McGalliard Creek Watershed Plan

August 2017

Prepared by

Western Piedmont Council of Governments

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1 - Executive Summary

The purpose of the McGalliard Creek Watershed Plan is to build on the Lake Rhodhiss Watershed Management Plan that was written in 2009 by providing updated and more specific information on McGalliard Creek and providing new strategies and priorities in the Watershed that improve the water quality in the creek.

McGalliard Creek is approximately six miles long and drains residential, commercial, industrial, agricultural and forested land cover into Lake Rhodhiss. The Town of Valdese and some of its residents have expressed concern over the amount of sedimentation that can be found in the Creek. Water that was once deep and used as a place for recreational fishing has seen a great deal of its banks eroded and once deep areas of the creek become shallow. The creek is currently on the 303d list of impaired streams for a poor fish community.

The goal of the McGalliard Creek Plan will be to identify sources of impairment through data and stakeholder meetings, outline strategies to aid in watershed restoration, identify restoration activities and best management practices that best address the issues, and compile a project atlas of identifiable properties that best meet the goals of the project. The plan will build on what was started in the Lake Rhodhiss plan, but will be a more site-specific plan that concentrates only on McGalliard Creek.

In 2009, a 9-element plan for the Lake Rhodhiss Watershed was completed. McGalliard Creek falls under that Lake Rhodhiss Plan, however, the Rhodhiss watershed is a huge area, and the plan did not target specifics for each of the impaired streams in the watershed. In order to help identify issues and implement strategies that will mitigate water quality issues in the creek a more specific plan for McGalliard Creek needs to be implemented.

The Town of Valdese is very concerned about the creek. The creek runs in and out of the Town limits of Valdese, but the Town does have an interest in seeing the fish communities in the creek improve. The Town currently has a park along the creek. Fishing used to take place along the banks of the creek, but recently the creek has become more and more shallow, and the edges of the creek have begun to erode away. The Town is committed to seeing work done along the creek and a plan to identify the issues is the first step.

A volunteer group called the Friends of Valdese Recreation is also heavily involved in activities along the creek. They have initiated a trail along an easement that runs adjacent to the creek. Part of this would require conservation easement along a large tract of land along the creek. The Town is currently working with the Foothills Conservancy to obtain this property, by applying for a CWMTF Grant.

With the Town and volunteer groups already setting things in motion that is a clear interest in water quality activities along McGalliard Creek.

McGalliard Falls Park waterfall

McGalliard Falls Park sediment

McGalliard Creek is on the State's 303d List of Impaired Streams for poor fish community. This plan identifies a few reasons why there may be a reduction in fish species in the creek, including an increase in sediment and erosion in the creek resulting in wider and shallower streams. Streambanks have begun to erode away, and the issue may be multiplying itself due to the water slowing down, and more sediment depositing in the creek bottom. Additionally, stormwater may be entering the creek more rapidly due to impervious surfaces in upland areas. There may also be little to no vegetation in riparian buffers along the stream causing more sandy sediment to enter the creek.

The McGalliard Creek Watershed Plan recommends strategies that apply directly to these issues stated above. Recommendation's include the following:

1. **Secure Adequate Funding**

Seek opportunities to continue and enhance funding for watershed coordinators; acquisition of buffers, stream restoration, wetland enhancement, education and outreach efforts, monitoring, BMP retrofits and overall watershed improvements in vital areas.

2. **Stream Bank Restoration**

Stream Bank Restoration can help improve sediment transport, improve habitat and reduce stream bank erosion through improving the flow of water and stabilizing the stream bank to prevent further erosion. Obtain funding to complete stream bank repair in heavily eroded areas in the stream.

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3. **Stormwater Management**

Implement stormwater controls along identified areas along the Creek. Fully implement stormwater permits and management plans throughout the region in conjunction with current Phase II programs

4. **Conservation Easement on 300-acre park**

Work to establish a conservation easements on the 300-acre property on the northern end of McGalliard Creek, which can be used for recreational, educational, or wildlife purposes, as well as much needed riparian buffer protection along the creek.

5. **Riparian Buffer Repair**

Increase amount of streamside woody vegetation that is functions as a filter and stream stabilizer through riparian buffer repair. Obtain funding to complete riparian buffer repair in heavily eroded areas in the stream.

6. Greenways Adjacent to Streams

Encourage development of greenways along riparian corridors. Greenways are useful for recreational, educational, wildlife, and transportation purposes, but they can also be used to establish much needed riparian buffer along waterways. An additional benefit is increased public access to the waterways, which in turn provide more eyes to report potential problems and an increased public awareness.

7. Public Participation

Increase awareness and concern for McGalliard Creek so that the public takes greater interest. Continue to gather stakeholders so that the project continues.

8. Education and Outreach

Increase awareness and concern for McGalliard in the region through comprehensive education and outreach efforts. Utilize Environmental Education practices and principles.

9. Fish Habitat Projects

Encourage projects within McGalliard Creek to improve fish habitat.

10. Water Quality Monitoring

Continue water quality monitoring to identify problem areas and document improvements
Incorporate a volunteer monitoring component

11. Illicit Discharge Monitoring

Encourage the public and local government officials to be on the lookout for potential illicit discharges along Mcgalliard Creek.

12. Septic Tank Repair Program

Continue to support and find funding for the Unifour Septic Tank Repair Program.

2 – Planning Process

One of the most important aspects of the planning process was stakeholder coordination so that WPCOG Staff could provide information and receive input from local citizens and governmental employees. The McGalliard Creek Advisory Committee was formed for this purpose. Monthly meeting were held during the course of the year. This allowed staff time to prepare maps and data to the committee, who in turn could provide a unique local perspective and provide some history of the creek. The WPCOG, using input from the McGalliard Creek Advisory Committee, and using data provided by NC DENR, Caldwell County Soil and Water, and the Western Piedmont Council of Governments developed the McGalliard Creek Watershed Plan.

The heart of the McGalliard Creek Watershed Plan are recommended strategies for education and outreach, planning and policy, restoration and retrofits, and research and monitoring. Section 9 includes all the recommendations together in summary and tabular form for quick reference

2.1 – Planning Staff

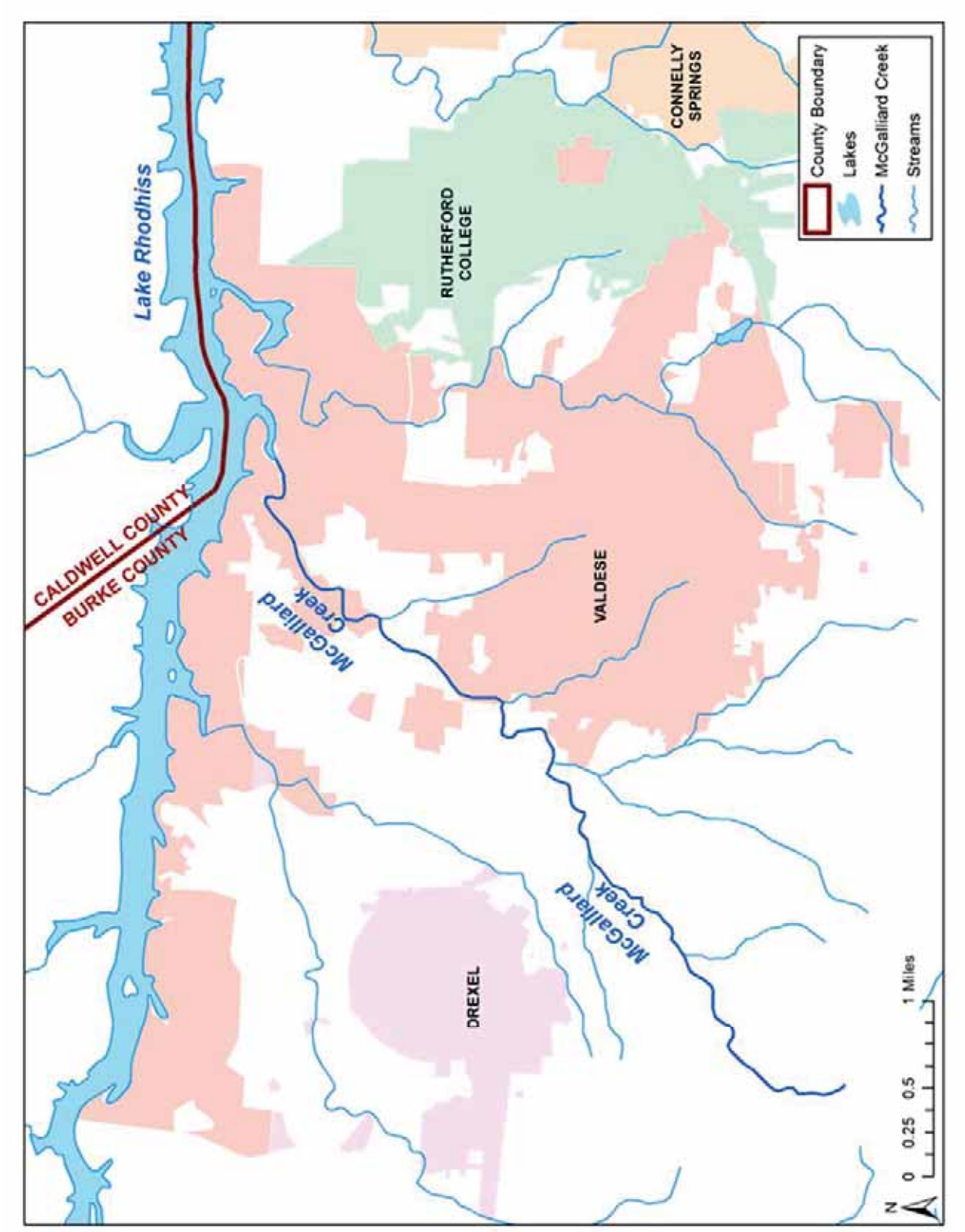
The WPCOG, using input from the McGalliard Creek Advisory Committee, and using data provided by NC DENR, Caldwell County Soil and Water, and the Western Piedmont Council of Governments developed the McGalliard Creek Watershed Plan. WPCOG Staff included:

- John E. Wear III, Natural Resources Administrator**,** Western Piedmont Council of Governments
- Erin Schotte, Planner, Western Piedmont Council of Governments
- Todd Stroupe, GIS Technician, Western Piedmont Council of Governments

2.2 – The McGalliard Creek Advisory Committee

The McGalliard Creek Advisory Committee formed at the beginning of this project in response to receiving the funding for the plan. The committee membership consists of representatives from Local Governments: many department staff (Planning/, Public Works, Stormwater and Recreation) and the Western Piedmont Council of Governments. Membership is open to all who are interested.

Stakeholders attended the monthly meetings and held discussions on topics such as recommended strategies, priority properties, and conducted stream walks. Recommendations and priority areas from the Plan were presented to the McGalliard Creek Advisory Committee on December 12, 2016. Those present at the meeting were satisfied with the final recommendations and priority areas as presented.



Map 1: McGalliard Creek

3 - Regional Profile

Burke County is located in the western portion of North Carolina and is bordered by McDowell County to the west, Caldwell County to the northeast, Avery County to the north, Catawba County to the east, and Rutherford and Cleveland Counties to the south. The total land area of the County is 505 square miles. The current population (2015) is estimated to be at 90,723.

Municipalities within Burke County include Morganton, the largest municipality and county seat, Glen Alpine, Drexel, Valdese, Rutherford College, Connelly Springs, and Hildebran; as well as portions of Rhodhiss, Hickory, and Longview. The total land area of the County is 505 square miles. The current population (2015) is estimated to be at 90,723.

Valdese is located in western North Carolina in east Burke County. It is the county's second largest town with an estimated population of 4,900 in 2012. The Catawba River/Lake Rhodhiss forms the town's northern boundary while the southern boundary coincides roughly with Interstate 40. The neighboring towns of Rutherford College and Drexel are situated nearby to the east and west, respectively.

Burke County and Valdese are part of the Greater Hickory Metropolitan Area, which has a population of more than 350,000 people, and is readily accessible to many major employment, transportation, and recreation centers. Counties located in the region include Alexander, Burke, Caldwell, and Catawba Counties.

3.1 - Population Growth (1970-2012)

There has been relatively slow population growth in Burke County and Valdese since 1970. From 1970 to 2010, the town's population grew by 14.7 percent while Burke County grew by 20 percent. Between the decennial census year of 2010 and the year 2012, the Valdese population failed to grow and decreased by 0.4 percent. During this same time period, Burke County's population also experienced a slight decline and decreased by 0.2 percent. As a result, Valdese's share of the county total population, which was 5.3 percent in 1970, had decreased slightly to a 4.9 percent share by 2012.

It is shown in Table 1 that Valdese grew at a slower rate than the county, region, state, and nation as a whole between 1990 and 2010. While the town grew by 14.7 percent during that time, the county and state grew by 20 and 44 percent respectively. From 2010 to 2012, the rate of population growth in Valdese, and throughout the nation and particularly in the region, slowed dramatically until it actually reached decline in the Hickory MSA, Burke County and the Town of Valdese.

	1990	2010	2015	% Change 1990-2010	% Change 2010-2015
Valdese	3,914	4,490	4,442	14.7	-0.1
Burke County	75,744	90,912	89,114	20	-2.0
Hickory MSA	292,409	365,497	365,471	25	0.0
North Carolina	6,628,637	9,535,483	10,056,683	44	5.5
United States	248,709,873	308,745,538	320,896,618	24	3.9

Table 1: Population Change 1990-2010

3.2 Projected Population Growth (2010-2030)

Projecting future population growth is inexact by nature and can be challenging at any scale. This is especially true for small cities and towns. Municipal population growth is largely dependent on issues such as birth rate, migration, annexation, and other factors, such as economic conditions.

The North Carolina Office of State Planning provides population projections for every county in the state. The population projections used here for Burke County and the Town of Valdese assume that the town will continue to account for its historical share of the county population through 2030 (approximately five percent).

The Office of State Planning indicates that Burke County is not likely to experience any population growth through 2030 and actually predicts that the county will have a net loss of roughly 189 residents between 2010 and 2030, as shown in Table 2-2.This will leave Burke County with a population of approximately 90,723 in 2030. If during this time Valdese maintains five percent of the County's population, its population would remain fairly stable, gaining approximately 45 additional residents from 2010 to 2030 to reach a population of roughly 4536 inhabitants. As mentioned previously, recently annexed territory and underdeveloped residential subdivisions may contribute to the uncertainty of these population projections.

	Valdese	Burke County	North Carolina
2010 (estimate)	4490	90,912	9,535,483
2020 (projection)	4536	90,725	10,614,863
2030 (projection)	4536	90,723	11,629,559

Table 2: Population Projections 2010 - 2030

4 – Project Planning Area

4.1 – Lake Rhodhiss

Lake Rhodhiss is a 3,515-acre reservoir located on the Catawba River in western North Carolina. This lake lies within Burke and Caldwell Counties and is a run-of-the-river reservoir located on the Catawba River downstream of Lake James and upstream of Lake Hickory. It was impounded in 1925 by Duke Energy for generating hydroelectric power. Three municipalities, Granite Falls, Lenoir, and Valdese, have public water intakes located along the lake. Water from the lake is also used for waste assimilation, drinking water, industrial water supply, recreation, and habitat for fish and wildlife species (See Map 2: Lake Rhodhiss Watershed).

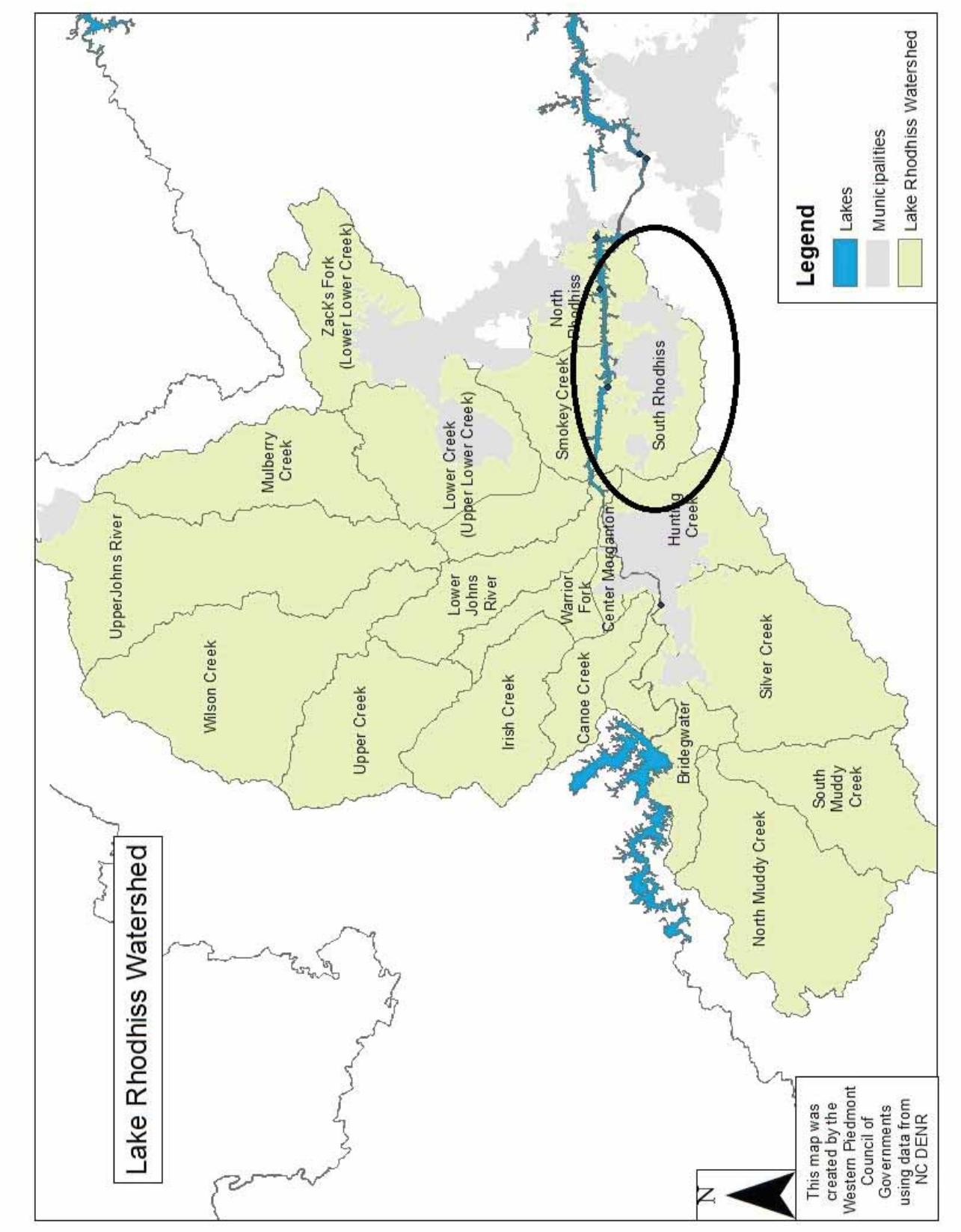
The watershed area of Lake Rhodhiss is 710 square miles in size, and the lake has the greatest watershed: surface area ratio of any North Carolina impoundment along the Catawba. Topography and soils vary considerably within the watershed. The northern portion of this watershed is very rural, undeveloped and contains substantial federal land holdings. Urban areas are generally concentrated in Lenoir, Morganton and Marion, as well as the I-40 and US 70 corridors between Morganton and the unincorporated Icard area of Burke County. Development activities are concentrated along these corridors.

4.2 - Impaired Streams in the Watershed

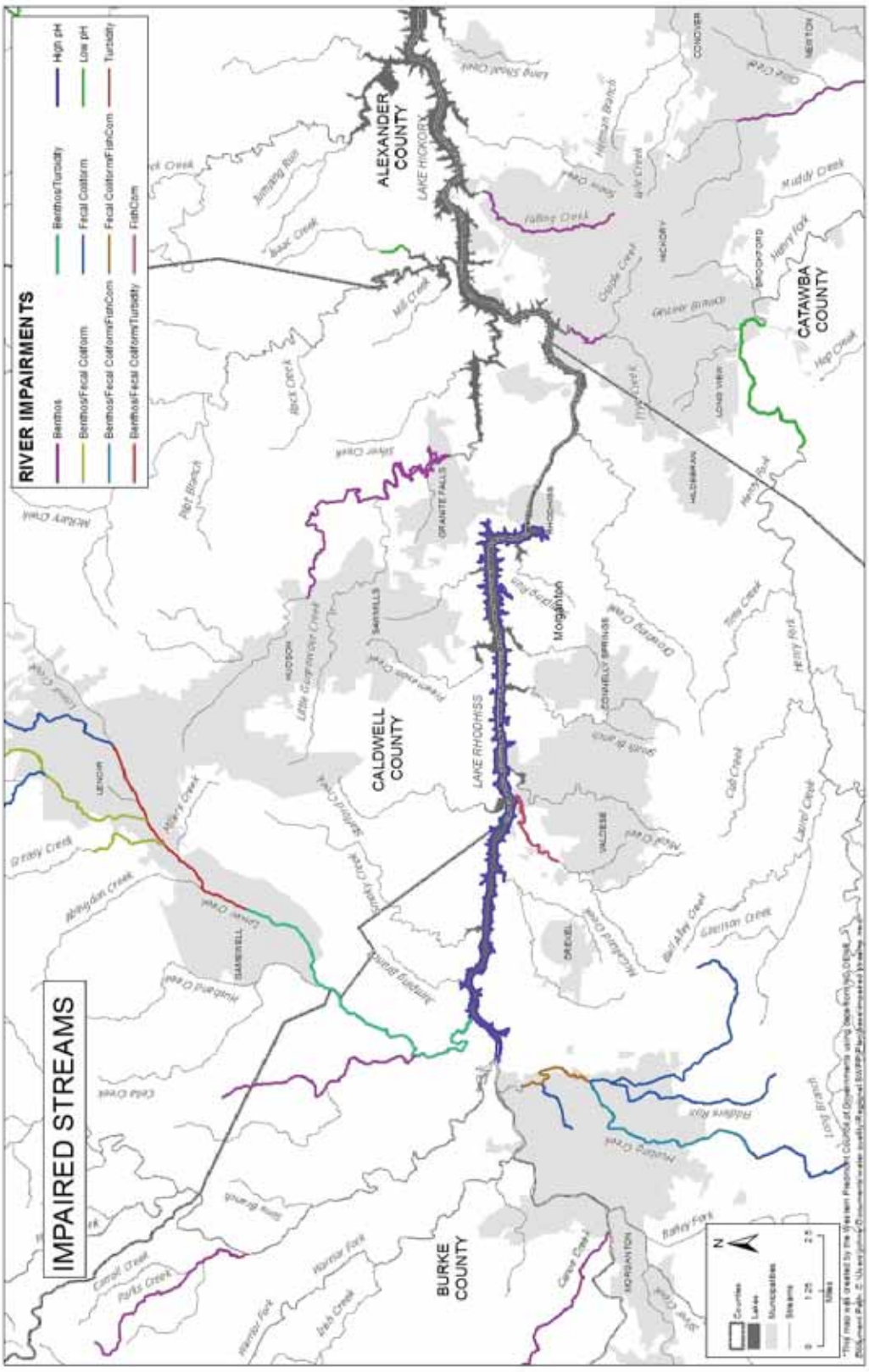
The federal Clean Water Act requires states to develop a 303(d) list identifying waters not meeting water quality standards. This list, developed every two years, identifies of all the impaired lakes and streams found in the state. Waters are placed on this list regardless of whether the source of pollution is known and whether the pollution sources can be legally controlled or acted upon by the state.

Currently several streams within the Lake Rhodhiss and Lake Hickory watershed are listed as impaired by North Carolina Department of Water Quality (DWR) and EPA. In 2006, Lake Rhodhiss was added to this national impaired waters 303d list. The impairment was triggered by pH values exceeding numerical standards. High pH and other water quality indicators relate back to excessive nutrient loading, especially phosphorus. The lake was more eutrophic (fertile, biologically active) than desirable for a drinking water source. Thankfully, there is no human health concerns based upon this water quality condition. Recently, Lake Rhodhiss was removed from the 303d list by the state. According to the 2014 Integrated Report, (the 2016 report has not been approved by EPA), the three assessment units that compose Lake Rhodhiss are all meeting criteria for all parameters, with the exception of mercury - fish tissue, but the entire state is not meeting that parameter.

McGalliard Creek is one of many impaired streams found in Lake Rhodhiss. McGalliard Creek is on the 303d list of impaired streams for Fish Community (See Map 3: Impaired Waters in the Lake Rhodhiss Watershed).



Map 2: Lake Rhodhiss Watershed

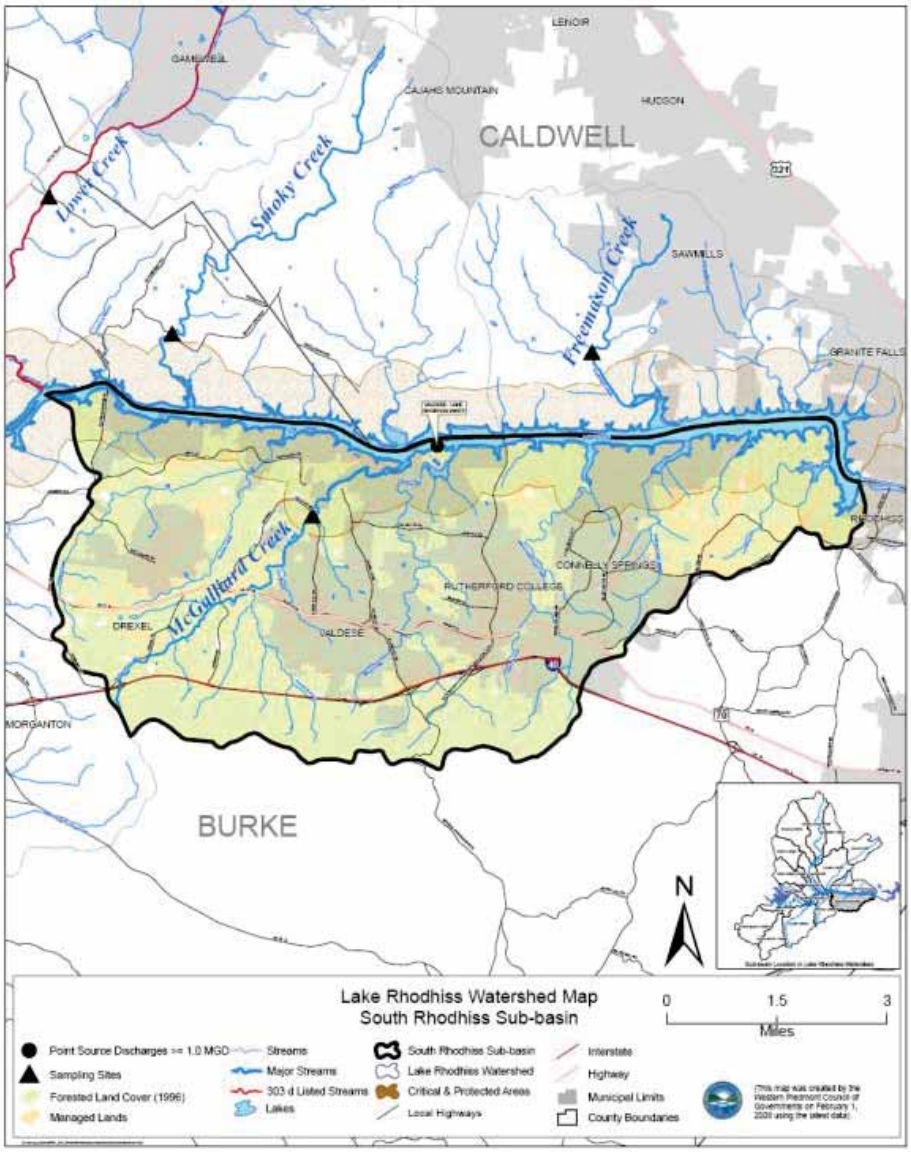


Map 3: Impaired Waters in the Lake Rhodhiss Watershed

4.3 – South Rhodhiss Watershed

McGalliard Creek is located in the South Rhodhiss watershed, which is HUC Code 3050101090010, and is approximately 38.03 square miles. Within this sub-basin are the Towns of Connelly Springs, Valdese, Rutherford College and Drexel. The watershed is located entirely in Burke County. This 12-Unit HUC is much larger than the drainage area for McGalliard Creek and also contains areas that are outside the focus of this plan (See Map 4: South Rhodhiss Watershed).

Land cover for the sub-basin is primarily forest and open space or pasture, and ranks 5thamong the other sub-basins with respects to developed land use. The South Rhodhiss sub-basin ranks low among the other sub-basins with respect to its percentage of agriculture.



Map 4: South Rhodhiss Watershed

4.4 - McGalliard Creek Proposed Watershed

For the purposes of this plan, a new watershed has been delineated to include just the drainage area for McGalliard Creek and its tributaries. This watershed was delineated using topography, as well as GIS to determine the boundaries of the watershed.

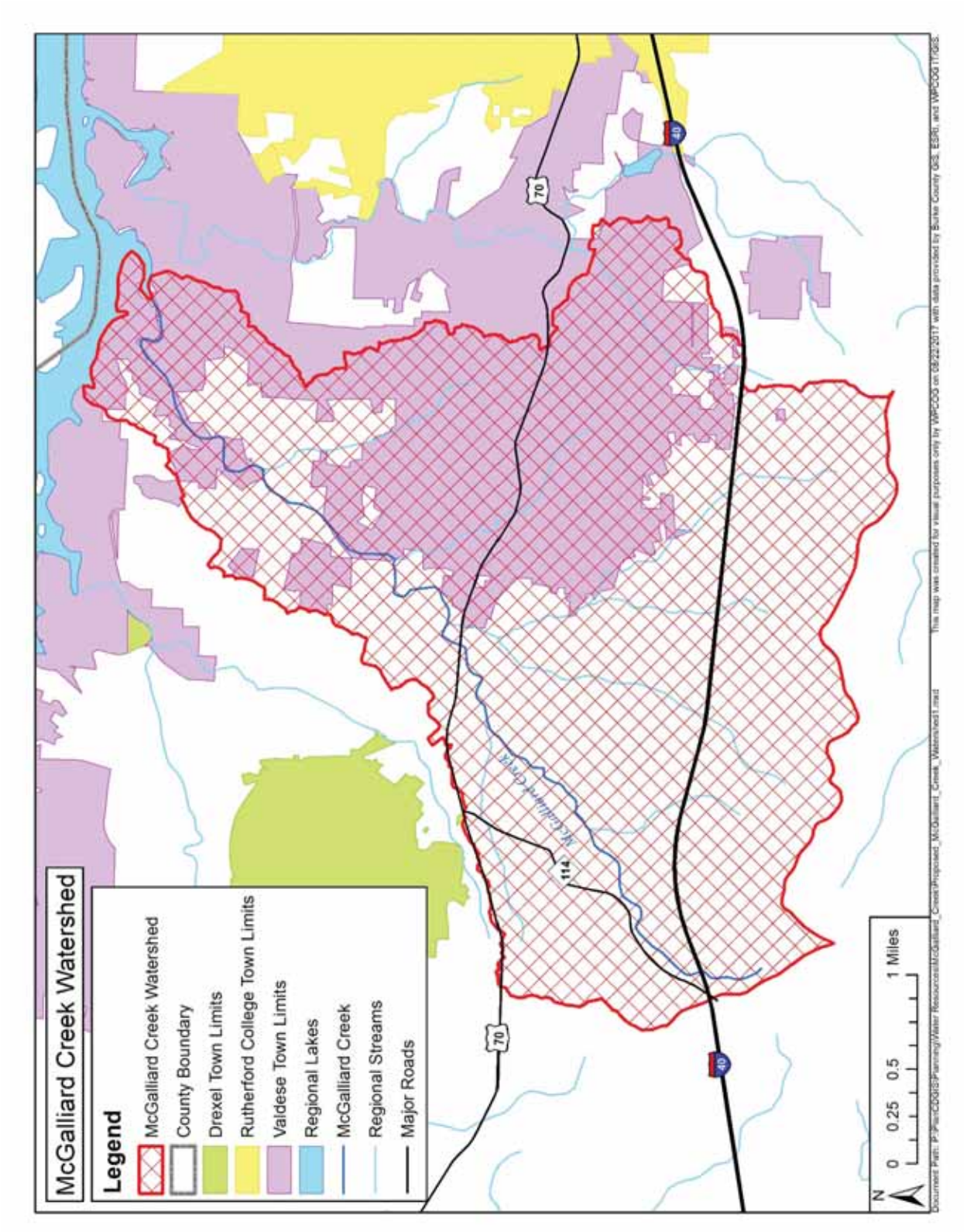
The NC Division of Water Quality uses Hydrologic Unit Codes to catalogue and identify watersheds. The smallest is the 12-unit HUC which has a geographic area representing part of all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature. These units subdivide the subregions and accounting units into smaller areas. The smallest geographical unit defined by the HUC code system for McGalliard Creek is shown as the South Rhodhiss Watershed on Map 4. In order to determine what the actual watershed is for McGalliard Creek, Staff used GIS and topography to delineate a new smaller watershed that would represent just McGalliard Creek and its tributaries.

This area is 9.86 square miles and just includes portions of Burke County and the Town of Valdese. For the purposes of the McGalliard Creek Watershed Plan, this new watershed will be used as the project area (Map 5: Proposed McGalliard Creek Watershed).

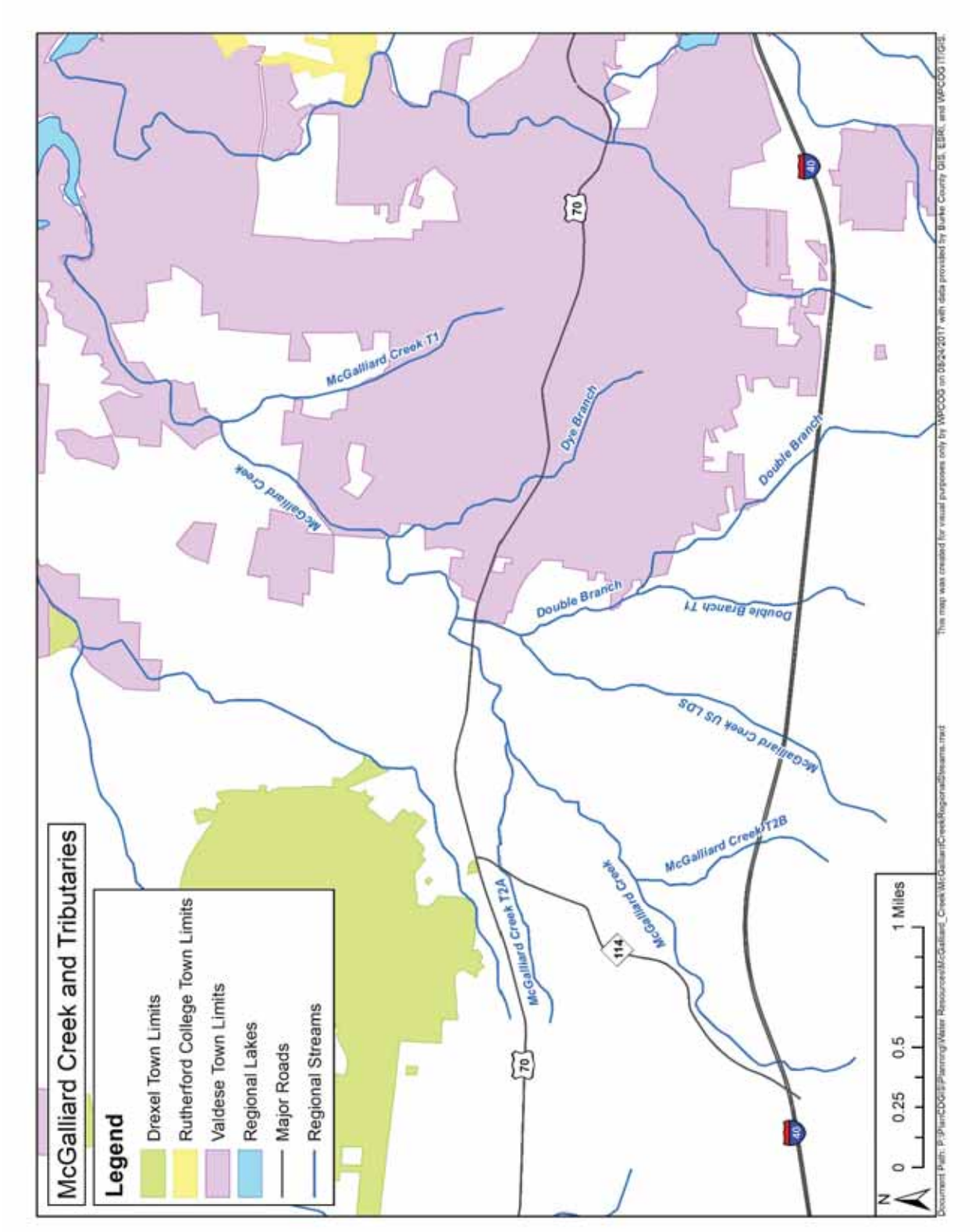
McGalliard Creek itself is six miles long, with seven tributaries equaling up to over ten miles in length. The tributaries and their length are shown in Table 3. Additionally, the Tributaries are shown geographically on Map 6: McGalliard Creek and Tributaries.

Stream Name	Length (Feet)	Length (Miles)
McGalliard Creek	31,737.876	6.011
Dye Branch	7,515.615	1.423
McGalliard Creek T1	7,001.769	1.326
Double Branch	13,232.387	2.506
McGalliard Creek T2A	6,654.770	1.260
McGallaird Creek T2B	4,796.287	0.908
Double Branch T1	5,408.517	1.024
McGalliard Creek US LDS	9,727.115	1.842

Table 3: McGalliard Creek and Tributaries Length



Map 5: McGalliard Creek Watershed



Map 6: McGalliard Creek and Tributaries

5 – Characteristics of the McGalliard Creek Watershed

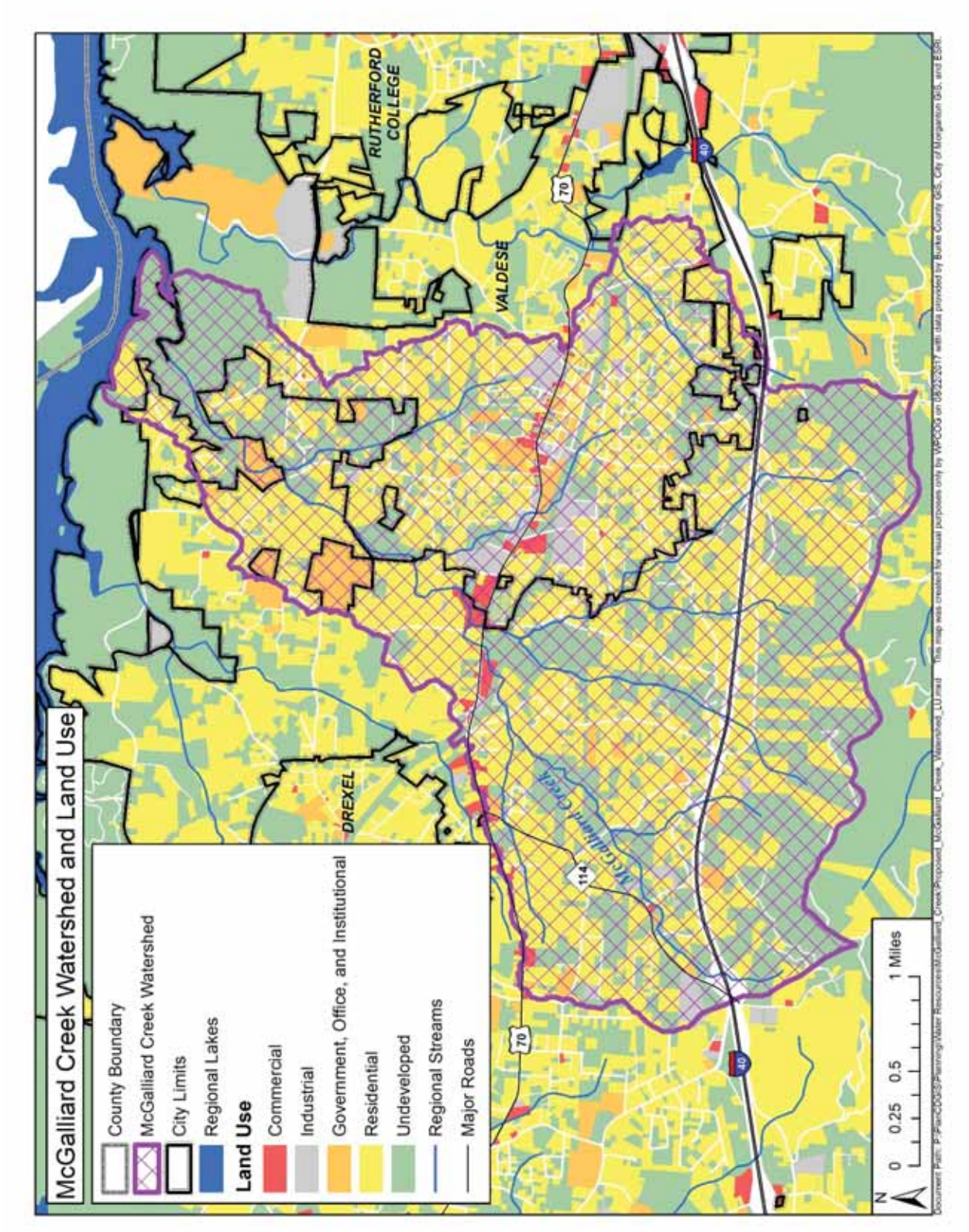
5.1 - Land Use in the Watershed

In the past few decades, there has been residential, commercial and industrial development that has taken place that has changed the amount of impervious surface and stormwater runoff entering the creek. This has changed the volume of water entering the creek and the amount of time that it takes water to reach the creek has decreased. Because of this, the banks of the creek have begun to erode, and the sediment is filling in the creek, making it wider and shallower. These wide shallow streams have reduced the flow of water, increasing the amount of sediment that is sinking to the bottom and changing the biological function of the creek.

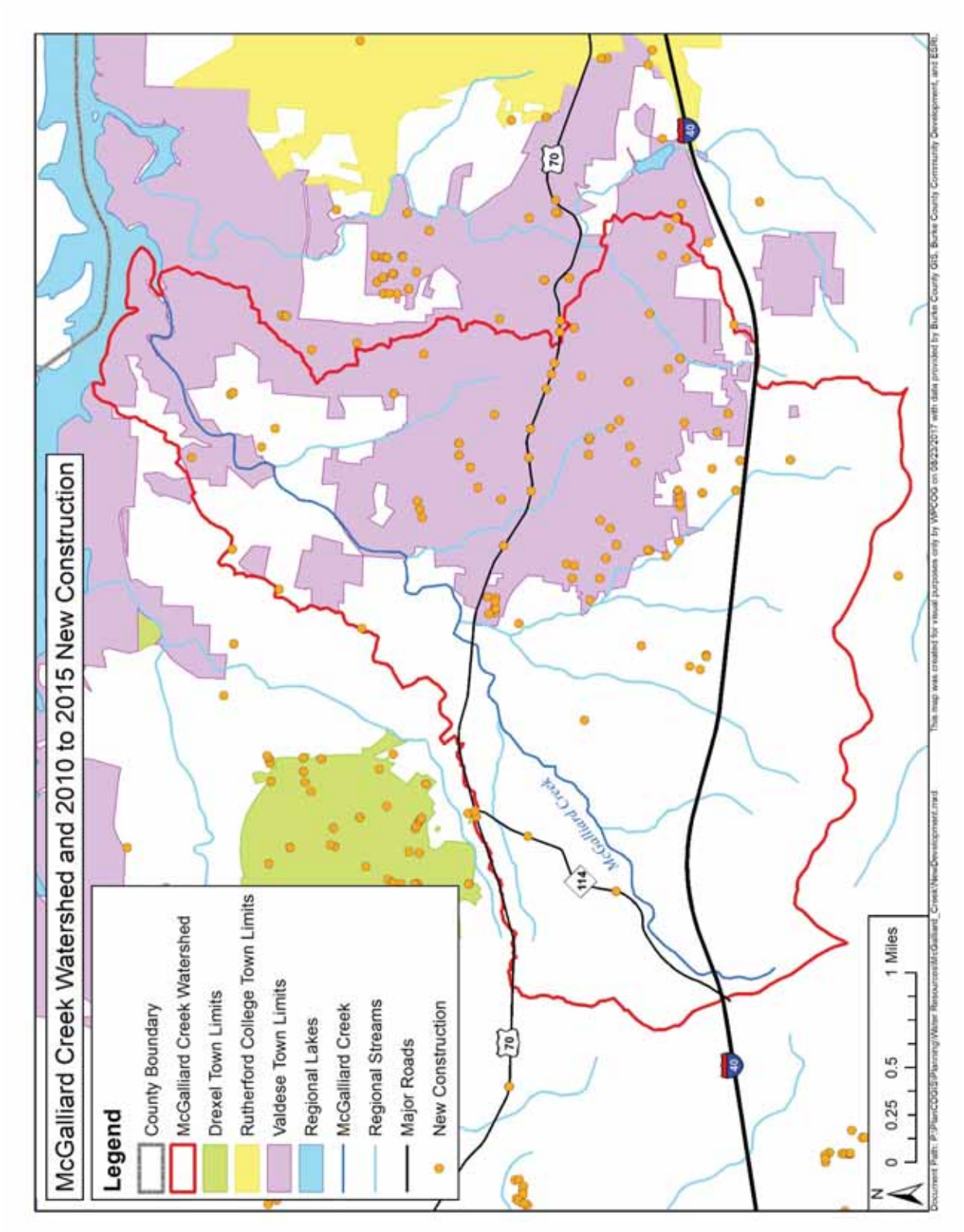
McGalliard Creek and its tributaries mainly flow through residential and vacant properties. Even when flowing through commercial properties, some riparian buffer is still present. Of the tributaries, Dye Branch is the most exposed to industrial use, and in the past has been exposed to chemical runoff from nearby industry in the 1990's and early 2000's. These plants have shut down, and this has not been an issue since (Map 7: Proposed McGalliard Creek Watershed and Land Use).

New construction in the watershed from 2010 to 2015 was mostly concentrated in the Town of Valdese, and would have had more of an effect on tributaries than the main stem of McGalliard Creek, or the impaired portion of the stream itself (Map 8: Proposed McGalliard Creek Watershed and 2010-2015 New Construction).

Dye Branch near industrial properties



Map 7: McGalliard Creek Watershed and Land Use



Map 8: McGalliard Creek Watershed and 2010-2015 New Construction

5.2 Soils and Topography in the Watershed

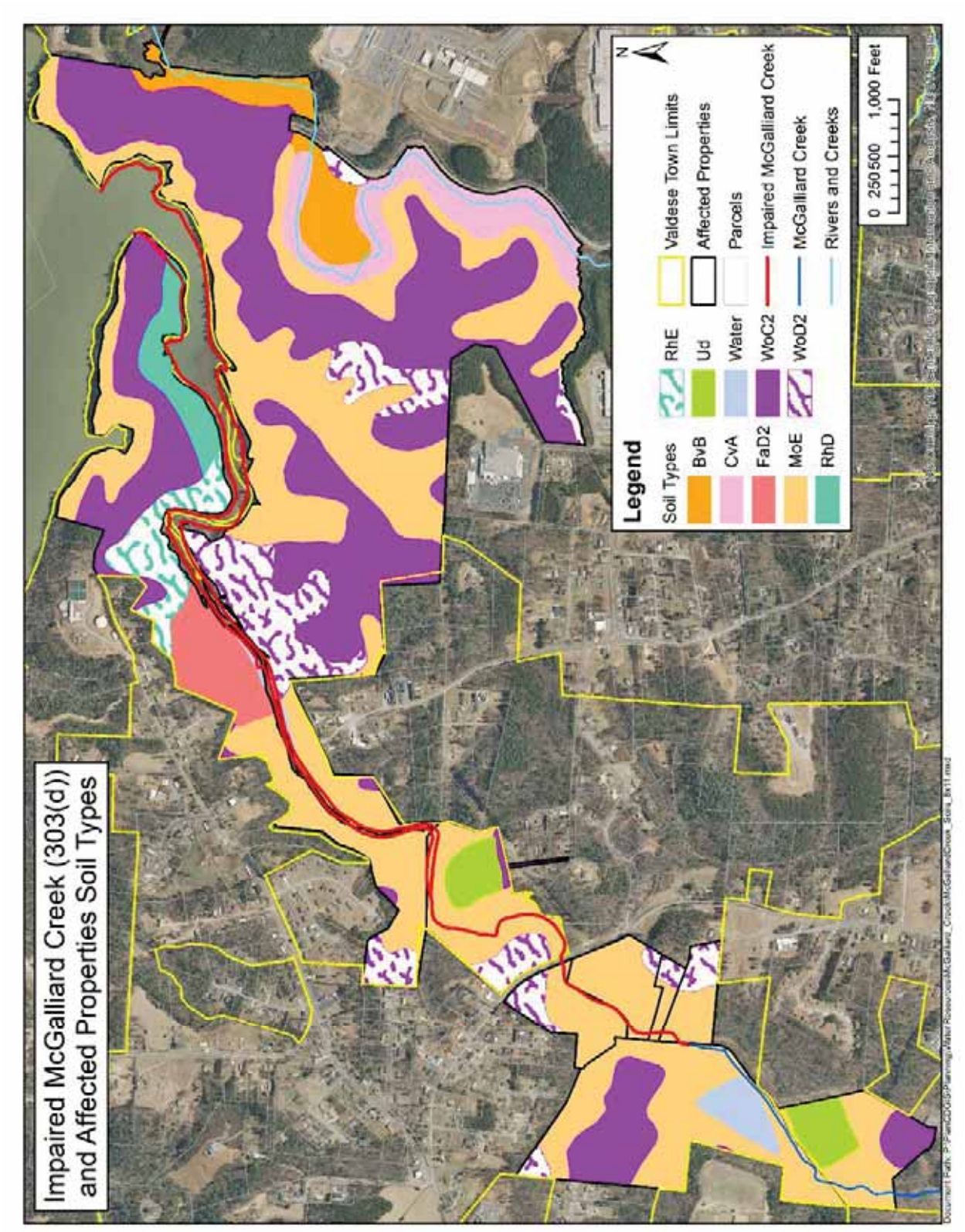
The soil types for the creek are indicators of steep slopes, especially in the impaired portion of the creek. The majority of the impaired portion of the creek is made up of 25 to 60 percent slopes (Map 9: Impaired McGalliard Creek and Affected Properties Soil Types). Additionally, Topography in the McGalliard Creek Watershed shows that slopes do become steeper at the impaired portion of the stream, including properties slightly before the McGalliard Falls Park and all the way out to Lake Rhodhiss (Map 10: Proposed McGalliard Creek Watershed with Elevation Contours).

Table 4: McGalliard Creek Soil Types

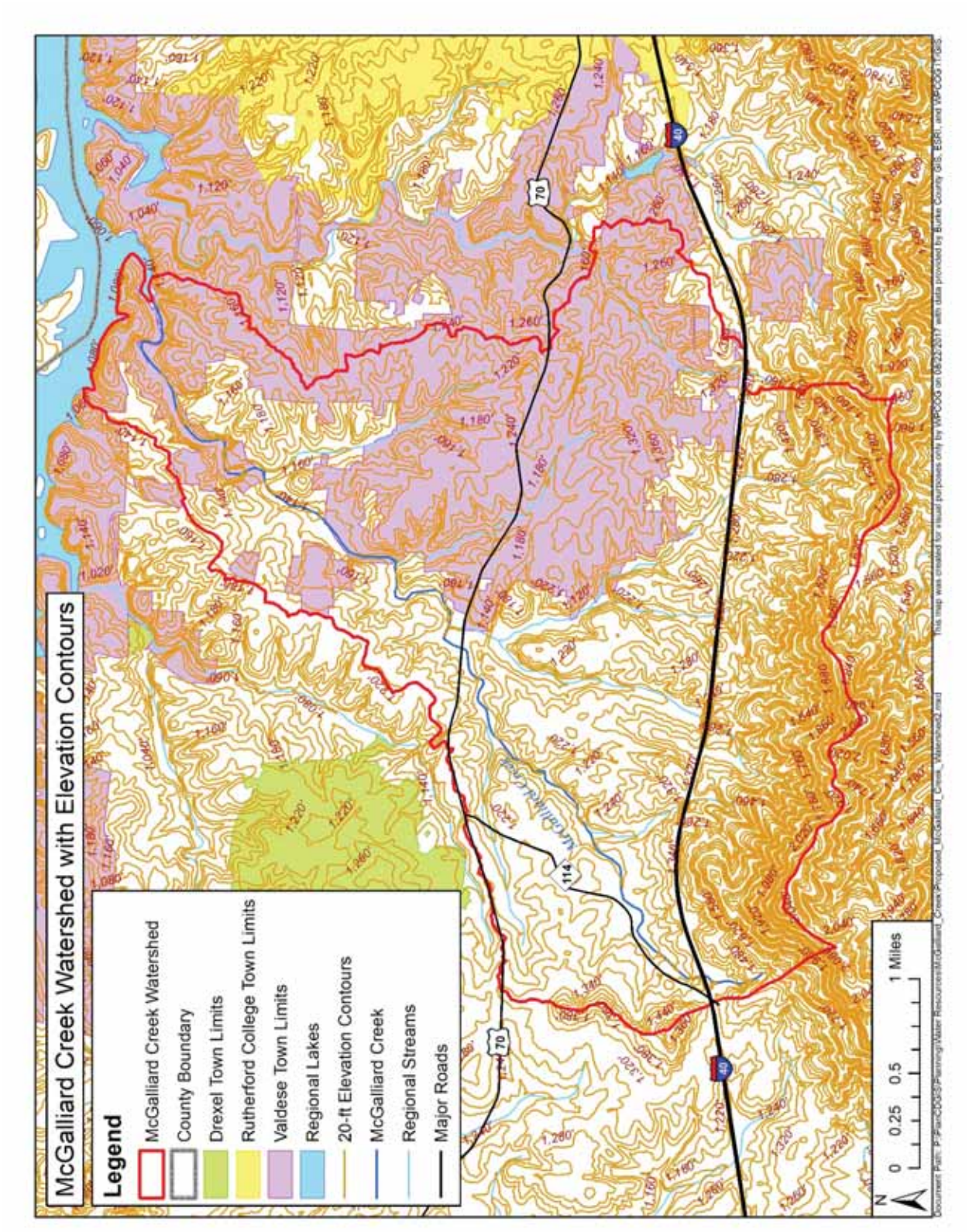
MoE—Meadowfield-Rhodhiss complex, 25 to 60 percent slopes, very stony		
Setting	**Composition**	**Land Use**
Landscape: Piedmont uplands Landform: Ridges Elevation: 1,000 to 1,250 feet Hillslope profile position: Backslopes and shoulders Geomorphic component: Side slopes, nose slopes, and head slopes Shape of areas: Irregular or elongated Size of areas: 4 to 200 acres	Meadowfield soil and similar soils: 60 percent Rhodhiss soil and similar soils: 20 percent Dissimilar soils: 20 percent	**Dominant uses:** Woodland **Other uses:** Home sites and pasture

WoD2—Woolwine-Fairview complex, 15 to 25 percent slopes, moderately eroded		
Setting	**Composition**	**Land Use**
Landscape: Piedmont uplands Landform: Ridges Elevation: 950 to 1,220 feet Hillslope profile position: Backslopes Geomorphic component: Side slopes and nose slopes Shape of areas: Long and narrow or irregular Size of areas: 10 to 80 acres	Woolwine soil and similar soils: 55 percent Fairview soil and similar soils: 25 percent Dissimilar soils: 20 percent	**Dominant uses:** Woodland **Other uses:** Pasture

FaD2—Fairview sandy clay loam, 15 to 25 percent slopes, moderately eroded		
Setting	**Composition**	**Land Use**
Landscape: Piedmont uplands Landform: Ridges Elevation: 950 to 1,200 feet Hillslope profile position: Shoulders and backslopes Geomorphic component: Side slopes and nose slopes Shape of areas: Long and narrow with irregular widths Size of areas: 4 to 200 acres	Fairview soil and similar soils: 95 percent Dissimilar soils: 5 percent	**Dominant uses:** Woodland **Other uses:** Pasture and orchard crops



Map 9: Impaired McGalliard Creek and Affected Properties Soil Types



Map 10: Proposed McGalliard Creek Watershed with Elevation Contours

5.3 Photographic Documentation of the Watershed

The following photographs were taken at different intervals down McGalliard Creek. Some of them were taken at road locations and some were taken during stream walks. Location of the photos are shown on Maps 11-13: McGalliard Creek Orthos (3 of 3)

Photo 1: Looking South on Cook Road

Photo 2: Looking North on Cook Road

Photo 3: Looking South on High Peak Road

Photo 4: Looking North on High Peak Road

Photo 5: Looking South on Messer Road

Photo 6: Looking North on Messer Road

Photo 7: Looking South Highway 70

Photo 8: Looking North on Highway 70

Photo 9: Looking North on Dye Branch

Photo 10: Looking South toward Dye Branch and McGalliard Creek intersect

Photo 11: Looking South on McGalliard Creek

Photo 12: Looking North on McGalliard Creek

Photo 13: Looking South on McGalliard Creek

Photo 14: Looking South on McGalliard Creek

Photo 15: Looking North on McGalliard Creek

Photo 16: Looking North on McGalliard Creek

Photo 17: Looking South on Falls Road

Photo 18: Looking North on Falls Road (McGalliard Falls Park)

Photo 19: Looking South towards Falls Road Bridge

Photo 20: Looking South towards Falls Road Bridge

Photo 21: Looking North on McGalliard Creek towards the Falls

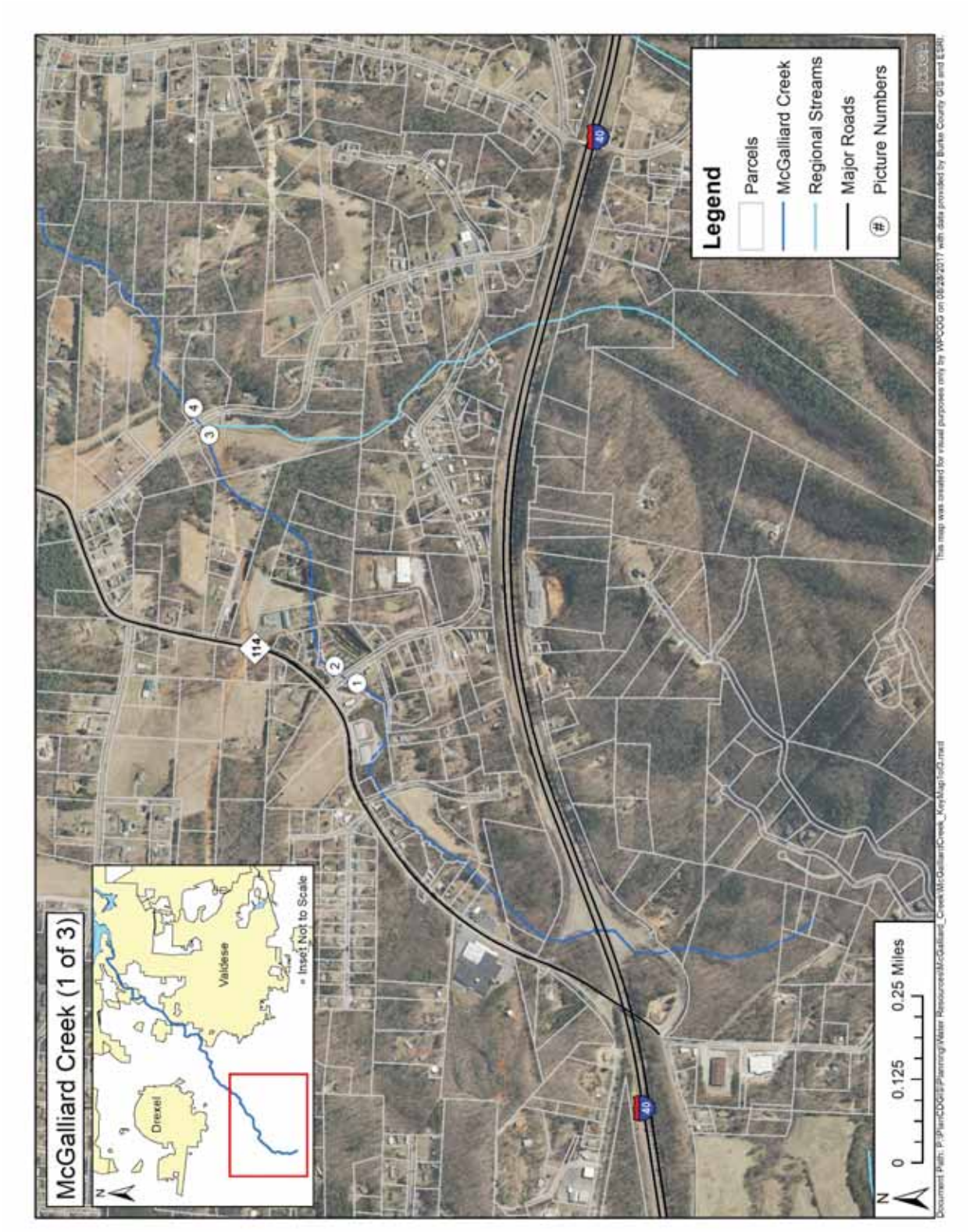
Photo 22: Looking North on McGalliard Creek towards the Falls

Photo 23: Looking North on McGalliard Creek after the Falls

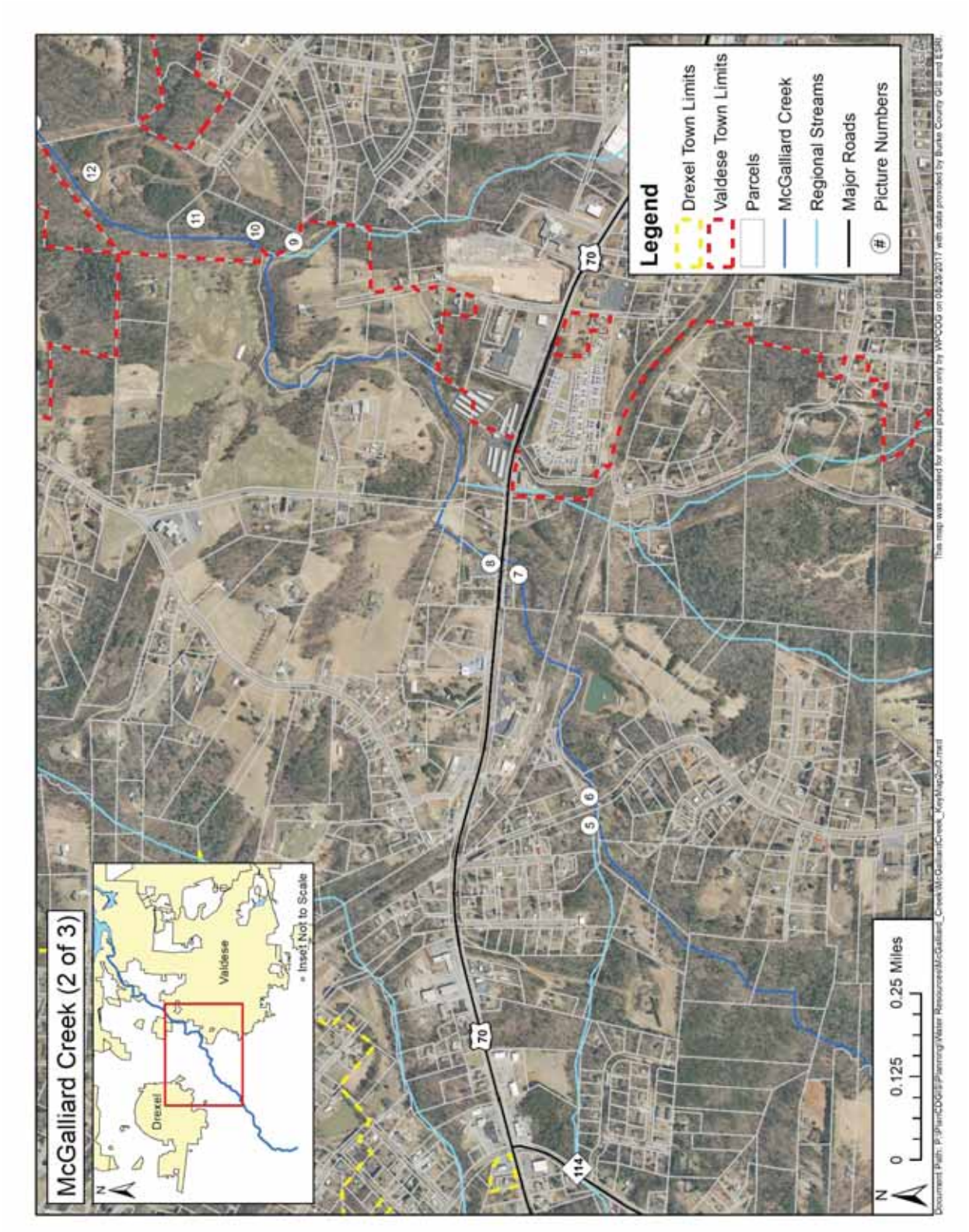
Photo 24: Looking North on McGalliard Creek after the Falls

Photo 25: Looking down on McGalliard Creek after the Falls

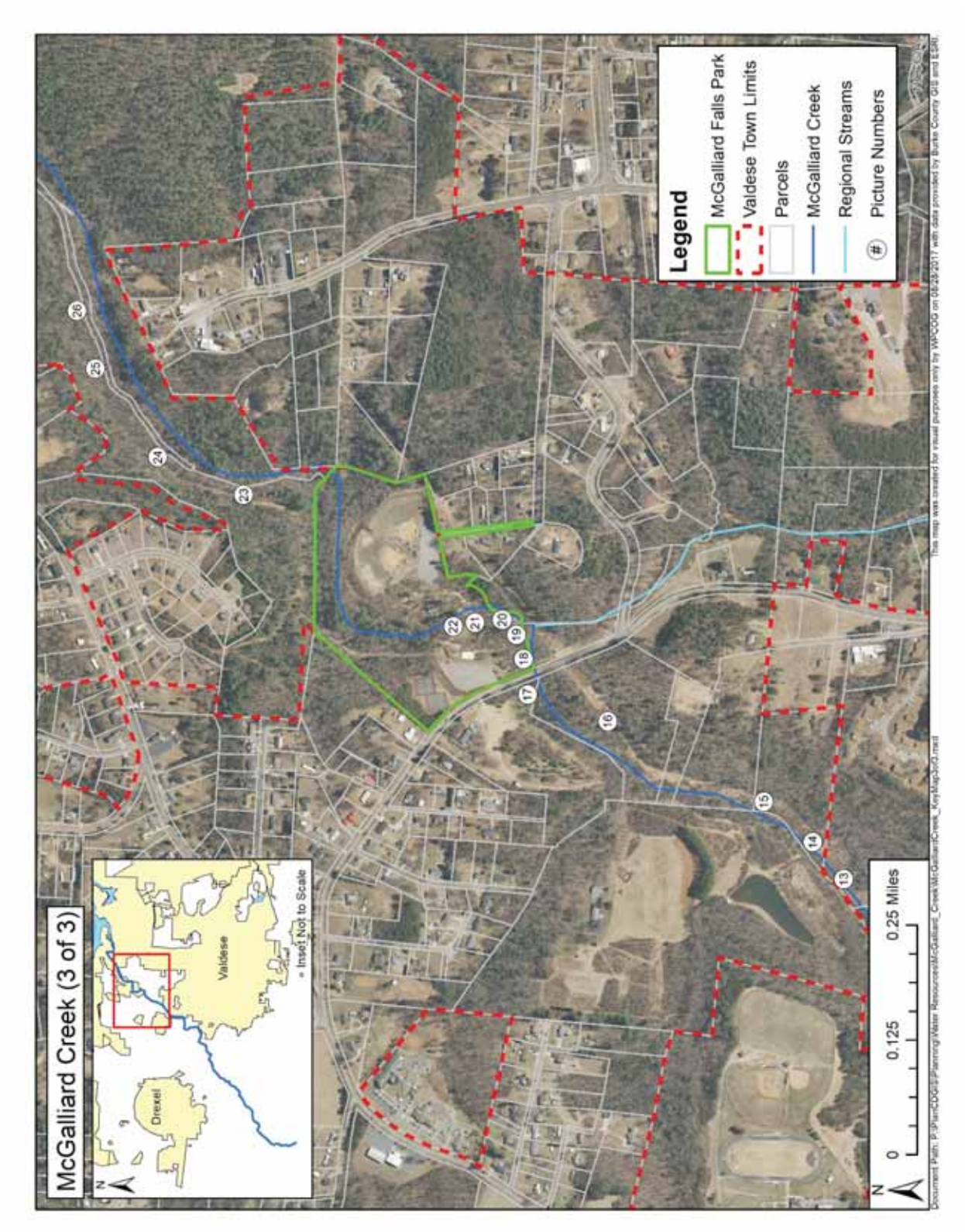
Photo 26: Looking down on McGalliard Creek after the Falls



Map 11: McGalliard Creek Orthos (1 of 3)



Map 12: McGalliard Creek Orthos (2 of 3)



Map 13: McGalliard Creek Orthos (3 of 3)

6- Monitoring

There is minimal monitoring data on McGallaird Creek. The creek was monitored in 2003 and received a Fair Benthic Rating. The Creek was monitored again in 2007 for benthic and received a Good-Fair Rating. This rating allowed the creek to be removed from the Impaired Waters list for its benthic impairment. There is no indication as to why the benthic community has improved, however, Dye Branch, a tributary to McGalliard Creek got its name due to dye from upstream industry that was being dumped in the creek. This caused the stream to turn blue or red at various times. These operations had stopped doing this in early 2000, which could have made a significant improvement in the benthic macroinvertebrate populations.

Benthic macroinvertebrates, or aquatic insects, are indicators of water quality. The presence of certain species of benthic macroinvertebrates in a water sample can indicate good water quality, if those species are pollution intolerant. The more of these species that you find in the sample, the better the water quality. Likewise, other benthic macroinvertebrates can be indicators of poor water quality, if you find more of those types, and none of the other.

Large industrial vats located next to Dye Branch

The Creek was monitored in 2003 for the fish community and received a Poor rating. The creek has remained on the list of impaired streams for the Poor rating for fish community. The Catawba River Bain Plan states that DWQ will re-sample the fish community during the next sampling cycle to evaluate if water quality improvements are seen there as well.

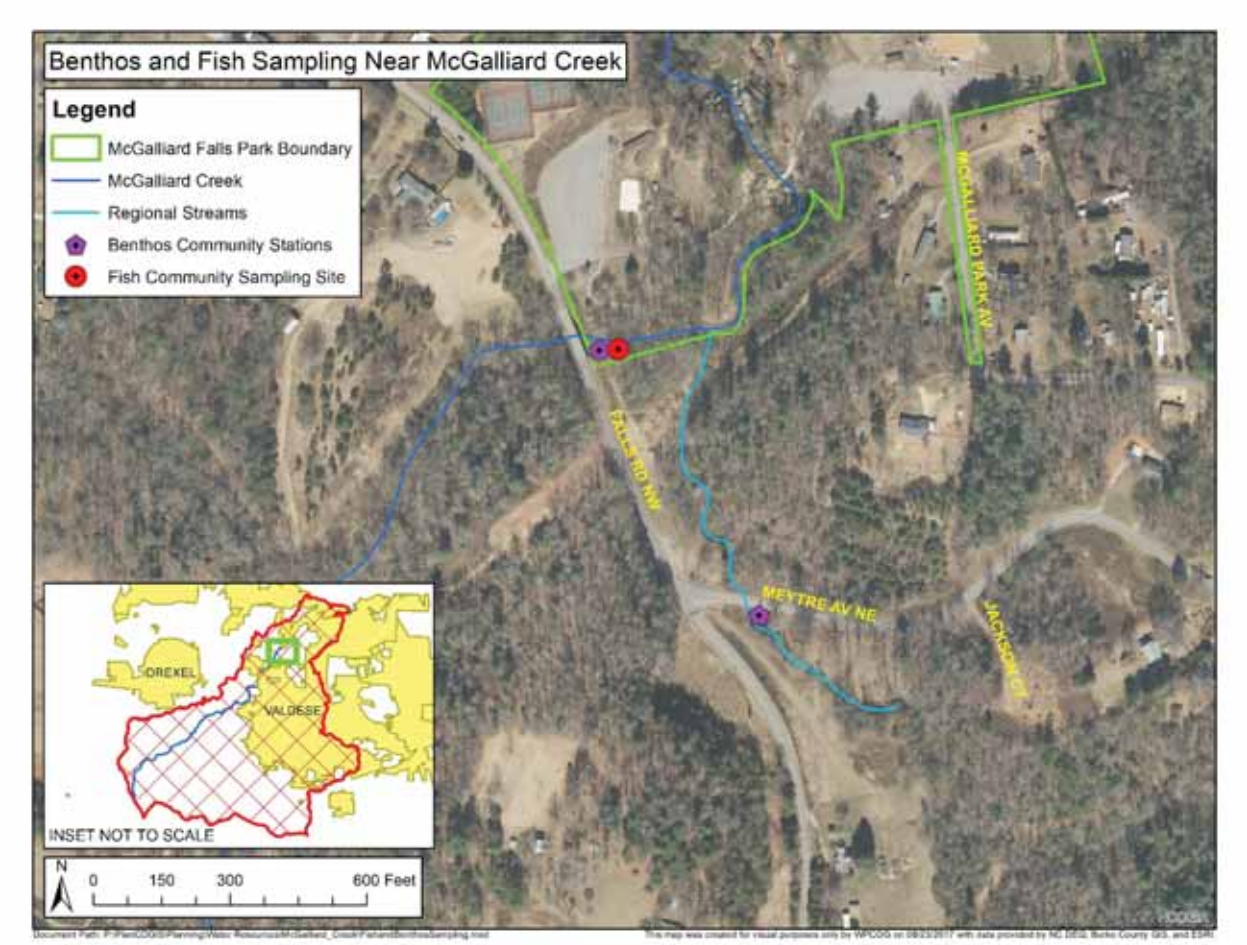
There are three monitoring sites that NC Division of Water Resources uses on McGalliard Creek. The monitoring sites for both benthos and fish community are located at the southern most portion of McGalliard Falls Park, and there is another benthos monitoring site located at McGalliard Creek T (Map 14: Benthos and Fish Sampling near McGalliard Creek). Fish Communicty monitoring took place in 1993, 1997, 2002, and 2003. The results of the sampling can be found in Table 5.

Further monitoring needs to take place in the creek to determine if there are any traces of pollutants from past industrial spills within the soils. Though water quality could be a cause of impairment in the stream the MCAT committee felt that the improvement in the benthic communities indicated that there was an improvement in the water quality. The fish impairment may be more of an issue of water quanity due to eroding of streambanks and the shallowing of the creek itself due to high volumes of sediment.

Table 5: NC DWR Fish Community Monitoring

Date	DWR Sample Number	Family	*Scientific Name*	Number Collected
05/10/93	93-18	Catostomidae	*Scartomyzon rupiscartes*	1
05/10/93	93-18	Centrarchidae	*Lepomis auritus*	33
05/10/93	93-18	Centrarchidae	*Lepomis macrochirus*	4
05/10/93	93-18	Centrarchidae	*Micropterus salmoides*	2
05/10/93	93-18	Cyprinidae	*Campostoma anomalum*	1
05/10/93	93-18	Cyprinidae	*Clinostomus funduloides*	3
05/10/93	93-18	Cyprinidae	*Nocomis leptocephalus*	20
05/10/93	93-18	Cyprinidae	*Notropis chlorocephalus*	2
05/10/93	93-18	Ictaluridae	*Ameiurus platycephalus*	1
05/06/97	97-35	Catostomidae	*Scartomyzon rupiscartes*	3
05/06/97	97-35	Centrarchidae	*Lepomis auritus*	24
05/06/97	97-35	Centrarchidae	*Lepomis gulosus*	1
05/06/97	97-35	Centrarchidae	*Lepomis macrochirus*	8
05/06/97	97-35	Centrarchidae	*Micropterus salmoides*	1
05/06/97	97-35	Cyprinidae	*Campostoma anomalum*	4
05/06/97	97-35	Cyprinidae	*Clinostomus funduloides*	21
05/06/97	97-35	Cyprinidae	*Nocomis leptocephalus*	40
05/06/97	97-35	Cyprinidae	*Notropis chlorocephalus*	52
05/06/97	97-35	Cyprinidae	*Semotilus atromaculatus*	11
05/03/02	2002-45	Catostomidae	*Scartomyzon rupiscartes*	4
05/03/02	2002-45	Centrarchidae	*Lepomis auritus*	79
05/03/02	2002-45	Centrarchidae	*Lepomis macrochirus*	1
05/03/02	2002-45	Centrarchidae	*Micropterus salmoides*	9
05/03/02	2002-45	Cyprinidae	*Clinostomus funduloides*	9

05/03/02	2002-45	Cyprinidae	*Nocomis leptocephalus*	37
05/03/02	2002-45	Cyprinidae	*Notropis chlorocephalus*	2
05/03/02	2002-45	Cyprinidae	*Semotilus atromaculatus*	1
05/03/02	2002-45	Ictaluridae	*Ameiurus platycephalus*	1
07/30/03	2003-47	Catostomidae	*Scartomyzon rupiscartes*	1
07/30/03	2003-47	Centrarchidae	*Lepomis auritus*	2
07/30/03	2003-47	Centrarchidae	*Lepomis macrochirus*	9
07/30/03	2003-47	Cyprinidae	*Nocomis leptocephalus*	1



Map 14: Benthos and Fish Sampling near McGalliard Creek

7 – Prioritization in the McGalliard Creek Watershed

The McGalliard Creek Advisory Team prioritized restoration, preservation, or stormwater BMP activities and worked to identify priority properties for conservation and for restoration, or buffer repair. The committee was provided maps highlighting the following criteria:

1. Properties abutting 303(d)-listed impaired stream,
2. The length of stream bank on the property, and
3. Properties that are publicly-owned (or pending, such as the Lake Rhodhiss Park property).

Properties with greater stream bank lengths, on the 303(d) list, that are under public control would receive the highest priority. The committee also considered issues which had been visually-identified, including steep slopes or poor riparian buffers (Map 15: Impaired McGalliard Creek and Affected Properties and Map 16: Impaired McGalliard Creek and Affected Properties Ortho)

Based on the criteria above and the committee's knowledge of the area, the committee discussed which properties should be the first targets for restoration and for conservation. The committee's discussion produced the following recommendations:

7.1 - Restoration Priority Properties

Town of Valdese (McGalliard Falls Park)

The Town of Valdese owns the McGalliard Falls Park, where much of the public activity and interest lies. It is also the sampling site used for monitoring fish populations by the State. Additionally, the Town of Valdese is the catalyst for the McGalliard Creek Watershed Project, and is eager to begin work on the project. For these reasons, it was easy to identify this property as the primary priority (See section 8.2).

McGalliard Creek runs through the park, so one property owner, another benefit of this property, owns both sides of the creek. In addition to streambank repair, a stormwater study is needed at the bridge that crosses over the creek at Falls Rd. NW. There is a great deal of stormwater that enters the creek here, that could be a cause of much of the erosion. BMPs could be implemented that may slow down the water entering the bridge (See section 8.4).

Genant Property

The Genant Property has 840 linear feet of streambank and is upstream of McGalliard Falls Park.

Cline Property

The Cline Property has a total of 349 linear feet of streambank and is upstream of McGalliard Falls Park. Additionally, there are some issues with sand and vegetation management on the Duke Easement. In the past, the utility line easement has been sprayed with an herbicicde that may have killed the vegetation to such a degree that much of the sany soil had nothing to keep it

from eroding and being carried downstream. Duke Energy has been notified of the issue and has said that the easement will just be mowed in the future.

Lail Property

The Lail Property has 205 linear feet of streambank and is upstream of McGalliard Falls Park.

7.2 – Conservation Priority Properties

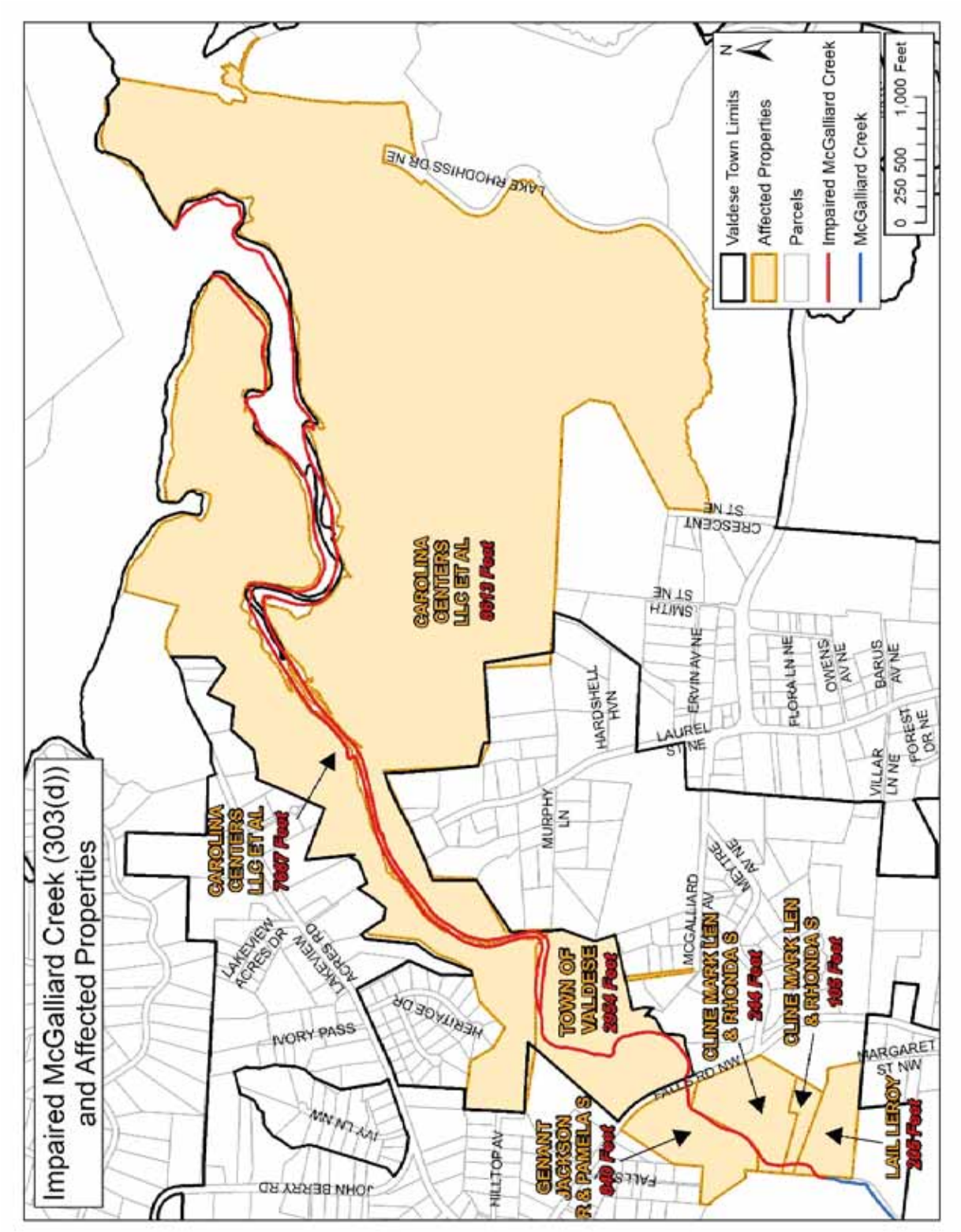
Carolina Centers LLC ET AL

The southern Carolina Centers LLC property is the primary priority for conservation. The Town of Valdese has hopes that it will be converted to a park after the Town has purchased it (See Section 8.4). The property acquisition and conservation easement (established with the assistance of CWMTF) will preserve the passive nature of the park and the riparian greenway trail for generations of public enjoyment. It will also protect and enhance:

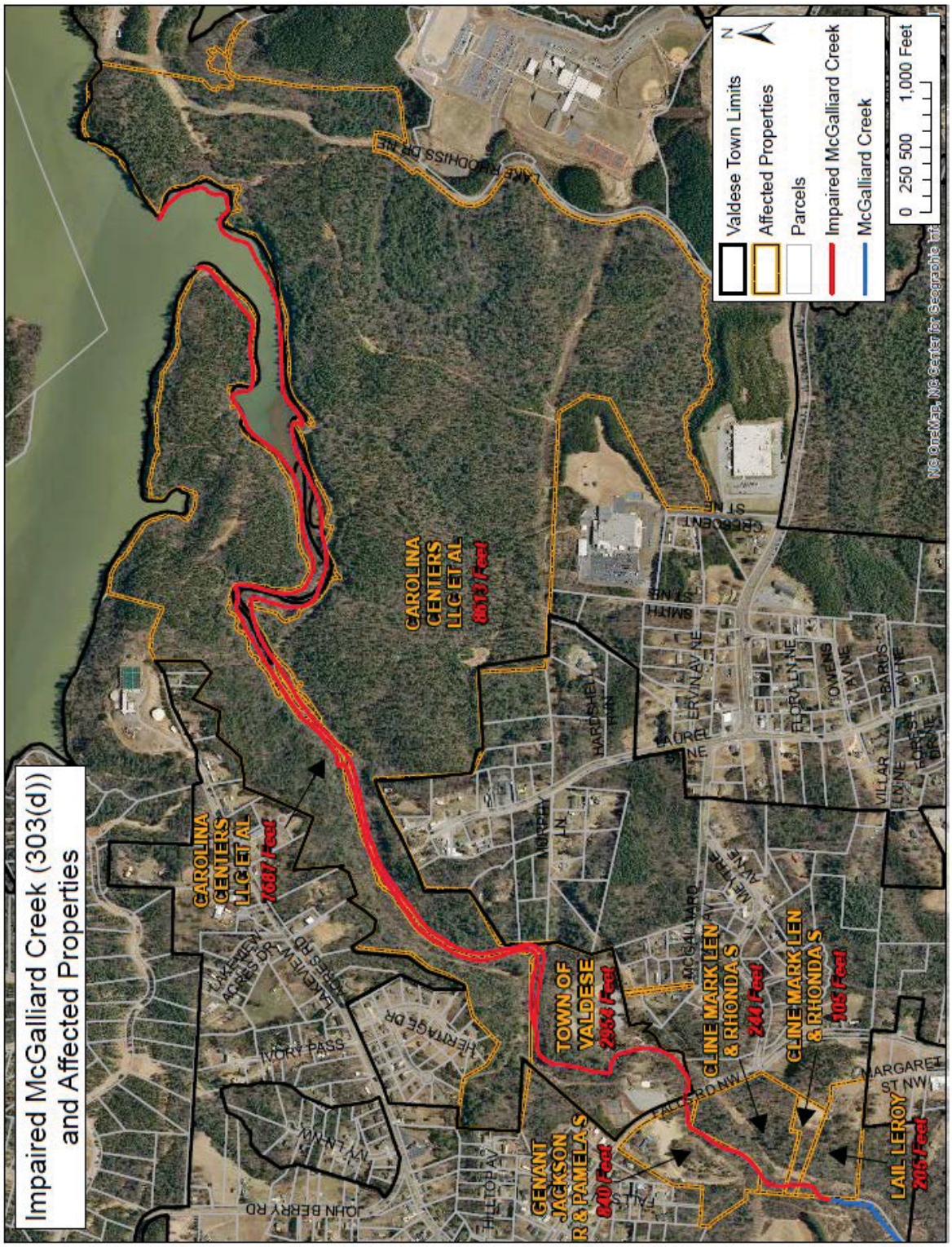
- Nearly 18,000 linear feet of McGalliard and Hoyle Creeks, and their adjacent wetlands,
- About 1,500 linear feet of Lake Rhodhiss,
- More than 3,500 linear feet of tributary streams, including streamside areas with the threatened plant, dwarf flowered heartleaf, and
- At least 151 acres of forested buffers around these surface waters and plant population (CWMTF easement area) and 151 acres of upland forests—natural, diverse habitats for birds and wildlife.

The peninsula property north of the new park property, is set to house residential development and has been subdivided into 10-acre tracts. The committee hopes to preserve the existing buffer on the stream.

Additionally, the Town would like to have a conservation easement on all properties where streambank repair takes place.



Map 15: Impaired McGalliard Creek and Affected Properties



Map 16: Impaired McGalliard Creek and Affected Properties Ortho

8 – Strategies

8.1 - Secure Adequate Funding

Seek opportunities to continue and enhance funding for watershed coordinators; acquisition of buffers, stream restoration, wetland enhancement, education and outreach efforts, monitoring, BMP retrofits and overall watershed improvements in vital areas.

To continue to implement the projects designated by the McGalliard Creek Watershed Management Plan, more funding will be required. Funding sources are found in Appendix A of this plan. Steps in acquiring funding include identifying funding sources most appropriate for each recommendation in the Plan, identifying project partners, developing pre-proposals for grant applications, and obtaining letters of support from partners as needed.

8.2. - Stream Bank Restoration

Stream Bank Restoration can help improve sediment transport, improve habitat and reduce stream bank erosion through improving the flow of water and stabilizing the stream bank to prevent further erosion. Obtain funding to complete stream bank repair in heavily eroded areas in the stream.

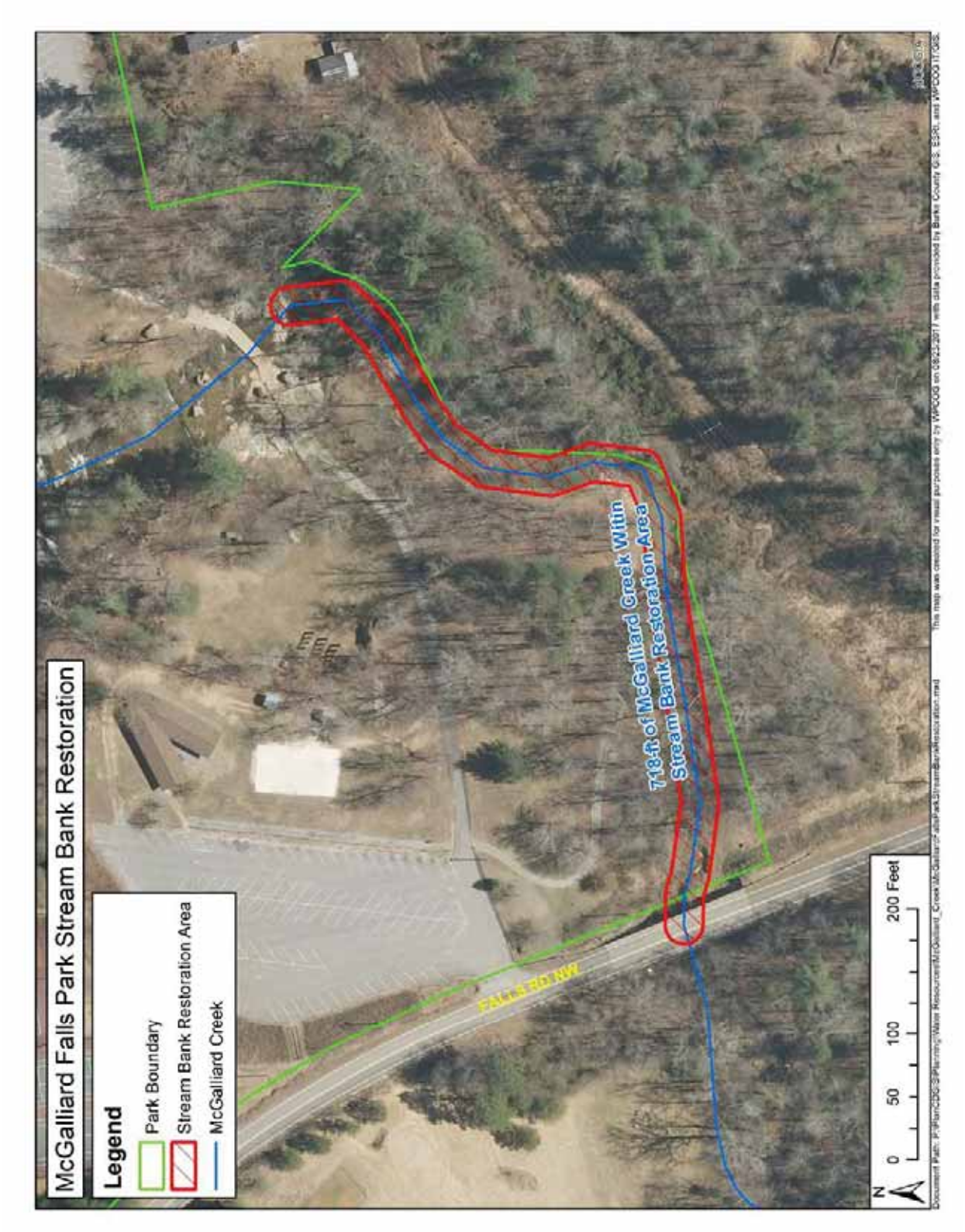
Stream Bank Restoration can help improve sediment transport, improve habitat and reduce stream bank erosion through improving the flow of water and stabilizing the stream bank to prevent further erosion. Replanting the streambank with native plants help to stabilize the work completed will prevent further degradation. Some stream banks in the McGalliard Creek Watershed are highly eroded leading to stream bank erosion, property loss, sedimentation, and degraded aquatic habitat. Many sections of the creek have widened, probably due to an increase in stormwater runoff. These widened streams have become shallower due to an increase in sediment, which is setting on the bottom due to the slower moving water.

McGalliard Falls Park is an example of an area where the streambank has become wider and more shallow. The images below show the difference in how the creek looks to the south of Falls Road, and then how the creek suddenly becomes wider once it has crossed under the bridge and into McGalliard Falls Park. There is a very clear widening of the creek.

The 718 linear feet of property that stretches from the bridge at Falls Road to the rock structures in the creek prior to the waterfall is the priority for the plan (Map 17: McGalliard Falls Park Streambank Restoration). Additionally, stormwater BMPs and fish habitat structures need to be implemented on the same property (Sections 8-3 and 8-7).

Looking South off Falls Road

Looking North off Falls Road (McGalliard Falls Park)



Map 17: McGalliard Falls Park Streambank Restoration

Phases	Rural Cost (L/F)		Suburban-Urban Cost (L/F)	
	Range	Average	Range	Average
Design	$15-31	$22	$21-56	$32
Construction	$50-65	$58	$77-142	$109
Construction Inspection/Management	$5-16	$11	$5-14	$12
Total Costs		$106		$218

Table 6: Costs of Streambank Repair

Streambank repair costs for design and construction are presented in Table 6. This means that the cost for the McGalliard Falls Park project (upper portion before the falls) could cost up to $152,216. This includes the 718 linear feet for both sides of the creek, which comes to 1,436 linear feet. In a rural area, this is an average of $106 dollars per linear feet. Costs for other priority projects are listed in Table 7.

Property	Linear Feet	Cost
McGalliard Falls Park (upper portion –before the Falls)	1,436	$152,216
McGalliard Falls Park (lower portion –after the Falls)	1,518	$160,908
Genant Property	840	$91,560
Cline Property	349	$38,041
Lail Property	205	$22,236

Table 7: Costs of Project Specific Streambank Repair

8.3 - Stormwater Management

Implement stormwater controls along identified areas along the Creek. Fully implement stormwater permits and management plans throughout the region in conjunction with current Phase II programs

Effective stormwater management is essential for the protection of McGalliard Creek. The Town of Valdese has developed both commercially and industrially over many decades. As the surrounding area continues to experience growth, some of the agricultural and forested areas in the McGallaird Creek watershed will be developed over the next several decades.

A best management practice (BMP) is a practice or combination of practices providing the most effective and practicable (including technological, economic, and institutional considerations) means of controlling point or non-point source pollutants at levels compatible with environmental quality goals. A stormwater BMP is a technique, measure, or structural control used to manage the quantity and improve the quality of stormwater runoff in the most cost-effective manner. These stormwater BMPs may provide flow control, pollutant removal or pollution source reduction, either individually or in combination.

Land management BMPs impact both the quantity of stormwater runoff and the amount of pollution entering water bodies as a result of land development activities. Improvements in land management are necessary to reduce the delivery of pollutants to water resources and prevent flooding and stress of channels downstream of the development. In general, these practices serve to promote infiltration of rainwater, slow runoff velocities and filter out particulate matter and other pollutants in stormwater runoff. Minimization of impervious surfaces and the protection of natural riparian buffers are two core strategies within this category of management practices.

BMPs that increase stormwater retention time, promote infiltration and provide filtration should all be incorporated into the compliance strategy for post-construction stormwater management regulations. Site plan review for new developments should address storm water quality as well as storm water quantity issues.

Stormwater BMPs can be implemented in key areas to help control the loss of streambank. Riparian buffer repair is important, but slowing down stormwater in key areas plays a big role in making sure that this doesn't happen again. The bridge that crosses the creek on Fall Rd. NW plays an imporrtant part in this. The committee felt that this is an area where a lot of stormwater may be converging from upland areas. It is important to determine the best ways to slow water down in this area using proper BMPs and stormwater controls.

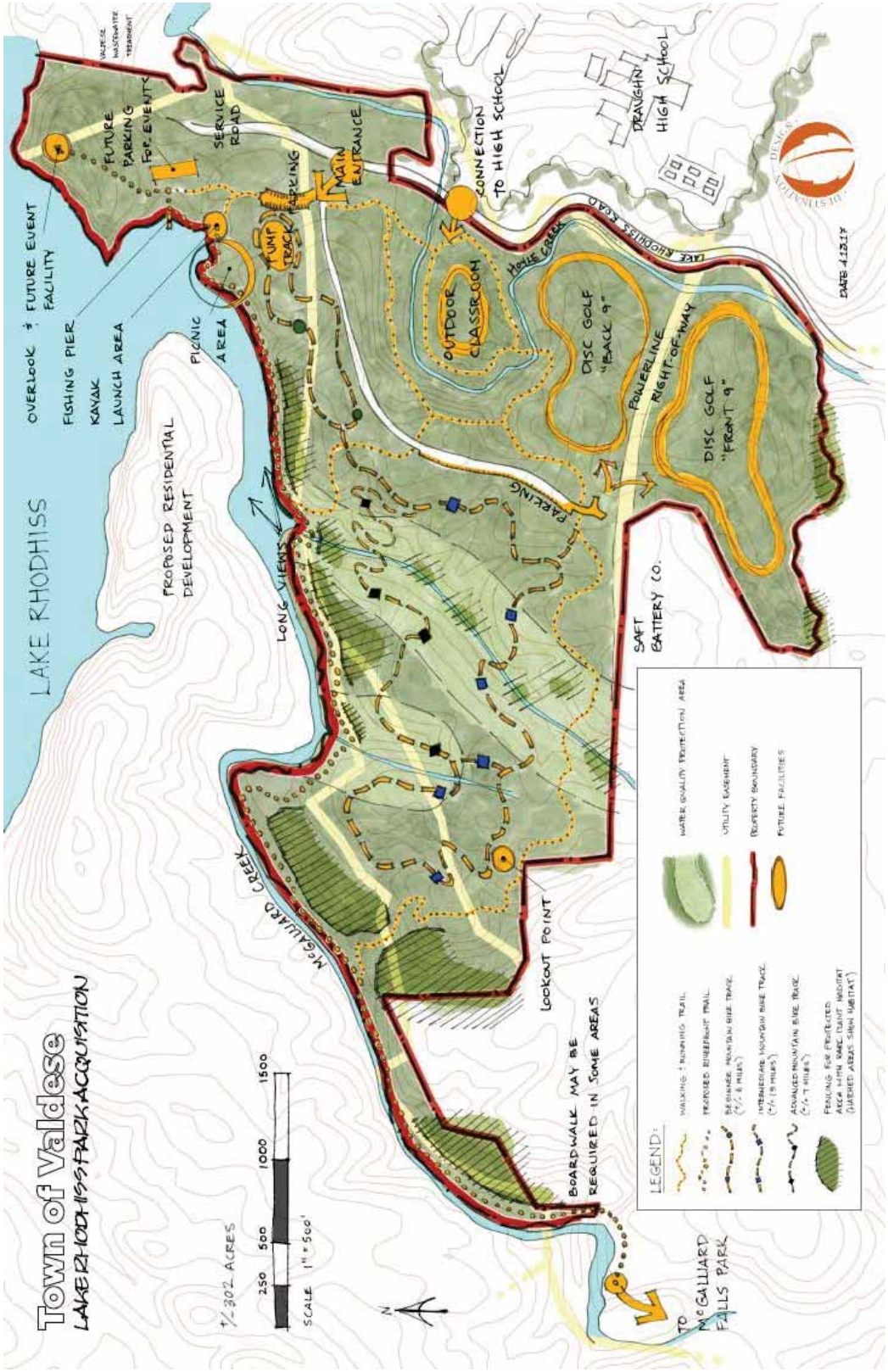
The southeast portion of the bridge at Falls Road

The northwest portion of the bridge at Falls Road

8.4 - Conservation Easement on 300-acre park

Work to establish a conservation easements on the 300-acre property on the northern end of McGalliard Creek, which can be used for recreational, educational, or wildlife purposes, as well as much needed riparian buffer protection along the creek.

The Friends of Valdese Recreation have recently applied for and received a PARTF grant for the Lake Rhodhiss Park Acquisition in Valdese. The grant is for $300,000 toward the acquisition of a 302-acre parcel. The parcel has varied topography including uplands and riparian land along the Lake Rhodhiss shoreline as well as McGalliard and Hoyle Creeks. Existing features include lake access, long-range views across Lake Rhodhiss of the Blue Ridge Mountains, and several logging roads and a sewer easement for immediate pedestrian access into the mature mixed-deciduous forest. The Town plans to develop a passive park on the site, including features such as walking and mountain biking trails, a picnic area, a fishing pier, a large disc golf course, and an outdoor classroom (Map 18: Lake Rhodhiss Park Acquisition).



Map 18: Lake Rhodhiss Park Acquisition

8.5 - Riparian Buffer Enhancement

Increase amount of streamside woody vegetation that functions as a filter and stream stabilizer through riparian buffer repair. Obtain funding to complete riparian buffer repair in heavily eroded areas in the stream.

For stream restoration projects, it may be determined that the stream banks are currently stable, but there is very little riparian vegetation. These conditions exist primarily in developed areas where there are utility easements. Riparian areas in such condition are not effective at capturing sediment or other pollutants originating from upland areas, or a lack of vegetation in the easement itself may cause a great deal of sediment to get in the creek. The Town or County must inspect these areas regularly to make sure that the easements remain vegetated. Additionally, the utility company can agree no to completely kill off the vegetation, but to mow instead. This has been an issue along McGalliard Creek in the past, however, the utility company has communicated that they will refrain from using sprays that completely wipe out any vegetation.

Additionally, forested buffers along streams act as filters to reduce sediment from nearby land uses. Riparian vegetation can reduce stream bank erosion during large storm events by stabilizing the soil. Reestablishing native trees, shrubs, and herbaceous plants can enhance riparian areas in the McGalliard Creek Watershed.

Figure 9 shows an area in a utility easement that has maintained by Duke Energy. The Local Governments involved, or the WPCOG, should communicate regularly with Duke Energy to emphasize the importance of maintain the buffer to better protect and enhance riparian buffer along the Creek.

Utility Easement on McGalliard Creek

8.6 - Greenways Adjacent to Streams

Encourage development of greenways along riparian corridors. Greenways are useful for recreational, educational, wildlife, and transportation purposes, but they can also be used to establish much needed riparian buffer along waterways. An additional benefit is increased public access to the waterways, which in turn provide more eyes to report potential problems and an increased public awareness.

Often easements or fee-simple purchase of riparian buffers on waterways can be turned into greenways, and can sometimes be the catalyst for protection of the waterways.

One particularly exciting amenity to be developed in the short-term is the greenway connecting McGalliard Falls Park with the Lake Rhodhiss Park property. The greenway will follow an existing sewer easement along McGalliard Creek and will connect with trails throughout the property to provide a variety of walkable routes. This is clearly a strong desire of the community, as supported by the Town's Comprehensive Plan, WalkRCV Pedestrian Plan, and the Valdese Parks and Recreation Plan (See Map 15: Lake Rhodhiss Park Acquisition) .

8.7 - Public Participation

Increase awareness and concern for McGalliard Creek so that the public takes greater interest. Continue to gather stakeholders so that the project continues.

Current Stakeholders and the WPCOG should continue to invite interested parties to join the McGalliard Creek Advisroy Committee. Work should continue on the Creek for years to come, and the more interested parties that are involved, the more interest in the creek will be sustained.

Stream clean-ups should also be focused on McGalliard Creek and its feeder streams located in the McGalliard Creek watershed. There are not currently any programs or activities that take place in these areas. This voluntary program would involve members of the community in a hands on activity to clean up the creek. Local citizen groups adopt a waterway, or a portion of one, and become informed stewards, learning how to react to the changing stream conditions. There are more than 200 existing Stream Watch groups in North Carolina, however, none are active in our region. They are composed of elementary school students, scout troops, businesses, and retirement groups. Stream Watch groups can be started from scratch or existing organizations can adopt streams; they are asked to conduct two visual monitoring and litter clean up sessions per year. They also are encouraged to become the local experts on their streams' dimensions, history and wildlife, and act on behalf of the streams' best interests.

8.8 - Education and Outreach

Increase awareness and concern for McGalliard in the region through comprehensive education and outreach efforts. Utilize Environmental Education practices and principles.

The Western Piedmont Stormwater Partnership, WPCOG, Burke County Soil and Water and NC Science House have taken the lead in promoting educational activities within the Lake Rhodhiss Watershed. Education and Outreach more specific to McGalliard Creek can be developed, which could include:

Developing print material outlining steps citizens can take to protect water quality in the watershed. The WPCOG has developed a brochures in the past that have been used by local governments in Burke and Caldwell Counties to assist them with meeting the NPDES Phase II stormwater requirements.

Identify and quantify the economic effects of poor water quality in the watershed. Economic effects of poor water quality should be quantified and shared with decision-makers and citizen groups. The Western Piedmont Council of Government (WPCOG) has developed presentations that cover drinking water, wastewater, property loss/degradation and other costs.

Building a kiosk at McGalliard Falls Park outlining water quality issues, and how local citizens can help improve water quality through their own actions.

8.9 - Fish Habitat Projects

Encourage projects within McGalliard Creek to improve fish habitat.

Since 2003, McGalliard Creek has been on the 303d list of impaired streams for poor Fish Community. In order to reestablish this community it is important to not only repair the stream but improve the fish habitat so that fish populations can be reestablished. Some ways to improve fish habitat include creating deeper water, reestablishing pool habitat, creating a narrower channel width, removing sediment and reestablishing riffles. Additionally, adding cover for fish creating hiding or resting areas or add substrate and food for aquatic organisms throughout addition of woody debris. Some methods include:

Boulder Clusters

Boulder clusters are groups of large rocks placed in a stream to improve habitat, and create scour holes and areas of reduced velocity. Placing the boulders in the stream creates eddies or vortices in their wake, which create overhead cover for fish by partially diffusing sunlight. Boulder clusters can also generate scour that cause pockets of deeper water to develop, which adds to the physical diversity of the stream

Boulders can be used in most stream habitat types including riffles, runs, flats, glides and open pools, but are most effective in wide, shallow streams with gravel or rubble beds. In deep streams, they can provide cover and improve substrate.

Revetments and cover logs

Revetments and cover logs include the use of brush and woody material secured to the streambank to provide overhead cover for fish and support insect and other fish food organisms. These structures can provide limited streambank protection. Various materials and techniques can be used, but must be securely anchored to avoid becoming dislodged.

8.10 - Water Quality Monitoring

Continue water quality monitoring to identify problem areas and document improvements Incorporate a volunteer monitoring component

Regular collection of water quality data should occur mnore frequently in McGalliard Creek than it currently is. Due to the possibility of industrial chemicals still being asctive in the soil from past activity in Dye Branch, or to see if there are chemical reasons that the fish community has been reduced, rather than just physical reasons. The return of benthic organisms to the creek is a good sign that the water may have improved.

A cost effective way to accomplish the monitoring would be to incorporate a volunteer monitoring component, though training, coordination and quality control of volunteers would be needed. A couple of possibilities include the Catawba River Foundation Covekeeper and Lenoir

Rhyne University's Reese Institute for the Conservation of Natural Resources has some student macro invertebrate sites that can be utilized for monitoring water quality as well.

Once work has been completed on the McGallaird Falls Property, a five year monitoring project should take place to track how well fish communities are responding to the work. It is the goal of the project to return the Fish Community numbers in that area to the 1997 numbers.

8.11 Illicit Discharge Monitoring

Encourage the public and local government officials to be on the lookout for potential illicit discharges along Mcgalliard Creek.

The Town of Valdese has done a good job with their illicit discharge program in recent years. This work should continue so that issues that occurred on Dye Branch do not happen again.

Additionally, sewer lines shouls continue to be inspected by the Town. Sanitary sewers were designed and built to carry wastewater from domestic, industrial and commercial sources, but not to carry stormwater. Nonetheless, some stormwater enters sanitary sewers through cracks, particularly in older lines, and through roof and basement drains. Alternately, leaks in the lines could potentially drain into and contaminate water sources within the McGalliard Creek Watershed. These areas should be should be monitored to determine if any sewer line leaks are responsible for fecal coliform hot spots.

8.12 – Septic Tank Repair Program

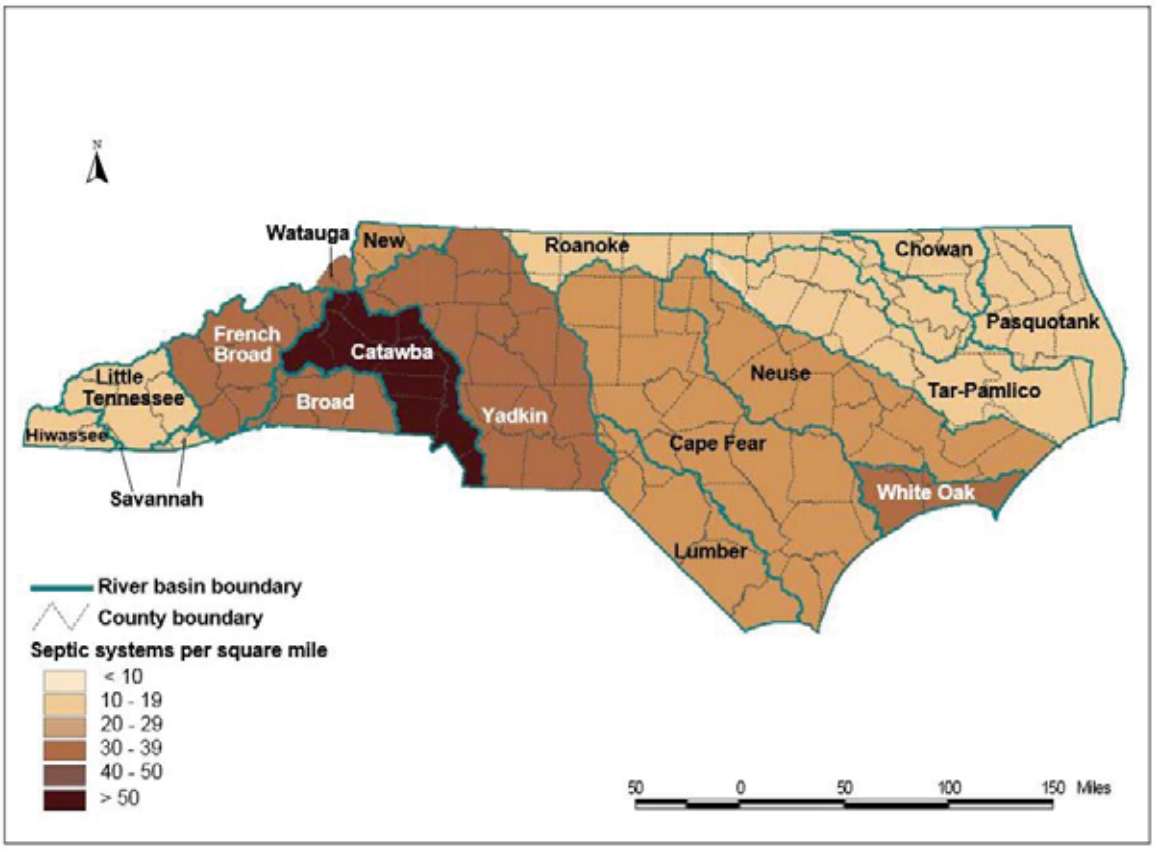
Continue to support and find funding for the Unifour Septic Tank Repair Program.

While the fecal coliform is not specifically an issue for McGalliard Creek, the areas within the Catawba River Watershed are among the areas having the highest densities of septic tanks in North Carolina. While actual numbers are unknown, many of these older systems are failing, and thus pose a threat both to the populace and the environment. Many of these failing systems are owned by middle and low-income residents who do not have the financial resources to pay for repair work. In addition, many local governments cannot justify extending sewer to rural areas in the region.

When household septic systems fail, untreated sewage can contaminate the surrounding land and nearby water sources. This untreated wastewater may contain dangerous viruses and bacteria that can threaten human health as well as pollute the environment. Septic systems are designed to remove or break down contaminants contained in sewage before it enters groundwater. When these pollutants are not treated properly, bacteria and other contaminates could infiltrate nearby lakes and streams, used as public water sources.

The Western Piedmont Council of Governments (WPCOG) has administered a no-interest, revolving loan program for qualifying homeowners for repairing failing septic systems. This program was a partnership involving the WPCOG, Alexander, Burke, Caldwell and Catawba Counties. The WPCOG continues to look for. The project currently prioritizes projects that are in areas that drain to waters that are on the 303d list.

The Unifour Septic System Repair Program is beneficial for multiple reasons including, helping low-income individuals with a much-needed expense, the public health benefits from preventing septic run-off, and the environmental benefits for water quality.



Map 19: Septic Tank Densities in the Catawba River Basin (NC Agricultural Resource Service, 2007)

9 – Recommendation/Implementation Tables

The following pages summarize the recommendations in tabular form. The recommendation tables are meant as a reference for the strategies that should be implemented in the McGalliard Creek Watershed.

The information in the recommendation tables contains additional information that may not appear in narrative sections of the plan, such as: costs estimates, potential partners and roles, performance indicators and estimated load reductions.

McGalliard Creek Watershed Protection Plan
RECOMMENDATION 1

Secure Adequate Funding

Strategy Narrative:	Seek opportunities to continue and enhance funding for watershed coordinators; acquisition of buffers, stream restoration, wetland enhancement, education and outreach efforts, monitoring, BMP retrofits and overall watershed improvements in vital areas

Key Actions:	Project Initiator(s):
Identify funding sources most appropriate for each recommendation in the plan Identify project partners Develop pre-proposals for grant application Obtain letters of support from partners as needed	Local partners WPCOG Town of Valdese

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefit
DEQ/DWR Cooperative Extension Schools NC Science House	• Coordination of grant application • Staff to write grant applications • Staff to administer grants • Awareness of potential grants availability	Better projects Maintain continuity of projects

Measureable Performance Indicators:	Annually, number of grants applied for and received; amount of grant funding applied for and received

McGalliard Creek Watershed Protection Plan
RECOMMENDATION 2

Stream Bank Restoration

Strategy Narrative:	Stream Bank Restoration can help improve sediment transport, improve habitat and reduce stream bank erosion through improving the flow of water and stabilizing the stream bank to prevent further erosion. Obtain funding to complete stream bank repair in heavily eroded areas in the stream.

Key Actions:	Project Initiator(s):
Identify deficiencies and make recommendations Apply for grant funding to complete stream bank repair. Obtain conservation easements along stream bank.	Town of Valdese Burke County WPCOG

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefits
DEQ/DWR WPCOG WRCS/Coop Ext Foothills Land Conservancy Duke Energy	State and Federal Regulations Engineering studies Funding	Aesthetics Fish habitat Less sediment

Measureable Performance Indicators:	Fish Habitat returns to 1997 numbers after five year monitoring study

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 3

Stormwater Management

Practice Narrative:	Implement stormwater controls along identified areas along the Creek. Fully implement stormwater permits and management plans throughout the region in conjunction with current Phase II programs

Key Actions:	Project Initiator(s):
Identify appropriate stormwater controls Seek funding for engineering and implementation	Town of Valdese Stormwater Administrator WPCOG

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefits
DEQ/DWR WPCOG	Ongoing training for stormwater staff and public service personnel Adequate funding and staffing	Consistent application across jurisdiction

Measureable Performance Indicators:	Ordinances in place. Watershed Annual Reports. Number of stormwater controls implemented.

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 4

Conservation Easement on 300-acre park

Strategy Narrative:	Work to establish a conservation easements on the 300-acre property on the northern end of McGalliard Creek, which can be used for recreational, educational, or wildlife purposes, as well as much needed riparian buffer protection along the creek.

Key Actions:	Project Initiator(s):
Work with the Fotthills Land Conservancy to obtain the easement from the current owner.	Foothills Land Comservamcy Town of Valdese Friends of Valdese Rec

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefits
DEQ/DWR, WPCOG/Cooperative Extension, Duke Energy, PARTF, CWMTF	Land Conservancy expertise Ownership of parcel	Increase recreational and Tourism opportunities

Measureable Performance Indicators:	Conserving the property through easement and/or fee simple ownership.

McGalliard Creek Watershed Protection Plan
RECOMMENDATION 5

Riparian Buffer Repair

Strategy Narrative:	Increase amount of streamside woody vegetation that is functions as a filter and stream stabilizer through riparian buffer repair. Obtain funding to complete riparian buffer repair in heavily eroded areas in the stream.

Key Actions:	Project Initiator(s):
Apply for grant funding to complete riparian buffer repair. Obtain conservation easements along riparian buffer.	Local partners WPCOG Town of Valdese

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefits
DEQ/DWR WPCOG WRCS/Coop Ext Foothills Land Conservancy Duke Energy	State and federal grants Engineered plan for erosion mitigation	Habitat protection Riparian buffer protection

Measureable Performance Indicators:	Linear feet of riparian buffer repaired.

McGalliard Creek Watershed Protection Plan
RECOMMENDATION 6

Greenways Adjacent to Streams

Strategy Narrative:	Encourage development of greenways along riparian corridors. Greenways are useful for recreational, educational, wildlife, and transportation purposes, but they can also be used to establish much needed riparian buffer along waterways. An additional benefit is increased public access to the waterways, which in turn provide more eyes to report potential problems and an increased public awareness.

Key Actions:	Project Initiator(s):
Obtain conservation easements along streams. Adopt and enforce an ordinance that protects 50 feet of vegetative buffer on the streams.	Local Governments WPCOG

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefits
DEQ/DWR, WPCOG, WRCS,/Cooperative Extension, Foothills Land Conservancy, WRC, Duke Energy, PARTF, CWMTF	State and Federal Grant Funding Easement preparation	Increase recreational and Tourism opportunities

Measureable Performance Indicators:	Annually, number of greenway trail projects applied for and received; amount of grant funding applied for and received, trail miles

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 7

Public Participation

Strategy Narrative:	Increase awareness and concern for McGalliard Creek so that the public takes greater interest. Continue to gather stakeholders so that the project continues.

Key Actions:	Project Initiator(s):
Collect and develop resource materials Present at community events Speak to other groups in the area Invite potential interested parties to meetings	Current Committee Members Town of Valdese

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefit
DEQ/DWR WPCOG Cooperative Extension	Lead implementer team to help recruit new members.	Citizen involvement. Multi-jurisdictional cooperation

Measureable Performance Indicators:	New members added. Increase in partnerships.

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 8

Education and Outreach

Strategy Narrative:	Increase awareness and concern for McGalliard in the region through comprehensive education and outreach efforts. Utilize Environmental Education practices and principles.

Key Actions:	Project Initiator(s):
Collect and develop resource materials Work with and in schools Present at community events Educational component added to publicly owned properties	WPCOG Municipalities Phase II permittees

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefit
DEQ/DWR WPCOG Cooperative Extension Schools NC Science House	Funding for educational kiosk or signage along trail.	Citizen involvement. School educational value Serves multiple purposes

Measureable Performance Indicators:	Number of public reached, number and type of written resources available, number of students/schools reached

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 9

Fish Habitat Projects

Strategy Narrative:	Encourage projects within McGalliard Creek to improve fish habitat.

Key Actions:	Project Initiator(s):
Encourage scouts and other groups to participate in fish habitat projects Town sponsored fish habitat projects Apply for small habitat grants from Duke Energy and other resources.	Local Governments WPCOG

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefits
DEQ/DWR, WPCOG, WRCS,/Cooperative Extension, Foothills Land Conservancy, WRC, Duke Energy, PARTF, CWMTF	Grant Writing Knowledge of fish habitat	Increase recreation al and Tourism opportunities

Measureable Performance Indicators:	An increase is fish habitat during monitoring. Fish community numbers are back at 1997 levels.

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 10

Water Quality Monitoring

Strategy Narrative:	Continue water quality monitoring to identify problem areas and document improvements Incorporate a volunteer monitoring component

Key Actions:	Project Initiator(s):
Utilize previous monitoring locations Add new monitoring sites as needs occur Periodic collection of water quality data Pre and Post monitoring at restoration and BMP sites	DEQ

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefit
DEQ/DWR WPCOG Cooperative Extension Lenoir-Rhyne University, Reese Institute	Varies based on extent of study Field monitoring equipment, lab analysis Training, coordination and quality control of volunteers needed	Citizen and student involvement possible early detection of problem

Measureable Performance Indicators:	Number of sites sampled on yearly basis

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 11

Illicit Discharge Monitoring

Strategy Narrative:	Encourage the public and local government officials to be on the lookout for potential illicit discharges along Mcgalliard Creek.

Key Actions:	Project Initiator(s):
Develop educational materials Walk system lines	WPCOG Town of Valdese

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefit
DEQ/DWR Phase II SW Permit Holders WPCOG	Staff time Educational materials	Savings in potential clean-up cost Permit compliance

Measureable Performance Indicators:	Improvement in water quality. Reports of illicit discharges.

McGalliard Creek
Watershed Protection Plan
RECOMMENDATION 12

Septic Tank Repair Project

Strategy Narrative:	Continue to support and find funding for the Unifour Septic Tank Repair Program.

Key Actions:	Project Initiator(s):
Continue to look for further funding to support the septic tank repair project Coordinate with the County Environmental Health Departments to direct applicants to the program	WPCOG County Environmental Health

Potential Partners:	Resources/Technical Assistance Needed:	Additional Benefits
DEQ/DWR WPCOG WRCS/ Cooperative Extension CWMTF 319 Grant Program	State and federal grants Assistance from County Environmental Health Specialists	Remove fecal coliform Health Hazards

Measureable Performance Indicators:	Annually, number of residential loan applied for and received; amount of grant funding applied for and received.

10 – Long Term Planning Strategy

One of the goals of the McGalliard Creek Watershed Plan was to prepare a comprehensive protection plan, using what has already been prepared, that can be used by local governments and agencies as roadmap for improving watershed quality conditions within the watershed.

The Plan is intended to be an evolving document, revised on a regular basis or as policies and economic conditions change. This is a plan encompassing a small geographic area that is intended to aid the acquisition of funding for projects in the McGalliard Creek watershed. The parties responsible for implementing the plan should review the document periodically to determine its effectiveness and the need for revisions.

The Plan will be presented to all local governments within the watershed by staff at the Western Piedmont Council of Governments. The local governments will be asked to voluntarily adopt the recommendations and begin implementing the plan in areas for which they have authority.

Strategy Timeline		1	2	3	4	5	6	7	8	9	10
Strategies		Implementation Year									
1	Secure Adequate Funding										
2	Stream Channel Restoration										
3	Stormwater Management										
4	Conservation Easement on 300 Acre Park										
5	Riparian Buffer Repair										
6	Greenways Adjacent to Streams										
7	Public Participation										
8	Education and Outreach										
9	Fish Habitat Projects										
10	Water Quality Monitoring										
11	Illicit Discharge Monitoring										
12	Sediment Dredging in the Creek										

References

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Virginia Department of Conservation and Recreation. 2004. The Virginia Stream Restoration and Stabilization Best Management Practices Guide. Richmond Va.

Western Piedmont Council of Governments. 2009. *Lake Rhodhiss Watershed Management Plan.* Prepared for Carolina Land and Lakes RC&D. Hickory, NC.

Appendix A
Funding Sources

Financial Assistance Resources
Grant, Loans and Cost Share

Agriculture Cost Share Program - Division of Soil and Water Conservation
Financial incentives for BMPs are provided through North Carolina's Agriculture Cost Share Program. This program is administered by the Division of Soil and Water Conservation (DSWC) within the NC Department of Agriculture and Consumer Services (NCDA&CS). Due to the program's success, it has been extended to all 96 Soil and Water Conservation Districts (SWCDs) that includes all 100 NC counties. 10-25%. Farmers
http://www.ncagr.gov/SWC/costshareprograms/ACSP/index.html

Aquatic Weed Problems – Division of Water Resources
Staff assists local governments by providing free evaluation of aquatic weed problems affecting public waters and **cost sharing** when control efforts are needed.
http://deq.nc.gov/node/82622

Aquatic Restoration Grants
US Army Corps of Engineers - Section 206. Aquatic ecosystem restoration and protection projects. 35%. Non-federal public agencies
http://www.nae.usace.army.mil/Missions/Public-Services/Continuing-Authorities-Program/Section-206/

Clean Water Management Trust Fund
CWMTF will fund projects that (1) enhance or restore degraded waters, (2) protect unpolluted waters, and/or (3) contribute toward a network of riparian buffers and greenways for environmental, educational, and recreational benefits.
http://www.cwmtf.net/

Clean Water Partners Infrastructure Program
The Rural Center of NC, as part of their Water 2030 Initiative, provides rural communities with grant funds to extend sewer lines and make wastewater system improvements. Local Government
http://www.ncruralcenter.org/index.php?option=com_content&view=article&id=114%3Aws-clean-water-partners&catid=48%3Acommunity-programs&Itemid=137

Clean Water State Revolving Fund and the NC Clean Water Revolving Loan and Grant Program
Wastewater System Expansion and Improvements - Division of Water Resources – Construction Grants and Loans Section**.** To fund drinking water capital projects that protect public health. These programs can provide both low interest loan and grant funds for wastewater treatment projects.
https://www.epa.gov/cwsrf
https://deq.nc.gov/drinking-water-state-revolving-fund-loan-program

Community Development Block Grant Program
All North Carolina small cities in Lake Rhodhiss Watershed are eligible to apply for US Department of Housing and Urban Development (HUD) funds. CDBGs are also available through the NC Rural Development Division.
http://portal.hud.gov/hudportal/HUD
http://www.nccommerce.com/rd

Community Conservation Cost Share Program (CCAP)
NCDA&CS – The Division of Soil and Water Conservation also offers incentive-based funds for non-agricultural BMP projects on public lands, as well as for some private/residential natural resource concerns.
http://www.ncagr.gov/SWC/costshareprograms/CCAP/index.html

Conservation Reserve Program (CRP)
USDA – Farm Service Agency (FSA) aids in converting highly erodible cropland or other environmentally sensitive acreage to vegetative cover. Cost Sharing. Farmers, Ranchers
http://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index

Conservation Reserve Enhancement Program (CREP)
USDA-FSA pays land owner an annual rental rate for removing environmentally sensitive land from agricultural production and introducing BMPs. The country's largest private-land conservation program. Up to 75% Cost Share. Farmers, Ranchers
http://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-enhancement/index

Cooperative Water Program
USGS Cooperative Matching Funds Program supports monitoring of water quality and clean-up of nonpoint source pollution. Local Governments
http://water.usgs.gov/coop/

Environmental Literacy Grants Program (ELG)
NOAA's Office of Education offers ELGs that support STEM learning by providing financial support for formal and informal EE techniques and supplies. Focus of stewardship and informed decision-making.
http://www.oesd.noaa.gov/grants/elg.html#page=about

Erosion and Sediment Control Awards- Energy, Mineral, and Land Resources
The North Carolina Sedimentation Control Commission (SCC) accepts and encourages proposals for research and/or educational projects related to erosion and sedimentation control.
http://www.dlr.enr.state.nc.us/eroprop.html

Environmental Quality Incentives Program (EQIP)
Farmers, Ranchers, and Eligible Civic Groups involved in Resource Planning
A voluntary program whereby eligible candidates who own or control land on which crops or livestock are produced in an identified priority area or have a State identified priority natural resource concern develop a conservation plan to manage one's valuable natural resources.
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/

Farmland Preservation Trust Fund -Dept of Agriculture and Consumer Services (NCDA&CS) –
NCDA&CS contracted with The Conservation Trust for North Carolina (CTNC) to accept farmland easement applications, and to administer state-appropriated funds.
http://www.ncadfp.org/

Farm Bill Programs
USDA-NRCS funds agricultural management and grassland, wetlands and wildlife preserve programs. Varies. Farmers, Ranchers
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/

Federal Programs Multiple Assistance Types – USDA Rural Business - Cooperative Service
Programs provide loans and grants for rural community water, sewage disposal, solid waste disposal, storm drain systems, telecommunications, computer networks and related technology. Eligible applicants include municipal and county governments, public service authorities, Indian tribal organizations and broadly based community nonprofit corporations.
http://www.rd.usda.gov/about-rd/agencies/rural-business-cooperative-service

Habitat Enhancement Program (HEP) - Duke Energy
https://www.duke-energy.com/lakes/hep-how-to-apply.asp

In-Lieu Fee Mitigation Programs – NCDEQ Division of Mitigation Services
Four voluntary In-Lieu Fee (ILF) mitigation programs for the public and private sectors to fulfill compensatory-mitigation requirements. Helps offset unavoidable environmental damage from transportation-infrastructure improvements and other economic development.
https://deq.nc.gov/about/divisions/mitigation-services/about-dms/dms-programs

Nonpoint Source Management Funding - 319 Grant Program
Division of Water Resources – Water Quality Section. The Clean Water Act - Section 319(h) allows EPA to provide funds to states (such as NC) who distribute the money to eligible candidates in a competitive process for innovative nonpoint source management strategies meant to be a demonstration for others.
http://deq.nc.gov/node/12634

Parks and Recreation Grant Programs - NC Division of Parks and Recreation
Grants to provided money to environmental organizations, and groups and state and local governments for park and recreation purposes, trail related needs and to acquire and protect important natural areas, preserve the state's ecological diversity and cultural heritage, and to inventory natural heritage resources of the state.
http://www.ncparks.gov/more-about-us/grants

Parks and Recreation Trust Fund (PARTF)
PARTF is the primary source of funding to build and renovate facilities in the state parks as well as to buy land for new and existing parks. A local government can request a maximum of $500,000 with each grant application.
http://www.ncparks.gov/more-about-us/parks-recreation-trust-fund

NC Rural and Economic Development Center – Economic Infrastructure Grant Program
The program is intended to help NC units of governments by funding up to $10,000 per job created, for up to one half of water and sewer infrastructure costs, or a maximum of $500,000, in projects that result in the creation of private sector jobs. Jobs must be full time, and must pay at least minimum wage. A local match of 5% of the total cost of the infrastructure is required.
http://www.ncruralcenter.org/index.php?option=com_content&view=article&id=107&Itemid=173

North Carolina Trails Program
The NC Adopt-A-Trail Grant program awards funds totaling $135,000 annually to government agencies, non-profit organizations, and private trail groups for such projects as trail building, trail signage and facilities, trail maintenance, and trail information brochures and maps.
http://www.ncparks.gov/more-about-us/about-parks-recreation/north-carolina-trails-program

Recreational Trails Program (RTP)
A $1.1 million dollar grant program with the intent to meet the trail and trail-related recreational needs identified by the Statewide Comprehensive Outdoor Recreation Plan (SCORP). The grant applicants must be able contribute 20% of the project cost with cash or in-kind contributions.
http://www.ncparks.gov/more-about-us/grants/trail-grants/recreational-trails-program

Urban and Community Forestry Grant Program
Division of Forest Resources. Grants are available to local or state government, educational institutions, non-profit 501(c)(3) organizations and other tax-exempt organizations. The program goal is to encourage citizen involvement in creating and supporting long-term and sustained urban and community forestry programs at the local level.
http://www.ncforestservice.gov/Urban/urban_grant_overview.htm

Waste Reduction Grants - Division of Environmental Assistance & Customer Service
Grants available to reduce the flow of waste (i.e., organics, construction and demolition debris, electronics, paper, etc.) to North Carolina disposal facilities. Some grants are accessible only to government and nonprofit organizations, while others are available to the private sector as well.
https://deq.nc.gov/conservation/recycling/local-government-recycling-assistance/grant-programs

Water Quality Management Planning and Protection - DEQ – DWR 205 (j) Grant Program
The Clean Water Act - Section 205(j) allows EPA to provide funds to states (such as NC) that distribute the money to eligible candidates (regional planning organizations) in a competitive process for water quality management planning. The Division prefers potential projects that deal with long-term growth management, impaired waters restoration, and public education. https://deq.nc.gov/about/divisions/water-resources/water-resources-grants/205j-wq-management-planning-grant

Water System Improvements – Division of Water Infrastructure
To provide guidance, technical and financial assistance to units of local government and certain non-profit water corporations, in order to provide safe drinking water in North Carolina.
http://portal.ncdenr.org/web/wi//application-information

Wetlands Protection Development Grant - USEPA
Develop comprehensive monitoring and assessment programs; Improve compensatory mitigation effectiveness; Refurbish wetland, aquatic resources, protection. 25%. States, tribes, local gov'ts interstate association, non-governmental organizations, (NGOs), intertribal consortia, nonprofit's
http://www.epa.gov/owow/wetlands/grantguidelines/

Water Resources Grants – Division of Water Resources
This program is designed to provide cost-share grants and technical assistance to local governments throughout the State. Applications for grants are accepted for seven purposes: General Navigation, Recreational Navigation, Water Management, Stream Restoration, Beach Protection, Land Acquisition and Facility Development for Water-Based Recreation, and Aquatic Weed Control.
https://deq.nc.gov/about/divisions/water-resources/water-resources-grants/financial-assistance

Voluntary Environmental Improvement Bonds – USEPA
The Environmental Finance Advisory Board recently released a report on summarizing an alternative funding strategy for local governments to promote household environmental projects. In a few other states where localities have been given (or already had) the authority to implement such a program, counties and municipalities have started to lend money to households that volunteer to install environmental improvements (i.e. photovoltaic panels, energy efficiency). The local government is then paid back through a special assessment on property through property taxes. These types of assessments could potentially be used for a number of environmental improvements to a property (i.e. green roofs, stream buffers, replacement of old wood stoves, etc.).
http://nepis.epa.gov/Exe/ZyNET.exe/P100AA92.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2006+Thru+2010&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C06thru10%5CTxt%5C00000025%5CP100AA92.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p%7Cf&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL

FOUNDATION FUNDING

The Foundation Center
This website provides information on individual grants as well as grants for non-profits.
http://foundationcenter.org/

Z. Smith Reynolds Foundation
This is a strong resource for county and town government striving to create "active" reform
ZSR Foundation Focus Areas: community and economic development; democracy and civic engagement; environment; pre-collegiate education; social justice and equity
http://www.zsr.org/

GRANT RESOURCE SITES

Environmental Finance Center at UNC Chapel Hill
In addition to its Environmental Funding Database for the Southeast, the EFC provides a compendium of NC water and sewer water funding resources. Federal funding sources for environmental protection, solid waste management, watershed protection, brownfields remediation, capacity building, and energy efficiency and conservation are posted online.
http://www.efc.sog.unc.edu/

Grants.gov
Allows organizations to electronically find and apply for more than $400 billion in Federal grants. Grants.gov is THE single access point for over 1,000 grant programs offered by all federal grant making agencies.
http://www.grants.gov/

EPA Grants
The EPA has created a guide to assist local governments in the federal grant process. A list of all EPA grants, including regional grants, can be found at http://www.epa.gov/epahome/grants.htm

ENVIRONMENTAL EDUCATION

American Honda Foundation Grants
The American Honda Foundation makes grants to K–12 schools, colleges, universities, trade schools, and others for programs that benefit youth and scientific education. The average grant range is $40,000 to $80,000. Grants are awarded on a quarterly schedule.
http://www.honda.com/community/applying-for-a-grant

Annenberg Foundation
The Annenberg Foundation focuses its grant-making on the following program areas: education and youth development; arts, culture, and humanities; civic and community; animal services and the environment; and health and human services. Letters of inquiry that address the Foundation's interests are accepted throughout the year. The Foundation only considers organizations that are tax exempt.
http://www.annenbergfoundation.org/grantmaking

Ben & Jerry's Foundation
The Ben & Jerry's Foundation offers competitive grants to not-for-profit, grassroots organizations throughout the United States which facilitate progressive social change by addressing the underlying conditions of societal and environmental problems. The Foundation will only consider proposals from grassroots, constituent-led organizations. Full grants range from $1,001 - $15,000 and throughout the year, the Ben & Jerry's Foundation may fund a small number of material grants for $1,000 or less. The application process to the Ben & Jerry's Foundation begins with an initial Letter of Interest, and if invited, is followed by a full proposal. Letters of Interest may be submitted at any time and are reviewed on an ongoing basis.
http://benandjerrysfoundation.org/grant-programs/

Campus Ecology Fellowships
For more than a decade, NWF's Campus Ecology program has been helping transform the nation's college campuses into living models of an ecologically sustainable society, and training a new generation of environmental leaders. Campus Ecology Fellowships are be awarded to college undergraduate and graduate students who desire to help reverse global warming on campus and beyond. The maximum grant request is $3,000
http://www.nwf.org/Campus-Ecology/Get-Involved/Apply-for-a-Fellowship.aspx

Garden Club of America Scholarships and Fellowships
GCA offers several research fellowships and scholarships for undergrads, grads and people already in the field. Topics include: ecological restoration, urban forestry, environmental studies, wetland studies, botany, desert studies and more.
https://www.gcamerica.org/scholarships

Georgia Pacific Foundation
The Georgia-Pacific Foundation supports a wide range of organizations that improve the quality of life in communities where Georgia-Pacific operates. The Foundation has identified the following key investment areas: educational efforts; community enrichment; environmental programs; and entrepreneurship initiatives. Applications may be submitted online from January 1 through October 31, annually.
https://www.gp.com/Company/Community/Foundation/Areas-of-Investment#Education

Lowe's Charitable & Educational Foundation Grants
Grants range from $5,000 to $25,000. Community improvement projects and K-12 Public School Initiatives are primary philanthropic focus areas.
http://www.lowes.com/cd_The+Lowes+Charitable+and+Educational+Foundation_474741445_

National Geographic Society Young Explorer Grants
The National Geographic Society's Young Explorers Grants offer opportunities to individuals between the ages of 18 and 25 to pursue research, exploration, and conservation-related projects consistent with National Geographic's existing grant programs, including the Committee for Research and Exploration, the Expeditions Council, and the Conservation Trust. The grant program accepts applications throughout the year.
http://www.nationalgeographic.com/explorers/grants-programs/young-explorers/

Toshiba America Grants for Enhancing Math and Science Ed.
Toshiba America grants up to $5,000 for 6th-12th grade teachers and up to $1,000 for K-5th grade teachers for enhancement in science and math education. K–5th grade program grants are due October 1. 7th - 12th grade program grants are due February 1 and August 1.
http://www.toshiba.com/taf/

Some local governments also subscribe to fee based grant information sites.

Information in this Appendices has been gleaned from multiple resources most notably:
Jessica Stevermer, Master of Public Affairs Student, Western Carolina University
North Carolina Office of Environmental Education
Paul Clark, NC DEQ Division of Water resources