Watershed-Based Plan

Georges Creek In The Saluda River Basin, South Carolina

SUBMITTED TO:
The South Carolina Department of
Health and Environmental Control

SUBMITTED BY:
Charly McConnell
Submitted as
M.S. Final Project Report,
Clemson University

May 2015

Table of Contents

List of Tables

List of Figures

1) Introduction

Water quality of streams, rivers, and lakes is a critical environmental health issue and must be protected in order to prevent pollution. Watershed-based plans are one way to define and address current and potential water quality issues within a given watershed. This watershed-based plan will take a detailed look at the Georges Creek watershed. This subwatershed located within the Upper Saluda River Basin has sites listed on the South Carolina Department of Health and Environmental Control (SC DHEC) 303(d) and Total Maximum Daily Load (TMDL) lists, making it a prime location to evaluate. The watershed-based plan will prioritize areas and best management practices (BMPs) to help reduce pollutant loads. The proposed plan will address pollution sources, expected load reductions for solutions, nonpoint source management measures, technical and financial assistance, education and outreach, implementation schedule, milestones, load reduction evaluation criteria, and monitoring. Potential project partners for this plan include Pickens County, Pickens County Clemson Extension Service, Upstate Forever, Save our Saluda, Pickens County Soil & Water District, Pickens County Beautification and Advisory Committee, Easley Baptist Hospital, City of Easley, Rockland Farms, Emerald Leaf Stables, Appalachian Council of Governments, Easley Combined Utilities, and USDA – NRCS. Overall, this plan will serve as an aid to help keep South Carolina waterways clean and beautiful one watershed at a time.

2) General Watershed Information

The Upper Saluda River Basin (HUC 03050109-03) covers a total of 148,672 square miles in South Carolina and is located within Greenville, Pickens, and Anderson Counties. This watershed-based plan focuses on Georges Creek (HUC 030501090302), a subwatershed located within the Upper Saluda River Basin. The subwatershed contains portions of two Small Municipal Separate Storm Sewer System (SMS4) areas, City of Easley and Pickens County (Figure 1). This watershed covers a total of 2,109.6 acres.

Location/Description

The Georges Creek watershed includes urban, suburban, and rural areas within the City of Easley and Pickens County. Five different named creeks are located within the watershed boundary and include Burdine Creek, Mud Dog Branch Creek, Hamilton Creek, Georges Creek, and Little Georges Creek. Downstream from the Georges Creek watershed lies Craven Creek, which is currently implementing a 319 watershed restoration grant. The Dolly Cooper Park in Powdersville also lies downstream from the Georges Creek watershed and is a very popular site for kayakers.

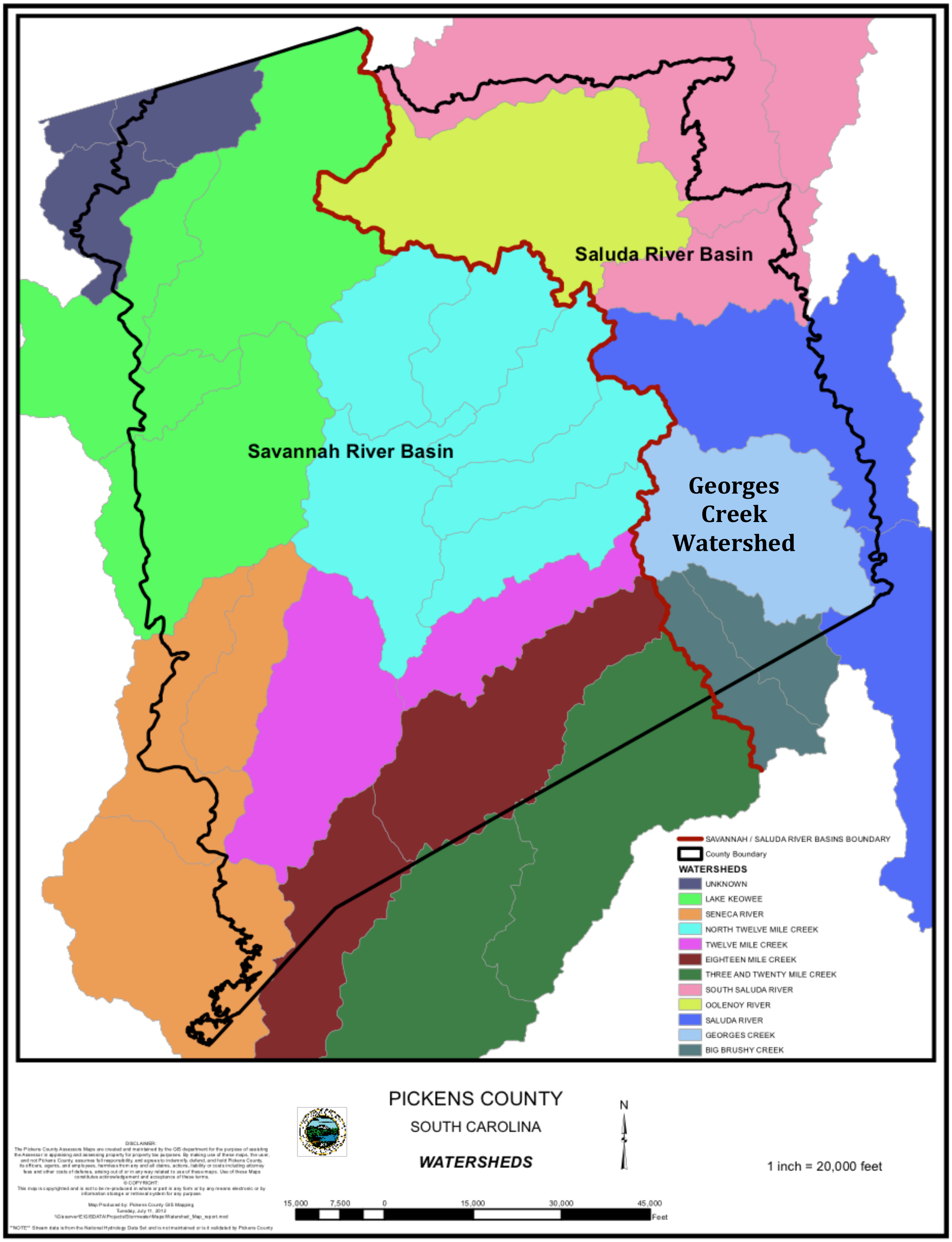

Figure 1: Watersheds Located in Pickens County

Populations, Communities, and Culture

This watershed includes communities within the City of Easley and Pickens County. Population for this watershed was estimated by identifying the number of occupied homes within the watershed and the average number of occupants per household for Pickens County. Census data from the Pickens County GIS Department was used to determine the number of occupied homes within the watershed and the average number of occupants per household for Pickens County was found by using the 2010 U.S. Census data (“State & County QuickFacts”, 2010). By using this information, the estimated population of the watershed area is 18,270, based on the number of occupied homes (7,308) and the average household size (2.5 occupants per household). Although this watershed is small in area, the location has potential for both industrial and residential growth. US Hwy 123 bisects the watershed and includes both commercial and industrial uses. Construction of the proposed Doodle Trail has the potential to bring additional growth to the watershed. The Doodle Trail will be a multi-use trail running from downtown Pickens and end in downtown Easley, at Georges Creek.

Rich in history and culture, the Georges Creek watershed encompasses a variety of landscapes. The railroad is one of the most historical aspects of this watershed, playing a role in the past, as well as the present. The track runs through the heart of downtown Easley and many other parts of the Georges Creek watershed. This railroad, known as the Pickens Doodle, helped in the development of the textile industry for this area during the late 1800’s and early 1900’s (“History of Easley, SC”, n.d.). Bowens Mill (Figure 2) was built in 1880 and is still standing within the Georges Creek watershed. This mill included a store, blacksmith’s shop, sawmill, and cotton gin. Each piece of Easley’s history has had impacts on this watershed.

Figure 2: Bowen's Mill Site

Geography and Climate

Located within the Piedmont Foothills region of South Carolina, the Georges Creek watershed is composed of a variety of different landscapes. Using data from the Pickens County GIS department, land cover for this watershed was divided into seven categories, as shown in Figure 3. Forested land makes up the majority of the watershed with 58%. Grass or agricultural land makes up the next largest portion of the watershed by 32%. This information shows that the majority of the Georges Creek watershed is rural with only 9% being developed or urban areas (Figure 4).

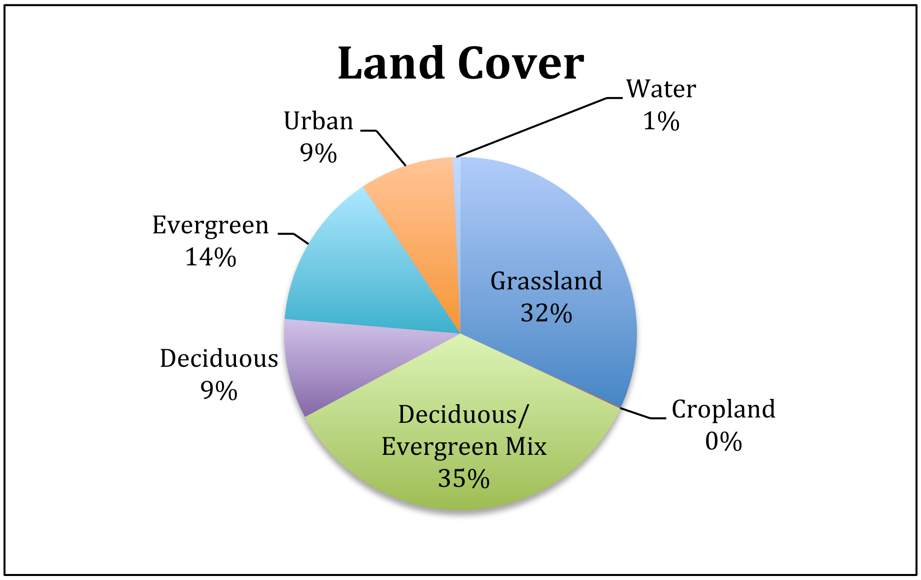

Figure 3: Overall Land Cover Percentages

Average temperatures for Pickens County are 42°F in the winter, 60°F in the spring and fall, and 70-80°F in the summer ("South Carolina State Climatology Office", 2010). Average annual precipitation for Pickens County is 53.44 inches ("South Carolina State Climatology Office", 2010). Soil types found within the Georges Creek watershed according to the Pickens County GIS Department include clay loam, cobbly loam, fine loam, loam, and sandy loam, the majority being clay loam (Figure 5). The diverse characteristics of this watershed, including its location, land cover, climate, and soil types, make it a unique geographical area within the state of South Carolina.

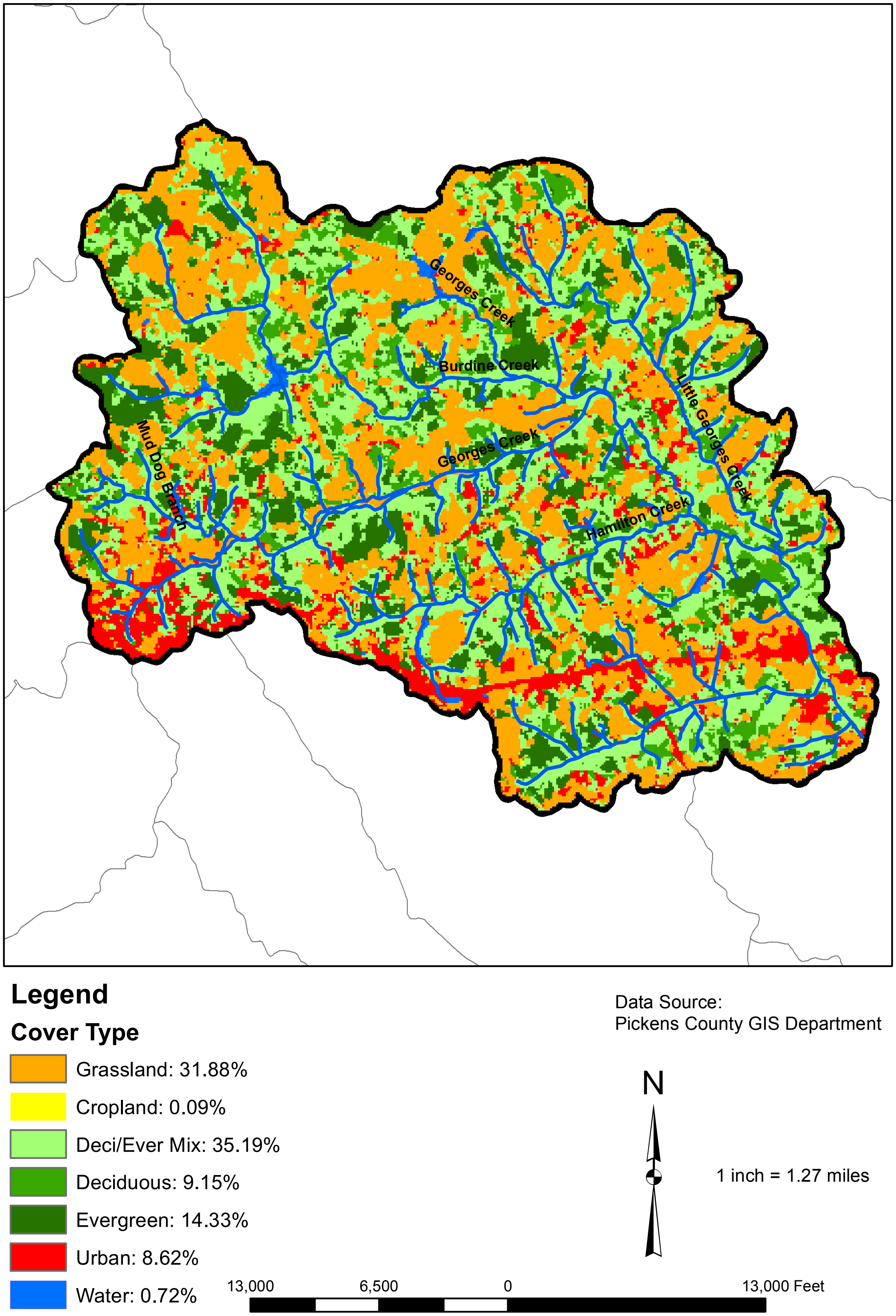

Figure 4: Georges Creek Watershed 2002 Land Cover Map

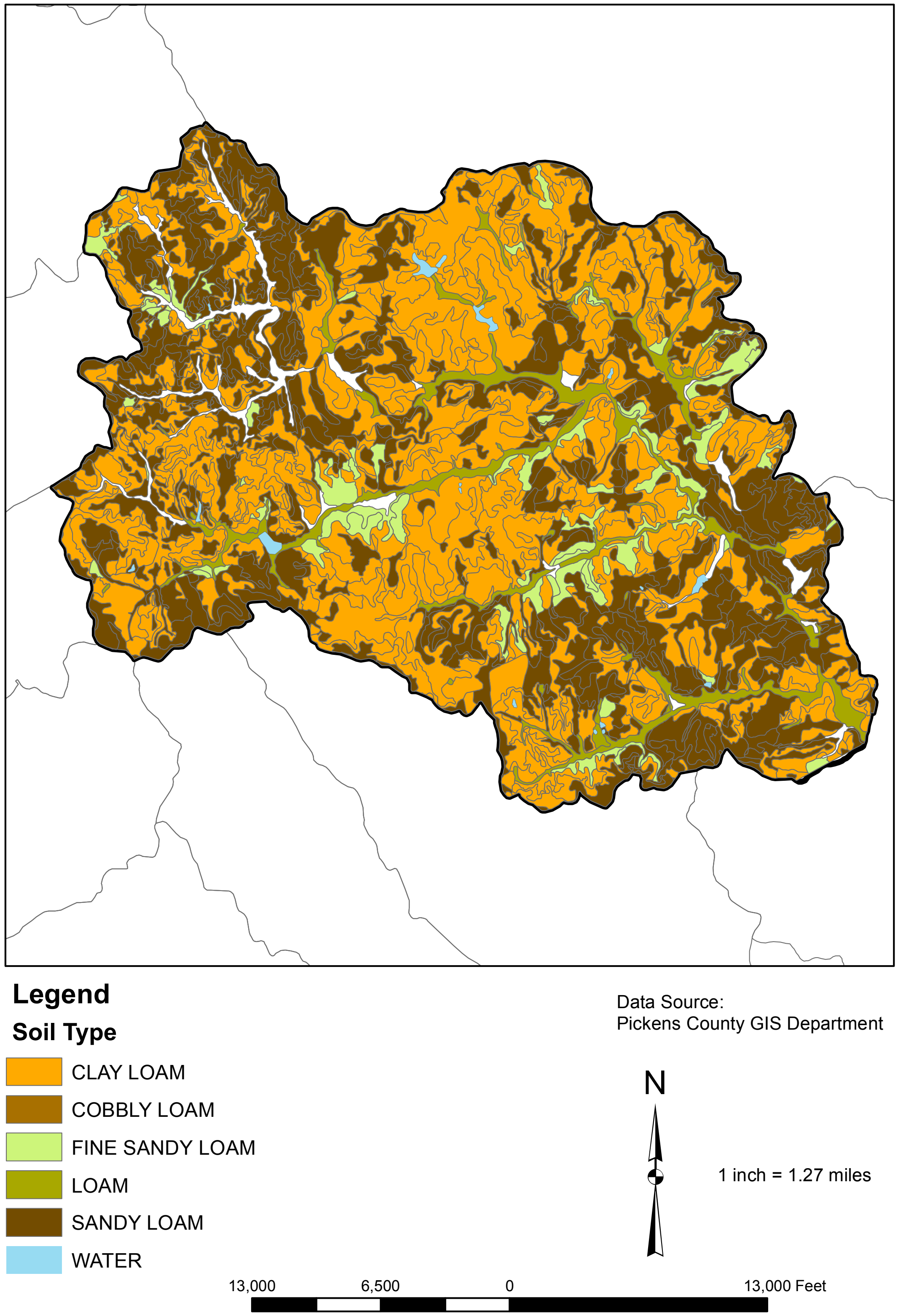

Figure 5: Georges Creek Watershed Soils Map

3) Water Quality Impairments and Sources

History of Water Quality

The 303(d) listed impairment for Georges Creek is fecal coliform (FC) bacteria. FC bacteria are found in the digestive tract and feces of warm-blooded animals. From a management perspective, notable source categories include livestock, poultry, wildlife species and humans. When present, diseases can be transmitted to humans through contact or consumption of contaminated water. The presence of these bacteria indicate that surface waters may contain pathogenic microbes. For this reason FC, has historically been used in South Carolina as the bacterial indicator to evaluate the quality of freshwaters for designated uses. A daily concentration of 400 colony forming units (CFU's) per 100 milliliters (mL) of water and a 30-day geometric mean of 200 counts per 100 mL was the water quality standard for FC ("EPA Finalized TMDL Upper Saluda River Basin", 2004). Water samples exceeding this standard more than 10% of the time were considered as not supporting for the designated use. Sites considered to be impaired for FC are placed on the South Carolina Department of Health and Environmental Control's (SC DHEC) 303(d) list.

In 2012, SC DHEC switched the bacterial indicator for freshwaters from FC to *Escherichia coli* (*E. coli*), which has nationally been considered to be the recommended indicator of fecal pollution in freshwaters. Currently the SC state water quality standard for *E. coli* is a daily concentration not to exceed 349 CFU/100 mL and 30-day geometric mean of 126 CFU/100 mL for recreational use ("R 61-68, Water Classifications & Standards", 2012). The presence of FC and *E. coli* in freshwaters acts as an indicator of fecal pollution and is not usually seen as a threat to human health. When the presence FC or *E. coli* exceeds water quality standards, this is known as fecal contamination. This is a health risk to humans because it could contain disease-causing organisms such as pathogenic bacteria, parasites, viruses, or protozoa. *E. coli* bacteria are often more prevalent in turbid waters because they are highly associated with sediment particles. When sediment is mobilized due to heavy rainfall or disturbance, an increase in bacteria levels is often a result (“Citizens Monitoring Bacteria”, 2008). Due to the recent transition of bacterial indicators, the majority of available water quality data is for FC. As directed by SC DHEC, bacteria load reductions for this plan were estimated using FC data, while the monitoring plan is designed to test for *E. coli*.

Water Quality Monitoring Stations and TMDLs

Section 303 of the Clean Water Act requires states to monitor surface waters and list any that exceed established water quality standards for designated uses. There are four SC DHEC monitoring stations within the Georges Creek watershed. These water quality monitoring stations were strategically placed in order to provide the best evaluation of this watershed. Based on data collected from the monitoring stations and from sampling by SC DHEC, levels of FC bacteria exceeding water quality standards have been found. The Saluda River Basin contains several streams that are listed on the 2004 Section 303(d) list of impaired or threatened waters. This list is commonly known as the 303(d) list and is compiled every two years by SC DHEC, providing information on waterbodies all over the state regarding their status of impairment and attainment of their designated uses, whether recreational or other. The Georges Creek watershed has two sites listed on the 303(d) list, S-865 and RS-06151. Both are listed for biological impairment and are designated for aquatic life use. Impaired waterbodies can be removed from the 303(d) list when they have either attained water quality standards or by the approval of a TMDL by EPA. Status of approved TMDL sites are provided through a biennial report from SC DHEC. The approval of a TMDL does not necessarily ensure that water quality standards will be met for any specific site; once a TMDL is approved, each waterbody will be labeled as either supported or not supported, depending on whether or not water quality standards have been achieved. TMDLs were developed for Georges Creek and approved by EPA at water quality monitoring sites S-005 and S-300, as shown in Figure 6.

Table 1: Monitoring Station Descriptions

Station	Description of Station	Subwatershed	Length in Miles	Use Supported	TMDL Status
S-005	NE Easley	Georges Creek	2.24	No	TMDL Developed
S-300	Georges Creek at S-39-28	Georges Creek	5.74	Yes	TMDL Developed

Table 1 provides a description of the TMDLs within the focus area and their current status. Both water quality monitoring stations within this watershed are listed for bacteria impairment and are designated for recreational use (“EPA Finalized TMDL Upper Saluda River Basin”, 2004). According to the 2012 303(d) list, both TMDLs within the watershed were not supported for recreational use, but as of August 19, 2014, site S-300 is now listed as fully supported. This means that the percentage of FC bacteria are greater than 25% of the water quality criteria established for site S-005 and less than 25% at site S-300.

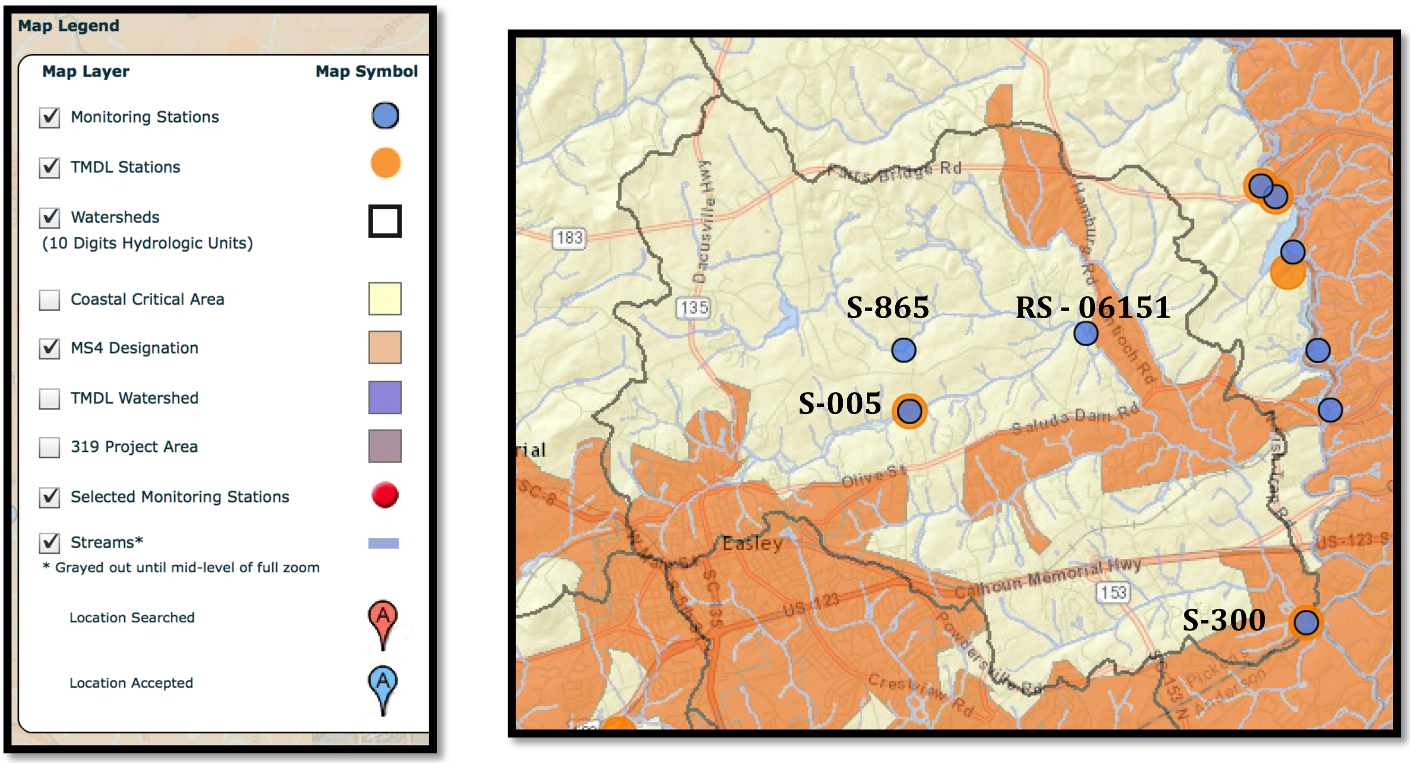

Figure 6: Georges Creek Watershed Water Quality Monitoring Stations

Possible sources of fecal coliform identified in the watershed include leaking sewer lines, sanitary sewer overflows (SSOs), failing septic systems, agricultural runoff, cattle-in-streams, urban runoff, and wildlife (“Watershed Water Quality Assessment”, 2011). According to SC DHEC’s Watershed Water Quality Assessment for the Saluda River Basin, the TMDL requires a reduction of 64% in fecal coliform loading at site S-005 for this stream to meet the recreational use standard (“Watershed Water Quality Assessment”, 2011). Data used to determine if sites have met water quality standards are based on water quality sampling collected by SC DHEC. More specifically, sampling data related to fecal coliform that has been collected and is available for each station. The table below displays the data available from 1996 - 2000 for each site (“EPA Finalized TMDL Upper Saluda River Basin”, 2004).

Table 2: SC DHEC Water Quality Sampling Data from 1996-2000 by Monitoring Station

Station	Total Number of Samples (1996 – 2000)	Percent Exceedences	Number of Violations (above 400 CFU/mL)
S-005	29	79%	23
S-300	17	53%	9

As shown in the table above, the site with the highest percent exceedence and number of violations is site S-005. Although site S-005 appears to have the highest fecal coliform bacteria impairment, data may be considered outdated for current evaluation; more current data would better clarify each stations status. Water quality data on the Saluda River Basin from EPA’s Storet Data Warehouse was reviewed, but gaps of data within Pickens County was the reason it was not used for this plan.

4) Pollution Sources

There are two types of pollution, point and nonpoint sources, and bacteria pollution can originate from both types. A point source pollutant is a type of pollutant that can be identified as a single or definite source. Impacts from these sources are easier to identify, isolate, and quantify. Nonpoint source pollutants on the other hand are generally the result from many different sources and are diffused across the landscape.

Table 3: Potential Sources of Bacteria Pollution Within the Watershed

Potential Sources of Bacterial Pollution in the Georges Creek Watershed
Livestock and Agriculture • Horses • Cattle • Sheep & Goats • Swine • Poultry • Cropland
Wastewater • Septic Tanks • Wastewater Treatment Plants and associated infrastructure
Urban • Domestic Pets • Stormwater Runoff
Wildlife • Deer • Feral Hogs • Beavers • Water Fowl

Nonpoint source pollution includes stormwater pollution and is caused by runoff from rainfall flowing over the ground and picking up and carrying pollutants into waterways. Stormwater runoff is the nations number one source of water pollution (“What is Nonpoint

Source Pollution", 2013). Table 3 lists all the potential sources of bacterial pollution in the Georges Creek watershed.

Point Sources

Wastewater treatment plants (WWTPs) can be considered a point source for bacteria pollution. In order for these WWTPs to discharge their treated effluent into surface waters, they must obtain a National Pollution Discharge and Elimination System (NPDES) permit. There are three active NPDES facilities that are permitted to discharge fecal coliform bacteria into the Georges Creek watershed (Table 4). Even with these permits, wastewater treatment facilities occasionally experience SSOs. Untreated sewage is discharged into local waterways during these events, which can occur during either dry or wet weather conditions. Events that can result in improper wastewater discharges into receiving waters include blocked pipes, construction activities, equipment failures, and heavy rain events. SSOs are tracked by SC DHEC and are listed online with the most recent overflows within 3 years ("Sewer Sanitary Overflow", 2014). SC DHEC also recognizes certain WWTPs that strive to meet or exceed customers' expectations in environmental protection as Facilities of Excellence. The Easley/Georges Creek Lagoon was awarded this in 2013 ("DHEC Recognizes Facilities of Excellence", 2014).

Table 4: WWTPs in the Georges Creek Watershed

Facility Name	NPDES No.	Flow (MGD)	Receiving Stream
HSL Inc	SC0001155	0.066	Hamilton
Alice MFG/Ellison Plant	SC0001171	0.026	Burdine/Georges/Saluda River
Easley/Georges Creek Lagoon	SC0023043	0.82	Georges Creek
Crosswell Elem Sch/Pickens Co	SC0037486	Inactive 02/28/01	Hamilton/Georges/Saluda River

Nonpoint Sources

As mentioned earlier, nonpoint source pollution comes from a variety of sources ("Citizens Monitoring Bacteria", 2008). These pollutant sources can include sediment, bacteria, motor oil, and nutrients. Nonpoint pollutant sources contributing to bacterial impairment include septic systems, agriculture, domestic pets, and wildlife. Since the Georges Creek watershed is mainly composed of rural areas, emphasis is placed on bacterial inputs from agriculture, failing septic tanks, and wildlife populations. Although urban areas only make up roughly 9% of the watershed, efforts will be made as a proactive step to ensure proper public education and outreach regarding domestic pets and stormwater runoff within the watershed.

a) Livestock and Agriculture

Livestock are one of many agricultural sources for bacteria loading in waterways. Such impairment results when livestock have access to streams and contribute bacteria directly into waterways through their fecal matter or indirectly by disturbing stream banks and thus causing erosion. Excessive application of manure as fertilizer can also contribute to elevated bacteria levels. Also, runoff from agricultural facilities, such as concentrated animal feeding operations (CAFOs), caused by rain events can lead to increased bacterial levels into streams as well as other pollutants such as fertilizers, pesticides, and sediment by washing these pollutants directly into any nearby waterways.

Agricultural land makes up roughly 32% of Georges Creek and makes this land use a likely contributor of bacteria to the watershed (Figure 7). Windshield surveys, observations made while driving through the watershed, confirm that there are several horse farms located within the area. The number of animals in this watershed was estimated by combining information from the USDA Census of Agriculture with a GIS analysis of farmland acreage. The acreage of farmland within this watershed is based on an analysis of the Pickens County GIS Department land cover data. Total acreage of farmland and total animal counts for each county were obtained from the USDA Census of Agriculture ("2012 Census County Level Data", 2012). A ratio of animals per acre in Pickens County was determined based on this information. This ratio was then applied to the acreage of farmland within the Georges Creek watershed to estimate the total number of farm animals living within the watershed boundary. An example formula is show below.

$$\text{Number of (Cattle) in Georges Creek Watershed} = \frac{\text{Total Number of (Cattle) Within the County}}{\text{Total Acreage of Farmland Within the County}} \times \text{Acreage of Farmland Within Georges Creek Watershed}$$

Although horse farms were the must abundant based on windshield surveys, based on these calculations, cattle are the most abundant pasture-based animal living within the watershed. Other livestock that could potentially impact bacteria levels in Georges Creek are listed in Table 5.

Table 5: Estimated Number of Farm Animals in Georges Creek

Watershed	Farm Animals				
	Cattle	**Horses**	**Goats**	**Swine**	**Sheep**
Georges Creek	100	21	12	6	3

Cropland can also contribute to bacteria levels within waterways, due to manure applications, such as cow manure, horse manure, and chicken litter. Excess amounts of manure can be washed into nearby streams during rain events and thus impacting the water quality. Proper storage and management of manure are both important aspects to consider and could both cause elevated levels of bacteria in streams (“Equestrian-Related Water Quality Best Management Practices”, 2004).

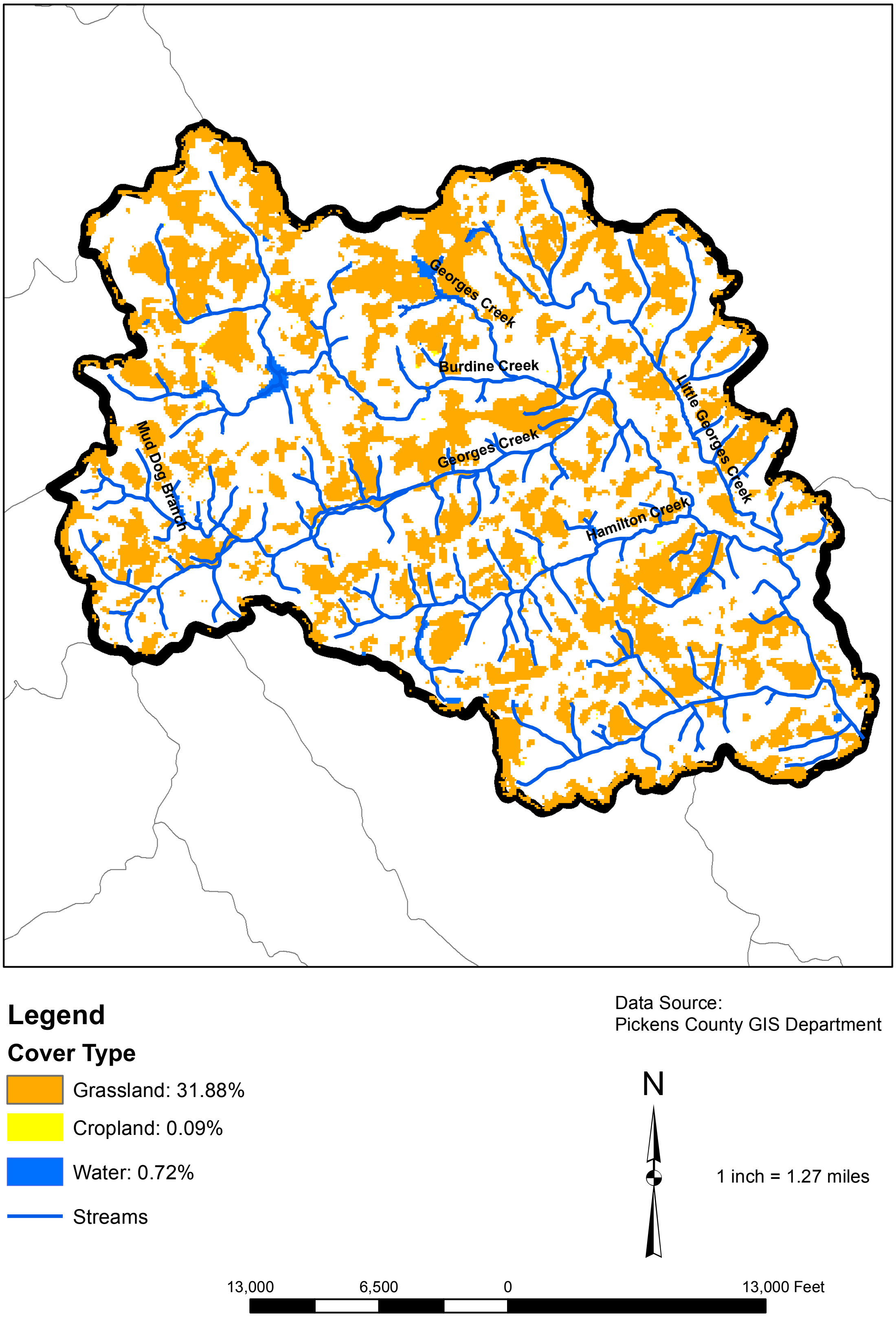

Figure 7: Georges Creek Watershed Agricultural Land

b) Septic Systems

Septic systems also play a significant role in nonpoint source pollution of bacteria to surface waters, especially when damaged or improperly maintained. There are four main components to a septic system: an exit pipe, a septic tank, a drain field, and a soil layer. The exit pipe transports the wastewater out of the home into the septic tank, which is where the waste material naturally breaks down. The drain field is where the effluent is discharged; the soil layer helps to filter and break down wastewater contaminants (“How a Septic Tank System Works”, 2014). Untreated wastewater has the potential to leak into surface and groundwater when there are improper connections, clogs, heavy use or systems are unmaintained.

The total number of households on septic systems was determined by using the total number of households within the Georges Creek watershed (as described in Section 2) and subtracting that from the number of households on sanitary sewer systems as provided by sewer utilities (Figure 8). For the Georges Creek watershed there is only one sewer district, Easley Combined Utilities, who provide service to 1,511 homes within the watershed. After subtracting the total number of households in the Georges Creek watershed from the number of households on sanitary sewer systems, it is determined that there are approximately 5,797 houses with septic systems in the Georges Creek watershed.

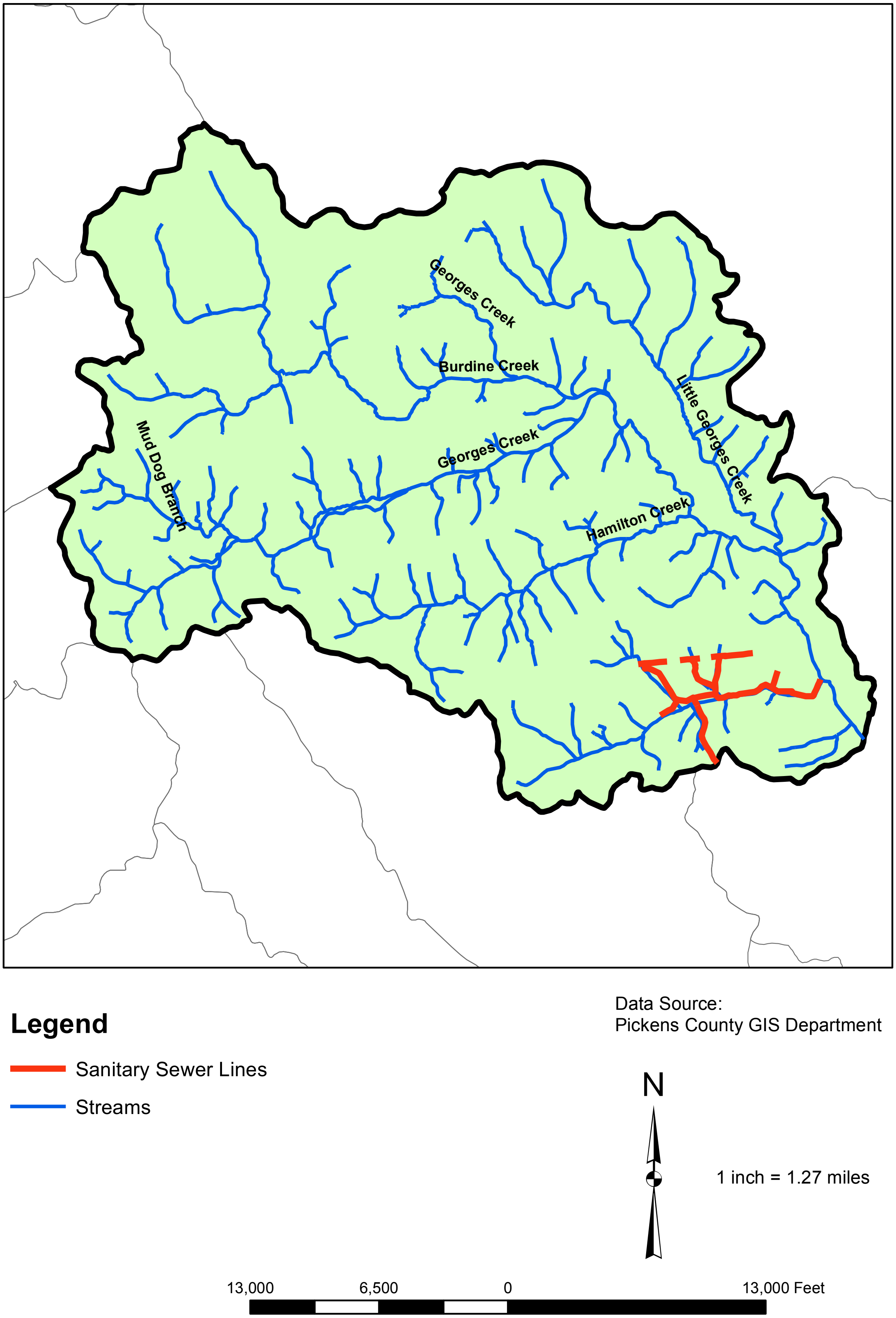

Figure 8: Georges Creek Watershed Sanitary Sewer

c) Domestic Pets

When domestic pet waste is not properly disposed, it can pose a potential threat to human health and water quality. Pet waste left on the ground can be carried by stormwater runoff into nearby waterways and thus cause bacteria pollution. Impairment from pet waste is often more problematic in densely developed areas with higher numbers of impervious surfaces. Roughly 9% of the Georges Creek watershed is considered urban or developed (Figure 9). Even though this accounts for a relatively small area of the watershed, proactive measures will be made in order to educate and involve the surrounding communities on the impacts pet waste can cause.

The estimated number of dogs living within the Georges Creek watershed was determined by using the total number of households within a subwatershed area (as calculated in Section 2) and a formula prepared by the American Veterinary Medical Foundation ("Pet Ownership Calculator", 2013). The number of dog-owning households was found by multiplying the national percentage of dog-owning homes by the total number of households in the Georges Creek watershed. This number was then multiplied by the national average of dogs in homes in order to find out the estimated number of dogs living within this watershed.

Based on these calculations, there are approximately 4,267 dogs living within this watershed. According to the Environmental Protection Agency (EPA), a single dog produces approximately 274 pounds of waste per year ("Pet Waste Management", 2014). Using the calculated number of dogs living within the Georges Creek watershed and the EPA statistic that a dog can produce 274 pounds of waste per year, dogs living within this watershed produce approximately 1.17 million pounds of waste each year.

In order to educate the public on proper ways to dispose of their pets' waste, public outreach campaigns will be developed within the watershed. Local pet supply stores, veterinary offices, horse farms, livestock supply stores and pet groomers have been identified within the watershed to reach the proper target audience (Appendix A). Also, community parks have been identified to find the most effective places for pet waste stations.

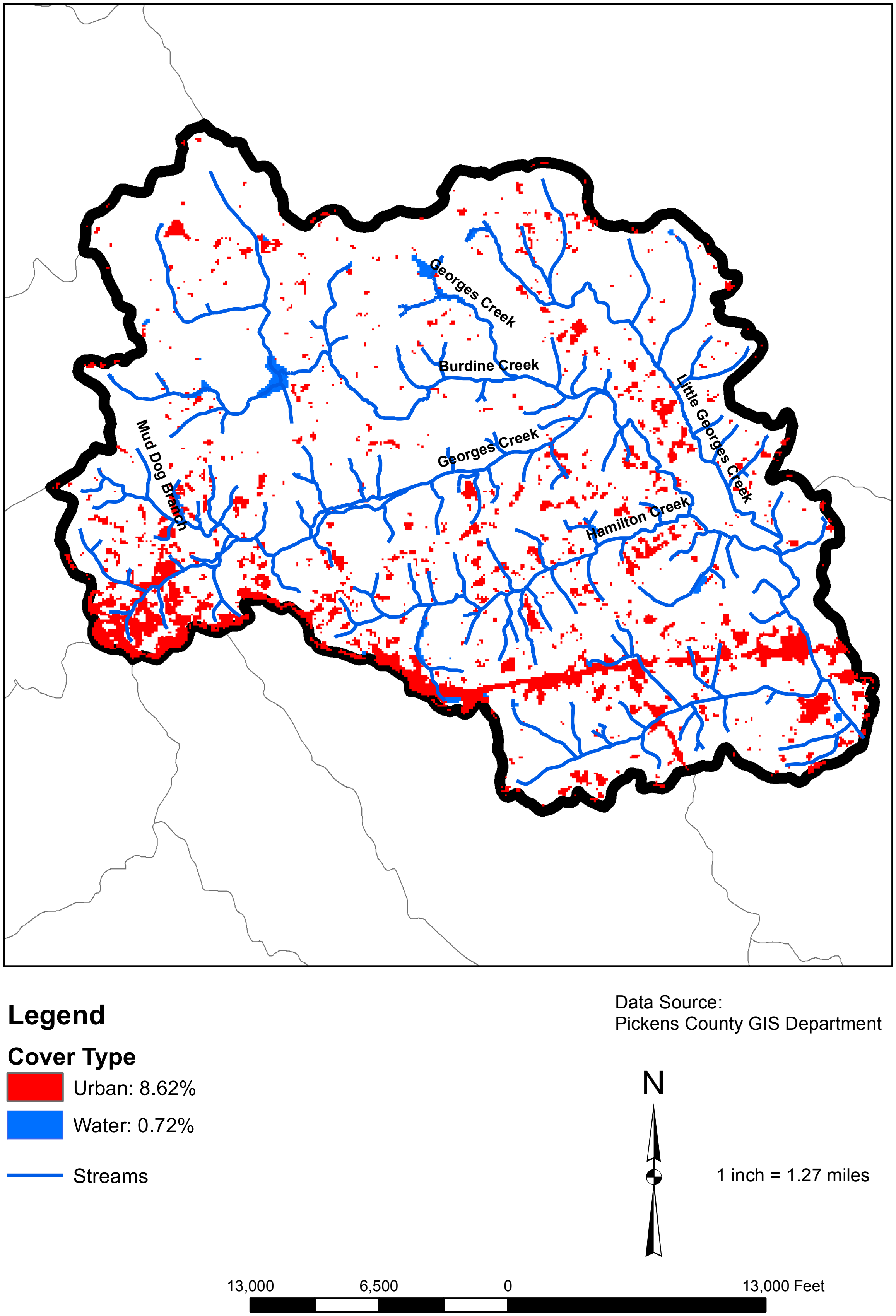

Figure 9: Georges Creek Watershed Urban Land

d) Wildlife

Forested areas make up approximately 59% of the Georges Creek watershed and thus has the potential to play a role in contributing to high bacterial levels (Figure 10). Even though wildlife does play a role, targeting this population offers more management challenges than the other three categories. Wildlife issues are site specific and change constantly. Wildlife also has the potential to physically alter the creek, for example beavers or wild hogs. Since the majority of the watershed is rural, farm ponds are a frequent sight. These ponds serve as nesting and foraging habitats for waterfowl, including Canadian Geese. Not only does each goose produce one to two pounds of waste per day, the waste from one goose contains 25 times the amount of FC bacteria as human waste (“Resident Canada Geese: Along the Waterfront”, 2013). Proper knowledge and education of management for all types of wildlife could prove a useful tool within the Georges Creek watershed.

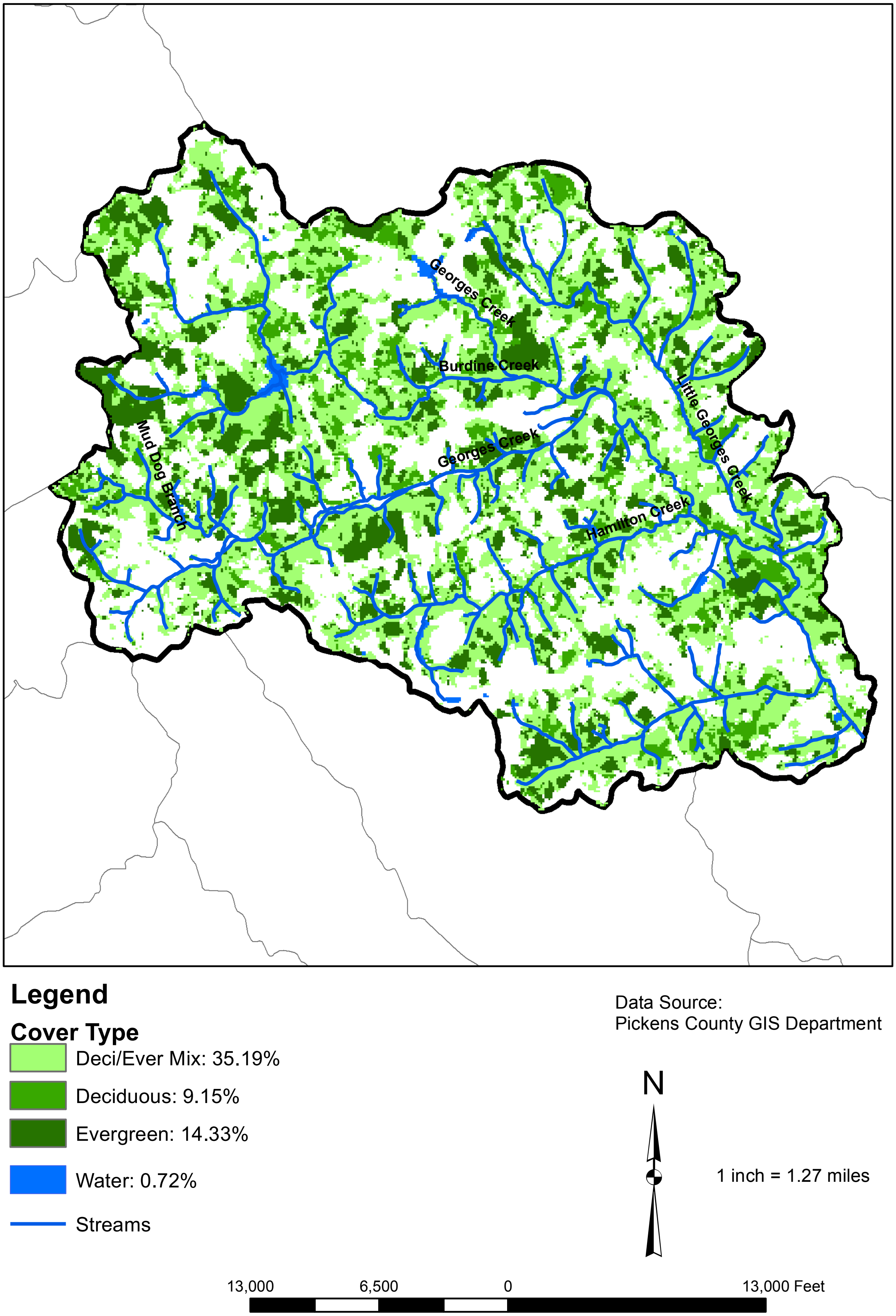

Figure 10: Georges Creek Watershed Forested Land

5) Bacteria Load Reductions

Bacteria load reductions for this plan were based on the Upper Saluda River Basin TMDL for fecal coliform bacteria (“EPA Finalized TMDL Upper Saluda River Basin”, 2004). Data provided were used to calculate specific nonpoint source bacteria load reductions for Georges Creek. Three WWTPs operate within Georges Creek, and as NPDES permitted facilities, were not included in the load reduction calculations in this watershed-based plan.

Bacteria Load Reduction Calculations

The nonpoint load reduction needed was calculated using information from the 2004 Upper Saluda River Basin TMDL for Fecal Coliform Bacteria and represents the bacteria reduction needed from nonpoint sources per day and year in order to meet water quality standards in the Georges Creek watershed (Table 6). According to the TMDL, both sites S-005 and S-300 needed a 64% reduction in order to meet water quality standards. As of August 19, 2014, site S-300 achieved attainment for bacterial water quality standards.

Table 6: Bacteria Load Reductions

Station ID	TMDL Existing Load (counts/ day)	TMDL Existing Waste Load Continuous (counts/day)	Existing Nonpoint Load (counts/ day)	TMDL Nonpoint Percent Reduction Needed	Nonpoint Load Reduction Needed (counts/day)	Nonpoint Load Reduction Needed (counts/year)
S-300	7.80E+11	1.38E+10	7.66E+11	64%	4.90E+11	1.79E+14
S-005	1.17E+11	1.24E+10	1.05E+11	64%	6.72E+10	2.45E+13

TMDL Existing Load: This comes directly from the 2004 Upper Saluda River Basin TMDL for Fecal Coliform Bacteria and represents the total bacteria load from both point and nonpoint sources. See “Existing Load” column in Table 1 on page 3 of the TMDL. Results are shown in counts/day, as per the TMDL.

TMDL Existing Waste Load Continuous: This comes directly from the 2004 Upper Saluda River Basin TMDL for Fecal Coliform Bacteria and represents the bacteria load from point sources. See “Existing Waste Load Continuous” column in Table 1 on page 3 of the TMDL. Results are shown in counts/day, as per the TMDL.

Existing Nonpoint Load: This represents the bacteria load from nonpoint sources and is calculated by subtracting the TMDL Existing Load and the TMDL Existing Waste Load Continuous. Results follow the TMDL example and are shown in counts/day.

TMDL Nonpoint Percent Reduction Needed: This information comes directly from the 2004 Upper Saluda River Basin TMDL for Fecal Coliform Bacteria and represents the percent reduction needed from nonpoint sources to achieve water quality standards. See “Percent Reduction” column in Table 1 on page 3 of the TMDL.

Nonpoint Load Reduction Needed (counts/day): This represents the bacteria load reduction needed from nonpoint sources and is calculated by multiplying the Existing Nonpoint Load by the TMDL Nonpoint Percent Reduction Needed. Results follow the TMDL example and are shown in counts/day.

Nonpoint Load Reduction Needed (counts/year): This represents the bacteria load reduction needed from nonpoint sources and is calculated by multiplying the Nonpoint Load Reduction

Needed (counts/day) by 365 days/year. Results are shown in counts/year in order to facilitate calculations for recommended BMP installations per year.

After bacteria load reductions were calculated for S-005 and S-300, recommended bacteria reductions from various BMP categories were calculated, as seen in Table 7.

Table 7: Recommended Annual Load Reductions

Watershed	Recommended Septic Reductions (Counts/Year)	Recommended Agricultural Reductions (Counts/Year)	Recommended Pet Waste Reductions (Counts/Year)	Recommended Total Bacterial Reduction (Counts/Year)
Georges Creek	1.40E+13	2.11E+14	3.18E+13	2.57E+14

The recommended septic reductions listed in Table 7 refer to what is ideally needed annually in order to repair all malfunctioning septic systems in households that fall under the 10% failure rate. This is found by multiplying the number of homes on septic by 10% failure rate and by the standard bacteria load per household/year (2.42E+10 colonies).

The amount of bacteria removed annually by fencing livestock out of 0.25 mile stretch of riparian buffer represent recommended agriculture reductions. The number of livestock in Georges Creek can be found in Section 4. Recommended agricultural reduction rates can be found by multiplying the total number of livestock within 0.25 mile of waterway by the annual waste produced by the specific livestock animal.

Pet waste reductions represent the annual bacteria reductions expected from the installation of pet waste stations. This is with an assumed 50% success rate. By multiplying the number of dogs in the area by a 50% success rate and by the standard annual bacteria load per dog (1.49E+12 colonies), one is able to calculate recommended pet waste reductions.

Table 8 shows the recommended number of BMPs needed to install within the Georges Creek watershed in order to meet the recommended annual load reductions for each BMP category found in Table 7.

Table 8: Total Number of Recommended BMPs

BMP Type	Standard Bacteria Reduction	Source of Standard	Recommended # of BMP Installs	Total Bacteria Load Removed
Agricultural BMP Bundle	1.86E+13 per bundle annually	Ag BMP Bundle Calculations	12	2.23E+14
Septic System Repair	2.42E+10 per household	STEPL Model	578	1.40E+13
Pet Waste Station	2.19E+12 per station annually	SC DHEC Standard Numbers	15	3.29E+13

The total number of recommended BMPs listed in Table 8, will cause a bacteria reduction rate of 2.70E+14 counts/year. This will meet the nonpoint source reduction needed for the watershed.

6) Recommended BMPs and Total Cost Estimates

a) Agricultural BMPs

Agricultural BMPs not only reduce bacteria pollution in nearby waterways, but also improve foraging conditions for livestock. Throughout the watershed, livestock have direct access to streams, contributing to bacteria levels directly. For this reason, one of the main focuses concerning agricultural BMPs will be on restricting the access of livestock to streams via stream bank fencing. This BMP has proved to be successful for several local 319 projects including the Twelve Mile watershed ("Watershed Improvement Summary", 2009) Once livestock are fenced out of streams it is necessary that they have alternative water sources. These two BMPs often go hand in hand and will be a part of the Agricultural BMP Bundle, which has proved to be successful for five completed 319 implementation projects ("South Carolina Nonpoint Source Management Program 2012 Annual Report", 2012). An average agricultural BMP Bundle causes a 1.86E+13 annual bacteria reduction and includes the following:

- 1,868 feet of fencing
- 2,138 square feet of Heavy Use Area
- 599 linear feet of waterline
- 1 alternative watering facility
- 0.23 acres of riparian buffer area
- 1 well with pump

Another main focus for agricultural BMPs is proper manure management. The following is a list of BMPs that are recognized to be the most effective for agricultural areas contributing to bacteria pollution ("Agricultural Best Management Practices Database", 2012).

- **Stream Bank Fencing** – By installing fences, livestock are excluded from stream bank access. This helps prevent manure from being directly deposited into streams, protects riparian vegetation, and reduces erosion along stream banks.
- **Stream Bank Crossings** – These provide protection when livestock are moved from one area to another and must cross over streams. Stream bank crossings help reduce erosion within crossing areas.
- **Alternative Water Sources –** Local streams are often used as the primary watering source for livestock, but when livestock are fenced out of streams alternative watering sources become necessary.
- **Animal Heavy Use Areas** – Heavy use areas include areas where it is difficult to maintain vegetation due to high concentrations of animals. Alternative watering sources are a common example of a heavy use area. Installations of durable materials help reduce erosion and stormwater runoff.
- **Riparian Buffers** – Riparian buffers are vegetated areas along waterways that work to stabilize soil and filter runoff. Restoration of riparian buffers will help reduce manure, sediment, fertilizers, pesticides, and other pollutants from washing into local waterways.
- **Manure Management** – When used correctly, manure can serve as a natural fertilizer for crops and pastureland. Proper manure management includes suitable storage facilities and locations, soil testing, and composting.

Since agricultural land makes up roughly 32% of the watershed and it has been observed that livestock have regular access to Georges Creek, livestock are a likely contributor to bacteria pollution. The implementation of agricultural BMPs would bring site S-005 closer to attainment.

Agricultural BMP Unit Costs Estimates and Funding Options

Estimates for agricultural BMP unit costs are based on information provided by the USDA. Cost estimates and funding options for the selected agricultural BMPs are summarized in the following table.

Table 9: Agricultural BMP Unit Costs and Potential Funding Sources

Nonpoint Sources of Bacteria Pollution	BMP	Estimated BMP Unit Cost	Potential Funding Sources
• Cattle • Horses • Sheep & Goats • Swine • Poultry • Cropland	Stream Bank Fencing	$3.50/foot	• WHIP • EQIP • AWEP • County Governments • SC DHEC 319 Funds
	Stream Bank Crossing	$4.27/square foot	
	Alternative Watering Source	$760 each	
	Heavy Use Area	$1.21/square foot	
	Riparian Buffer	$250/acre	
	Manure Management	$11.88/square foot	

There are numerous cost share programs at the federal, state, and local levels. All are available to landowners interested in installing these types of BMP projects.

Potential funding sources for agricultural BMPs include:

South Carolina Department of Health and Environmental Control (SC DHEC)

319 Nonpoint Source Pollution Grants are available through SC DHEC in efforts to help reduce nonpoint source contributions to South Carolina's waterbodies. These grants pay up to 60% of eligible project costs, with a 40% non-federal match.

US Department of Agriculture Natural Resources Conservation Service (NRCS)

NRCS offers several different programs to homeowners that provide both financial and technical assistance for improvements on their land, including installing riparian buffers, protecting wetlands, and conserving water resources. Such programs include the Wildlife Habitat Incentives Program (WHIP), the Environmental Quality Incentives Program (EQIP), and the Agricultural Water Enhancement Program (AWEP).

Local Governments

Pickens County and the City of Easley both have the potential to be partners by providing in-kind support for local water quality projects, as funding becomes available.

Community Participation

Involvement through community participation includes voluntary contributions from residents within the watershed, such as monetary and in-kind. These contributions can be used to meet match requirements from other grant funding sources.

b) Septic System BMPs

Septic system repairs and replacements are another way to reduce bacteria pollution in our local waterways. When septic systems are inspected and maintained regularly, bacteria leakage from faulty systems is likely prevented. The following BMPs are considered to be the most effective for residential areas contributing to bacteria pollution related to wastewater.

- **Septic System Repairs and Replacements –** It is estimated that in an average year, 10-30% of septic systems experience failure, usually due to poor maintenance ("Overview – Septic Tanks", 2014). In order to prevent bacteria from leaking into nearby waterways, septic systems that are not functioning properly need to be repaired or replaced. In order to maintain efficiency, septic tanks should be inspected and pumped, as needed, every 3 to 5 years ("Pumping (Cleaning Out a Septic Tank)", 2014).
- **Extending Sewer Lines –** In areas with highly confirmed concentrations of failing septic systems, the most long-term cost effective solution may be to extend municipal sewer lines to areas of concern, where possible.

Due to the rural landscape and the limited access to sanitary sewer throughout the watershed, septic system repairs and replacements are recommended throughout the entire watershed. In order to keep track of when repairs and replacements should be made before problems arise, it is also recommended that septic systems be inspected every one to two years ("Septic Tank Inspections", 2014).

Septic System BMP Unit Cost Estimates and Funding Options

Many homes within the Georges Creek watershed are not within access for municipal sanitary sewer lines and therefore septic systems are the most appropriate option for wastewater treatment. If not maintained, repairs for septic systems are oftentimes necessary. Estimates for septic system BMP unit costs are based on information provided by EPA and Easley Combined Utilities. Cost estimates and potential funding options for septic system BMPs are described in the following table.

Table 10: Septic System BMP Unit Costs and Potential Funding Sources

Nonpoint Sources of Bacteria Pollution	BMP	Estimated BMP Unit Cost	Potential Funding Sources
• Septic Tanks • Wastewater Treatment Plants	Replacement or repair of onsite septic systems	$4,000 per system	• SC DHEC 319 Grant • Local Governments • USDA Rural Development • State Revolving Funds
	Extension of sewer lines	8” - $64/foot 10” - $75/foot 12” - $85/foot 15” - $105/foot 18” - $115/foot	

Potential funding source programs for septic system repairs and replacements are listed below.

South Carolina Department of Health and Environmental Control (SC DHEC)

319 Nonpoint Source Pollution Grants are available through SC DHEC in efforts to help reduce nonpoint source contributions to South Carolina’s waterbodies. These grants pay up to 60% of eligible project costs, with a 40% non-federal match.

Local Governments

Pickens County and the City of Easley both have the potential to be partners by providing in-kind support for local water quality projects as funding becomes available. Local sewer authorities may also be able to provide the appropriate assistance for septic system repairs and replacements.

State Revolving Funds

There are currently two State Revolving Funds, the Clean Water State Revolving Fund and the Drinking Water State Revolving Fund. These funds are administered to provide low-interest loans for investments associated with water and sanitation infrastructures, as well as for implementation of nonpoint source pollution control projects.

c) Urban BMPs

Implementation of targeted BMPs for urban and residential areas can be an effective way for preventing bacteria runoff into nearby waterways. Domestic pet waste and stormwater runoff management are the two focuses for this watershed. The following list is of BMPs are considered effective for urban areas within this watershed for bacteria pollution (“Best Management Practices”, 2014).

- **Pet Waste Stations** –When pet waste is left on the ground, it can be carried into nearby waterways during rain events; therefore pet waste should be properly collected and disposed of in order to prevent bacteria from entering nearby streams. The use of pet waste stations in public or well-traveled areas encourages the proper disposal of pet waste. It is important that pet waste stations are regularly emptied and restocked with new bags.

- **Pet Waste Bag Holders** – While pet waste stations serve as a stationary solution, pet waste bag holders act as a portable option for proper pet waste disposal. Pet waste bag holders can be easily clipped onto leashes when going on walks with your pet and pet waste bag refills can easily be purchased at any pet store.
- **Storm Drain Markers** – Storm drains typically transport stormwater directly into nearby waterways. By marking storm drains with educational markers, the public will become more aware of how pollutants in or near storm drains end up in their local waters. Public areas and neighborhoods serve as great places to mark storm drains.
- **Stream Bank Restoration**– Highly eroded areas along streams, as well as areas taken over by invasive plants, serve as prime locations for stream bank restorations. Sites where the public has access are ideal, providing opportunity for education through involvement. Stream banks are able to reduce and filter out some pollutants before entering into the stream.
- **Rain Gardens** – Areas that experience flooding problems are ideal for the installation of a rain garden. These are landscaped depressions that receive and slowly infiltrate stormwater runoff. Rain gardens help to intercept and filter out pollutants before they reach nearby streams.

Urban BMP Unit Cost Estimates and Funding Options

Estimates for urban BMP unit costs are based on information provided by Pickens County Stormwater Partners (PCSP). The following table includes estimated costs and potential funding sources for urban BMPs.

Table 11: Urban BMP Unit Costs and Potential Funding Sources

Nonpoint Sources of Bacteria Pollution	BMP	Estimated BMP Unit Cost	Potential Funding Sources
• Domestic Pets • Stormwater Runoff	Pet Waste Stations	$225 each ($300 for installation with bags)	• SC DHEC 319 Funds • Pickens County Stormwater Partners • Local Governments
	Pet Waste Bag Holders	$500/250	
	Storm Drain Markers and Glue	$1400/500	
	Stream Bank Restoration	$109/linear ft	
	Rain Garden	$15/square ft	

The previous BMPs would work as both public education and involvement for nearby communities on ways to reduce bacteria pollution in local waterways. Public education and involvement are both requirements in SC DHEC's Municipal Separate Storm Sewer System (MS4) permit. It is key for these BMPs to be placed in well-traveled and visible areas in order to impact as many people as possible. PCSP conducts stormwater education and involvement for Pickens County and will serve as an important partner in reaching local communities.

d) Wildlife BMPs

Forested areas make up roughly 59% of the entire Georges Creek watershed. This forested land provides habitat for a variety of wildlife, allowing for their contribution to bacteria levels in nearby streams. Wildlife populations and their foraging and nesting locations change frequently making them hard to target. Wildlife BMPs are both animal and site specific; therefore it will be more cost effective to further identify nuisance wildlife populations and specific priority BMPs as part of the public outreach and education campaign. This will be done through development of educational outreach materials regarding proper management of nuisance wildlife. Once nuisance wildlife are identified, locations and types of BMPs can be prioritized. The following list gives detail to possible wildlife BMPs:

- **Stream Bank Fencing** – By installing fences, wildlife populations are limited to stream bank access. This helps prevent both bacteria from waste being deposited into streams, as well damage to the landscape such as erosion along stream banks.
- **Riparian Buffers** – Riparian buffers are vegetated areas along waterways that work to stabilize soil and filter runoff. When wildlife populations are abundant near a stream bank, local vegetation and buffers can be greatly altered or destroyed. Effective management of riparian buffers is necessary in order to help maintain buffers and their success in preventing manure, sediment, and other pollutants from washing into local waterways.
- **Trapping** – Trapping includes catching, removal, and relocation of any nuisance animal. Within Georges Creek, this BMP would be most effective with feral hog and beaver

populations. Box, swing, and corral traps are used to trap feral hogs, while Conibear traps are used to trap beavers.

- **Hunting** – One of the most common methods used to control wildlife population is hunting. Proper education and licensing are required for this BMP.
- **Dam Removal** – Areas where beaver populations are an issue, dam removal would also serve as an option. It is important that beaver dams are destroyed properly, because beavers can rebuild their dam in one night (“Beaver in South Carolina”, 2014).

Wildlife BMP Unit Cost Estimates and Funding Options

Several listed wildlife BMPs are also mentioned as possible agricultural BMPs. These can be used to control both wildlife and livestock populations. Some of the potential funding sources for wildlife BMPs are also mentioned in the agricultural BMP section. Estimates for Wildlife BMP unit costs are based on information provided by the USDA and SC DNR. The following table provides an overview of wildlife BMP unit costs and possible funding sources.

Table 12: Wildlife BMP Unit Costs and Potential Funding Sources

Nonpoint Sources of Bacteria Pollution	BMP	Estimated BMP Unit Cost	Potential Funding Sources
• Feral Hogs • Beavers • Deer • Canada Geese	Stream Bank Fencing	$3.50/foot	• SC DHEC 319 Funds • WHIP • EQIP • AWEP • County Governments
	Riparian Buffers	$250/acre	
	Box, Swing, and Corral Traps	$320-460 each	

Potential funding sources for wildlife BMPs are listed below.

South Carolina Department of Health and Environmental Control (SC DHEC)

319 Nonpoint Source Pollution Grants are available through SC DHEC in efforts to help reduce nonpoint source contributions to South Carolina's waterbodies. These grants pay up to 60% of eligible project costs, with a 40% non-federal match.

US Department of Agriculture Natural Resources Conservation Service (NRCS)

NRCS offers several different programs to homeowners that provide both financial and technical assistance for improvements on their land, including installing riparian buffers, protecting wetlands, and conserving water resources. Such programs include the Wildlife Habitat Incentives Program (WHIP), the Environmental Quality Incentives Program (EQIP), and the Agricultural Water Enhancement Program (AWEP).

Local Governments

Pickens County and the City of Easley both have the potential to be partners by providing in-kind support for local water quality projects as funding becomes available.

Community Participation

Involvement through community participation includes voluntary contributions from residents within the watershed, such as monetary and in-kind. These contributions can be used to meet match requirements from other grant funding sources.

7) Public Education and Outreach

As minimum requirements in SC DHEC's Municipal Separate Storm Sewer System (MS4) permit, public education and outreach and public involvement/participation serve as two very important areas that allow for impact to the local communities within the Georges Creek watershed. A detailed list of methods that could be beneficial to use are listed below.

Newsletters and Newspapers – The Easley City News is the local newsletter for residents living within the Georges Creek watershed. Newspapers that have the potential to reach residents within this watershed include The Easley Progress and The Pickens County Courier. Partnerships with these local newsletters and newspapers would allow for articles on LID and agricultural practices and septic tank maintenance to be printed. Articles have the potential to reach a wide audience and impact a large group of people.

Workshops, Presentations, and Festivals – Workshops are a way to educate and involve homeowners and community groups on a variety of topics that they might find interesting and important. Potential workshop topics could include manure management, pond management, septic system maintenance, and nuisance wildlife management. Presentations to local schools and community groups such as Boy and Girl Scout troops, garden clubs, and homeowner associations, are approaches to educate a variety of age groups within the watershed. Presentation topics could include general stormwater awareness, Carolina Yards, and storm drain marking. Each topic has the potential for not only education, but also interaction and involvement. The enviroscape, a runoff simulation model, can be used to demonstrate watersheds and the negative impacts that stormwater has on them, while community groups can not only learn about storm drain marking, but also go out and actually mark the drains. Finally, there are many festivals hosted within the watershed. Festivals allow for one on one interaction with local residents, each festival drawing in a different target audience. Examples of festivals within the focus area include the Easley Farmers Market, Easley Community Clean-up Day, and the Easley Fire Department Event. A more detailed list of schools, community groups, and other potential partners for public education and outreach are listed in Table 13.

Table 13: Community Groups, Schools, and Organizations for Public Outreach

List of Community Groups within the Georges Creek Watershed
Schools: • Crosswell Elementary • McKissick Elementary • Easley Christian School • Mt Olive Christian Academy • SDPC Adult Education Center
Community Groups: • Boy Scout Troops • Girl Scout Troops • Garden Clubs • Homeowner Associations
Parks: • City of Easley Community Garden • Easley Baptist Hospital Community Park

Signage and Displays – Educational signage and displays are a way to provide information to the public about issues concerning the Georges Creek watershed. Ideal places for signage and displays include public places where everyone has access. Such locations include Easley City Hall, Easley Baptist Hospital Park, and the City of Easley Community Garden. Easley Baptist

Hospital Park is one of two parks located within the watershed, with the only public access to the creek. Signage educating the public on BMPs at the park such as pet waste stations and stream bank rehabilitations would be methods to educate the public on the BMPs installed and their purposes. Kiosks would be another way to display educational signage on a variety of topics that could educate the public about the watershed and ways to protect it. The City of Easley Community Garden is the other park located within the watershed and would also serve as a location to educate the public on BMPs for homeowners such as rain barrels, rain gardens, and rain chains through signage. Displays and signage at horse farms would also be beneficial for the Georges Creek watershed and would allow agricultural target audiences to be met.

8) Implementation Schedule, Milestones, and Measurable Goals

This watershed-based plan implementation schedule will cover a span of 2 years and work to decrease bacteria loads and increase the overall water quality of Georges Creek. Implementation strategy for this watershed will include the following: Project Identification, Implementation, Evaluation, and Refinement.

Project Identification – Before projects can be identified, the main focus for this period includes building and identifying partnerships and relationships with homeowners and organizations. It is important to develop partnerships with people who are knowledgeable of BMPs and which are best suited for different purposes. Guidance from a variety of organizations will be needed to reach the four targeted categories of BMPs: Agricultural and Livestock, Septic Systems, Urban Areas, and Wildlife. Building relationships with homeowners will be essential for the installation of agricultural and wildlife BMPs. These categories have similar BMPs and are very site specific. Partnerships with Clemson Extension, Carolina Clear, and Pickens County Stormwater Partners will be used to conduct a public outreach campaign for septic system BMPs. Finally, potential locations for pet waste stations will need to be identified as well as neighborhoods within the watershed where storm drains need to be marked.

Project Implementation – Projects that are considered to be of higher priority will be implemented first. The number of projects implemented will depend on landowner participation and available funding.

Evaluation and Refinement - Since it is impossible to accurately predict outcomes, due to landowner participation and a variety of potential obstacles, periodic reassessments of project goals will be necessary. Evaluation of public education and outreach strategies as well as individual BMP projects will be very important. Keeping records of problems that arise before, during, and after construction of BMPs will allow for a better management process for any future participants. It is very important to be able to identify problems faced and be able to adapt to new solutions.

Critical Areas

There are two areas within the watershed that are seen as critical areas and hold priority over other sites (Figure 11). Around and upstream of site S-005, which is not in attainment, is one of the critical areas. There are many cattle farms near this site allowing for agricultural BMP projects to take priority in this area. Farther upstream project areas include Easley Baptist Hospital Walking Trail and the Easley Community Garden for LID practices. The second critical area is upstream of site S-300 where two horse farms, Emerald Leaf Stables and Rockland Farms, and one school, Crosswell Elementary, are located in the watershed. Partnerships with the horse farms and school will help keep site S-300 in attainment. BMPs stated in the WBP will have priority placement in these critical areas. By implementing BMPs in these areas, bacteria load reductions may be reduced and water quality goals met.

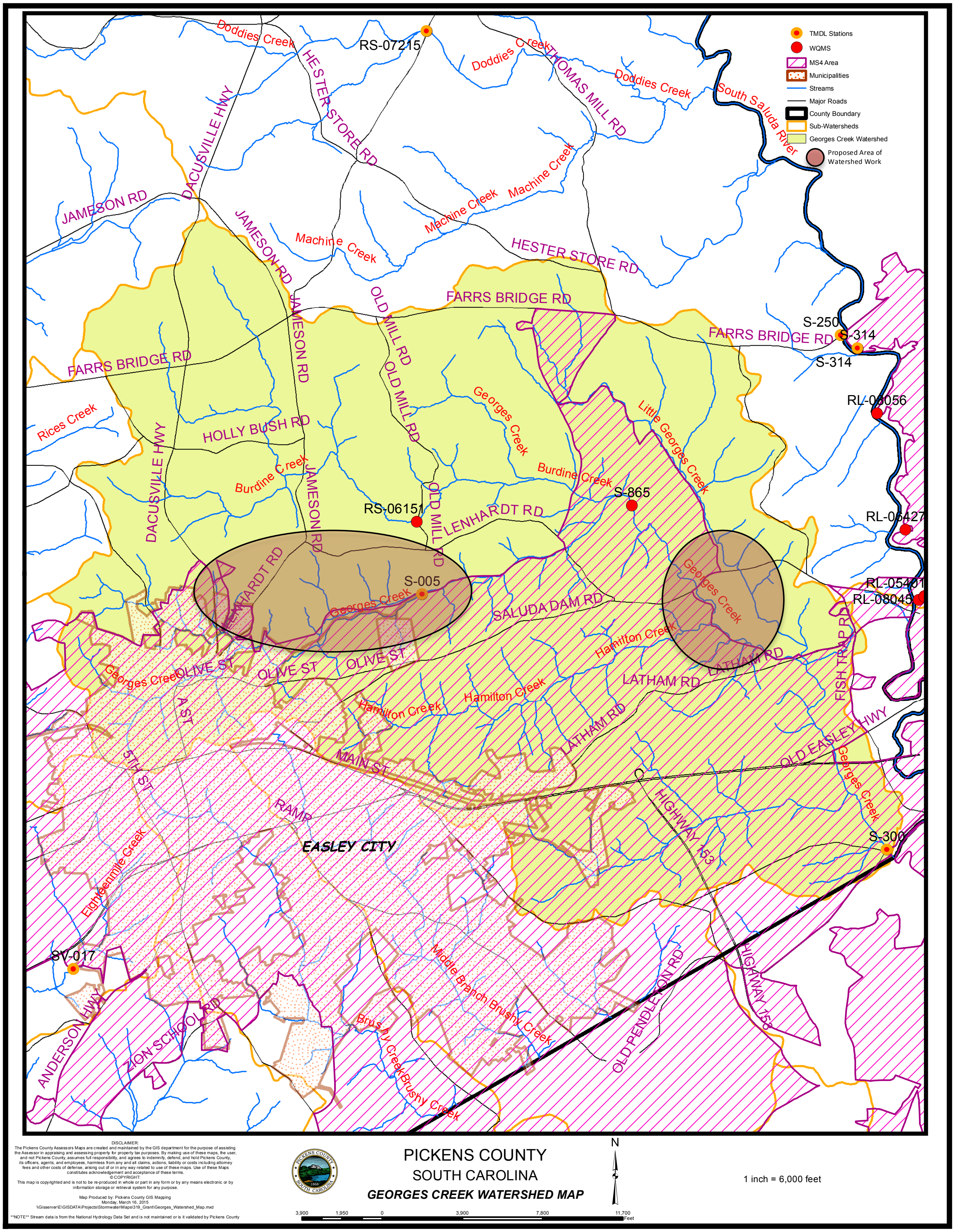

Figure 11: Critical Areas Within Georges Creek Watershed

Table 14 provides milestones that are recommended through this watershed-based plan and the time frame each should be accomplished.

Table 14: BMP Implementation Timeline

Milestones	Time Frame (Months)
Build relationships with landowners and recruit participation	1-6
Host a project partner meeting to discuss BMP implementation	2
Create outreach materials on septic tank maintenance	2-6
Create outreach materials on manure management	2-7
Create educational displays for public locations	2-12
Write articles to feature in local newsletters and newspapers	2-12
Mark storm drains in neighborhoods	3-24
Project partner meets and revise plan as needed	6
Host a septic system maintenance workshop and survey participants	6-8
Install 2 pet waste stations	6-12
Install 3 agricultural BMPs	6-22
Provide educational materials to landowners with septic tank problems	6-22
Project partner meetings and revise plan as needed	12
Repair/replace 3 septic systems	12-24
Restore a stream bank	12-24
Host a manure management workshop and survey participants	15-17
Project partner meetings and revise plan as needed	18
Host a pond & geese management workshop and survey participants	20-22
Survey participating landowners	23
Complete installation of all proposed structural BMPs	23

9) Water Quality Monitoring

Instream water monitoring is used to assess baseline conditions of a stream as well as any changes or improvements to stream conditions after BMP projects have been implemented. The water quality monitoring plan proposed below includes sampling sites, sampling frequency, microbial source detection techniques, and individuals or organizations that could conduct water sampling.

Proposed Monitoring Locations

SC DHEC water quality monitoring sites that exist within the Georges Creek watershed include S-005, S-300, S-865, and RS-06151. In addition to these four sites, a fifth site upstream of site S-005, located at the headwaters of the creek near Easley Baptist Hospital is recommended. Sampling above site S-005 would give a better insight to where the pollution source is originating. This location is the most urbanized area within the watershed, providing an opportunity to collect and analyze water samples from a variety of surrounding land uses. Additional sites may be added in order to further pinpoint sources as needed.

Monitoring Techniques

For all five of the proposed monitoring sites, instream water quality monitoring should be conducted. Sampling should be taken seasonally or quarterly, ideally during a rain event. Samples should be taken before and after BMP implementation, in order to observe any changes or trends in water quality. By comparing monitoring results to bacteria standards, percent attainment relating to water quality goals can be determined.

Analytical Techniques

Most Probable Number (MPN) Method

E. coli can be sampled using the Most Probable Number (MPN) method. This method enumerates *E. coli* for determining bacterial density or concentration.

Microbial Source Tracking

More definitive than the MPN method, Microbial Source Tracking (MST) is a method used to determine genetic sources of fecal contamination in surface waters. Possible fecal contamination sources that can be determined include human, livestock, wildlife, and domestic pets. MST also gives the total amount of *E. coli* present in each water sample. This could prove to be a very useful tool if funding is available.

Volunteer Monitoring

Volunteer monitoring programs are a way to involve local communities on the education of nearby streams while assessing its water quality. School and community groups, as well as interested citizens, are great prospects for volunteer monitoring programs. Volunteers will have the opportunity to be trained in the Georgia Adopt-A-Stream program. This program encourages individuals and communities to monitor and/or improve sections of streams, wetlands, lakes or estuaries through several levels of involvement (“About Georgia Adopt-A-Stream”, n.d.).

10) Conclusion

This watershed-based plan focuses on the Georges Creek watershed and the importance of protecting its water quality. A TMDL was developed for two water quality monitoring stations located within the watershed, S-005 and S-300. TMDL site S-005 is currently impaired for bacteria and needs a 64% load reduction in order to attain standards for recreational use. Site S-300 is impaired for bacteria, and although it is in attainment at this current time, an increase in pollution sources could cause the site to become unsupported. With potential sources of pollution identified and possible BMPs proposed, this plan gives detailed solutions for reducing the pollutant load in Georges Creek. By partnering with local organizations, an education and outreach strategy has been developed in order to involve the local communities within the watershed. A BMP implementation schedule was developed to meet set milestones and measureable goals. Lastly, water quality monitoring was discussed, with proposed locations, strategies, and techniques for Georges Creek. By looking at Georges Creek from a watershed management perspective, this plan is able to provide detailed information on all aspects that affect this watershed.

Appendices

Appendix A: List of Veterinary Offices, Pet Groomers, Pet Supply Stores, Horse Farms, and Livestock Supply Stores.

Name	Address
Veterinary Offices • Langston's Veterinary Clinic • Banfield Pet Hospital	**Veterinary Offices** • 103 N A Street Easley, SC 29640 • 139 Rolling Hills Cir Easley, SC 29640
Pet Groomers • Chuck's Pet Grooming • Angelpaws Pet Grooming and Boarding	**Pet Groomers** • 325 Fleetwood Dr Easley, SC 29640 • 109 Twin Pond Rd Easley, SC 29640
Pet Supply Stores • Pet Smart	**Pet Supply Stores** • 139 Rolling Hills Cir Easley, SC 29640
Horse Farms • Rockland Farms • Emerald Leaf Stables	**Horse Farms** • 338 Old Saluda Dam Rd Easley, SC 29640 • 102 Old Saluda Dam Rd Easley, SC 29640
Livestock Supply Stores • Tractor Supply Co.	**Livestock Supply Stores** • 339 Rolling Hills Cir Easley, SC 29640