal operations and 20 percent degraded (non-forested) riparian buffers. Upper Mulberry Creek and its headwater tributaries are classified as HQW (high quality waters) by DWR, and 20 percent of the streams in the watershed are DWR-classified trout streams. The watershed is part of a priority habitat area (WRC, 2005) and is home to five NHEOs. The primary goal for restoration efforts in this watershed is protection of the high-quality aquatic habitat and fish communities in Mulberry Creek and (downstream) in Johns River.



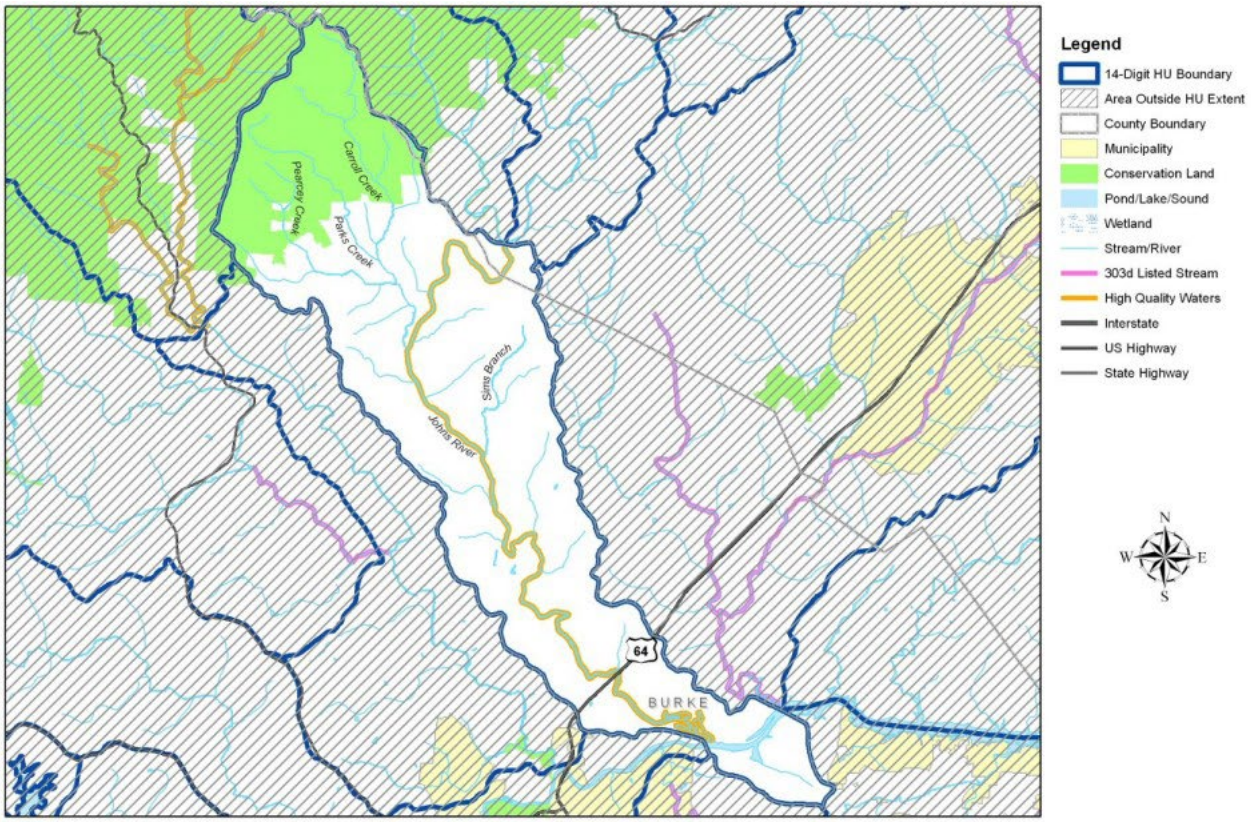
Wilson Creek (including Harper Creek): 03050101070030

At 69 square miles in area, this watershed is the largest TLW in the upper Catawba basin. Wilson Creek and its headwater tributaries flow off the eastern slopes of Grandfather Mountain in eastern Avery County and through a relatively pristine (96 percent forested) landscape. This area is known for its excellent recreational opportunities, including scenic waterfalls, wilderness hiking and nationally recognized trout fishing. Wilson Creek is one of only four rivers in North Carolina designated as a *National Wild and Scenic River*. One hundred percent of the stream miles are classified as HQW and trout waters, and 84 percent of the land area is in conserved status (including Blue Ridge Parkway and Pisgah National Forest). The watershed is home to 85 NHEOs (the most of any HU in the Catawba River Basin), and it is a WRC priority habitat area (2005). Only 5.5 percent of its riparian buffers are non-forested. This HU is one of four new TLWs designated in the 2009 RBRP for the upper Catawba basin. The primary goals for this watershed are (1) continued protection of its excellent aquatic habitat, riparian buffers and trout fishery; and (2) investigation into the causes/sources of declining pH values in its streams.

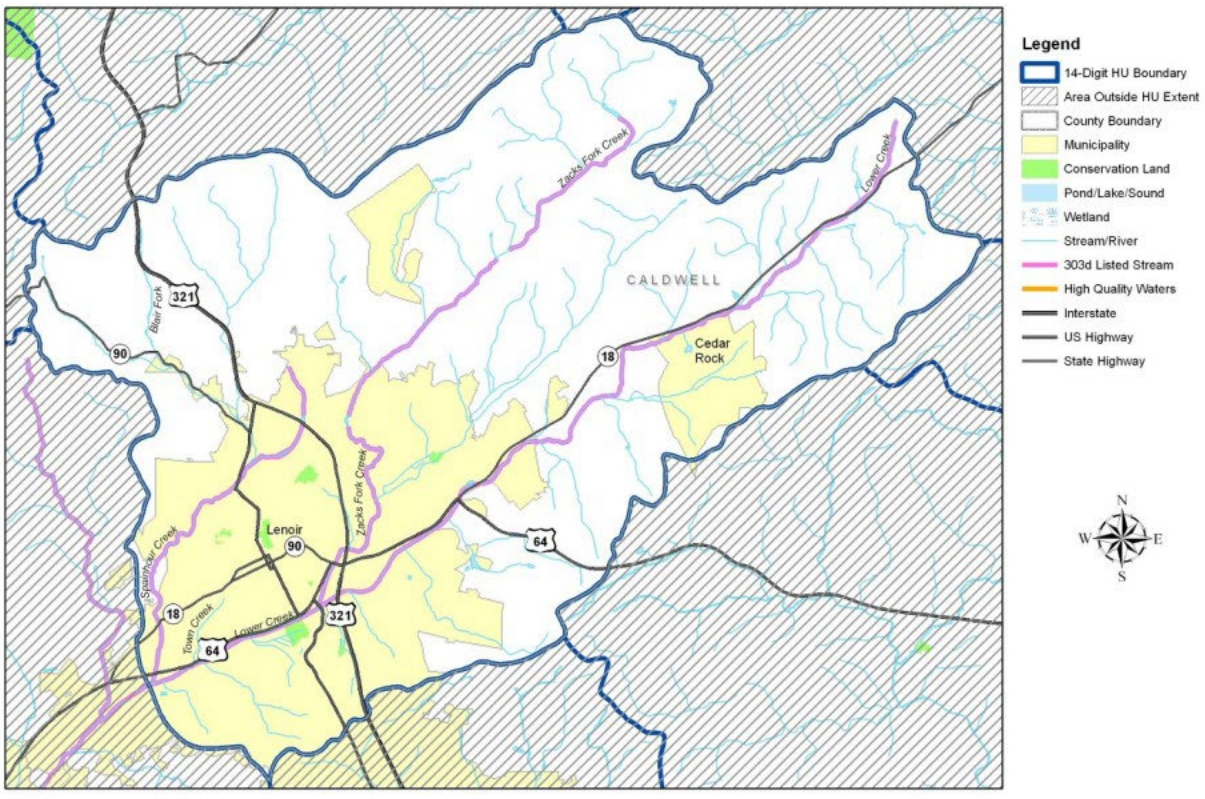


Lower Johns River: 03050101070040

The Johns River flows southward through Burke County into the Catawba River at the upper end of Lake Rodhiss (a nutrient- and sediment-impaired reservoir), just northeast of Morganton. This watershed is 27 square miles in area, 83 percent forested, 13 percent agricultural (with two animal operations) and contains 13 percent degraded (non-forested) riparian buffers. Sixty-two percent of the stream miles are HQW-classified and 21 percent of the land area is conserved (primarily the headwater portions within Pisgah National Forest). It is a WRC priority area (2005) and is home to 13 NHEOs. DWR is seeking to partner with key landholders and stakeholders (e.g., Crescent Resources, NC Wildlife Resources Commission, Burke NRCS and SWCD) to protect riparian habitat and implement agricultural BMPs at key sites within the Johns River system (DWR, 2004).



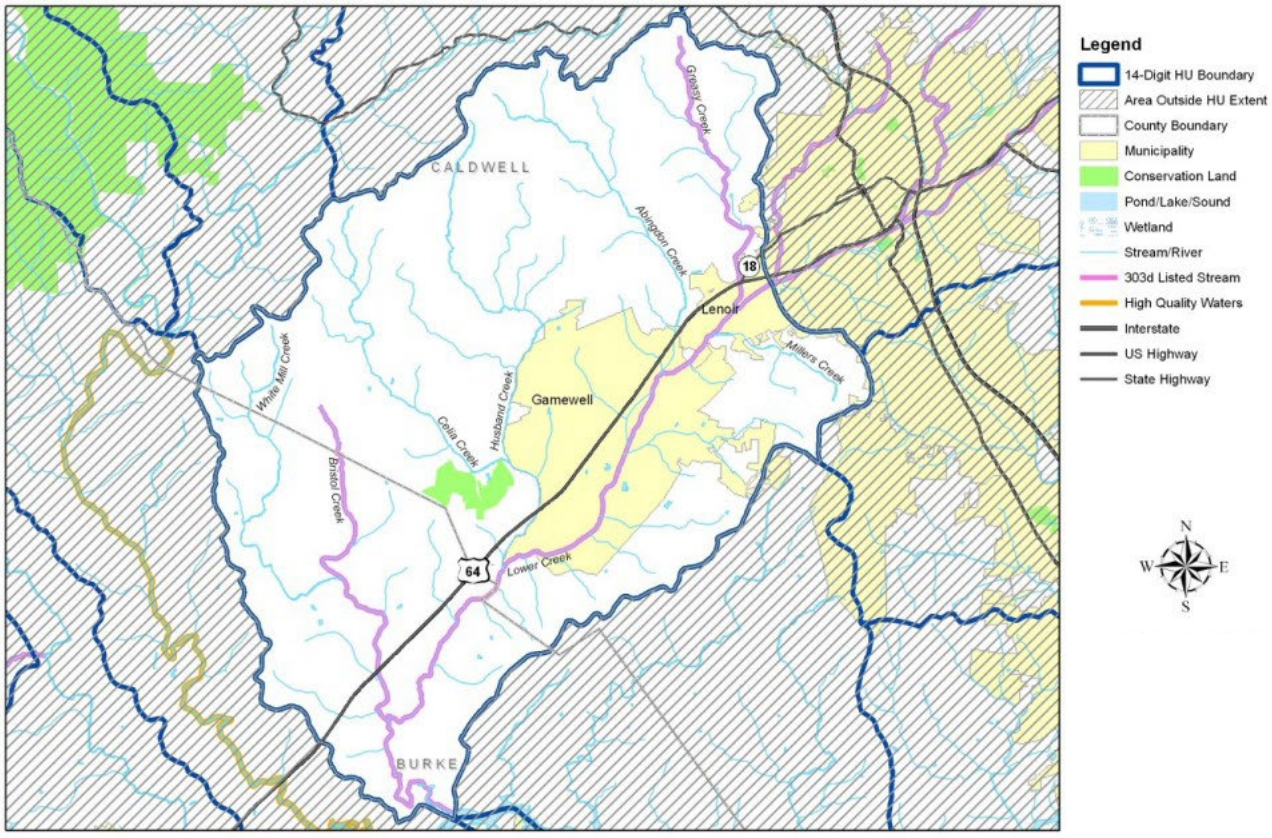
Upper Lower Creek (including Spainhour Creek): 03050101080010
Together with the next TLW in this document (*lower* Lower Creek), this 41-square mile watershed is a focus of DMS's Lower Creek Local Watershed Planning (LWP) initiative. Upper Lower Creek and its two major tributaries, Zacks Fork and Spainhour Creeks, flow through the heart of Caldwell County into the City of Lenoir. The watershed is characterized by relatively high impervious cover, primarily concentrated within the city limits of Lenoir, and 50 percent degraded (non-forested) riparian buffers – the highest percentage of degraded buffers of any of the 20 TLWs selected in the upper Catawba basin. Less than one percent of the land area is in conserved status (primarily within municipal parks) and there are significant levels of aquatic habitat degradation associated with nonexistent riparian buffers, severe streambank erosion and stormwater flows from impervious surfaces. Lower Creek, Zacks Fork Creek and Spainhour Creek were all considered impaired for aquatic life (and turbidity violations in Lower Creek) based on sampling conducted by DWR (2004) and were placed on the 2006 303(d) list. Goals for this watershed include riparian buffer and stream channel restoration, coupled with improved stormwater management (and BMPs) within urban catchments.



Upper Catawba River Basin Restoration Priorities 2009

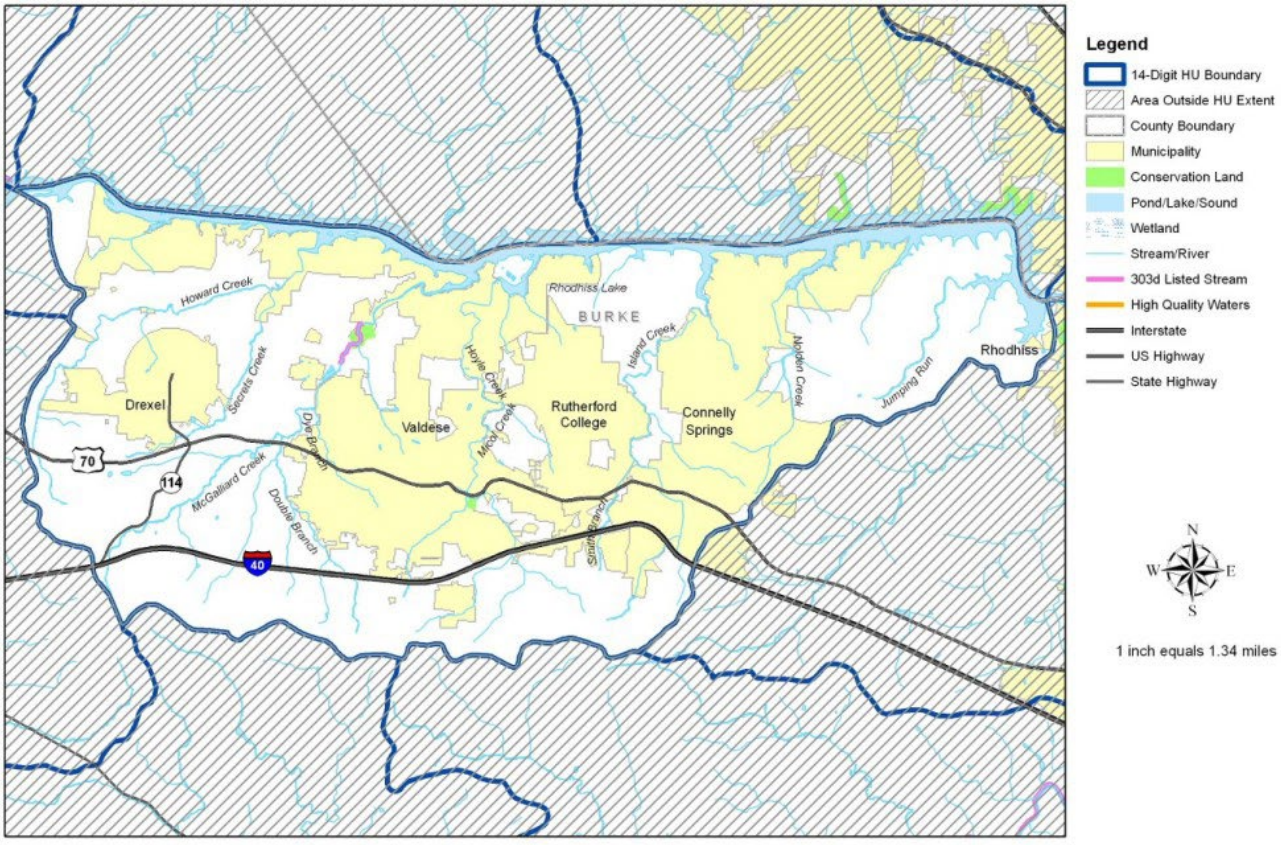
Lower Lower Creek (including Bristol Creek): 03050101080020

This 58-square mile HU constitutes the lower portion of the Lower Creek watershed in Caldwell and Burke counties and was included in DMS's Lower Creek LWP (watershed assessment and planning) effort. It includes the southern portion of the City of Lenoir and all of the Town of Gamewell. Its land cover characteristics are: 2.2 percent imperviousness, 63 percent forested, 24 percent agricultural, 36 percent non-forested riparian buffers and 12 permitted animal operations. It suffers from similar stressors as those identified for the *upper* Lower Creek watershed, including urban stormwater runoff, degraded buffers, eroding streambanks, and sediment/ turbidity issues. Streams considered impaired for aquatic life (based on benthic sampling results) include the Lower Creek tributaries, Greasy Creek and Bristol Creek (DWR, 2004). The implementation of buffer restoration projects, coupled with agricultural and urban stormwater BMPs within priority sub-watersheds, would help address the water quality impairment and habitat degradation noted across the Lower Creek watershed. DWR's 319 program funded a Watershed Coordinator position to help coordinate implementation of the Lower Creek *Watershed Management Plan* recommendations and projects (administered through Caldwell SWCD).



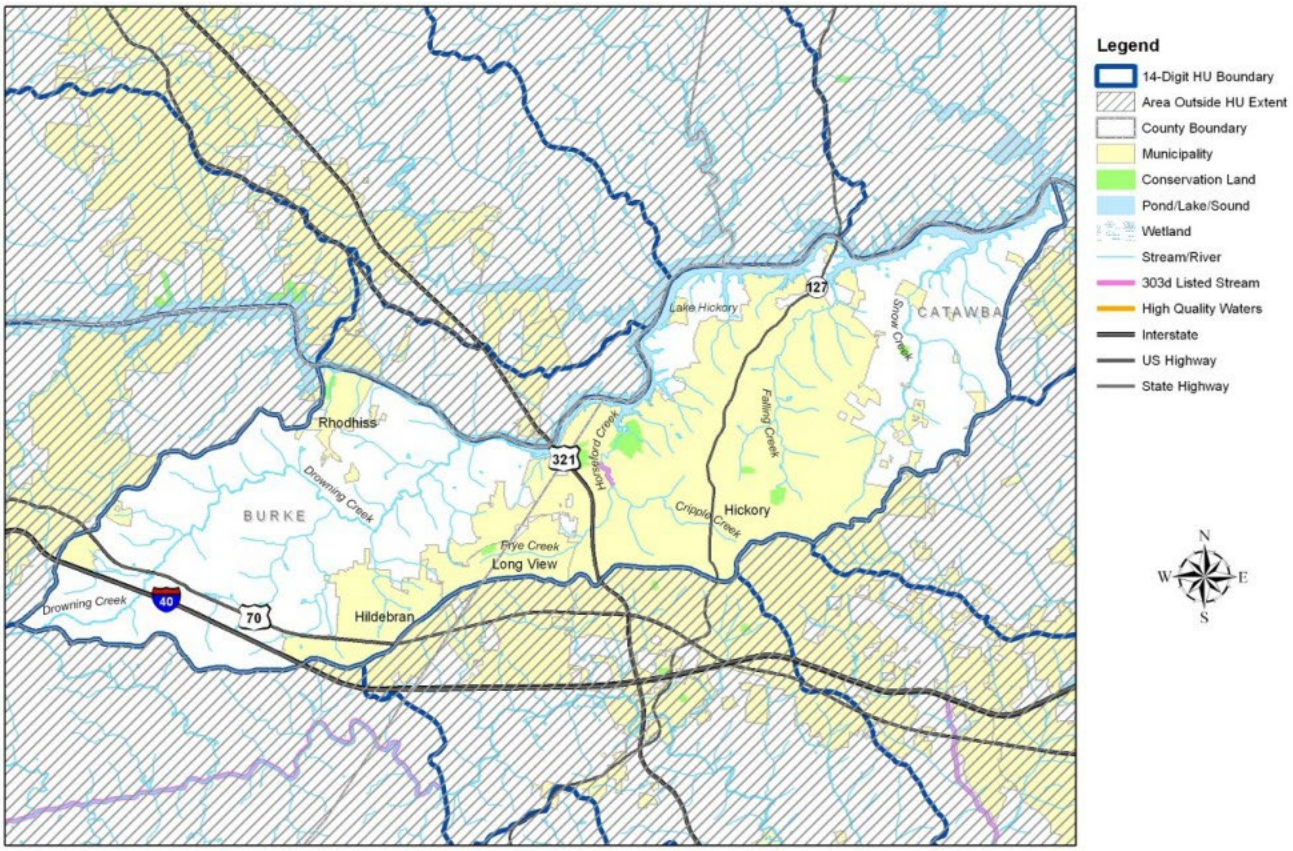
McGalliard Creek: 03050101090010

This 38-square mile watershed includes several streams that flow directly into Lake Rodhiss through the towns of Drexel, Valdese, Rutherford College and Connelly Springs. A significant portion of the area is urban or otherwise 'built-up' land cover, with total watershed imperviousness estimated at 5.3 percent. There is some agricultural land use, with 15.4 percent agricultural land cover and 8 animal operations in the watershed. Twenty-five percent of the riparian buffer area is non-forested. The entire watershed is classified as having WSW waters, as Lake Rodhiss is a water supply reservoir serving several municipalities in Burke County. The lower 3.9 miles of McGalliard Creek is considered impaired due to declining fish and benthic bioclassifications (DWR, 2004) and this stretch was placed on the 2006 303(d) list. Impacts from urban runoff and insufficient riparian buffer vegetation are noted by DWR (2004), and these are attributed primarily to the residential, commercial and transportation land uses that dominate the watershed.



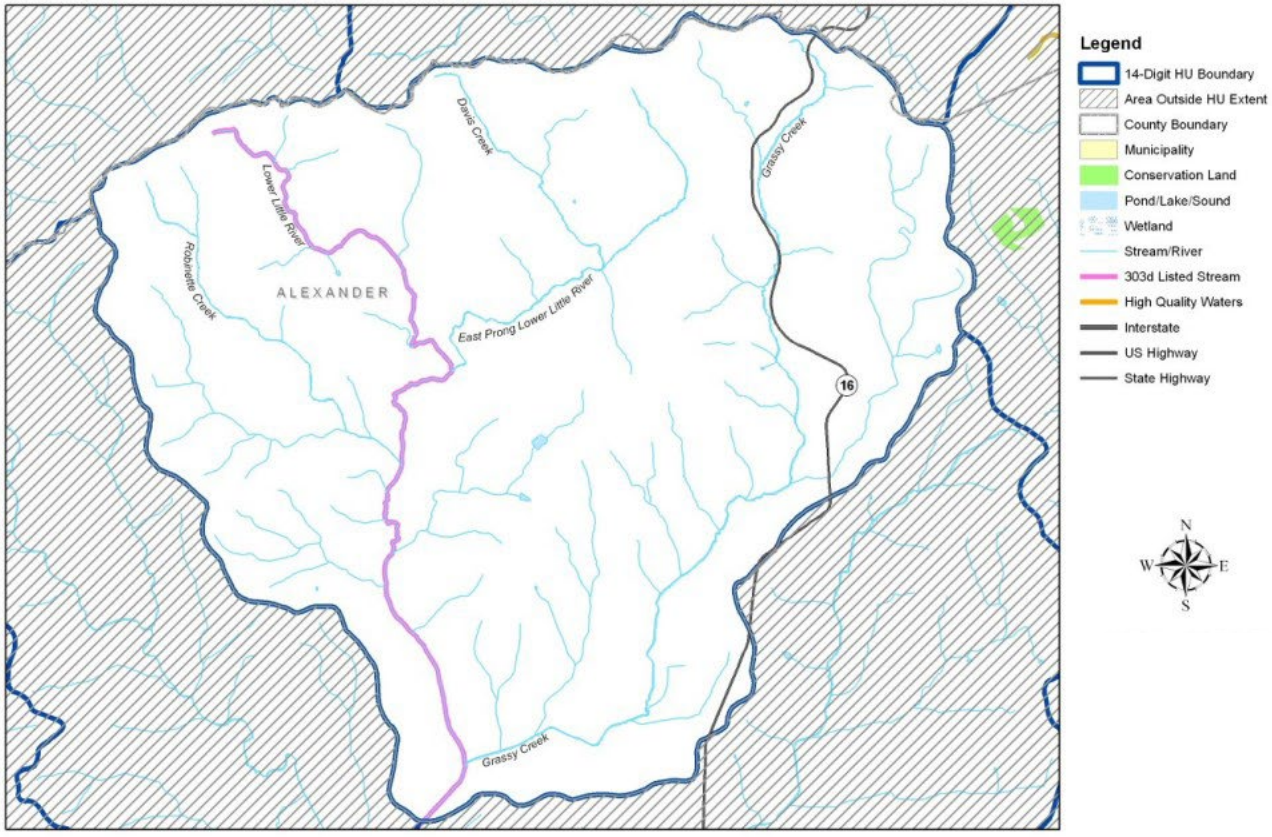
Drowning Creek, Horseford Creek, Falling Creek: 03050101090020

This 45-square mile HU, which spans the Burke-Catawba county line, includes three streams that flow directly into the Catawba River and Lake Hickory (below Lake Rodhiss). The watershed includes most of the northern portion of the City of Hickory and is heavily developed, with only 26 percent forested cover (the lowest of any of the upper Catawba TLWs) and a total imperviousness of 13.8 percent (the highest of any of the upper Catawba TLWs). Over 48 percent of riparian buffers are degraded (non-forested). Over 70 percent of the stream miles are classified as WSW waters and nearly 20 percent of the watershed falls within an area covered by the NPDES Phase II stormwater rules. A small stretch of Horseford Creek (0.4 miles) is rated as impaired due to poor benthic bioclassifications caused by urban runoff (DWR, 2004). With the mix of agricultural lands (primarily in the Drowning Creek sub-watershed) and urban lands, and heavily degraded riparian buffers, there is likely no shortage of stream/buffer restoration opportunities within this watershed. Also, candidate sites for stormwater BMP projects are likely numerous across the Hickory area.



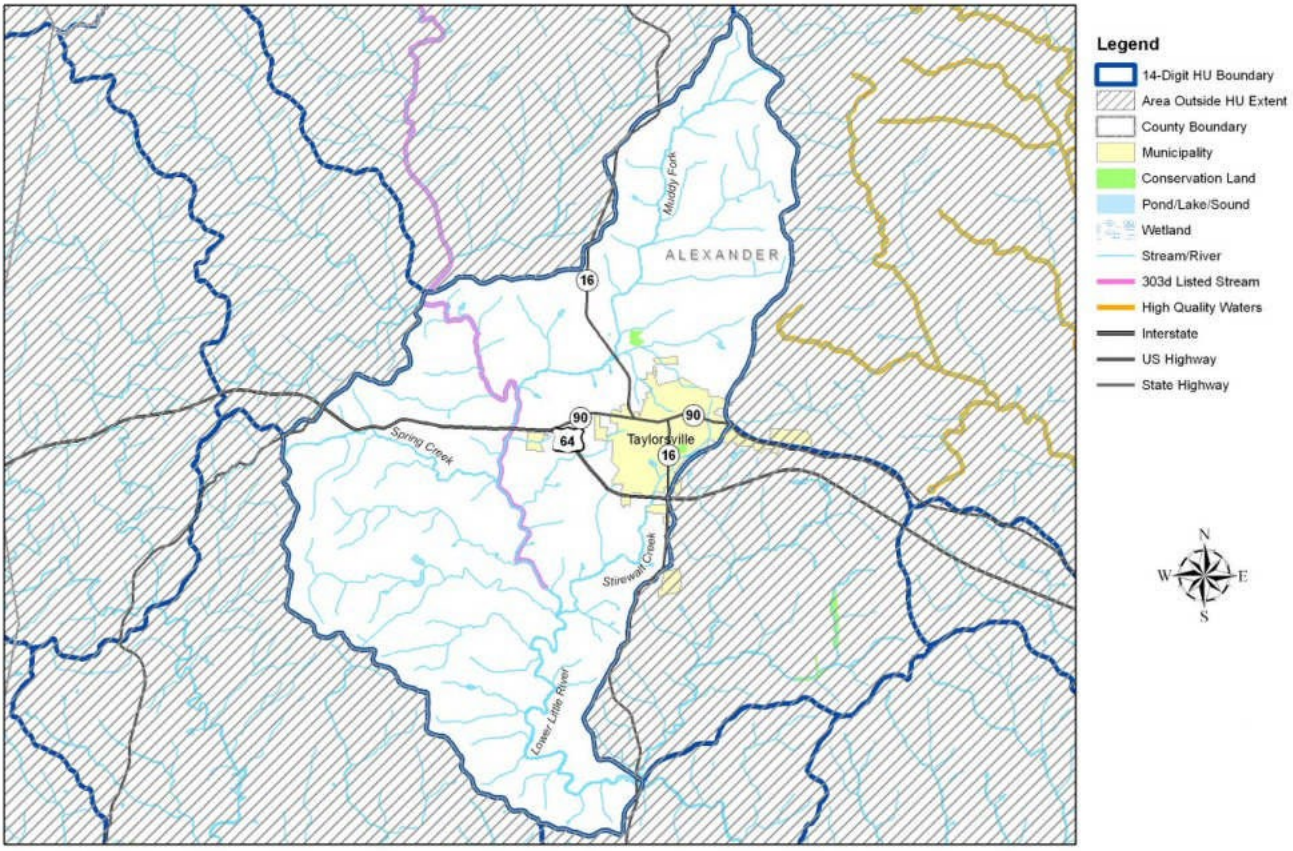
Lower Little River, incl. Grassy Creek: 03050101120010

The Lower Little River drains a portion of the Brushy Mountains and northwestern Alexander County (northwest of Taylorsville). This is a significantly agricultural watershed (22 percent agricultural cover; 26 permitted animal operations) with 30 percent degraded (non-forested) riparian buffers. With nine NHEOs and 73 percent forest cover, yet no conserved lands, there is a clear need for stream and riparian buffer protection within the watershed. A 14-mile stretch of the upper Lower Little River, including its entire length within this HU, is rated as impaired due to declines in fish and benthic bioclassification scores (DWR, 2004). The major aquatic stressors appear to be degraded or nonexistent buffers and sediment inputs from unstable streambanks, in-stream sediment mining ("sand dipping") and agricultural practices. This is one of four new TLWs that were designated in the 2009 upper Catawba basin RBRP.



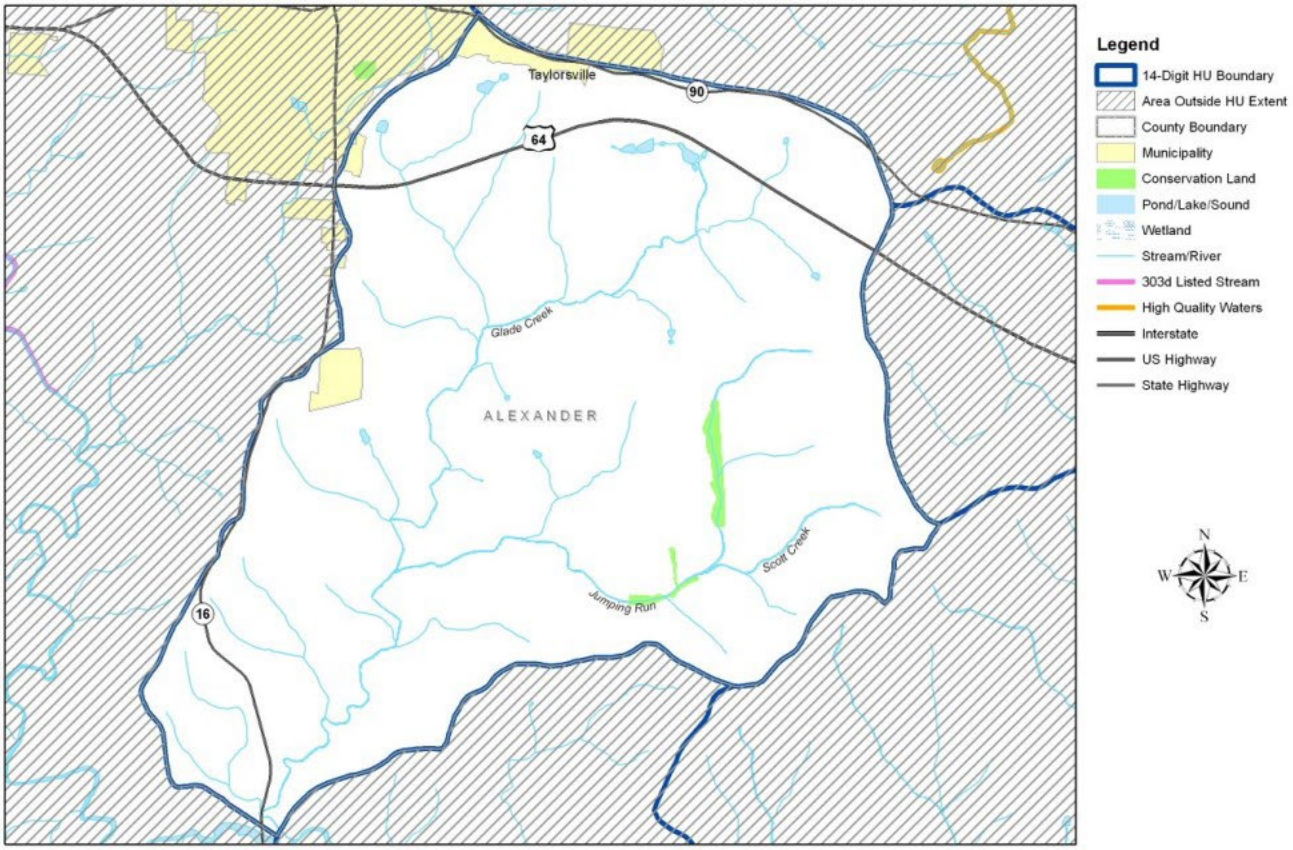
Lower Little River, including Muddy Fork: 03050101120030

This is the adjacent lower portion of the Lower Little River drainage system, comprising a 37-square mile area extending through the primarily agricultural landscape of central Alexander County. This watershed also encompasses much of the Town of Taylorsville. It is 41 percent agricultural land cover, 47 percent forested, and includes 50 permitted animal operations (the most of any TLW in the upper Catawba). Thirty percent of its riparian buffers are non-forested and the built-up areas around Taylorsville contribute to an overall watershed imperviousness of 2.4 percent. For reasons noted in the preceding TLW discussion (see page 24), a stretch of the Lower Little River within this HU has been rated as impaired by DWR (2004). There are likely to be abundant stream and buffer restoration/enhancement and preservation opportunities within this watershed, as well as agricultural BMP project sites.



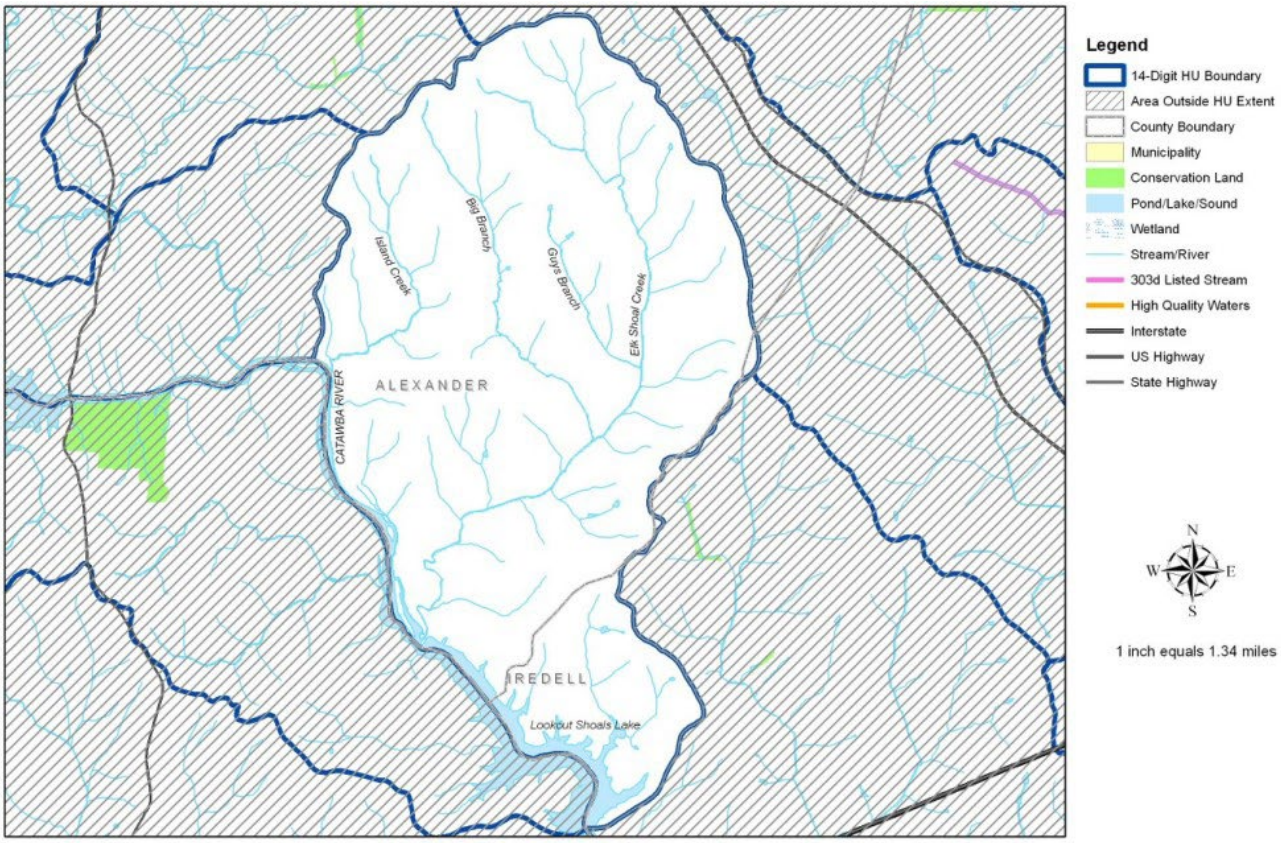
Jumping Run: 03050101120040

Jumping Run flows into the Lower Little River just a couple miles south of Taylorsville in south-central Alexander County. Its 13-square mile drainage area is the smallest of all the upper Catawba TLWs and is dominated by agriculture. Agricultural land cover is over 51 percent (the highest of any TLW within the upper Catawba River basin), and the watershed is home to 13 permitted animal operations. A fish sampling site on Glade Creek (tributary to Jumping Run just south of Taylorsville) yielded a bioclassification score of Excellent in 2007 (DWR, 2008), indicating that aquatic habitat may remain healthy in some headwater areas of this watersheds. Over 80 percent of the stream miles are classified as WSW waters. This watershed is likely to contain a good mix of restoration/enhancement and agricultural BMP opportunities, and may even contain some preservation-worthy headwater tracts



Elk Shoals Creek: 03050101130010

Elk Shoals Creek – the largest sub-watershed within this HU -- flows into the Catawba River (Lookout Shoals Lake) in the extreme southeastern corner of Alexander County. With over 45 percent agricultural cover, 19 animal operations and 26 percent non-forested riparian buffers, there are likely to be numerous stream restoration and agricultural BMP opportunities within the watershed. One hundred percent of the watershed is WSW-classified waters.



De-listed Watersheds (former TLWs)

Two 14-digit hydrologic units (HUs) that had been selected as TLWs within the upper Catawba River basin in EEP's 2004 *Watershed Restoration Plan* for the Catawba were de-listed as targeted watersheds in the 2009 update.

Upper Catawba River: 03050101010010

This 37-square mile, asset-rich watershed constitutes the headwaters of the Catawba River above the Town of Old Fort in western McDowell County. The land within this HU is 92 percent forested and 56 percent conserved (Pisgah National Forest and Game Land; some Land Trust and CWMTF easements). Agricultural activities are extremely limited within the watershed (less than four percent agricultural land use and only two animal operations). DWR reported good to excellent benthic and fish community scores at three stations in 2007 (DWR, 2008). With little evidence of at-risk streams and much of the land area within this HU already protected, DMS decided that currently this watershed does not need to be targeted for restoration/enhancement or preservation efforts.

Warrior Fork: 03050101060020

Despite having some potential watershed stressors (including 25 percent agricultural land use and 29 percent degraded riparian buffers), DMS staff decided that a sufficient number of other HUs flowing to the Catawba River and Lake Rodhiss in the Morganton area (including the Irish Creek watershed immediately *above* Warrior Fork) had already been targeted. Furthermore, a complete absence of DMS and non-DMS watershed projects means that the opportunity for synergizing with current restoration efforts is quite low in this particular HU.

References

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Watershed Needs Assessment Team. 2003. *Report from the Watershed Needs Assessment Team to the Mitigation Coordination Group*.

For More Information

Visit the DMS Watershed Planning Contacts page located here: https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Planning_Guidance_Docs/Watershed%20Planning%20Contacts.pdf

Definitions

303(d) List – This refers to Section 303(d) of the federal Clean Water Act, under which the U.S. EPA requires states to submit biennially a list of all impaired water bodies. Impaired water bodies are streams and lakes not meeting state water quality standards linked to their designated uses (e.g., water supply, recreation/fishing, propagation of aquatic life). Best professional judgment (in interpreting water quality monitoring data and observations) along with numeric and narrative standards/criteria are considered when evaluating the ability of a water body to serve its uses.

8-digit Catalog Unit (CU) – The USGS developed a hydrologic coding system to delineate the country into uniquely identified watersheds that can be commonly referenced and mapped. North Carolina has 54 of these watersheds uniquely defined by an 8-digit number. DMS typically addresses watershed – based planning and restoration in the context of the 17 river basins (each has a unique 6-digit number), 54 catalog units and 1,601 14-digit hydrologic units.

14–digit Hydrologic Unit (HU) – In order to address watershed management issues at a smaller scale, the U.S. Natural Resources Conservation Service (NRCS) developed methodology to delineate and uniquely identify watersheds at a scale smaller than the 8-digit catalog unit. A hydrologic unit is a drainage area delineated to nest in a multilevel, hierarchical drainage system. Its boundaries are defined by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream or similar surface waters. North Carolina has 1,601 14-digit hydrologic units.

Animal Operations – NPDES-permitted concentrated animal feeding operations (CAFOs). These are facilities with liquid manure treatment systems and with total animal counts equal to or exceeding the following thresholds: 2,500 swine (each > 55 lbs.); 10,000 swine (each < 55 lbs.); 1,000 beef cattle; 700 dairy cattle; 30,000 poultry.

Aquatic Habitat – the wetlands, streams, lakes, ponds, estuaries, and streamside (riparian) environments where aquatic organisms (e.g., fish, benthic macroinvertebrates) live and reproduce; includes the water, soils, vegetation, and other physical substrate (rocks, sediment) upon and within which the organisms occur

Benthic macroinvertebrates – organisms living in or on the bottom substrate of aquatic habitats; include insect larvae, worms, snails, crayfish and mussels; can be used as indicators of stream water quality and stream habitat condition

BMPs (best management practices) – any land or stormwater management practice or structure used to mitigate flooding, reduce erosion &

sedimentation, or otherwise control water pollution from runoff; includes urban stormwater management BMPs and agriculture/forestry BMPs

EEP – The North Carolina Ecosystem Enhancement combines existing wetlands restoration initiatives (formerly the Wetlands Restoration Program or NCWRP) of the N.C. Department of Environment and Natural Resources with ongoing efforts by the N.C. Department of Transportation (NCDOT) to offset unavoidable environmental impacts from transportation-infrastructure improvements.

GIS - A geographic information system integrates hardware, software, and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

High Quality Waters (HQW) - Supplemental NC DWR classification intended to protect waters with quality higher than state water quality standards. In general, there are two means by which a water body may be classified as HQW. They may be HQW by definition, or they may qualify for HQW by supplemental designation and then be classified as HQW through the rule-making process.

1) The following are HQW by definition:
• (Water Supply) WS-I, WS-II,
• SA (shellfishing area),
• ORW (outstanding resource water),
• Waters designated as Primary Nursery Areas (PNA) or other functional nursery areas by the Marine Fisheries Commission, or
• Native and special native (wild) trout waters as designated by the Wildlife Resources Commission.

2) The following waters can qualify for supplemental HQW designation:
• Waters for which DWR has received a petition for reclassification to either WS-I or WS-II, or
• Waters rated as Excellent by DWR,

II. Classifications by Other State and Federal Agencies

NCDWR – North Carolina Division of Water Resources

NCWRP – The North Carolina Wetlands Restoration Program was a wetland restoration program under NC DENR and a predecessor of the NCEEP and NC DMS.

Natural Heritage Element Occurrences (NHEOs) – NC Natural Heritage Program (NHP) documented locations of rare and endangered species (plant and animal) populations and occurrences of unique or exemplary

natural ecosystems and special wildlife habitats (terrestrial and palustrine community types).

Outstanding Resource Waters (ORW) - Supplemental NC DWR classification intended to protect unique and special waters having excellent water quality and being of exceptional state or national ecological or recreational significance. To qualify, waters must be rated Excellent by DWR and have one of the following outstanding resource values:

- Outstanding fish habitat or fisheries,
- Unusually high level of water-based recreation,
- Some special designation such as NC or National Wild/Scenic/Natural/Recreational River, National Wildlife Refuge, etc.,
- Important component of state or national park or forest, or
- Special ecological or scientific significance (rare or endangered species habitat, research or educational areas).
- No new discharges or expansions of existing discharges shall be permitted.

There are associated development controls enforced by DWR. ORW areas are HQW by definition.

Preservation – the long-term protection of an area with high habitat and/or water quality protection value (e.g., wetland, riparian buffer), generally effected through the purchase or donation of a conservation easement by/to a government agency or non-profit group (e.g., land trust); such areas are generally left in their natural state, with minimal human disturbance or land-management activities

RBRP - The River Basin Restoration Priorities are documents that delineate specific watersheds (Targeted Local Watersheds) within a River Basin that exhibit both the need and opportunity for wetland, stream and riparian buffer restoration.

Resource Professionals – staff of state, federal, regional or local (city, county) natural resource agencies –including planners, water resources and storm water engineers, parks & recreation departments, water quality programs, regional councils of government, local/regional land trusts or other non-profit groups with knowledge/expertise and/or interest in local watershed issues and initiatives

Restoration – the re-establishment of wetlands or stream hydrology and wetlands vegetation into an area where wetland conditions (or stable streambank and stream channel conditions) have been lost; examples include: stream restoration using natural channel design methods coupled with re-vegetation of the riparian buffer; riparian wetlands restoration through the plugging of ditches, re-connection of adjacent stream channel to

the floodplain, and planting of native wetland species; this type of compensatory mitigation project receives the greatest mitigation credit under the 401/404 regulatory framework

Riparian –relating to the strip of land adjacent to streams and rivers, including streambanks and adjoining floodplain area; important streamside zones of natural vegetation that, when disturbed or removed, can have serious negative consequences for water quality in streams & rivers

Significant Natural Heritage Areas (SNHA) – NC Natural Heritage Program identified areas containing ecologically significant natural communities or rare species. M ay be on private or public lands, and may or may not be in conserved status.

TLW - Targeted Local Watershed, are 14-digit hydrologic units which receive priority for DMS planning and restoration project funds.

Use Support –refers to the DWR system for classifying surface waters based on their designated best use(s); at present, the DWR primary stream classifications include the following: class C [fishing/boating & aquatic life propagation]; class B [primary recreation/direct contact]; SA [shellfish harvesting]; and WSW [water supply]. Supplemental classifications include High Quality Waters (HQW), Outstanding Resource Waters (ORW), Nutrient Sensitive Waters (NSW), Trout Waters (Tr), and Swamp Waters (Sw). All waters must at least meet the standards for class C waters

USGS – United States Geological Survey

Watershed –all the land area which contributes runoff to a particular point along a stream or river; also known as a “drainage basin”, although the term *Basin* usually implies a very large drainage system, as of an entire river and its tributary streams

Watershed Restoration Plan – Older versions of RBRP documents were called Watershed Restoration Plans. In essence, they are the same thing.