Upper Yadkin Pee-Dee River Basin Restoration Priorities 2009

Ecosystem Enhancement Program

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This document was updated by
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Cover Photo: Horne Creek, Surry County

Introduction

This document, prepared by the North Carolina Ecosystem Enhancement Program (EEP), presents a description of Targeted Local Watersheds within the upper portion of the Yadkin River Basin. This is an update of the original document developed in 2003 by the Wetlands Restoration Program (NCWRP), *Yadkin-Pee Dee River Basin Watershed Restoration Plan*.

This plan focuses on the **upper** Yadkin River Basin (USGS Catalog Units 03040101 and 03040102). The original plan selected **24** watersheds within the upper Yadkin basin to be targeted for stream, wetland and riparian buffer restoration and protection efforts. This plan presents an updated total of **37** Targeted Local Watersheds (TLWs) in the upper Yadkin River Basin.

This document is a supplement to the original *Watershed Restoration Plan* for the Yadkin-Pee Dee River Basin (2003) and draws information from the detailed document, *2008 Yadkin-Pee Dee River Basinwide Water Quality Plan*. This River Basin Restoration Priority (RBRP) document does not provide detailed information found in those documents; rather, it provides a quick overview of EEP, the criteria EEP uses to select new Targeted Local Watersheds and then describes the newly selected Targeted Local Watersheds.

In past documents, watersheds were delineated by the NCDWQ "subbasin" units and the smaller Targeted Local Watersheds were defined by USGS 14-digit hydrologic unit (HU). In this document, the watersheds are defined by the USGS 8-digit cataloging units and the Targeted Local Watersheds continue to be defined by the USGS 14-digit hydrologic unit.

What is a River Basin Restoration Priority?

North Carolina General Statute 143-214.10 charges EEP 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.

EEP develops River Basin Restoration Priorities (RBRPs) to guide its mitigation activities within each of the major river basins. The RBRPs delineate specific watersheds that exhibit a need for restoration and protection of wetlands, streams and riparian buffers. These priority watersheds, or Targeted Local Watersheds (TLWs), are 14-digit hydrologic units which receive priority for EEP 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

EEP 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: EEP evaluates DWQ use support ratings, the presence of impaired /303(d)-listed streams, and DWQ Basinwide Assessment reports to identify streams with known problems. EEP also assesses the potential for degradation by evaluating land cover data, riparian buffer condition, impervious cover, road density, and projected population increase.

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

Opportunity: EEP 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. EEP 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, NCDENR 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 EEP restoration and preservation projects and Local Watershed Planning initiatives.

Upper Yadkin River Basin Overview

The upper Yadkin River basin consists of two 8-digit Cataloging Units (CUs), 03040101 and 03040102. CU 03040101 comprises the drainage area of the upper Yadkin River and its tributaries extending downstream to its confluence with the South Yadkin River. CU 03040102 is the drainage area of the South Yadkin River subbasin. The total area of the upper Yadkin basin is 3,234 square miles, and it contains a total of 108 local watersheds (14-digit HUs). Information on population and land use in the upper Yadkin and major watershed stressors identified by the NC DWQ is presented below for each of the two CUs.

Upper Yadkin River Basin Restoration Goals

Based on an assessment of existing watershed characteristics and resource information, EEP has developed broad restoration goals for the upper Yadkin River Basin. The goals reflect EEP's focus on restoring or protecting wetland and stream functions, including water quality, hydrologic regime, and fish and wildlife habitat. Restoration goals for both CUs are, ideally, focused at the scale of 14-digit HUs (typically 10 to 100 square miles in area) or sub-watersheds delineated within these HUs (one to 10 square miles).

Primary watershed restoration goals include the following:

- Restoration of water quality and aquatic habitat in impaired stream segments;
- Protection of high-resource value waters, including HQW, ORW and WSW designated waters and those containing large numbers of rare and endangered aquatic species (NHEOs);
- Continuation of existing watershed restoration and protection initiatives and projects, including efforts funded by Clean Water Management Trust Fund (CWMTF), DWQ's 319 Program, NC EEP, Ag Cost Share Program (ACSP) and Community Conservation Assistance Program (CCAP);
- Collaborative efforts with local resource agencies, land trusts and willing landowners to implement new stream, riparian buffer and wetland restoration, enhancement and preservation projects within TLWs;
- Improved management of stormwater runoff (including the implementation of stormwater BMP projects), especially in urban and suburban areas contributing to downstream degradation of stream habitat and impairment of water quality; and
- Implementation of agricultural BMPs in order to limit inputs of sediment, nutrients and fecal coliform to streams from active farming operations.

03040101 [Yadkin River Headwaters]

This CU totals approximately 2,336 square miles in area and constitutes the Yadkin River headwaters. It includes the upper Yadkin River and its tributaries from their mountainous headwaters along the eastern slopes of the Blue Ridge escarpment, extending downstream to the Yadkin River's confluence with the South Yadkin River. Thirteen counties spanning the northwestern Piedmont region are included in its drainage area, and major

municipalities within this CU include the towns of Wilkesboro, Elkin, Mount Airy and Yadkinville, and the city of Winston-Salem. The upper Yadkin is home to approximately 660,000 people according to the 2000 Census, with the highest population densities occurring around three main urban areas (Winston-Salem; Mount Airy; Wilkesboro-North Wilkesboro). Winston-Salem and Forsyth County, including the Muddy Creek watershed, represent the largest concentration of urban/impervious land cover in the CU. This contrasts with the primarily forested land cover of the northwestern border of the CU, along the eastern slopes of the Blue Ridge in portions of Caldwell, Watauga, Wilkes and Surry counties. Overall land cover breakdown across the CU amounts to approximately 57% forested, 24% agricultural, 13% developed, and six percent 'other' categories (DWQ, 2008).

According to DWQ (2008), approximately 240 miles of stream in this CU are affected (impaired or impacted) by habitat degradation. The primary sources (stressors) causing this degradation include: naturally erodible soils; sediment and erosion from road construction and other land-disturbing activities (e.g., agriculture/pasture, logging, new home construction); and excessive stormwater flow off impervious surfaces in urban and suburban areas. Turbidity and fecal coliform violations have been documented at sites across the CU, although coliform concentrations exhibited a downward trend from 2002 to 2006 (probably due to implementation of agricultural BMPs and sewer infrastructure improvements). Nonexistent or degraded riparian buffers along stream channels are a significant contributing factor to the habitat degradation and water quality impairment noted within this CU. Even within the largely forested headwater streams within the CU, impacts are now apparent due to increasing development pressures in these areas (e.g., resort communities and second home construction in low-density subdivisions).

The Ecosystem Enhancement Program (EEP) has initiated two Local Watershed Planning (LWP) efforts within this CU over the past five years, one of which was completed in 2004 (Kerr Scott Reservoir LWP, Wilkes County) and one of which is ongoing in Surry County (Upper Yadkin-Ararat River LWP). For more information on these efforts, go to http://www.nceep.net/services/lwps/localplans.htm and click on the appropriate area of the statewide map.

Of the 80 fourteen-digit HUs (local watersheds) within this 8-digit CU, EEP has selected 27 as Targeted Local Watersheds (TLWs) for this updated RBRP. These encompass a wide variety of watershed conditions, including *assets* such as high quality waters (HQW), water supply watersheds (WSW), Natural Heritage Element Occurrences (NHEOs) and Wildlife Resources Commission (WRC) priority aquatic habitats and *problems* such as 303(d)-listed stream segments, animal operations, impervious cover and non-forested riparian buffers. Two previously selected TLWs within this CU have been de-listed in this updated document.

03040102 [South Yadkin River]

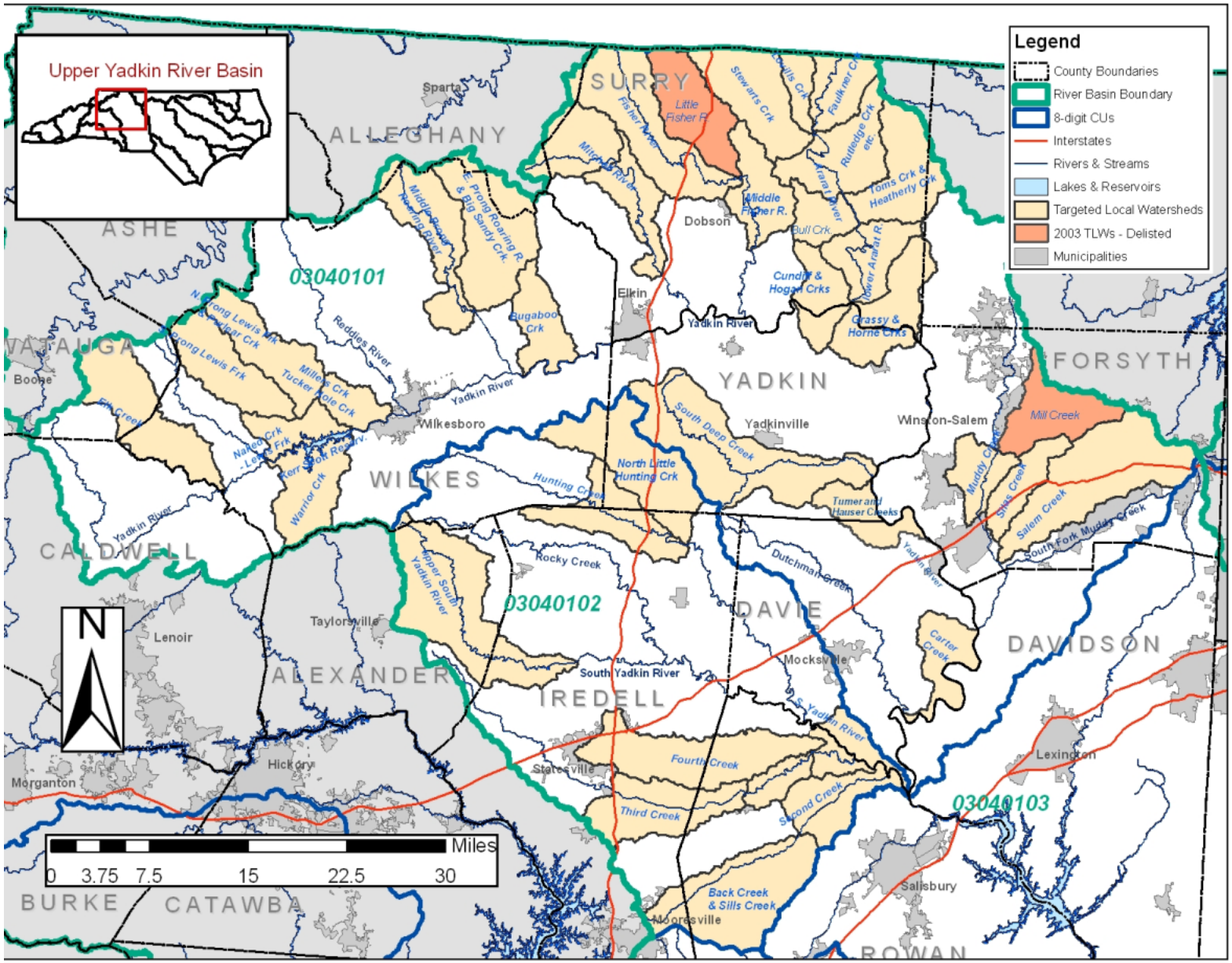
This CU constitutes the South Yadkin River and its tributaries, including Hunting, Rocky, Fourth, Third and Second Creeks. Covering large portions of Iredell, Davie and Rowan counties, the majority of this subbasin is located in the Southern Outer Piedmont and Northern Inner Piedmont ecoregions. It totals approximately 907 square miles in area, contains 28 fourteen-digit HUs and includes the municipalities of Statesville, Mooresville, Taylorsville and Mocksville. The South Yadkin CU is home to approximately 225,000 people according to the 2000 Census, with only one major urban area (Statesville). The city of Statesville in central Iredell County represents the largest concentration of urban land cover in the CU. Across this subbasin, forested land covers approximately 49% of the total area (most of which is concentrated along the Brushy Mountains in southeastern Wilkes and northern Alexander counties), agriculture lands 42%, and developed land about 9%.

DWQ (2008) notes that many of the streams within this high-agriculture CU suffer from moderate to severe bank erosion, shifting sandy substrates, channelization and sedimentation, and poor (or missing) riparian buffer vegetation. Local watersheds in the northern portion of this CU (north of Statesville) have Good or Excellent water quality based on benthic macroinvertebrates, whereas watersheds in the southern half (including Third Creek, Fourth Creek and North Second Creek) are characterized by more degraded benthic and fish communities. An overall pattern of habitat degradation across the CU, with impaired streams totaling nearly 160 miles, is caused by a variety of watershed stressors. These include all the stressors noted above for the Yadkin River headwaters (CU 03040101), with agriculture-related sources likely more important across this CU due to the more predominantly rural landscape of the South Yadkin River system. Stormwater runoff from urban impervious cover is also a significant source of steam impacts within (and downstream of) the Statesville area. Turbidity and fecal coliform violations follow similar spatial and temporal patterns as noted above for the first CU. Mining (quarries) and asphalt plants are identified as a possible source of steam impacts within at least one local watershed in the northern portion of the CU (Hunting Creek).

With this RBRP update, EEP has identified 10 of the 28 local watersheds (14-digit HUs) in this CU as targeted local watersheds (TLWs) for restoration/enhancement or protection projects. Seven of the 10 TLWs are located in the southern portion of the CU, including waters flowing out of the Statesville and Mooresville areas (e.g., Fourth, Third, Back and Sills Creeks) into more rural/agricultural landscapes.

EEP has not yet initiated any Local Watershed Planning efforts within this CU.

Upper Yadkin River Basin and Targeted Local Watershed Map



Upper Yadkin River Basin Restoration Priorities 2009

Targeted Local Watershed Summary Table

14-digit HU CODE	Major Streams	Area (sq. miles)	% Imperv. Cover	% Ag area	% 303D Miles (2006)	% Non-forest Buffer	# Animal Ops	% Forest-Wetland Area	% HQW-ORW Miles	% Tr Miles	% WSW Miles	% SNHA	# NHEOs	% Land in Conserv.	WRC Priority Area?	# non-EEP Proj.s	# EEP Proj.s (jan'09)	2003 TLW?
03040101																		
03040101010050	Elk Creek; Dugger Creek	50.6	0.2	5.1	13.0	11.4	1	92.0	100.0	69.2	0.0	7.7	19	3.1		2		Y
03040101010080	South Prong Lewis Fork	36.3	0.4	9.7	0.0	18.6	4	86.6	0.0	69.3	3.3	0.0	3	4.3		0		Y
03040101010090	N. Prong Lewis Fork; Purlear Crk.	35.1	0.2	15.5	0.0	21.5	17	80.8	0.0	25.2	20.5	13.4	4	13.9		1	2	Y
03040101010100	Naked Crk - Lewis Frk - K Scott Res.	17.7	0.8	21.0	0.0	23.9	11	68.9	0.0	28.5	52.9	0.0	0	14.1		1	1	Y
03040101010110	Warrior Creek - Kerr Scott Res.	34.2	0.6	15.5	0.0	23.1	10	76.8	0.0	28.6	32.6	0.0	1	12.7		2	2	Y
03040101020010	Millers Crk; Tucker Hole Crk.	14.0	5.6	28.2	0.0	39.9	11	43.0	0.0	17.2	94.9	0.0	0	1.3		1		Y
03040101060010	Middle Prong Roaring River & trib.s	43.8	0.3	15.0	0.0	13.8	20	81.7	28.9	70.3	0.0	9.0	21	36.7	yes	0		no
03040101060030	Big Sandy Crk - E. Prong Roaring R.	56.3	0.4	18.8	0.0	14.0	30	77.2	13.7	48.8	0.0	33.8	32	35.0	yes	0	1	Y
03040101070010	Bugaboo Creek	24.6	0.6	44.3	0.0	24.9	15	50.2	0.0	0.0	39.0	0.0	0	1.2		0	1	Y
03040101080010	upper Mitchell River & trib.s	29.3	0.2	3.4	0.0	8.3	2	93.4	100.0	100	0.0	4.4	1	8.5	yes	13	2	no
03040101080020	Mitchell River & trib.s	24.7	0.3	25.1	0.0	16.0	13	70.8	86.1	66.9	0.0	0.7	15	9.2	yes	29		no
03040101090010	upper Fisher River & trib.s	60.1	0.6	23.0	0.2	23.9	24	70.7	0.0	77.8	96.7	9.0	11	5.6		10	2	Y
03040101090030	middle Fisher River & trib.s	28.1	1.3	39.6	0.0	23.8	14	51.0	0.0	0.0	0.0	0.0	1	0.0		0	1	Y
03040101100010	Stewarts Creek & trib.s	42.1	2.8	36.1	0.0	37.5	12	47.8	0.0	13.9	66.6	0.0	0	0.0		0		Y
03040101100020	Lovills Creek	11.1	15.8	9.7	19.2	59.7	6	26.9	0.0	0.0	47.1	0.0	1	0.4		0		Y
03040101110010	Faulkner Creek - Ararat River	22.3	4.5	23.3	7.6	33.3	2	49.7	0.0	28.6	36.4	0.0	2	0.4		1		Y
03040101110020	Rutledge, Stoney & Flat Shoal Crks.-Ararat R.	39.2	1.6	31.6	0.0	22.9	11	56.9	0.0	0.0	0.0	0.0	0	0.0		2		Y
03040101110030	Toms Creek (incl. Heatherly Crk.)	40.1	1.3	30.3	1.4	19.7	4	59.8	0.0	0.0	68.6	0.0	0	0.0		2		no

14-digit HU CODE	Major Streams	Area (sq. miles)	% Imperv. Cover	% Ag area	% 303D Miles (2006)	% Non-forest Buffer	# Animal Ops	% Forest-Wetland Area	% HQW-ORW Miles	% Tr Miles	% WSW Miles	% SNHA	# NHEOs	% Land in Conserv.	WRC Priority Area?	# non-EEP Proj.s	# EEP Proj.s (jan'09	2003 TLW?
03040101110040	Bull Creek	**16.1**	0.6	43.8	0.0	22.1	8	49.3	0.0	0.0	0.0	0.0	0	0.0		0		no
03040101110050	lower Ararat River & trib.s	**27.3**	0.8	29.1	0.0	17.2	6	63.5	0.0	0.0	13.9	2.5	1	5.8	yes	0		no
03040101110060	Cundiff Crk., Hogan Crk.	**23.0**	0.4	41.3	0.0	24.8	26	51.8	0.0	0.0	0.7	0.0	0	0.2	yes	0		no
03040101110070	Grassy Crk., Horne Crk.	**38.5**	0.6	30.8	0.0	19.0	4	61.2	0.0	0.0	94.7	4.6	35	11.4	yes	0		no
03040101130020	South Deep Creek & trib.s	**80.2**	1.5	44.9	0.0	31.6	57	44.8	0.0	0.0	83.4	0.0	1	0.5	yes	9	**2**	no
03040101160010	Turner and Hauser Creeks - Yadkin River	**20.7**	0.5	39.1	0.0	24.9	14	54.5	0.0	0.0	94.4	0.0	2	0.0		0	**1**	no
03040101170030	Muddy Creek	**19.0**	7.4	17.4	13.2	50.7	5	32.8	0.0	0.0	0.0	0.0	0	0.3		0		no
03040101170040	Silas Creek	**19.5**	19.1	3.3	0.0	75.4	1	11.5	0.0	0.0	0.0	0.0	1	0.7		0	**1**	Y
03040101170060	Salem Creek	**70.1**	17.6	11.8	6.9	60.3	8	22.5	0.0	0.0	37.3	1.7	3	0.8		0		Y
03040101180020	Carter Crk. - Yadkin River	**22.8**	0.5	36.1	0.0	18.0	8	57.7	0.0	0.0	74.8	1.7	10	14.1		1		no
03040102																		
03040102010010	upper S. Yadkin River & trib.s	**78.6**	0.9	35.8	0.0	18.7	121	57.7	0.0	0.0	100.0	1.5	57	0.3		0		no
03040102020020	Hunting Creek & trib.s	**34.3**	0.8	41.8	0.0	16.1	23	51.5	0.0	0.0	100.0	0.2	6	0.2		0		no
03040102020030	North Little Hunting Crk & trib.s	**54.7**	1.2	45.7	0.0	25.8	61	45.7	0.0	0.0	100.0	0.0	2	0.0		0	**2**	no
03040102020070	South Yadkin River & trib.s	**11.8**	2.4	34.8	15.7	22.5	2	52.3	0.0	0.0	24.6	0.0	1	6.8		5	**1**	Y
03040102030020	Fourth Creek	**56.4**	5.1	41.8	14.3	37.7	24	36.1	0.0	0.0	0.0	0.5	6	0.1		1		Y
03040102030040	Lower Fourth Creek; South Yadkin River	**9.2**	0.5	39.3	36.4	13.8	4	56.1	0.0	0.0	15.3	0.9	1	12.9		2		Y
03040102040030	Third Creek & trib.s	**41.3**	2.5	44.2	12.7	28.5	14	44.8	0.0	0.0	0.0	0.0	3	1.5		0	**1**	Y
03040102040040	lower Third Creek	**11.9**	0.7	41.1	19.5	25.4	2	54.1	0.0	0.0	0.0	0.5	2	4.0		0	**1**	Y
03040102050020	Back and Sill Creeks; North Second Crk.	**65.0**	1.2	57.4	0.9	34.0	17	34.9	0.0	0.0	91.8	0.4	2	4.7		1		Y
03040102050030	lower Second Creek & trib.s	**28.8**	0.8	39.5	23.9	17.7	7	54.0	0.0	0.0	0.0	0.8	6	8.3		2	**2**	Y

Blue shading indicates EEP local watershed planning (LWP) HUs.

Table Abbreviations and Acronyms: Imperv. = percent impervious cover. Ag = agricultural land cover. Animal Ops = NPDES-permitted animal feeding operations. DWQ classifications: HQW = high quality waters; ORW = outstanding resource waters; Tr = trout streams; WSW = water supply watersheds. Natural Heritage Program (NHP) designations: % SNHA = percent of land area as NHP-designated Significant Natural Heritage Areas; NHEO = natural heritage element occurrences. Non-EEP projects = funded by 319, Clean Water Management Trust Fund (CWMTF) and local/regional Land Trusts. WRC = NC Wildlife Resources Commission. EEP = NC Ecosystem Enhancement Program. TLW = EEP targeted local watershed.

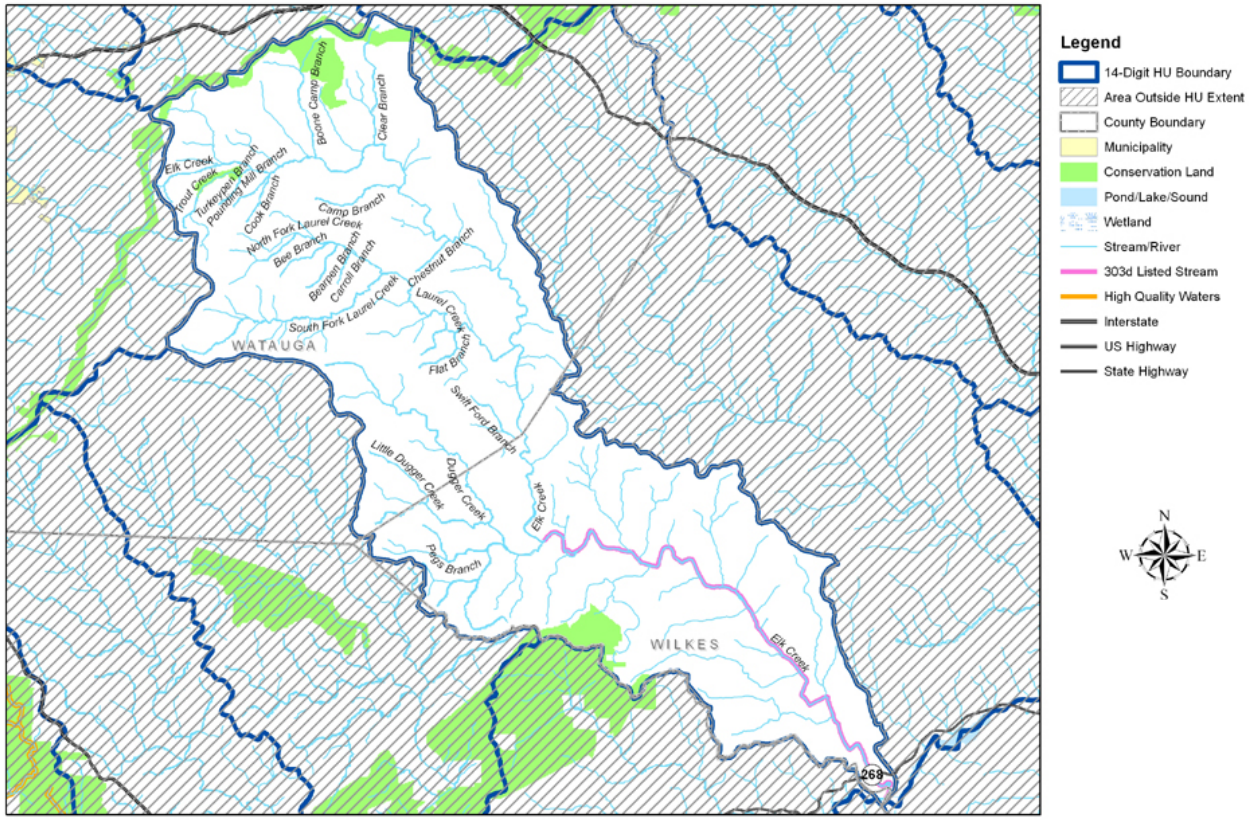
See also the **Definitions** section at the end of this document.

Discussion of Targeted Local Watersheds in Upper Yadkin River Basin

Yadkin 03040101

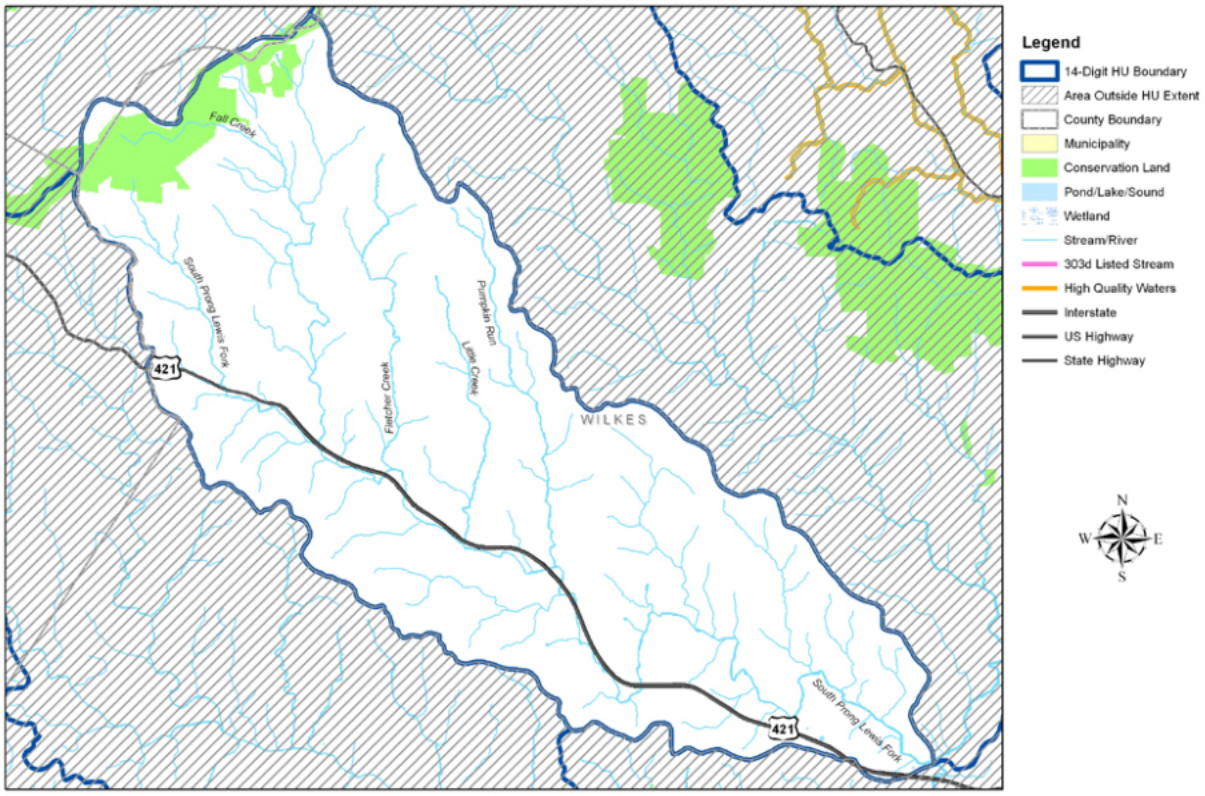
Elk Creek & tributaries, including Dugger Creek: 03040101010050

With its headwaters originating along the Blue Ridge escarpment in eastern Watauga County, this 51-square mile watershed is 92 percent forested, includes Outstanding Resource Waters and is home to a large number of Natural Heritage Element Occurrences (NHEOs). Elk Creek was rated as having an Excellent bioclassification score when sampled for benthos in 2006 (DWQ, 2007). However, the lower reach of Elk Creek in Wilkes County (9.1 miles from Dugger Creek to the Yadkin River) is considered to be impaired by DWQ (2008), on the basis of fecal coliform violations attributed to agriculture/pasture.



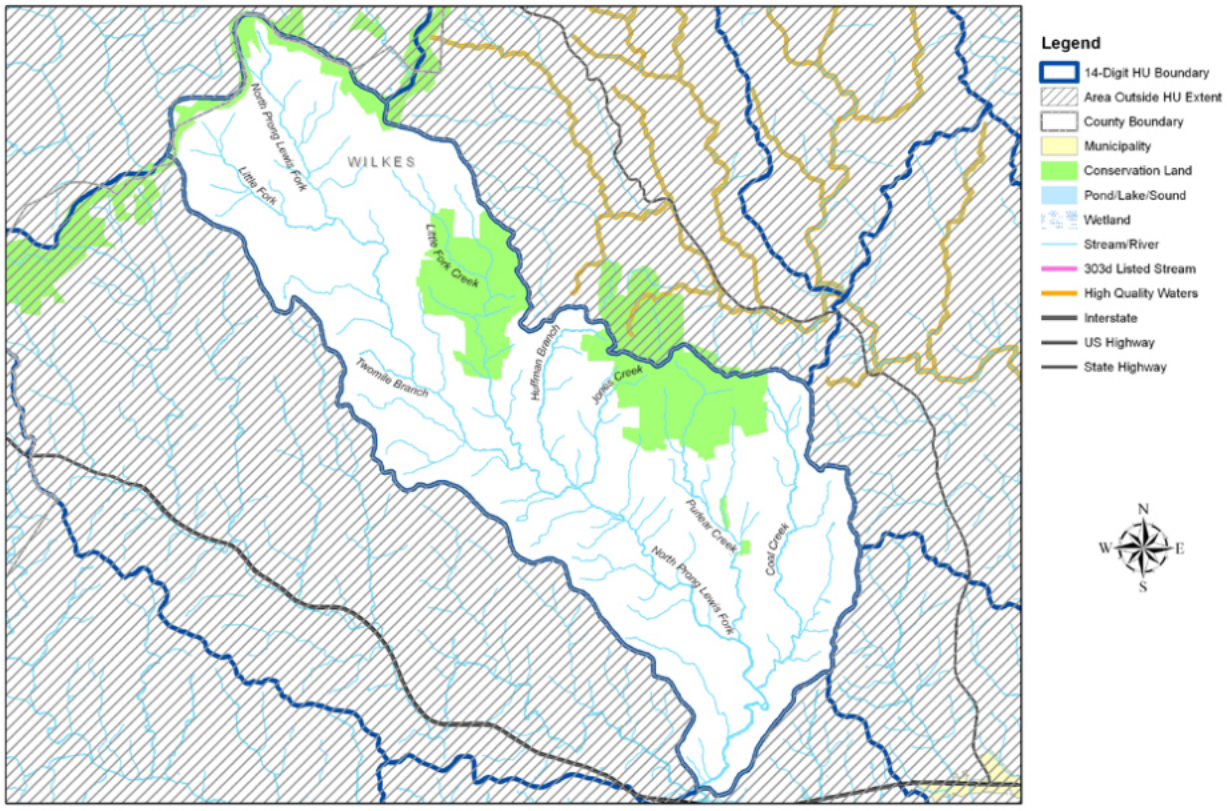
South Prong Lewis Fork: 03040101010080

The headwaters for this 36-square mile watershed originate along the slopes of the Blue Ridge in western Wilkes County. It is characterized by 10 percent agricultural lands, 87 percent forest and includes several permitted animal operations. A fish community assessment by DWQ in 2006 resulted in an Excellent bioclassification for the South Prong Lewis Fork (DWQ, 2007). It is one of five 14-digit HUs included in EEP's Kerr Scott Reservoir Local Watershed Planning (LWP) initiative, which was completed in 2004.



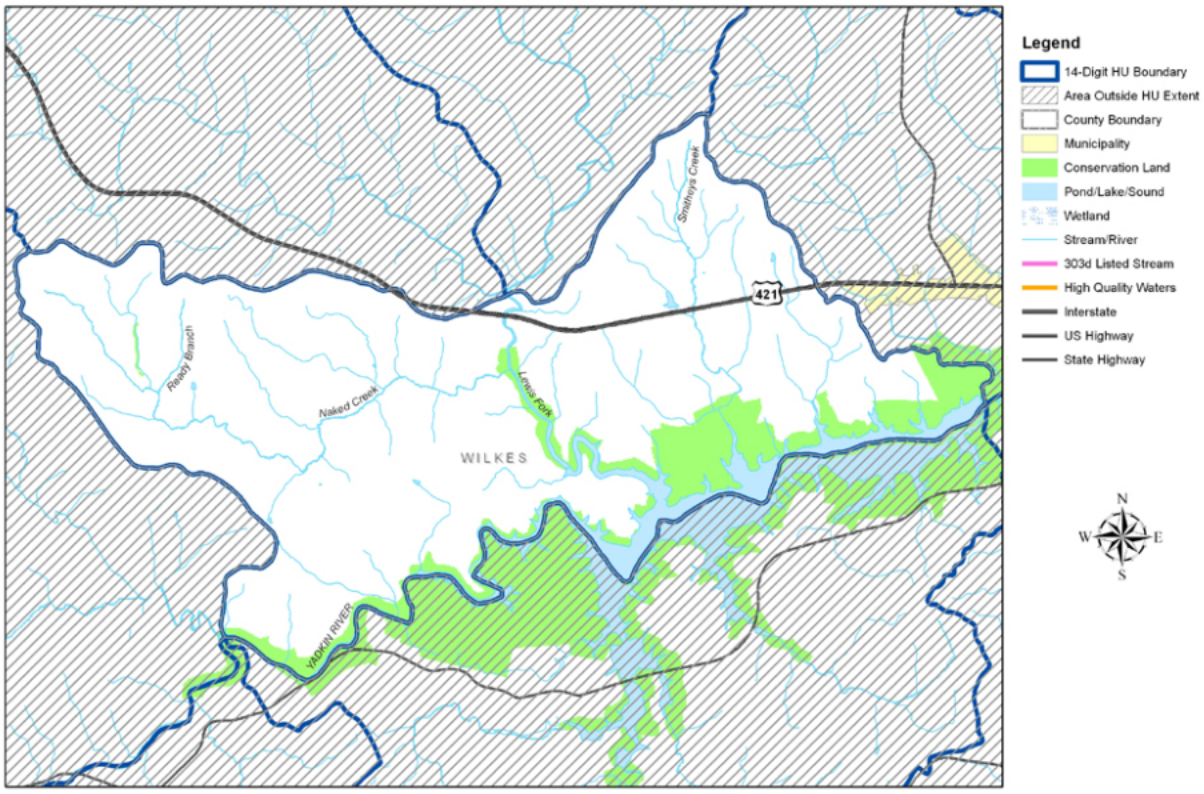
North Prong Lewis Fork and Purlear Creek: 03040101010090

Located contiguous to its South Prong neighbor, this watershed is 35 square miles in area and land cover is 16 percent agricultural and 81 percent forested,. It contains 17 permitted animal operations (NPDES-permitted concentrated animal feeding operations, or CAFOs), but over 13 percent of its area is in conserved lands (including Significant Natural Heritage Areas, SNHA). It is home to two EEP stream restoration projects and was also part of the Kerr Scott Reservoir LWP initiative.



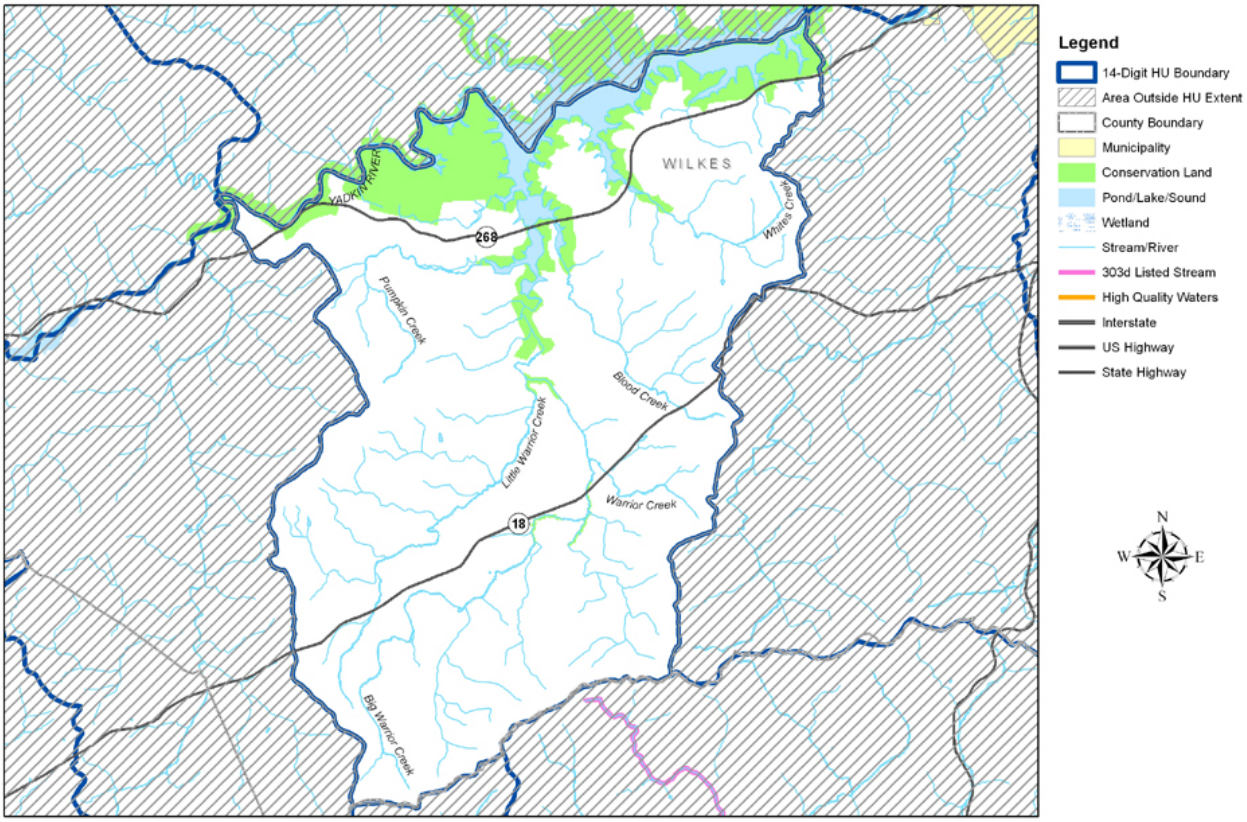
Naked Creek, Lewis Fork and Kerr Scott Reservoir: 03040101010100

This 18-square mile watershed is characterized by significant agricultural activity (21 percent agricultural land cover; 11 animal operations), a water supply watershed (WSW) designation and over 14 percent conserved lands. Fourteen percent of the watershed area is in conserved lands. It contains one EEP stream project and was part of the Kerr Scott Reservoir LWP initiative. A 0.9-mile stretch of Naked Creek is noted as being impacted by habitat degradation in the latest Basinwide Water Quality Plan (DWQ, 2008), the likely source of which is agriculture/pasture operations.



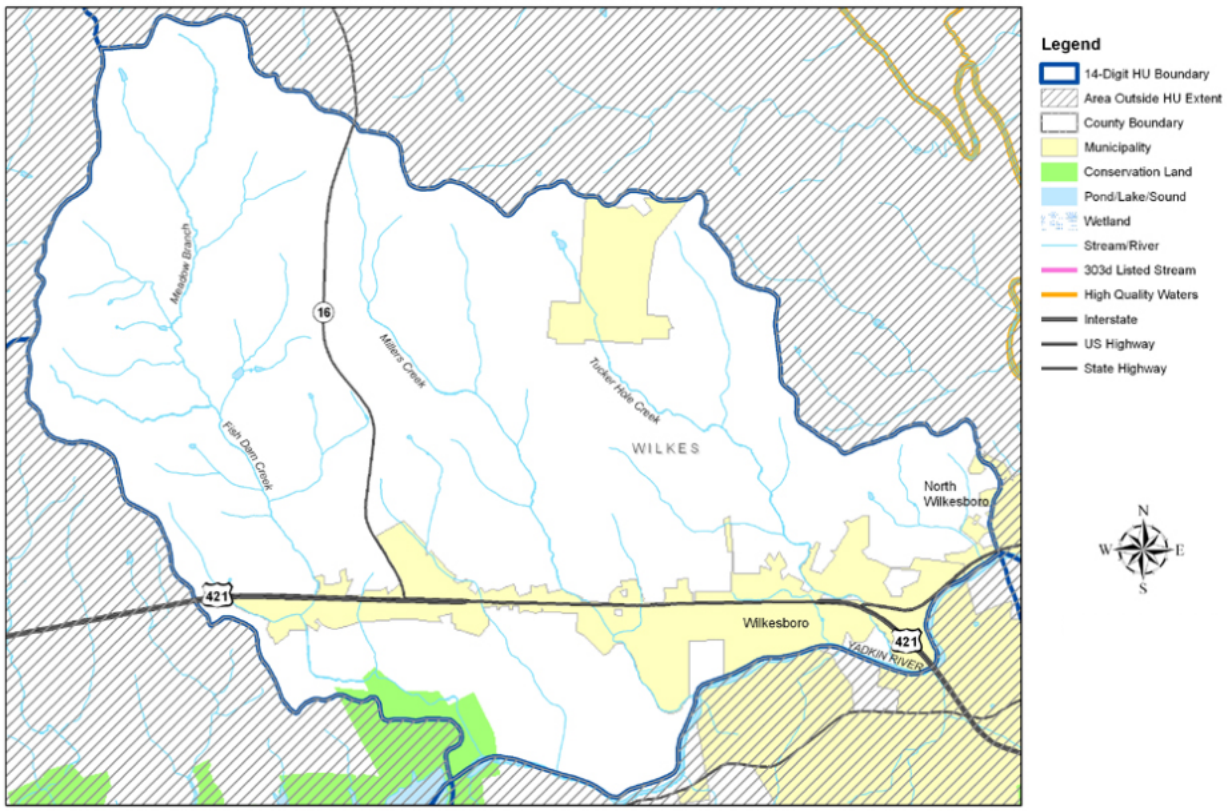
Warrior Creek and Kerr Scott Reservoir: 03040101010110

Host to two EEP stream projects and part of the Kerr Scott Reservoir LWP area, this watershed is 16 percent agricultural land and contains 10 permitted animal operations. Approximately 23 percent of its riparian buffers are non-forested, but nearly 13 percent of its land area is conserved and 33 percent of its stream miles are WSW waters. Two non-EEP funded projects (319, Land Trust and/or CWMTF efforts) are documented within the watershed.



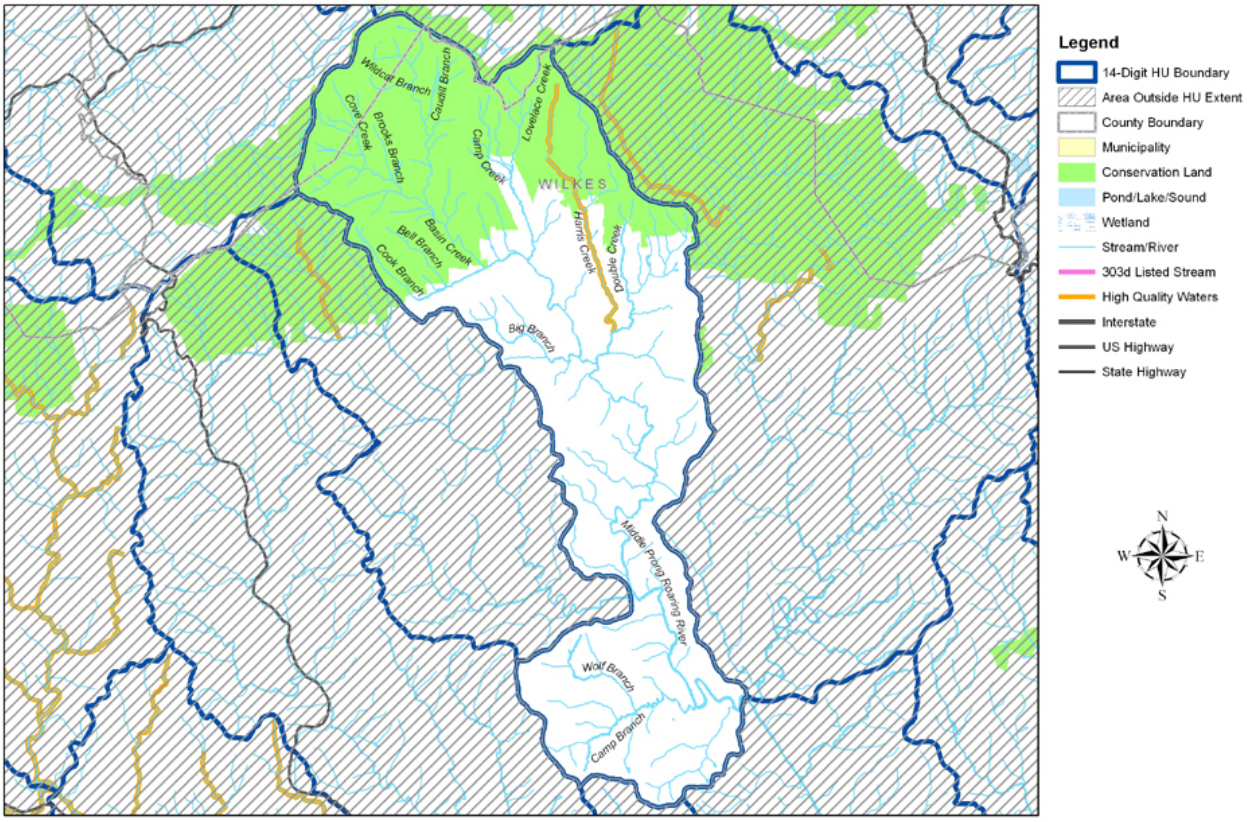
Millers Creek and Tucker Hole Creek: 03040101020010

The second smallest of all the targeted HUs in this CU (at 14 square miles), this watershed includes portions of Wilkesboro and North Wilkesboro and contains 5.6 percent impervious cover. With over 28 percent agricultural cover, 11 animal operations and 40 percent non-forested buffers, the potential for water quality impairment and habitat degradation is significant within this local watershed. In fact, the DWQ notes that 4.2 miles of Fish Dam Creek has been impacted by habitat degradation, with the most likely source being agriculture/pasture and impervious surfaces (DWQ, 2008). Despite containing WSW waters, this watershed only has approximately one percent of its land area in conservation. It was one of five 14-digit HUs included in the EEP LWP initiative for the Kerr Scott Reservoir (completed in 2004).



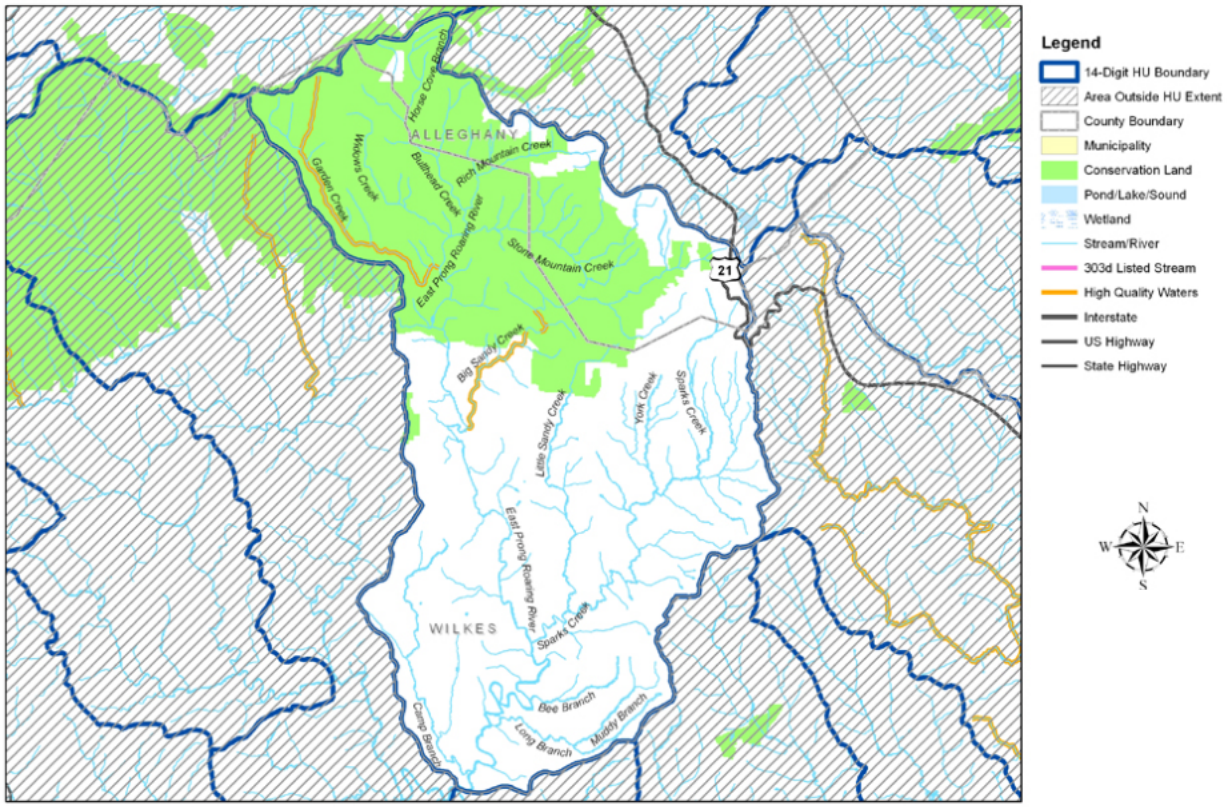
Middle Prong Roaring River: 03040101060010

This 44-square mile watershed is 82 percent forested, with 15 percent agricultural land cover and 20 permitted animal operations. Its headwaters flow off the Blue Ridge escarpment in northern Wilkes County, it includes HQW/ORW waters and it contains 21 NHEOs and 37 percent of the land area is protected -- including portions of Doughton Park and the Blue Ridge Parkway. Its bioclassification (Middle Prong Roaring River) is rated as Excellent based on a 2006 fish community sampling (DWQ, 2007), and it includes WRC priority aquatic habitat (2005 *Wildlife Action Plan*).



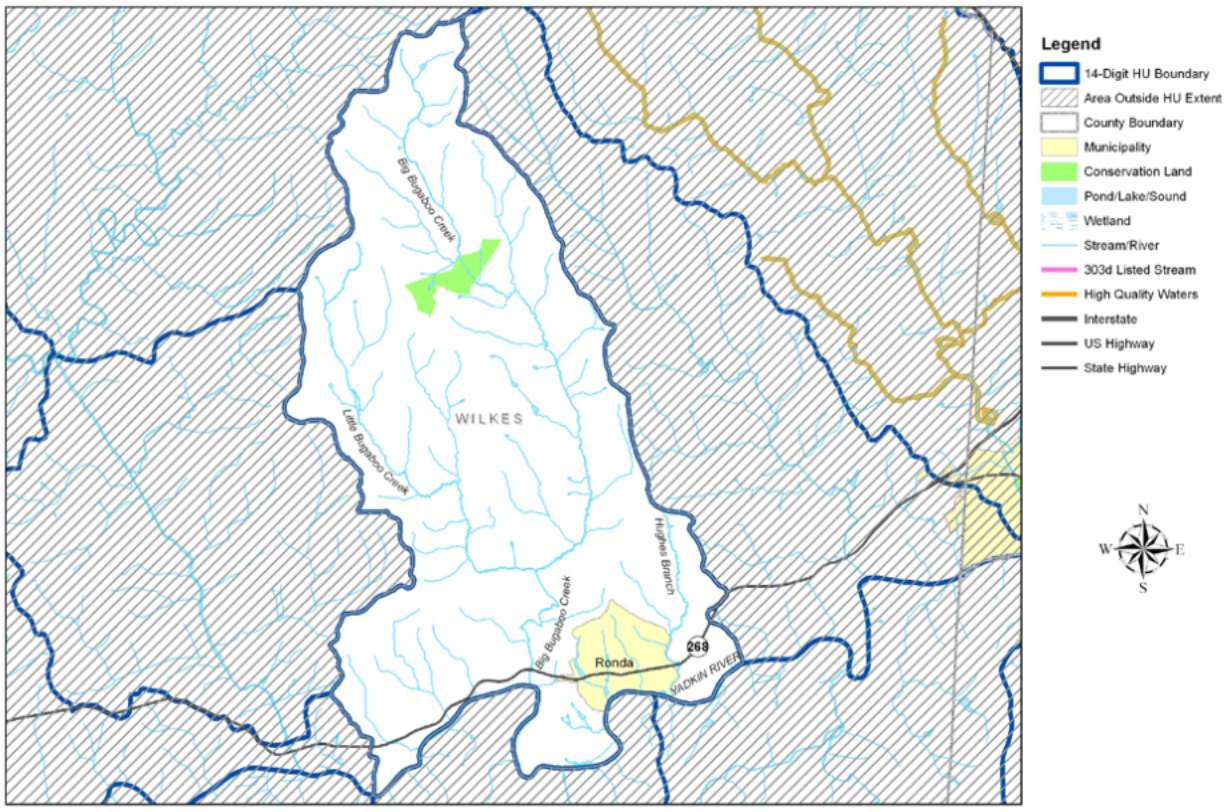
Big Sandy Creek – East Prong Roaring River: 03040101060030

Immediately adjacent to the Middle Prong Roaring River watershed, this 56-square mile watershed drains Stone Mountain State Park and has 35% of its area in conservation. With 32 NHEOs, a WRC-designated priority area for aquatic habitat conservation (2005) and HQW/ORW waters, this is clearly an asset-rich system worthy of preservation/conservation efforts. However, the lower reaches of this watershed includes significant agricultural activity (e.g., 30 animal operations) and degraded riparian buffers. EEP has one stream restoration (and wetlands creation) project in this watershed, at Stone Mountain State Park.



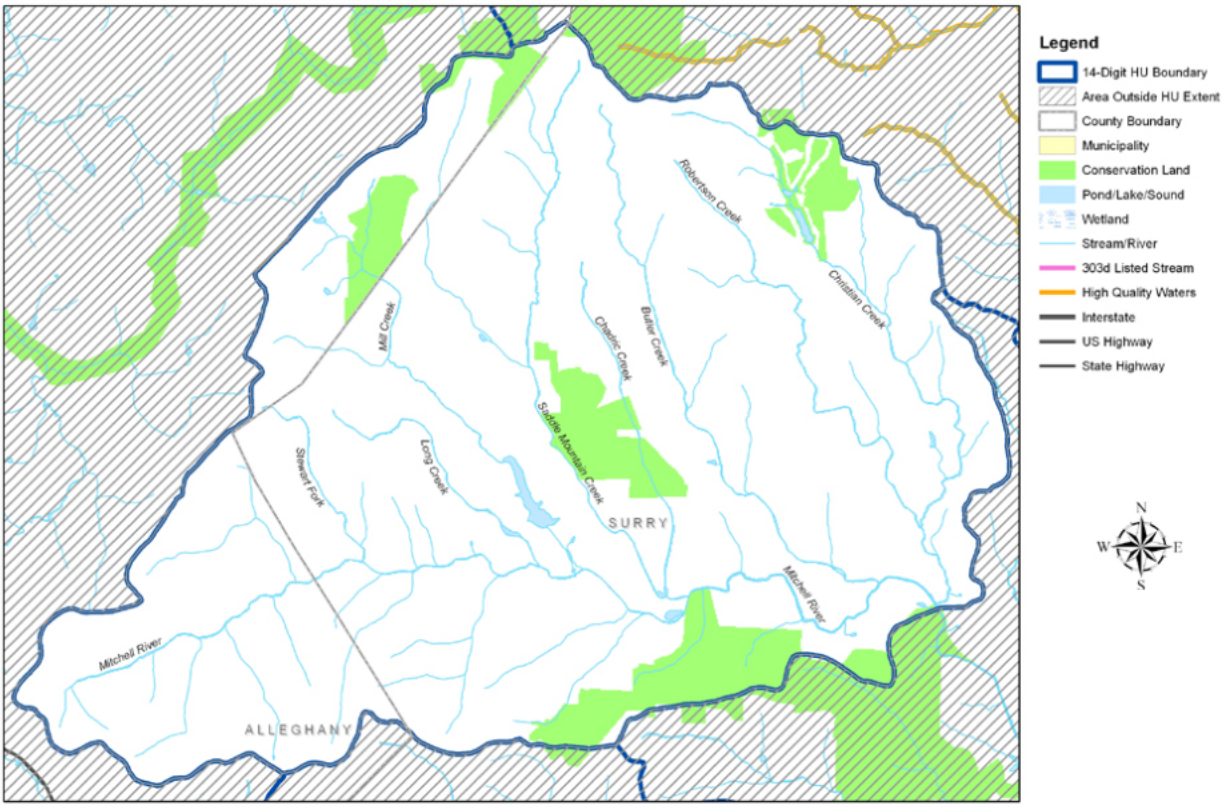
Bugaboo Creek: 03040101070010

This 25-square mile watershed, located in northeastern Wilkes County, is characterized by heavy agriculture (over 44 percent agricultural land cover and 15 animal operations) and 25 percent non-forested riparian buffers. It includes WSW waters, but only one percent of its land area is presently conserved. EEP has a stream restoration project on Little Bugaboo Creek.



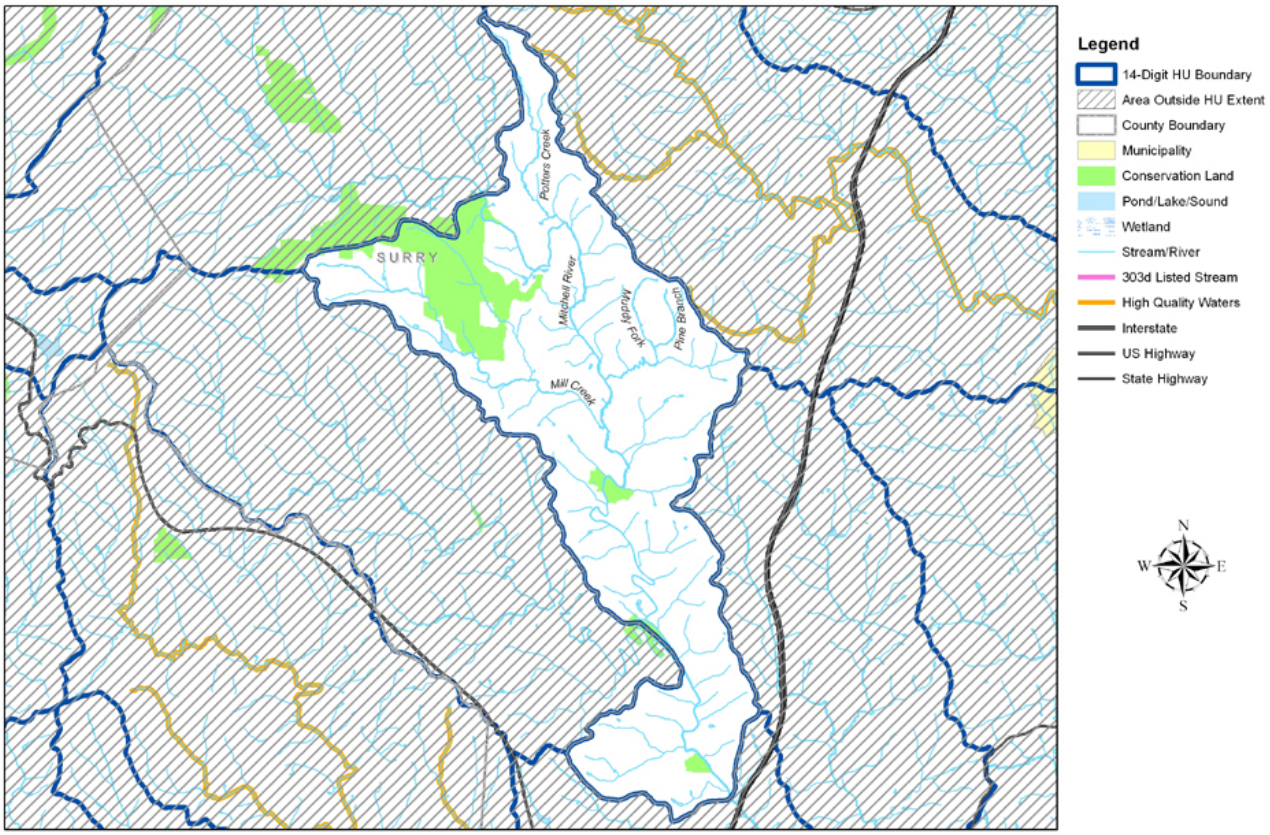
Upper Mitchell River: 03040101080010

Located in western Surry County, the upper Mitchell River drains a 29-square mile area that is 93 percent forested and contains Outstanding Resource Waters (ORW), trout streams, a significant percent of conserved lands (9.2 %) and very little agriculture. It contains two EEP stream projects and 13 non-EEP funded projects, coordinated through a very active watershed coalition and a knowledgeable and energetic staff with Surry County NRCS and SWCD. The entire Mitchell River system in Surry County has been identified by the NC Wildlife Resources Commission (WRC) and the NC Natural Heritage Program (NHP) as a priority area for the conservation of freshwater mussel species (personal communication: Brena Jones, WRC Aquatic Wildlife Diversity Biologist; November 2008) and as a priority area in the WRC's Wildlife Action Plan (2005).



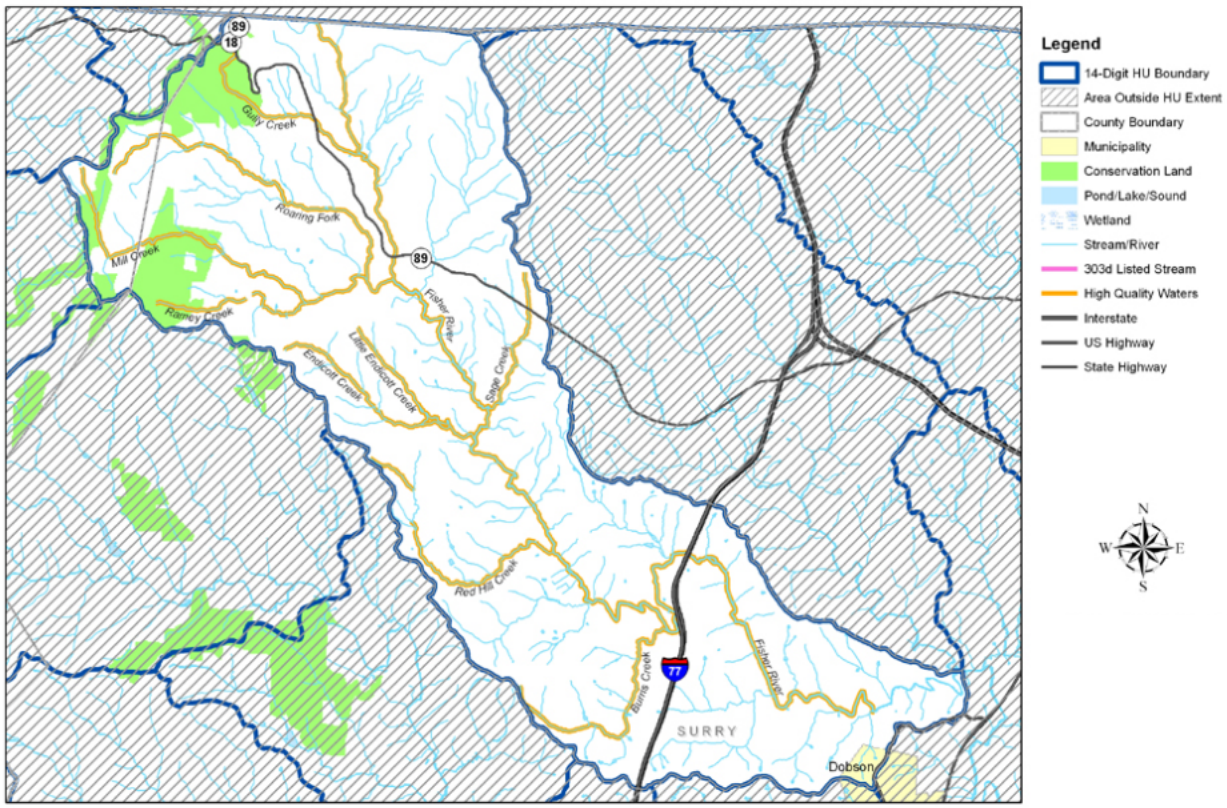
Middle Mitchell River: 03040101080020

Located immediately below (downstream of) the upper Mitchell River watershed described above, this 25-square mile HU is characterized by 25 percent agricultural land cover, 13 animal operations and 29 non-EEP funded watershed initiatives. As noted above, the entire Mitchell River system is a priority area for aquatic habitat conservation. Nearly 10 percent of its area is in conserved status and it is home to 15 documented NHEOs.



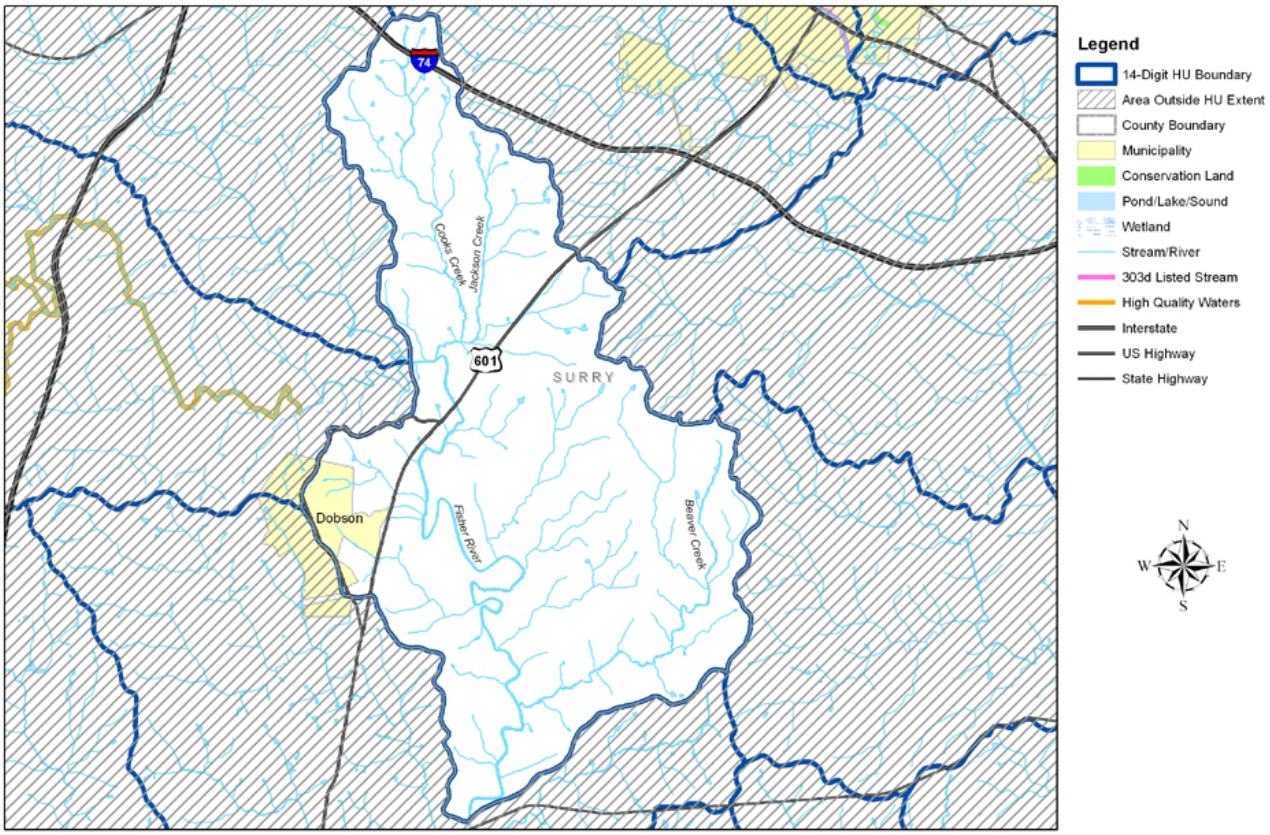
Upper Fisher River: 03040101090010

At over 60 square miles in area, this is one of the largest HUs selected as a TLW in the upper Yadkin CU. It is characterized by significant agricultural activity, including 24 permitted animal operations, and DWQ has reported declining bioclassification scores (based on benthic sampling) at two sites on the mainstem of the Fisher River (DWQ, 2007). A 0.5-mile stretch of Endicott Branch, a tributary to the upper Fisher River in northwestern Surry County, is impaired by habitat degradation associated with agriculture/pasturing activities (DWQ, 2008). Additionally, a 21.2-mile length of the Fisher River is considered to be impacted by turbidity violations attributed to general agriculture, impervious surfaces (probably around the Town of Dobson) and land clearing (DWQ, 2008). Ten non-EEP initiatives and two EEP stream projects are located in this watershed, which contains a total of approximately six percent conserved lands.



Middle Fisher River: 03040101090030

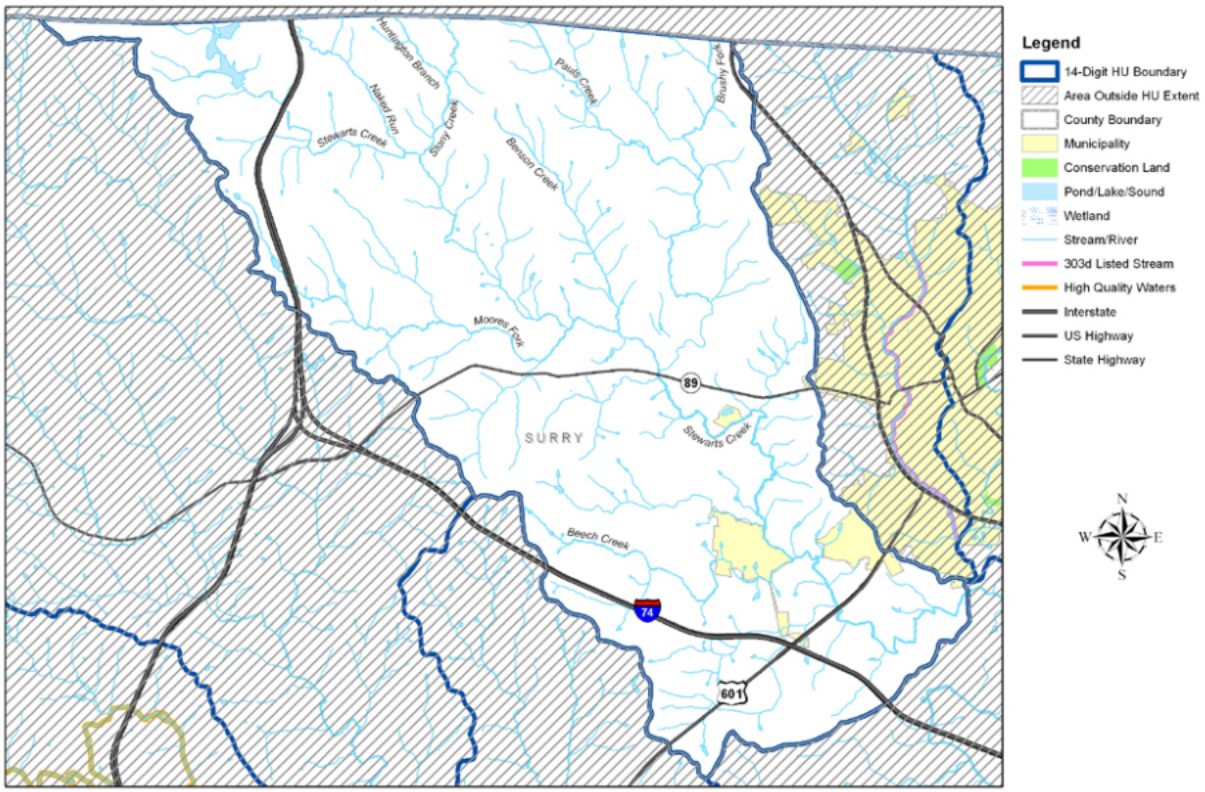
This is a 28-square mile watershed in central Surry County, immediately downstream of the upper Fisher River HU. It is characterized by widespread agriculture (40 percent of total land cover) and modest levels of impervious cover (1.3 percent). A major portion of the Town of Dobson is located in this watershed. The entire length of Cody Creek (7.0 miles), a tributary to the middle Fisher River, is impaired by turbidity violations attributed to impervious surfaces (DWQ, 2008). There is an EEP stream restoration project on Beaver Creek, and this watershed falls within a designated priority area for freshwater mussel conservation (Brena Jones, NC WRC, 2008).



Note: the following nine 14-digit HUs are part of the Ararat River Local Watershed Planning (LWP) effort, initiated by EEP in the spring of 2008. Surry County NRCS and SWCD, the City of Mount Airy, the Town of Pilot Mountain, Pilot View RC&D, Resource Institute, Inc., NC DWQ, NC WRC, the Clean Water Management Trust Fund (CWMTF) and Pilot Mountain State Park are all active partners in this effort, and – in partnership with cooperative landowners -- have been instrumental in pursuing the implementation of watershed improvement/protection projects throughout the LWP area. For additional details about this LWP, go to:
http://www.nceep.net/services/lwps/Ararat_River/Ararat_River_LWP_Fact_Sheet_update_dec_08.pdf .

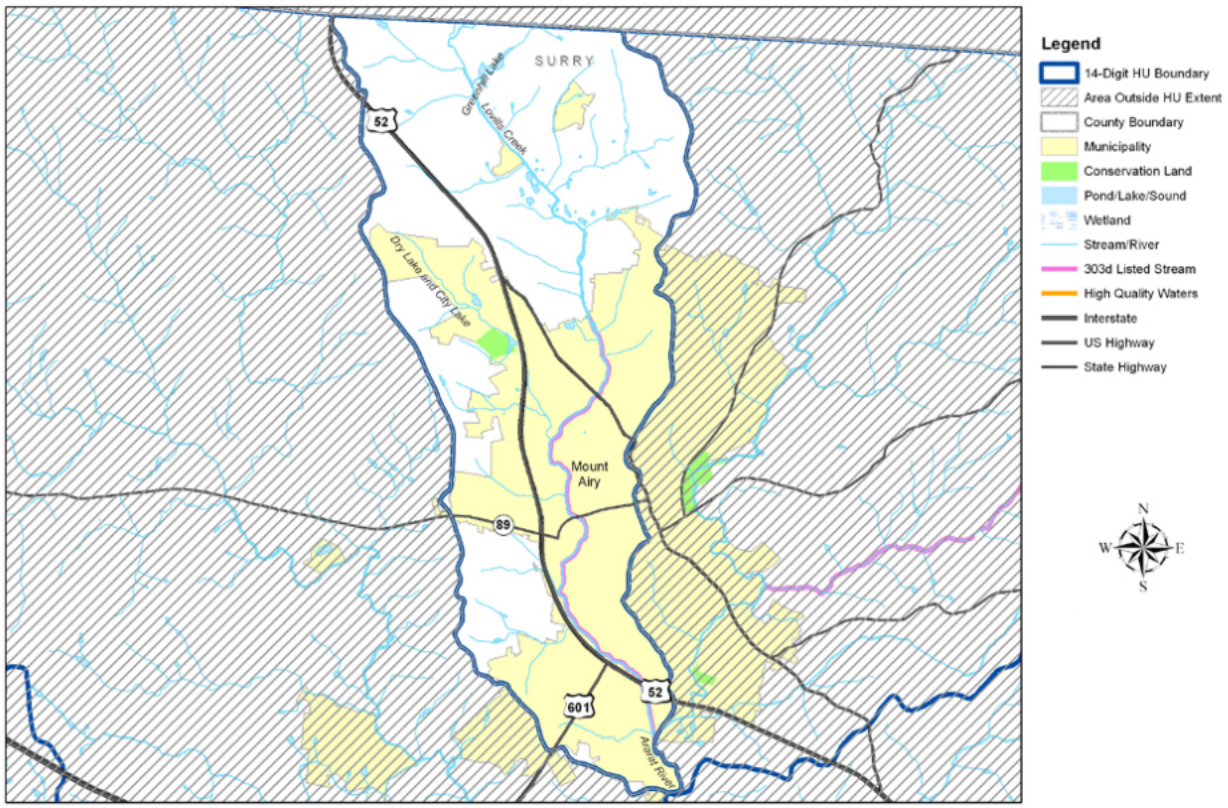
Stewarts Creek: 03040101100010

This 42-square mile watershed is largely agricultural, suffers from degraded riparian buffers and includes WSW-designated waters. A 3.3-mile stretch of Stewarts Creek is considered to be impacted by habitat degradation due to impoundments (DWQ, 2008). Impervious cover is estimated at 2.8 percent, as Stewarts Creek and its tributary streams flow through the western portion of the City of Mount Airy in northern Surry County. This is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative.



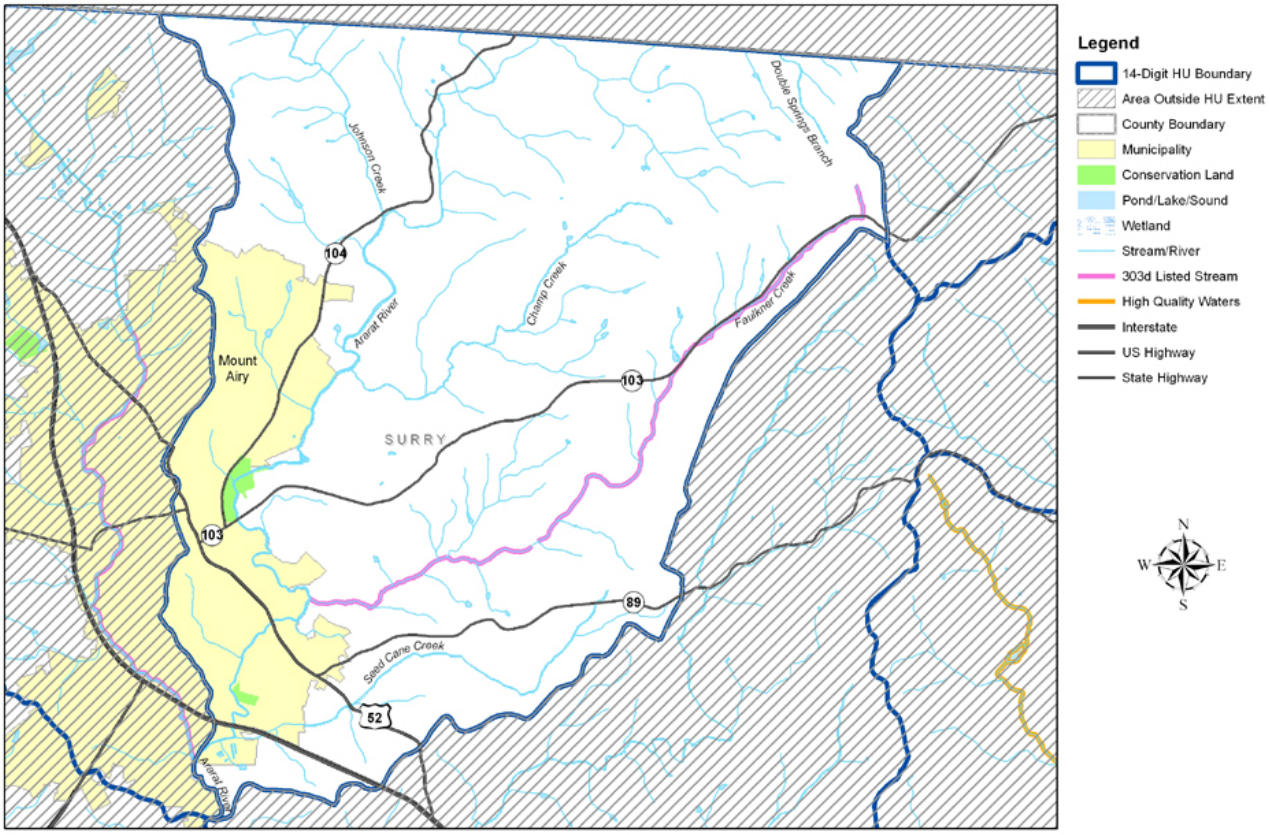
Lovills Creek: 03040101100020

At 11 square miles, this is the smallest of the TLWs selected within the upper Yadkin CU, but one of the most heavily impacted. This watershed drains a large portion of the City of Mount Airy. Impervious cover is estimated at 15.8 percent, agriculture accounts for only 10 percent of land cover, and degraded (non-forested) conditions characterize 60 percent of riparian buffers. High imperviousness, stormwater runoff, degraded or missing riparian buffers and permitted point source dischargers account for significantly degraded habitat and impaired water quality in Lovills Creek – 4.2 miles of lower Lovills Creek in Mount Airy is considered impaired (on the basis of aquatic life/benthos) according to DWQ (2008). The upper (northernmost) portion of this watershed in North Carolina is designated WSW. This is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative. Opportunities for improved stormwater management, including stormwater BMP retrofit projects, are likely abundant throughout the greater Mount Airy area.



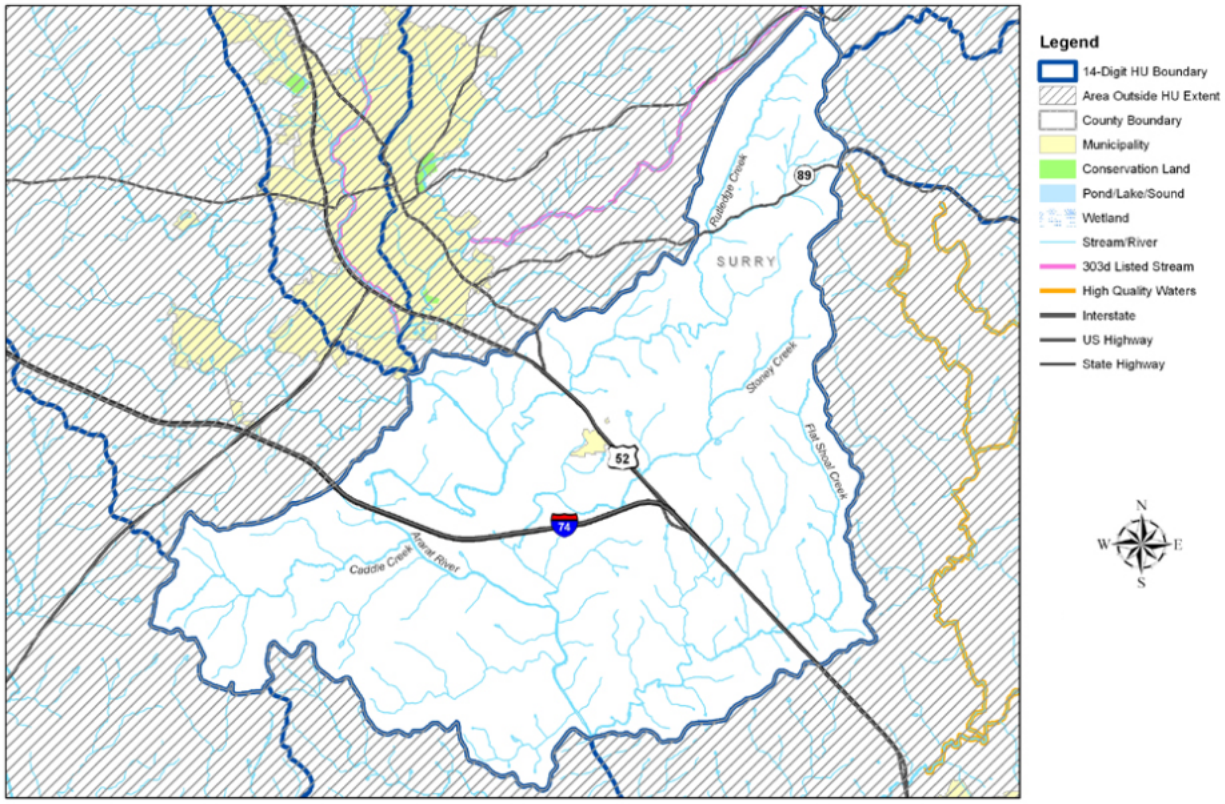
Faulkner Creek – Ararat River: 03040101110010

This 22-square mile watershed drains the eastern portion of the City of Mount Airy and is estimated to have 4.5 percent imperviousness. Its land cover is 23 percent agricultural and 50 percent forested, and 33 percent of its riparian buffers are degraded (non-forested). It includes WSW-designated waters in its upper (northernmost) portion. Faulkner Creek (6.1 miles) is impacted by habitat degradation associated with impervious surfaces according to DWQ (2008). This is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative.



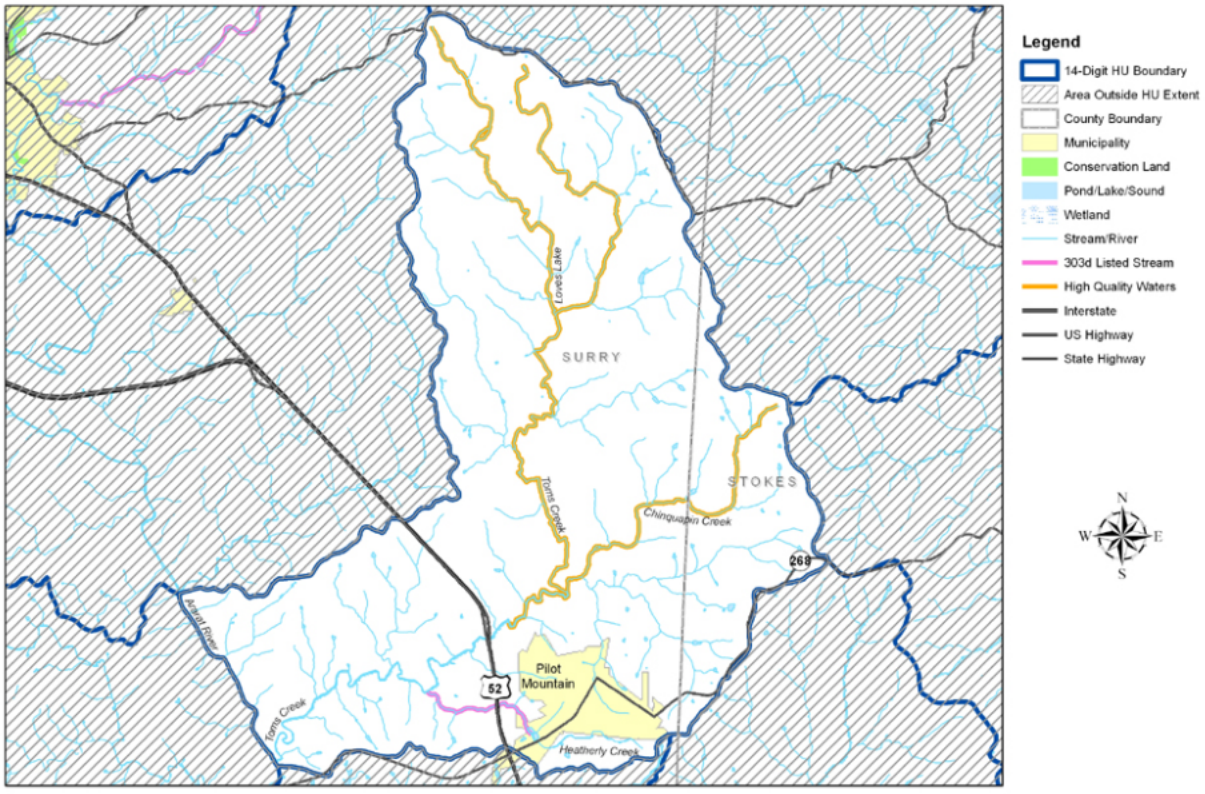
Rutledge, Stoney and Flat Shoal Creeks – Ararat River: 03040101110020

This watershed is 39 square miles and largely agricultural in its land use (32 percent), with 11 permitted animal operations. Flat Shoals Creek is impacted by habitat degradation, and a portion of the middle Ararat River in this watershed is considered to be impaired by turbidity and habitat degradation (DWQ, 2008). Many of these water quality impacts are likely associated with impervious surfaces in urban areas upstream of the watershed and locally degraded riparian buffers and unstable streambanks. The watershed is host to at least two non-EEP projects, including a 319- and CWMTF-funded *Agricultural Sediment Initiative* that focused on the implementation of agricultural BMPs on farms with cooperating landowners. This is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative.



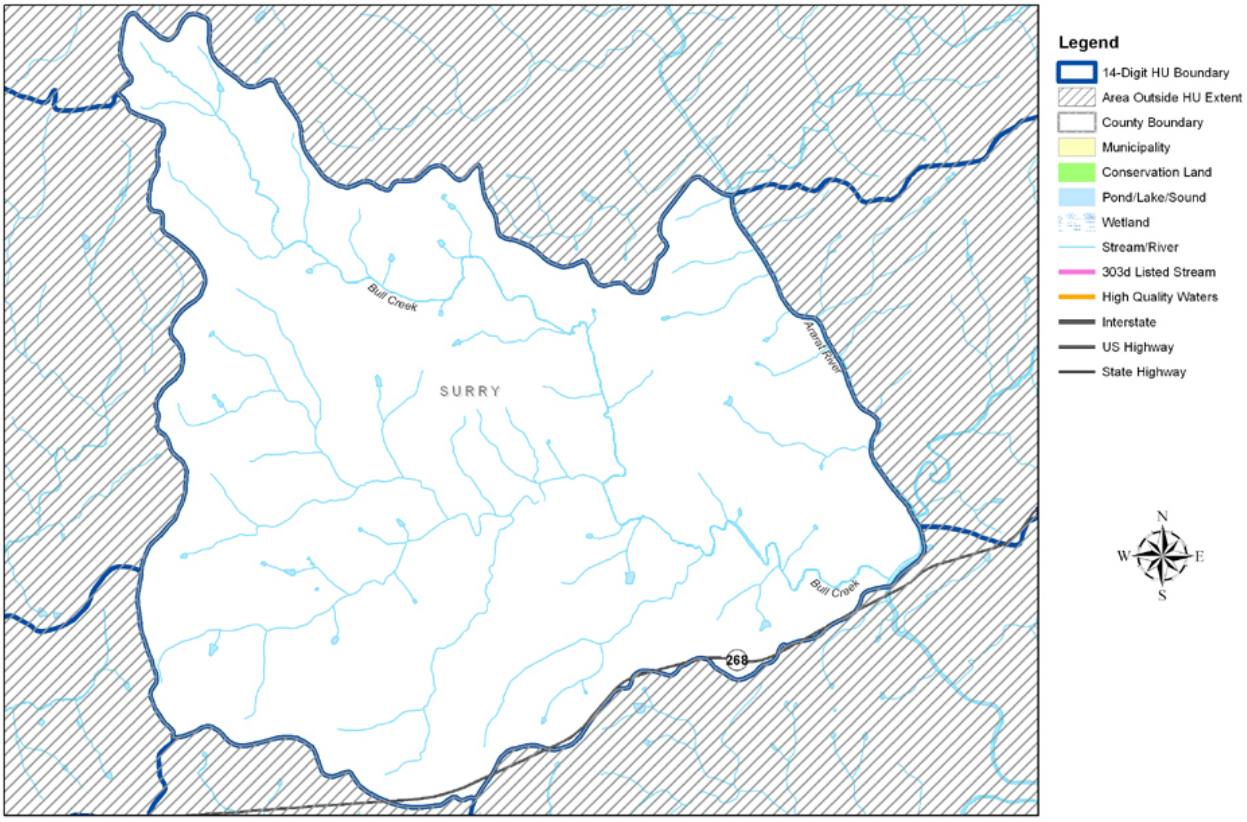
Toms Creek, including Heatherly Creek: 03040101110030

This 40-square mile system includes a mix of agricultural (30 percent of land cover; four animal operations) and urban land uses (Town of Pilot Mountain), with an overall imperviousness estimated at 1.3 percent. The upper two-thirds of this HU is a designated Water Supply Watershed (WSW) area. Lower Heatherly Creek, which drains the southwestern urban area around the Town of Pilot Mountain, is considered to be impaired by WWTP discharges (DWQ, 2008). Much of Heatherly Creek is impacted by non-point source pollution, including direct discharge of storm sewers, pronounced streambank erosion and in-stream sedimentation. Two non-EEP projects have been initiated within this watershed. Opportunities for improved stormwater management in/around the Town of Pilot Mountain should be identified as part of the EEP Ararat River LWP initiative.



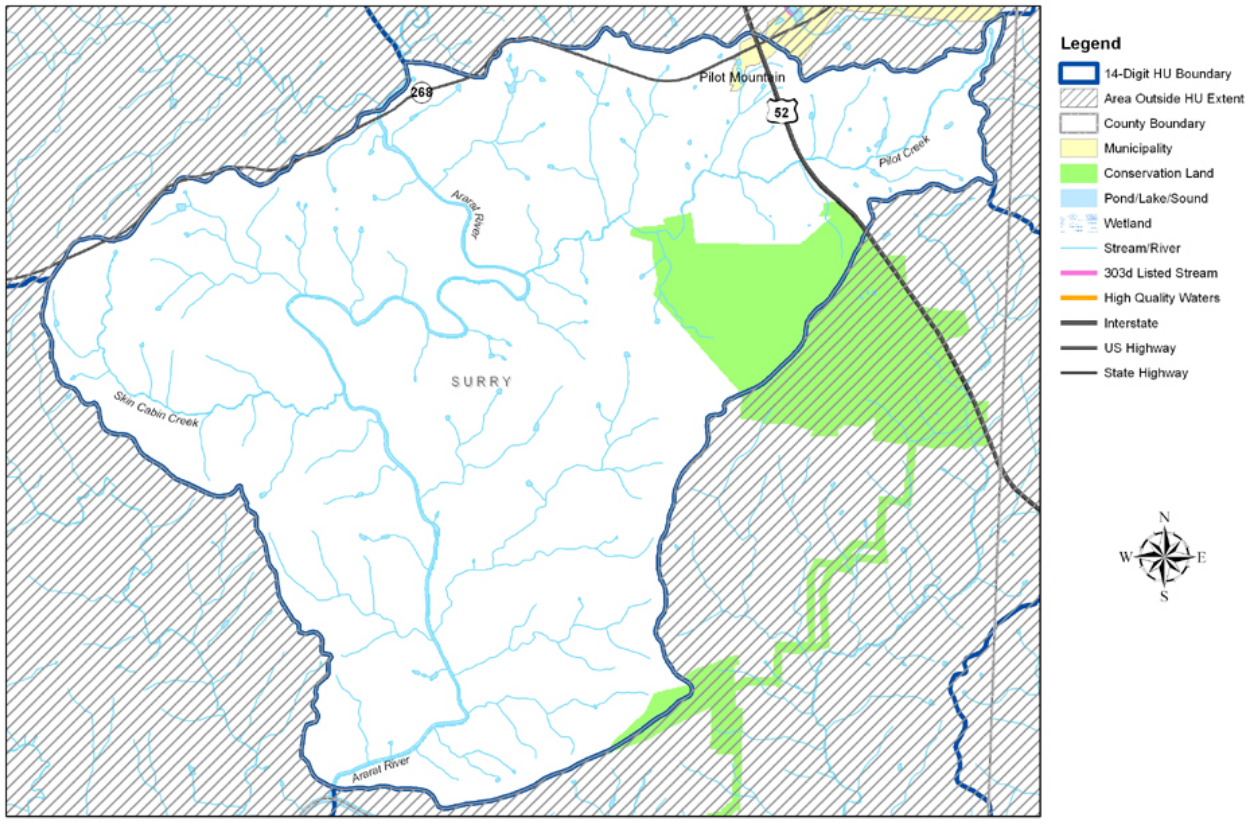
Bull Creek – Ararat River: 03040101110040

This is a predominantly agricultural watershed, draining 16 square miles in southeastern Surry County. It is characterized by 44 percent agricultural land cover, 8 permitted animal operations and 22 percent degraded (non-forested) riparian buffers. It includes a stretch of the lower Ararat River considered impaired due to turbidity and habitat degradation (DWQ, 2008). It is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative.



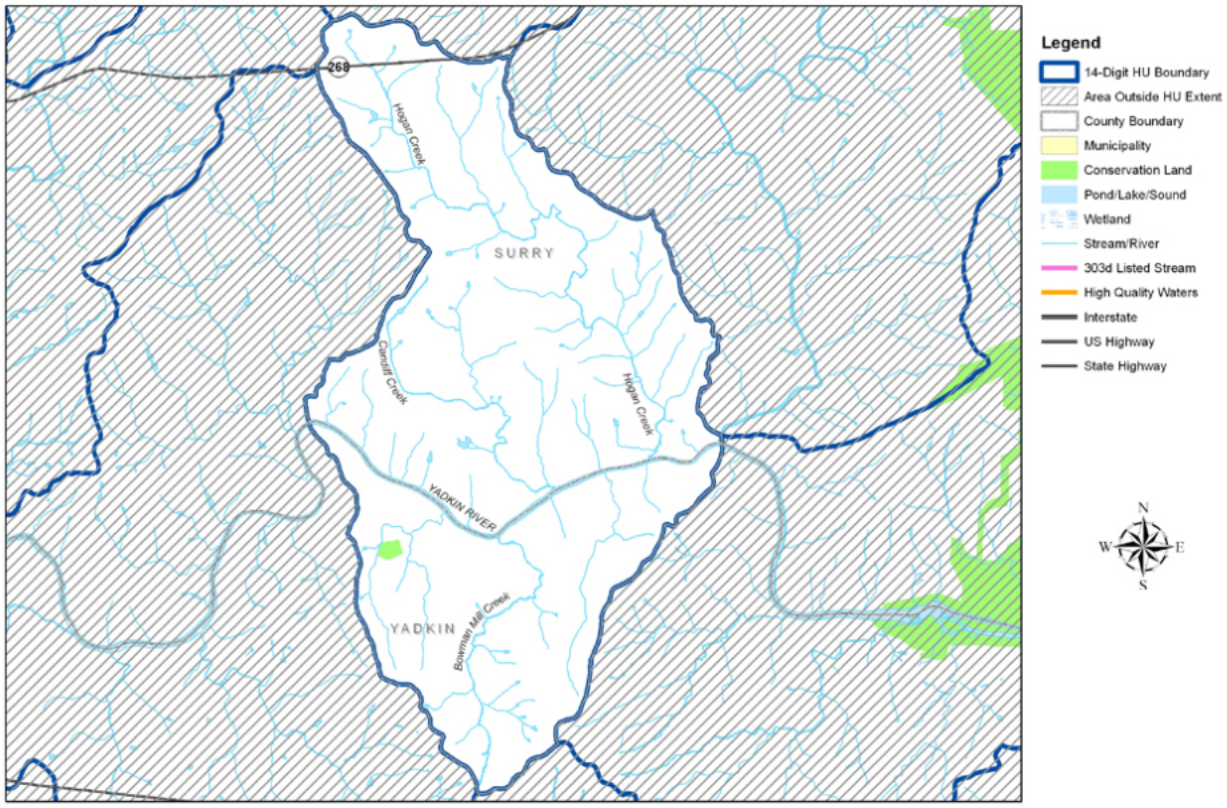
Lower Ararat River: 03040101110050

Comprising the drainage area of the lower Ararat River immediately upstream of its confluence with the Yadkin River (in extreme southeastern Surry County), this 27-square mile watershed is primarily forested (64% of total land cover) and agricultural (29%) in nature. A total of approximately 14 miles of the lower Ararat River are considered impacted and/or impaired by turbidity and habitat degradation (DWQ, 2008). Only 17 percent of its total riparian buffer mileage is degraded (non-forested), making this watershed a good candidate for habitat and/or farmland preservation initiatives, especially in headwater areas of Ararat tributary streams. [About six percent of its land area is presently in conserved status.] This watershed flows into the aquatic habitat priority area (for freshwater mussels) on the Yadkin River mainstem, as designated by WRC and NHP (WRC, 2005). It is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative.



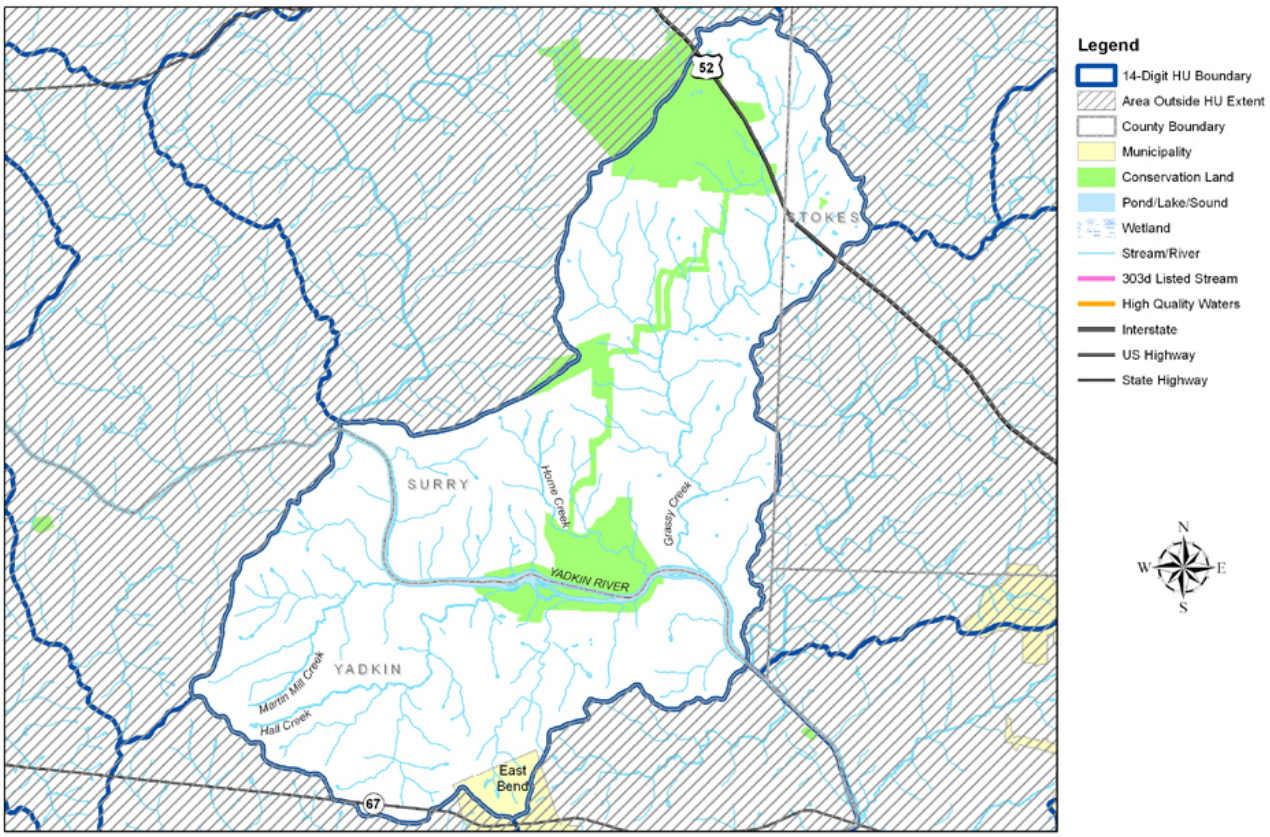
Cundiff Creek and Hogan Creek: 03040101110060

These two streams are direct tributaries to the Yadkin River in southeastern Surry County -- a priority area for aquatic habitat conservation, per the WRC and NHP (2005 *Wildlife Action Plan*). They comprise a 23-square mile watershed that is predominantly agricultural in nature (41 percent agricultural land cover; 26 permitted animal operations). With 25 percent non-forested riparian buffers and numerous animal farms, this watershed likely contains many opportunities for stream, wetlands and buffer restoration/enhancement projects. In fact, EEP is currently scoping one such project on Cundiff Creek, working with Surry SWCD and a cooperative landowner. This is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative.



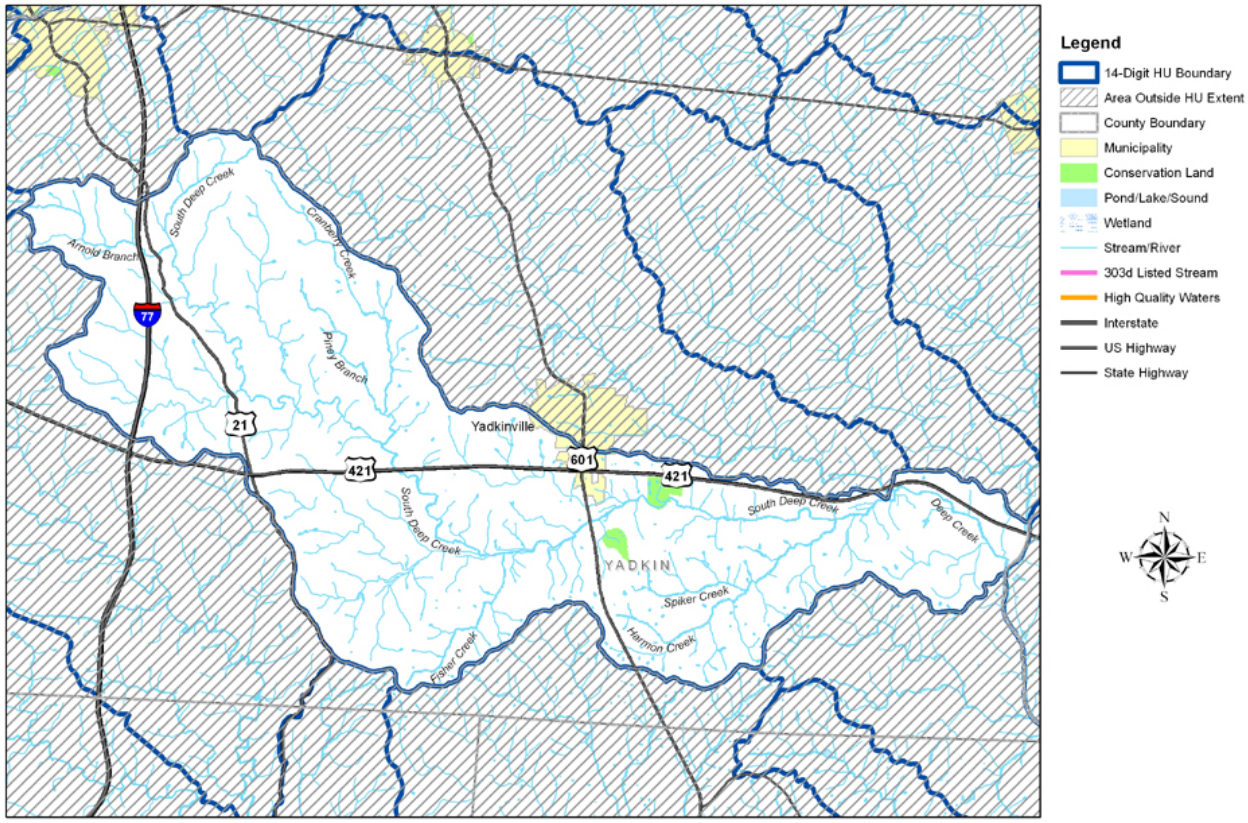
Grassy Creek and Horne Creek – Ararat River: 03040101110070

The headwaters of this 39-square mile watershed drain the Pilot Mountain State Park area in southeastern Surry County. Grassy Creek and Horne Creek flow directly into the Yadkin River, which is a priority aquatic habitat for freshwater mussel species (WRC, 2005). The watershed is largely rural in nature (31 percent agriculture; 61 percent forest; four animal operations) with predominantly WSW-classified waters (95 percent), and it contains 35 NHEOs and over 11 percent lands in conservation (as part of Pilot Mountain State Park). Opportunities for stream and riparian buffer restoration/enhancement and preservation are probably abundant. It is one of nine 14-digit HUs included in EEP's Ararat River LWP initiative.



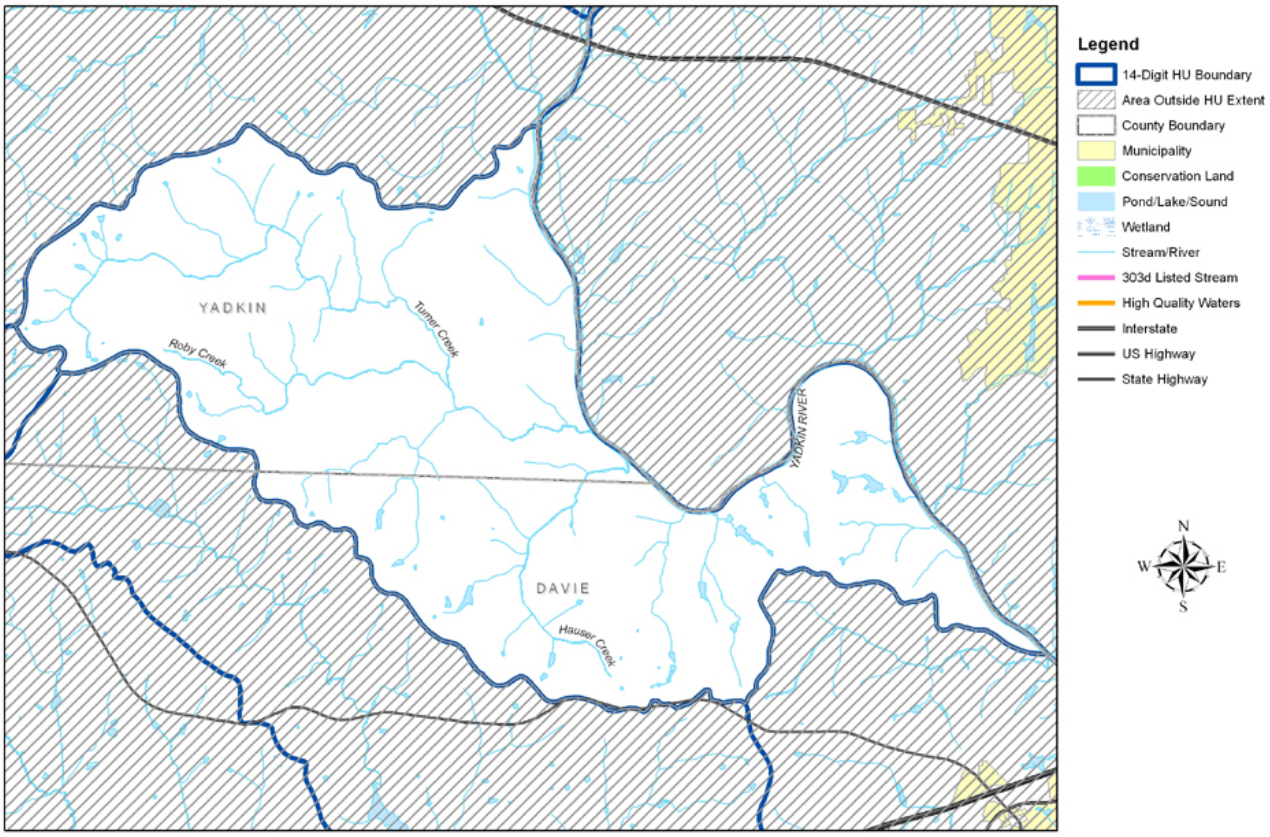
South Deep Creek: 03040101130020

At 80 square miles in area and covering a large portion of southern Yadkin County, this is the largest targeted watershed in the upper Yadkin CU. With 45 percent agricultural land use, 32 percent degraded (non-forested) riparian buffers and 57 animal operations, this is one of the most intensely agricultural watersheds in the upper Yadkin River basin. However, only 2.8 miles of South Deep Creek are considered impaired; this is due to turbidity violations attributed to general agriculture/pasture and impervious surfaces (DWQ, 2008). South Deep Creek flows along the southern portion of the Town of Yadkinville, so urban stormwater runoff may be causing non-point source impacts to aquatic habitat downstream of town. Over 80 percent of the watershed is WSW-classified and it includes priority aquatic habitat (WRC, 2005). Nine non-EEP and two EEP projects have been initiated within the watershed.



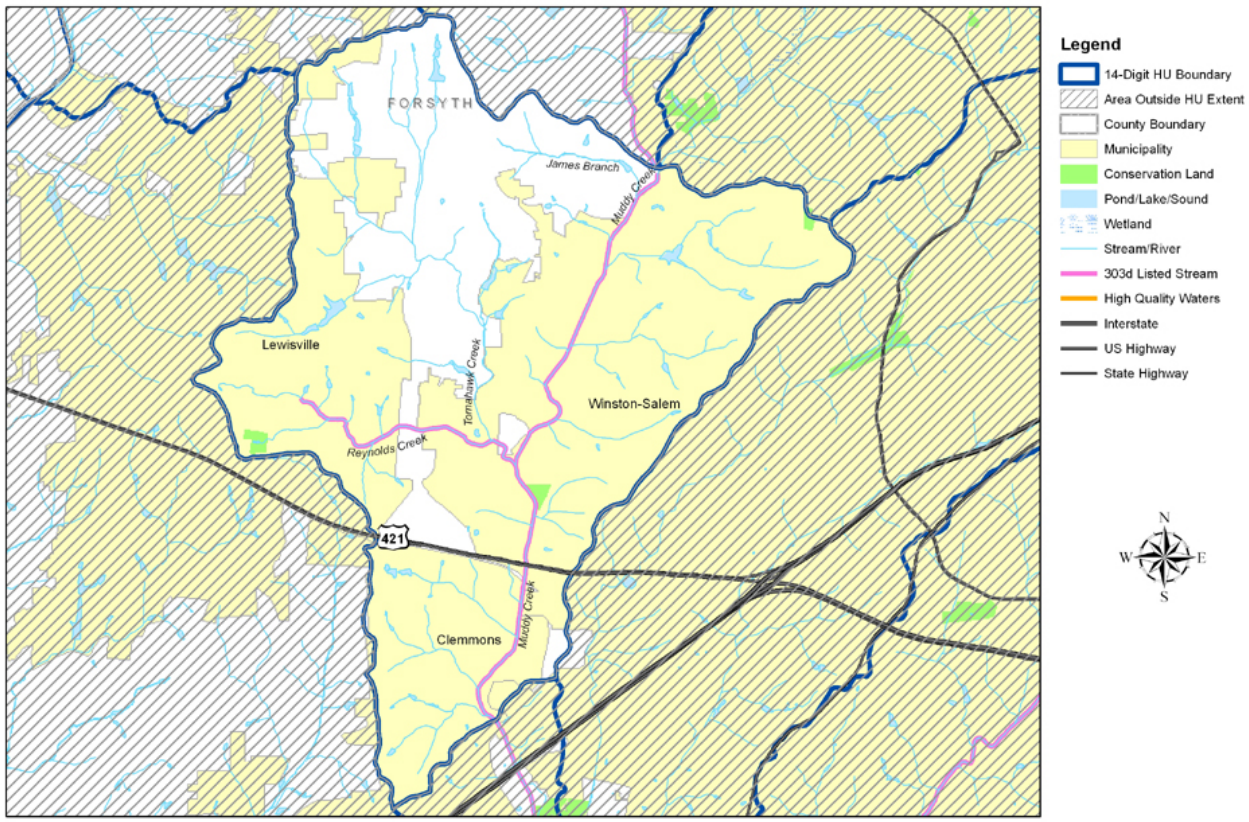
Turner and Hauser Creeks – Yadkin River: 03040101160010

This 21-square mile watershed straddles the Yadkin-Davie county line and is 39 percent agricultural lands. It includes 14 permitted animal operations and 15% degraded (non-forested) buffers. Over 90 percent of the watershed is WSW-classified and it contains two NHEOs. EEP has a stream restoration project on a tributary to Hauser Creek.



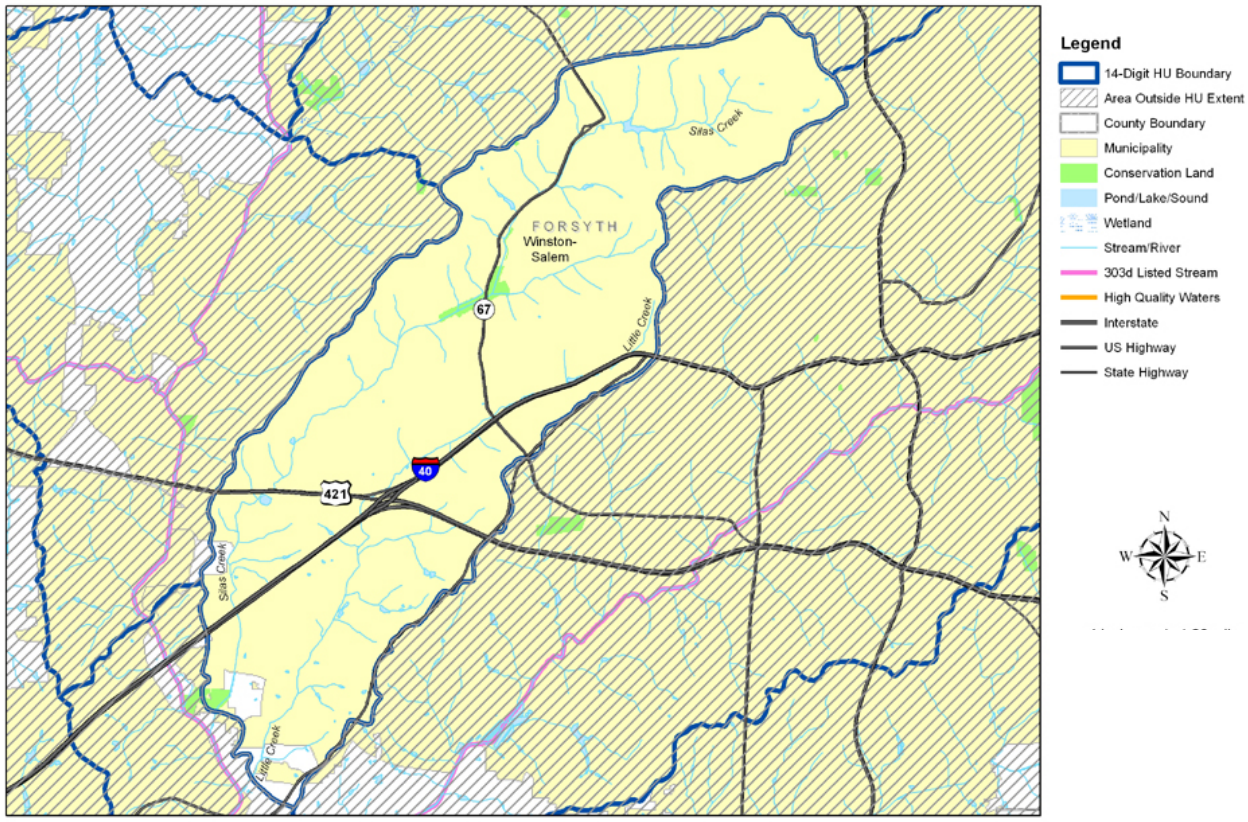
Muddy Creek: 03040101170030

This is a 19-square mile urban watershed in western Forsyth County, which drains portions of Winston-Salem and Lewisville. Impervious cover is estimated at 7.4 percent and degraded (non-forested) riparian buffers exceed 50 percent. Due to declining bioclassification (benthic) scores, the entire length of Muddy Creek through this watershed is considered impaired by DWQ (2008). Turbidity and fecal coliform violations associated with stormwater runoff are additional impacts noted in Muddy Creek (DWQ, 2008). A portion of the watershed falls under the Phase II NPDES stormwater requirements.



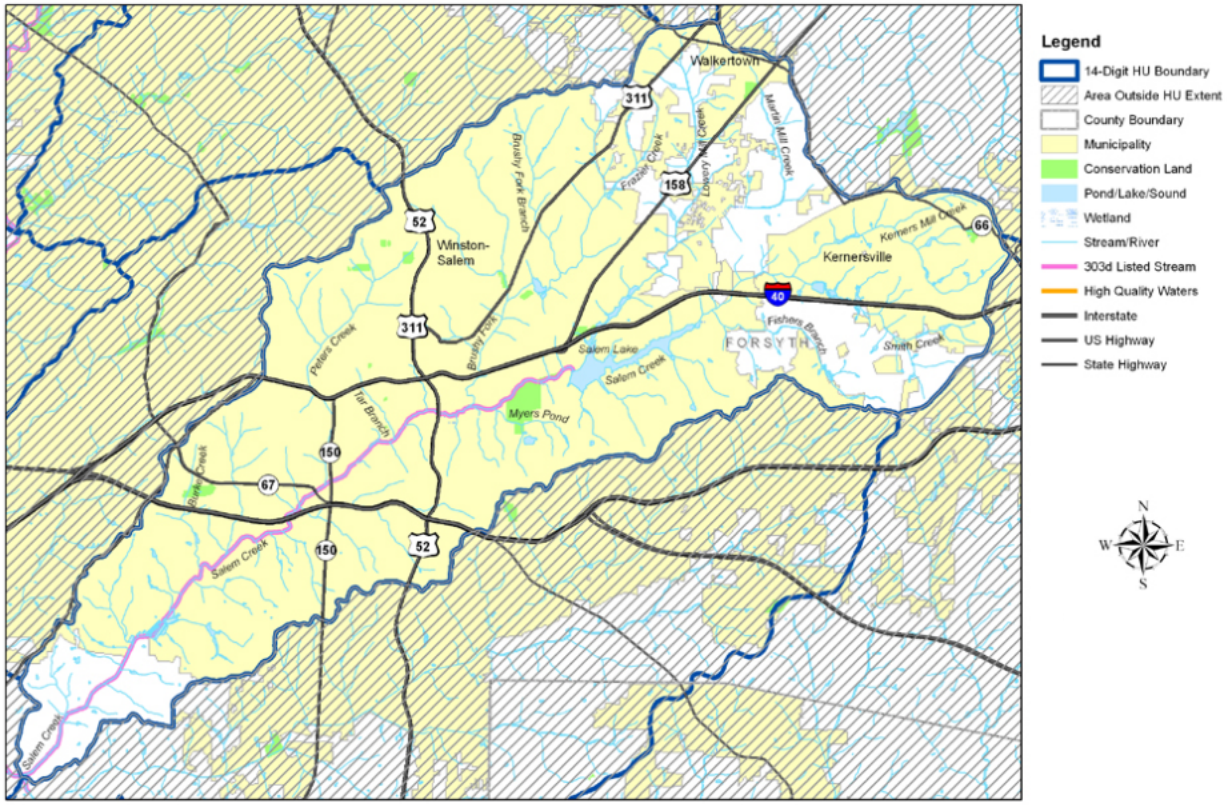
Silas Creek: 03040101170040

With impervious cover approaching 20 percent, this 20-square mile watershed is a highly urban system in southwestern Winston-Salem. Its forest cover is only 11 percent and its riparian buffers are 75 percent degraded (non-forested). DWQ reports Silas Creek to be impacted by habitat degradation along its 10-mile length, primarily due to urban construction projects and stormwater runoff (DWQ, 2008). EEP has a stream restoration/enhancement project planned for Silas Creek. A portion of the watershed falls under the Phase II NPDES stormwater requirements.



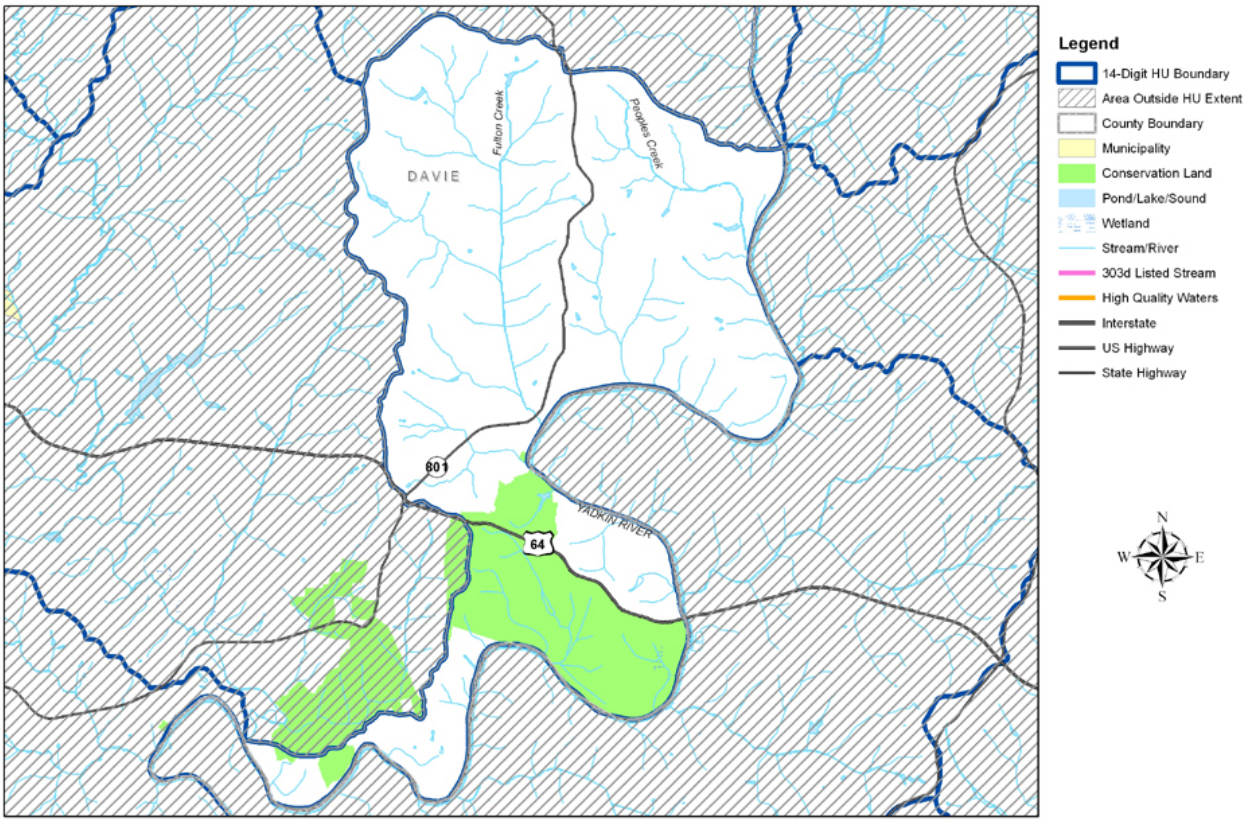
Salem Creek: 03040101170060

This is a large watershed (at 70 square miles, the second largest TLW in the upper Yadkin CU) that flows through the heart of Winston-Salem in central Forsyth County. It is characterized by 18 percent impervious cover, 60 percent degraded (non-forested) riparian buffers, and is even home to 8 permitted animal operations. Nearly 40 percent of the watershed contains WSW-classified waters. A large portion of the watershed falls under the Phase II NPDES stormwater requirements. The lower 12 miles of Salem Creek are rated as impaired due to habitat degradation, turbidity and fecal coliform violations (DWQ, 2008). The likely sources of this impairment include urban stormwater runoff, impervious surfaces and (in the headwaters east of Winston-Salem) general agriculture/pasture. There are no documented 319- or CWMTF-funded projects in the watershed, but there are likely numerous opportunities for improved stormwater management and stormwater BMPs.



Carter Creek – Yadkin River: 03040101180020

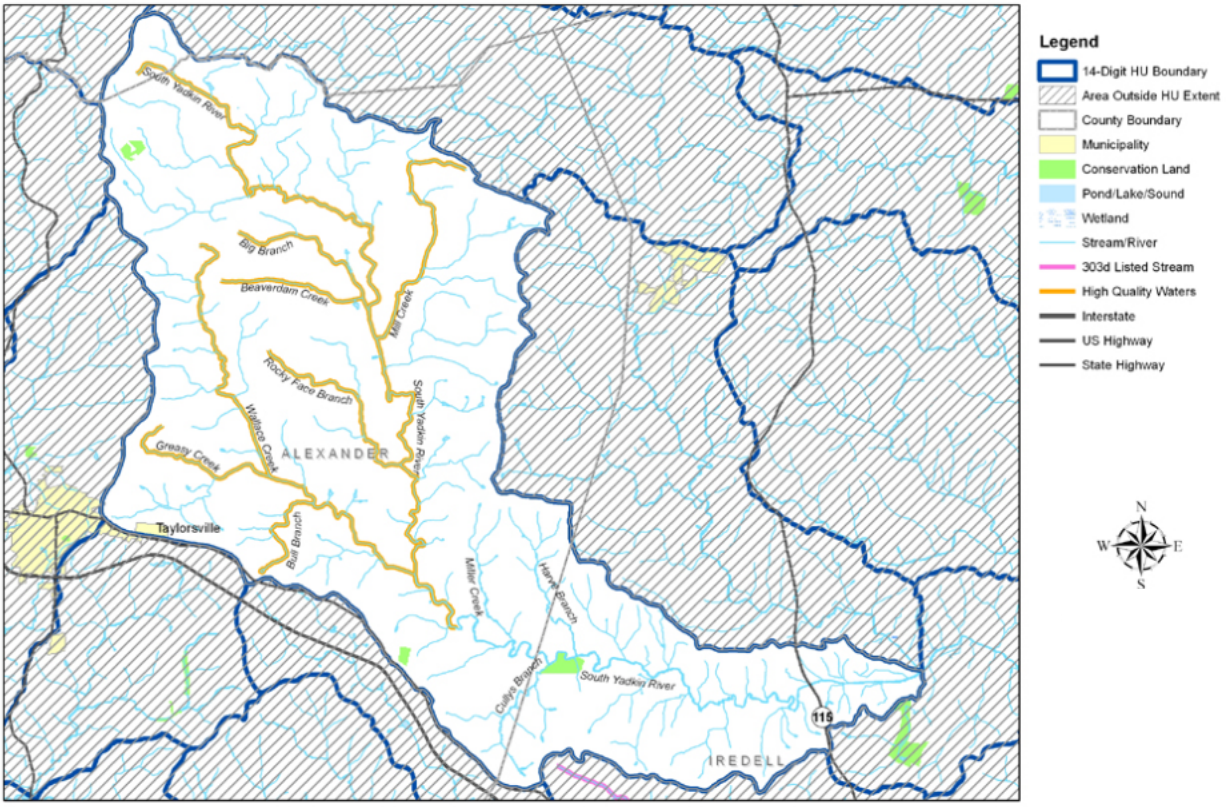
Located along the eastern border of Davie County (bounded by the Yadkin River), this 23-square mile watershed contains 36 percent agricultural lands, 58 percent forests/wetlands and 8 permitted animal operations. This is an asset-rich watershed, with 75 percent WSW waters, 10 NHEOs, 14 percent conserved lands and only 18 percent degraded (non-forested) riparian buffers. Preservation opportunities are likely abundant within this HU.



Yadkin 03040102

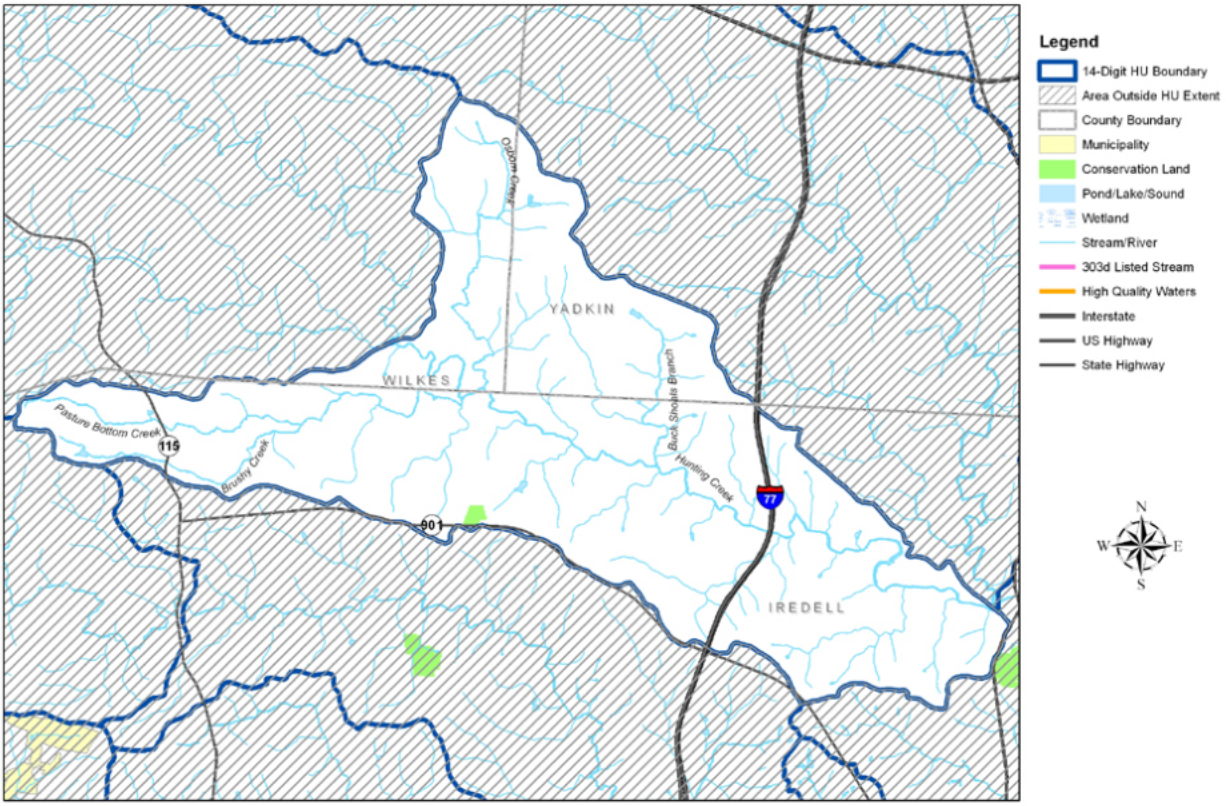
Upper South Yadkin River: 03040102010010

The upper South Yadkin River flows out of northeastern Alexander County, from a relatively forested region bordering the Brushy Mountains, through an increasingly agricultural landscape. The 79-square mile watershed (the largest of the TLWs selected within this CU) contains 36 percent agricultural land cover and is home to 121 permitted animal operations, by far the largest number (and greatest concentration) of animal farms in the entire upper Yadkin River basin. Despite the high amount of agricultural activity, only a relatively modest portion of riparian buffers (19 percent) are non-forested. The watershed is ecologically important, as it contains 57 NHEOs. Also, 100 percent of its area is classified as water supply waters (WSW).



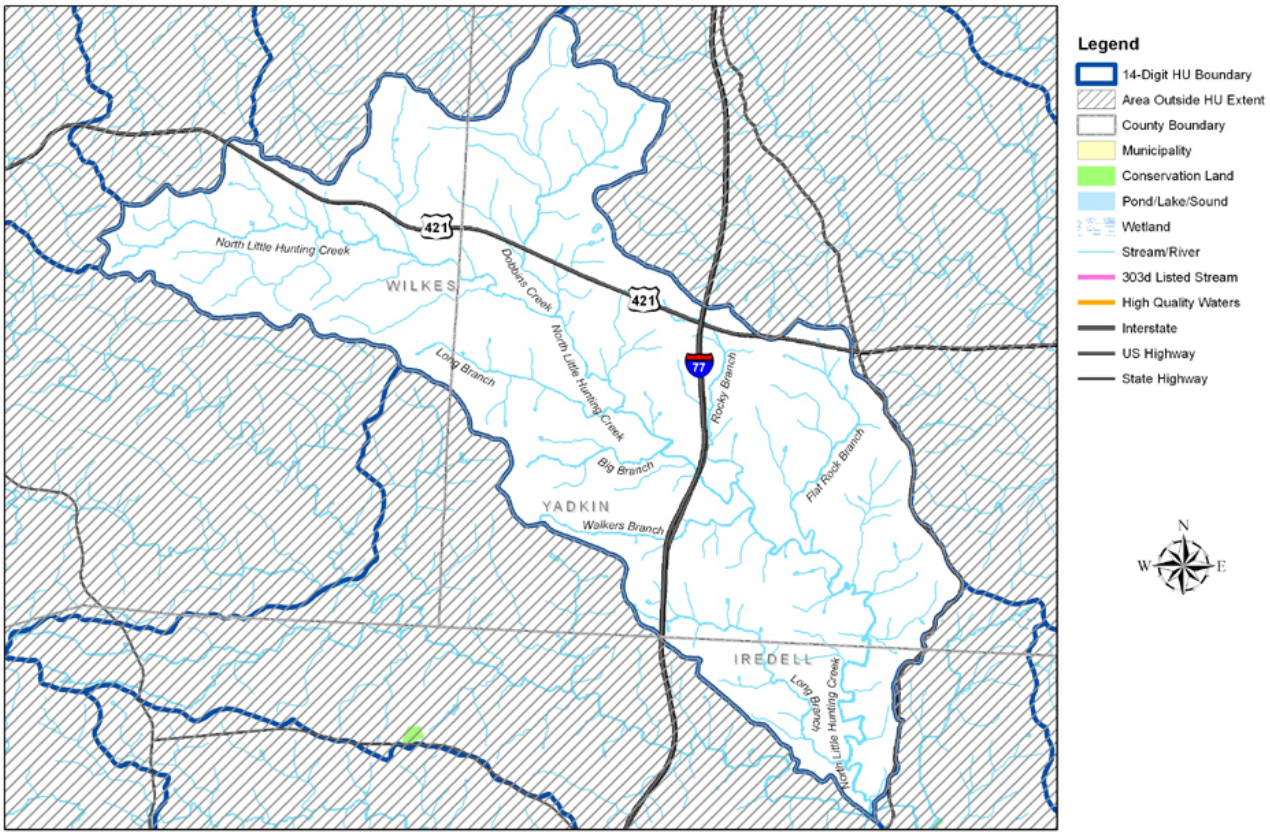
Hunting Creek: 03040102020020

This 34-square mile watershed spans the corners of three counties (Wilkes, Yadkin and Iredell) and is largely agricultural in nature. Its land cover is 42 percent agricultural and it is home to 23 animal operations. Despite the heavy agriculture, only 16 percent of riparian buffers in this watershed are not forested. The watershed falls entirely within a WSW area. The entire length of Hunting Creek through this HU is rated as impaired by turbidity (DWQ, 2008), with general agriculture/pasture indicated as the major source of the impairment. Six NHEOs occur within the watershed, and less than one percent of lands are in conservation status.



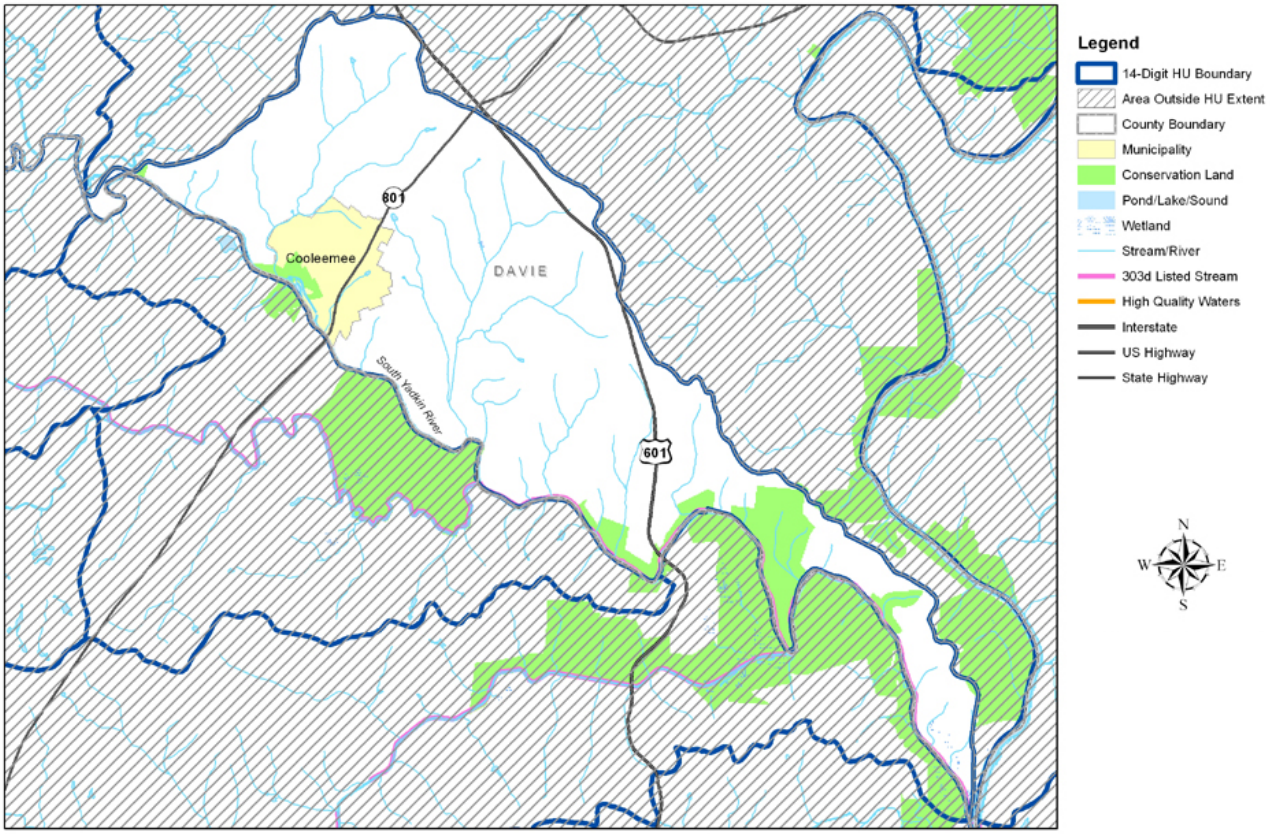
North Little Hunting Creek: 03040102020030

This is a tributary to Hunting Creek that flows from southeastern Wilkes County through the largely agricultural landscape of southwestern Yadkin County. It includes 46 percent agricultural land cover, 26 percent degraded (non-forested) riparian buffers, 61 animal operations, 1.2 percent impervious cover and 100 percent WSW waters. North Little Hunting Creek is impacted by habitat degradation due to general agriculture/pasture operations (DWQ, 2008). This watershed includes two EEP stream restoration projects.



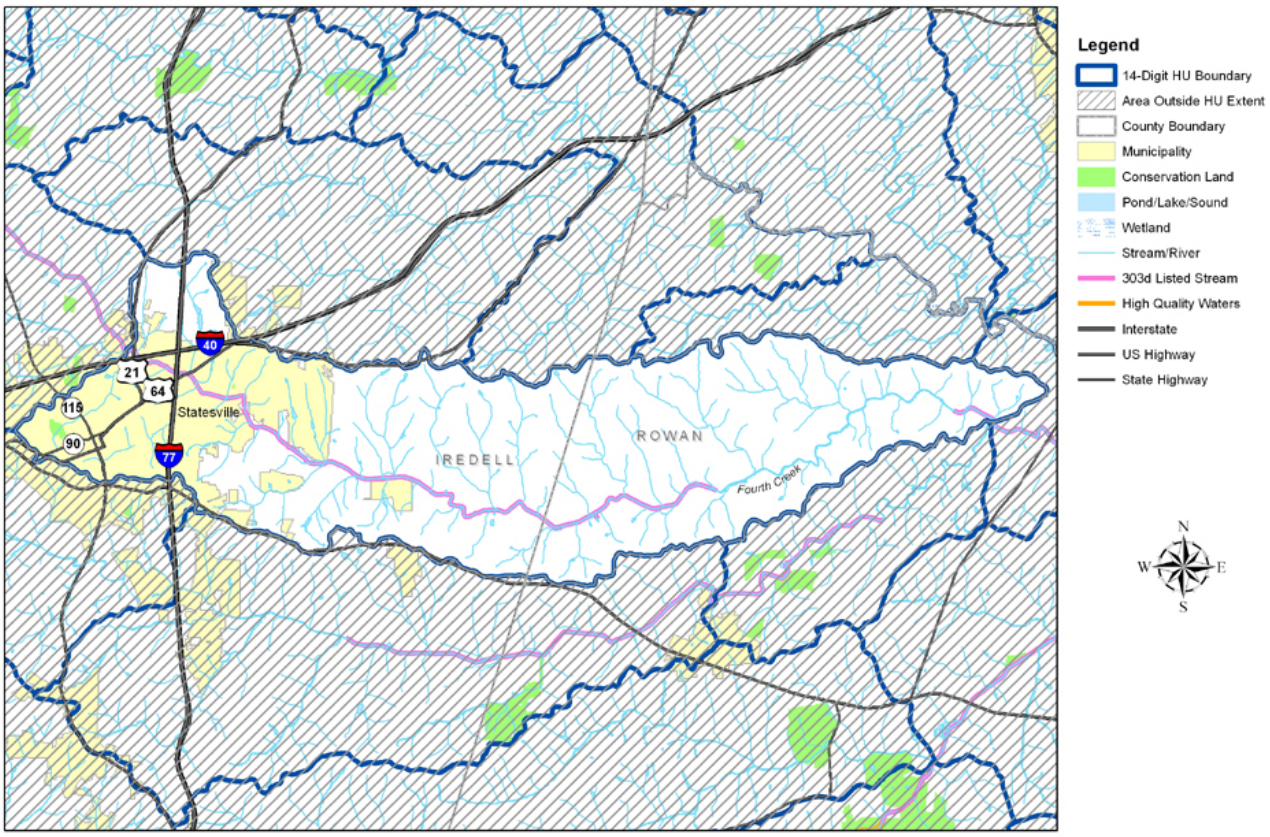
South Yadkin River: 03040102020070

This small HU (12 square miles) is located in southern Davie County, just south of Mocksville, and includes the small town of Cooleemee. It is characterized by 2.4 percent imperviousness, 35 percent agricultural cover, 23 percent degraded buffers and two permitted animal operations. Its assets include 6.8 percent conserved lands, five non-EEP projects and one EEP stream project. Stretches of the South Yadkin River, which forms the southwestern border of this HU, are impaired by turbidity and impacted by habitat degradation and fecal coliform (DWQ, 2008). Likely sources of these water quality impacts are impervious surfaces, stormwater runoff and general agriculture/pasture.



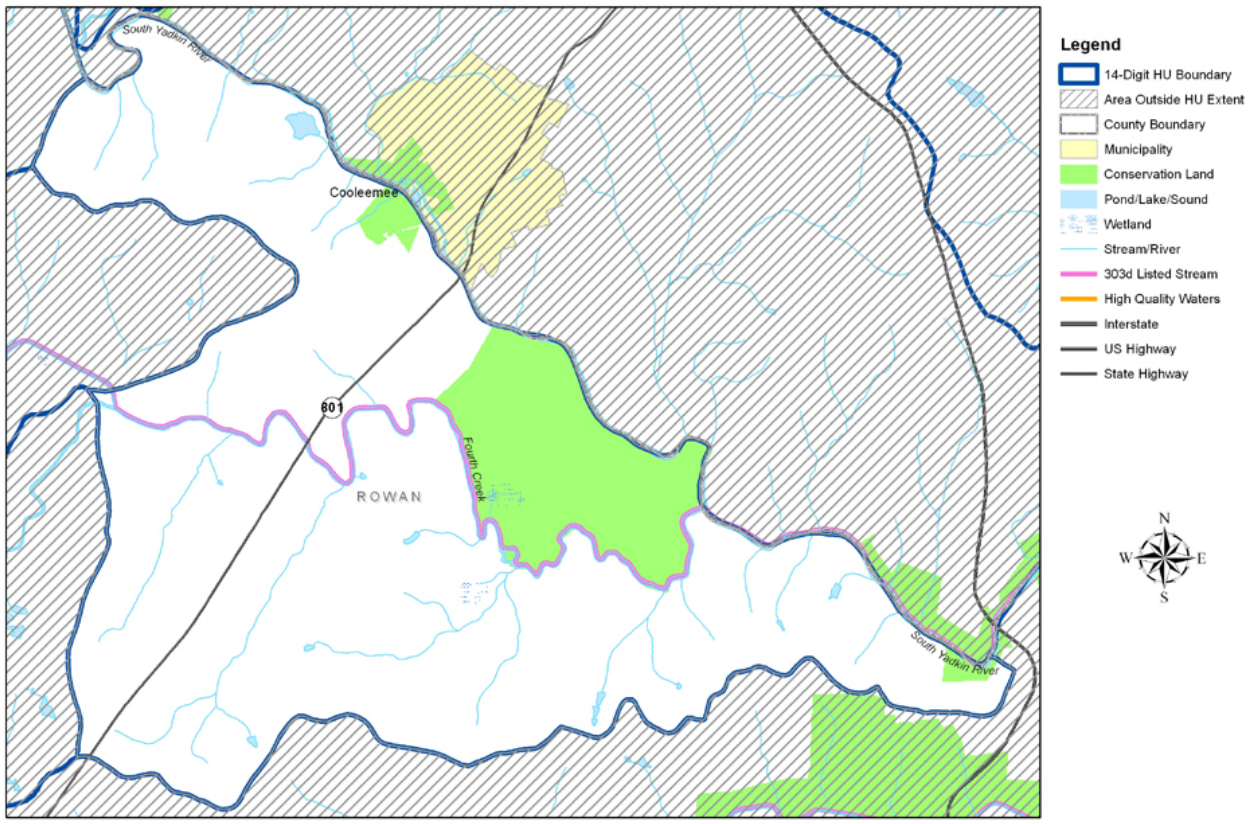
Fourth Creek: 03040102030020

This is a relatively large watershed (56 square miles) that extends from the City of Statesville in central Iredell County into northern Rowan County. Its headwaters are predominantly urban, with total watershed imperviousness estimated at 5.1 percent. The lower reaches are predominantly agricultural. Watershed-wide land cover is 42 percent agricultural cover, with 24 permitted animal operations and 38 percent degraded (non-forested) riparian buffers. A significant portion of Fourth Creek through this HU is rated as impaired from habitat degradation and turbidity violations, with likely sources including impervious surfaces, stormwater runoff and agriculture/pasture (DWQ, 2008). One non-EEP initiative is documented within this watershed, a 319-funded implementation of TMDLs (Total Maximum Daily Loads) for fecal coliform and turbidity.



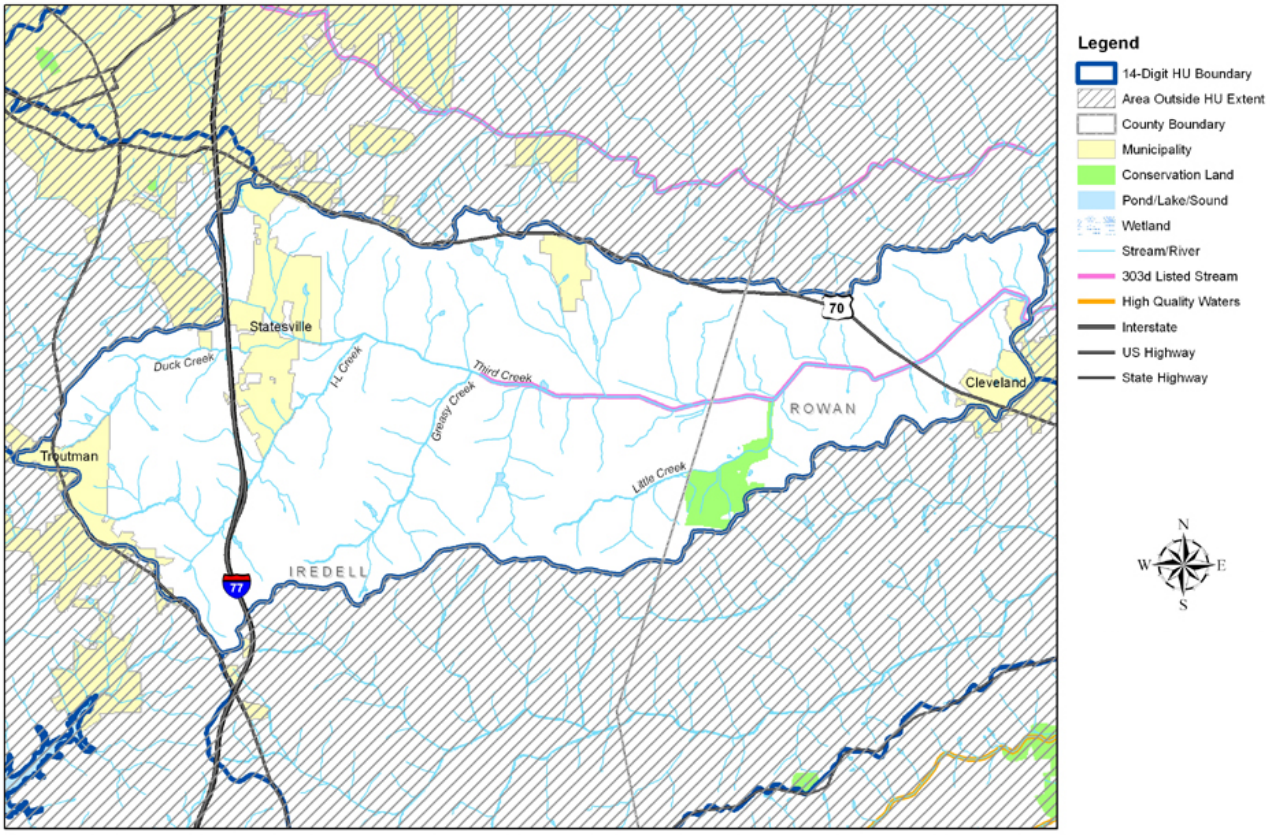
Lower Fourth Creek and South Yadkin River: 03040102030040

Located in northern Rowan County, this is the lowermost portion of the Fourth Creek drainage, including its confluence with the South Yadkin River. At 9.2 square miles, this is the smallest of the TLWs selected within this CU. The entirety of Fourth Creek and a portion of the South Yadkin River within this HU are impaired by various nonpoint sources, including stormwater runoff and agriculture (DWQ, 2008). With relatively healthy riparian buffers (only 14 percent non-forested), 56 percent forest-wetland area and 13 percent conserved lands, this watershed likely has a good mix of both restoration/enhancement and preservation opportunities. Two non-EEP projects have been funded within this HU.



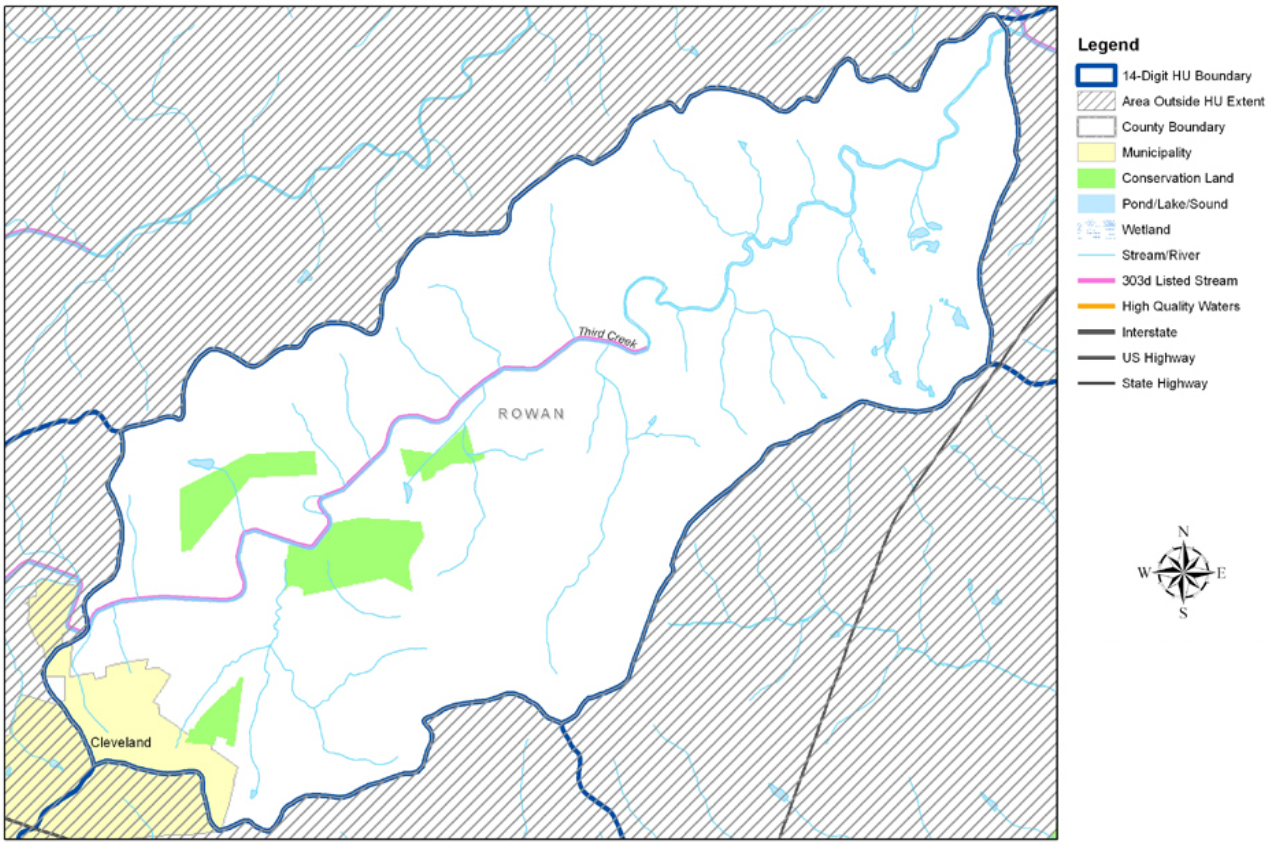
Third Creek: 03040102040030

This 41-square mile watershed encompasses a mixed suburban and rural landscape immediately southeast of the City of Statesville in Iredell and Rowan Counties. It contains 44 percent agricultural land cover, 29 percent degraded (non-forested) riparian buffers, 14 animal operations and 2.5 percent impervious cover. The entire length of Third Creek within this HU is impaired by turbidity from impervious surfaces and agriculture/pasture, and portions of it are impacted by fecal coliform (DWQ, 2008). There is one EEP stream project in the watershed.



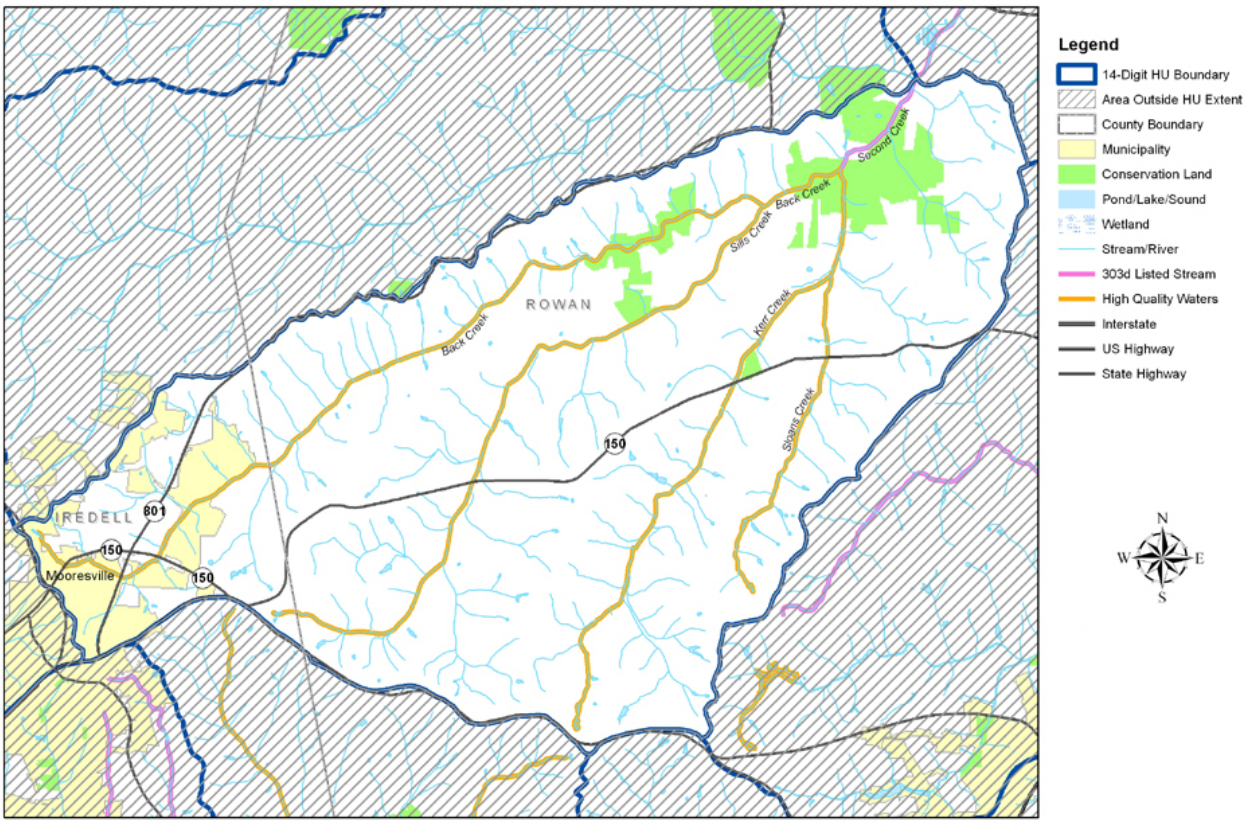
Lower Third Creek: 03040102040040

This 12-square mile watershed comprises the lower reach of Third Creek to its confluence with Fourth Creek in northern Rowan County. It includes 41 percent agricultural land cover, one percent impervious cover, 25 percent degraded riparian buffers and two animal operations. Conserved lands total four percent and there is one EEP project in the watershed. The upper half of Third Creek in this HU is impaired by turbidity and impacted by fecal coliform (DWQ, 2008).

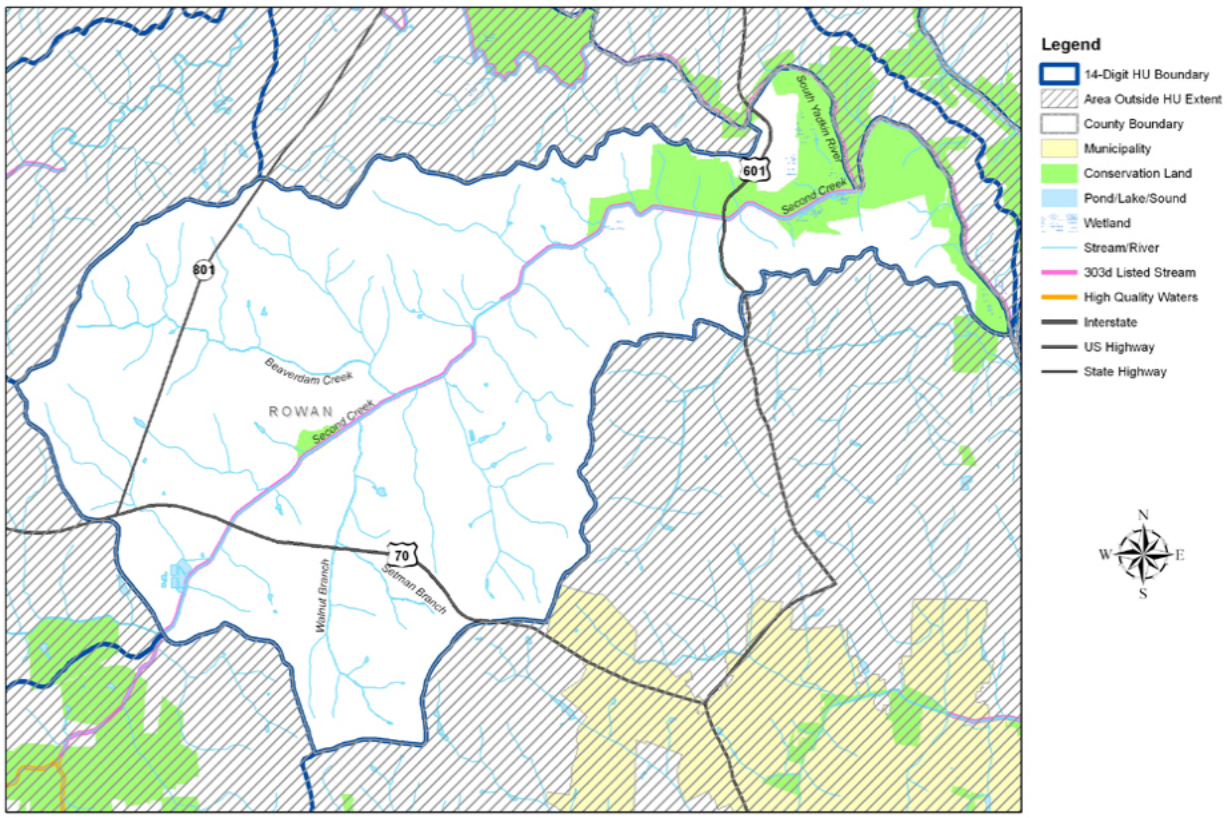


Back Creek and Sills Creek: 03040102050020

At 65 square miles in area, this is the second largest TLW selected within the CU. The headwaters of Back and Sills Creeks flow out of the Town of Mooresville (southern Iredell County) into the heavily agricultural landscape of western Rowan County. Back Creek flows into Second Creek (aka North Second Creek) at the lower end of the HU. With over 57 percent agricultural land cover, 17 animal operations and 34 percent degraded (non-forested) riparian buffers, this is one of the most agriculture-intensive watersheds in the entire upper Yadkin River basin. Over 90 percent of the HU is classified as WSW waters and approximately five percent is in conserved lands. Just over one percent of land cover is impervious surface (concentrated primarily within the headwaters in and around Mooresville). Second Creek is considered to be impacted by habitat degradation, from general agriculture/pasture operations and from impervious surfaces (DWQ, 2008). A field tour in January 2009 by EEP staff confirmed long reaches of Back and Sill Creeks to be significantly impacted – apparently by upstream stormwater inputs from the Mooresville area and by local agricultural activities, including livestock access to streams, unstable/eroding streambanks and degraded or nonexistent riparian buffers.



Second Creek: 03040102050030
This is a 29-square mile watershed in northern Rowan County, a few miles northwest of the City of Salisbury, that includes 40 percent agricultural land cover and 7 animal operations. Despite the significant agricultural activity, this HU has a relatively low proportion (less than 18 percent) of degraded riparian buffers. It contains six NHEOs, 8.3 percent conserved lands and two EEP stream restoration projects. Second Creek is impacted by habitat degradation from general agriculture/pasture and impervious surfaces (DWQ, 2008).



De-listed Watersheds (former TLWs)

Two 14-digit hydrologic units (HUs) that had been selected as TLWs within the upper Yadkin River basin in EEP's 2003 *Watershed Restoration Plan* for the Yadkin have been de-listed as targeted watersheds in this 2009 update.

Little Fisher River: 03040101090020 – significant agriculture, but no impaired waters noted by DWQ; no HQW/ORW waters; not a WRC/NHP habitat priority; no lands in conservation; no EEP projects; already have the upper and middle Fisher River watersheds (and numerous other HUs in Surry County) selected as TLWs.

Mill Creek: 03040101170020 – highly urban, but no DWQ impairment noted; no EEP projects; already have three urban HUs in Winston-Salem area selected as TLWs.

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For More Information

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http://www.nceep.net/pages/lwplanning.htm

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. EEP 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 DWQ 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 DWQ has received a petition for reclassification to either WS-I or WS-II, or
• Waters rated as Excellent by DWQ,

II. Classifications by Other State and Federal Agencies

NCDWQ – North Carolina Division of Water Quality

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

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 DWQ 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 DWQ 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 DWQ. 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. May 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 EEP planning and restoration project funds.

Use Support –refers to the DWQ system for classifying surface waters based on their designated best use(s); at present, the DWQ 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.