Rum Creek
Watershed Management Plan

September 2013

Watershed Management Plan

for

Rum Creek, Monroe County

Hydrologic Unit Code# #0307010313

Submitted by:

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Table of Contents

Overview

The Watershed Management Plan (WMP) is funded through Georgia EPD. The Environmental Protection Agency (EPA) *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* defines nine (9) elements to be addressed in the WMP. These nine (9) elements include:

1) **Causes and Sources.** Identification of causes and sources of pollution that need to be controlled to achieve load reductions.
2) **Load Reductions Needed.** Determine load reductions needed and estimate load reductions expected from the management measures described.
3) **Non-Point Source Management Measures.** A description of the management resources that will need to be implemented to achieve load reductions.
4) **Criteria to Measure Progress.** Develop criteria to measure progress toward meeting watershed goals.
5) **Information/Education Component.** Develop an information/education component that will be used to enhance public understanding of the project and encourage early participation in the overall program.
6) **Technical and Financial Assistance Needed.** Identify technical and financial assistance needed to implement plan.
7) **Implementation Schedule.** Develop a schedule for implementing the NPS management measures identified in this plan that is reasonable expeditious.
8) **Interim Milestones.** Develop interim milestones to track implementation of management measures.
9) **Monitoring Component.** Develop monitoring component to evaluate the effectiveness of the implementation over time.

This document should be revised and updated on a regular basis to include latest information, different strategies and new partnerships/stakeholders.

Introduction

Protecting and improving the water quality of all bodies of water in Monroe County is a primary goal of community officials. Clean water is important to everyone, and with growth and development occurring at a rapid pace, these bodies of water have been impacted by flooding, erosion, land development, road construction and a number of other activities. To protect these bodies of water, watershed protection is paramount. Watersheds are areas of land where the network of creeks and streams drain to a single body of water.

In 2004, the Georgia Environmental Protection Division (EPD) listed Monroe County's Rum Creek in the Section 303(d) list of impaired streams. To assist local officials, interested stakeholders, and property owners with improving the water quality of Rum Creek, EPD provided funding to complete a Watershed Management Plan (WMP) for Rum Creek. The intended purpose of the WMP is to provide interested stakeholders with sound watershed management techniques aimed at restoring water quality in the Upper Ocmulgee Watershed; specifically the six-mile segment of Rum Creek that runs from Sutton Road/McCommon Road and Ponder Trammel Road north to US 41 in the south and Lake Juliette in the east to Highway 41 in the west. This document is intended to help promote coordination among local, state and federal agencies, as well as public and commercial interests toward the same end.

Important steps that occurred during the creation of this document included: establishing a group of committed partners; identifying, verifying and prioritizing major causes or sources of contributing pollutants; determining effective management practices designed to reduce pollutants from those sources, and identifying possible funding mechanisms to assist with implementing appropriate controls/practices needed to restore water quality in the impaired segment of Rum Creek.

A Partnership Advisory Committee (PAC), made up of various stakeholders, played an instrumental role in providing technical knowledge related to possible contaminant sources as well as identification of the most effective Best Management Practices (BMPs). Additionally, targeted water quality monitoring was conducted over a defined period of time to screen for major impairment sources and identify potential "hot spots" of pollutant loadings in the water body.

The WMP addresses the nine (9) Key Elements of Watershed Planning as set forth by the U.S. Environmental Protection Agency (EPA). These 9 elements are:

1) Causes and Sources
2) Load Reductions Needed
3) Non-Point Source Management Measures
4) Criteria to Measure Progress
5) Implementation Schedule

6) Interim Milestones
7) Monitoring Component
8) Information/Education Component
9) Technical and Financial Assistance Needed

Causes and Sources

Watershed Characterization

Monroe County is located in middle Georgia and has a total land area of 396 square miles or 254,300 acres. The County seat is Forsyth, which is centrally located with the County. Rum Creek is located in east-central Monroe County between the City of Forsyth and Juliette, an unincorporated town located on the banks of the Ocmulgee River which forms the eastern boundary of the County. Rum Creek is part of the Upper Ocmulgee Watershed, located in the 10-digit Hydrologic Unit Code (HUC) #0307010313.

Specifically, the impaired segment of the Rum Creek Watershed stretches from Sutton Road / McCommon Road and Ponder Trammel Road in the north to US 41 in the south and Lake Juliette in the east to Highway 41 in the west. A review of aerial photography and observations from a field survey indicate that in the western portion of the watershed, there is urban development consisting of a mixture of residential, commercial, institutional, and transportation uses. The Rum Creek Wildlife Management Area (WMA) is in the eastern portion of the watershed. Operated by Georgia Department of Natural Resources (GADNR), the WMA surrounds Lake Juliette, a 3,600 acre reservoir which provides cooling water to Georgia Power's Plant Scherer, a coal-fired plant. The WMA itself encompasses more than 5,700 acres and provides opportunities for fishing, boating, hiking, hunting and camping. The WMA is also home to the Rum Creek MARSH project operated by the GADNR. The MARSH project is a refuge area for wintering waterfowl, such as ring-necked ducks, lesser scaup ducks, teal and mallards and Canada geese.[1] The remainder of the watershed is in large part heavily forested with scattered areas of pastureland and residences. There are also several significant wetland areas in the watershed; one near Highway 83 and Juliette Road as Rum Creek enters Lake Juliette and one near its confluence with Town Creek. There is a probable groundwater recharge area between Highway 18 and Highway 42 close to the Forsyth City Limits. The terrain consists of predominately rolling hills with several areas of steep slopes along Rum Creek between Juliette Road and Highway 83 and in the extreme southern portion of the watershed.

Human Population

According to the 2010 U.S. Census, Monroe County's total population is 26,424 comprised of 73.3 percent white and 23.7 percent black individuals. Monroe County's per capita income is $23,671 with 13.6% of individuals living below the poverty level. As of March 2013, Monroe County's unemployment rate was 8.3%, which is approximately the same as the State of Georgia's average rate (8.4%) and higher than the national rate of 7.6%.[2] County employment opportunities are largely concentrated around educational services, health care, and social assistance which employ 21.1% of the population, followed by retail trade at 13.4% and construction with 9%. Agriculture, forestry, fishing, hunting and mining only comprise 3%

[1] Georgia Department of Natural Resources, Wildlife Resources Division, Lake Juliette and Rum Creek WMA, http://www.georgiawildlife.org/node/1402.
[2] Georgia Department of Labor, http://www.dol.state.ga.us/pdf/pr/laborforce.pdf; The Georgia Statistics System: Unemployment Statistics, http://www.georgiastats.uga.edu/counemp.html.

of the employment industry within Monroe County. The agricultural operations within Monroe County are predominately comprised of chicken broilers and beef cattle.

Physical and Natural Characteristics

The following information is from the U.S. Department of Agriculture's (USDA) 2008 Soil Survey of Monroe County.[3]

Monroe County is predominantly dissected by the Towaliga and Little Towaliga Rivers and Tobesofkee, Little Tobesofkee, Echeconnee, and Rum Creeks and their tributaries, all of which are part of the Ocmulgee River Basin.

Soils

Monroe County is in the Southern Piedmont Major Land Resource Area (MLRA). Most of the soils on uplands are well drained and have a sandy loam or sandy-clay loam surface layer and a clayey subsoil that has yellow or red colors. Soils that have thicker subsoils are usually associated with areas of the broad, gently-sloping ridges or the moderately-sloping hillsides. Soils that have thinner subsoils are usually associated with strongly-sloping to steep hillsides. On nearly-level or gently-sloping river and stream terraces, soils are well-drained or moderately-well drained and have a sandy loam surface layer and a clayey subsoil. Soils on nearly-level flood plains are well-drained to poorly-drained and are mainly loamy throughout, with the exception of the coarser levee soils.

Climate

In winter, the average temperature is 46.4 degrees F and the average daily minimum temperature is 33.4 degrees. The lowest temperature on record, which occurred on January 21, 1985, is -5 degrees. In summer, the average temperature is 78.1 degrees F and the average daily maximum temperature is 90.2 degrees. The highest recorded temperature, which occurred on July 20, 1986, is 104 degrees. Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 46.56 inches. Of this, 24.53 inches, or 53 percent, usually falls in April through October. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 6.50 inches, recorded on July 24, 1971. Thunderstorms occur on about 55 days each year, and most occur between May and August. The average seasonal snowfall is about 0.9 inch. The greatest snow depth at any one time during the period of record was 10 inches on February 10, 1973. On the average, less than one day each year has at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 6.0 inches on January 19, 1992. The average relative humidity in midafternoon is about 52 percent. Humidity is higher at night, and the average at dawn is about 75

[3] Soil Survey of Monroe County, Georgia, http://soils.usda.gov/survey/online_surveys/georgia/monroeGA2009/Monroe_GA.pdf.

percent. The sun shines 70 percent of the time in summer and 60 percent in winter. The prevailing wind is from the west-northwest, except from August to September when it is from the northeast. Average windspeed is highest, around nine (9) miles per hour, in February and March.

Causes

The use classification for the Rum Creek watershed is "fishing." The criteria violation for Rum Creek Watershed is listed as Fecal Coliform (FC) which is generated by non-point sources of pollution.

The Georgia Department of Natural Resources (GADNR) conducted stream monitoring in the Ocmulgee River basin in 2004. Based on the monitoring results, Rum Creek upstream of Lake Juliette was placed on the State's 2006 impaired stream list for FC. An initial Total Maximum Daily Load (TMDL) plan for this stream segment was completed in 2007, with a Phase II TMDL completed in 2009. Total Maximum Daily Load refers to the total amount of a particular pollutant that can be discharged into a waterway per day without the waterway violating the State's water quality standards. The TMDL Implementation Plan was developed when Rum Creek was found to exceed the allowable amount of fecal bacteria and was identified by the State of Georgia on the Section 305(b)/303(d) list of impaired waters not supporting designated uses.

Standard reporting units for fecal coliform bacteria are in colony forming units (cfu). The State of Georgia's Water Quality Standards specify that fecal coliform concentration in a water body shall not exceed the 30-day geometric mean of 200 cfu/100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours for the months of May through October. For the months of November through April, fecal coliform is not to exceed a geometric mean of 1,000 per 100 ml based on at least four samples collected from a given sampling site over a 30-day period at intervals not less than 24 hours.

The presence of fecal coliform in aquatic environments may indicate that the water has been contaminated with fecal material of humans or animals. Fecal coliform bacteria can enter rivers and streams through direct discharge of waste from mammals and birds, from agricultural and storm runoff, and from human sewage.

Sources

Pollutants can come from two sources, Point Souces and Non-Point Sources. The U.S. Environmental Protection Agency (EPA) defines point source pollution as "any single identifiable source of pollution from which pollutants are discharged." Factories and sewage treatment plants are two common types of point sources. Unlike pollution from industrial and sewage treatment plants, non-point source (NPS) pollution comes from many diffuse sources.

Within the Rum Creek Watershed, the major sources of impairment are from non-point pollution, which comes from diffused areas rather than a specific measurable quantity at a single location. NPS is the leading cause of water pollution in the United States, with polluted runoff from agriculture considered the leading cause. EPA defines nonpoint source (NPS) pollution as:

"Caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas;
- Oil, grease, and toxic chemicals from urban runoff and energy production;
- Sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks;
- Salt from irrigation practices and acid drainage from abandoned mines;
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems."[4]

Identification of Potential Sources of Impairment

The identification of potential non-point sources of impairment in the Rum Creek Watershed is based on: 1) an in-house review of data and documents; 2) an evaluation of land cover/use information; 3) a visual in-field survey; and 4) input from the Rum Creek Stakeholders Advisory Group kick-off meeting held in 2010.

Staff conducted a visual field survey to verify land activities, determine possible sources or causes of impairments and to identify appropriate sampling sites for targeted watershed monitoring. An annotated copy of the visual field survey form, a map depicting selected sampling sites, as well as several representative photographs can be found in Appendix A. Field survey methods and activities were conducted in accordance with guidance provided by Georgia EPD.

The visual field survey determined that there are not any point or non-point sources of pollutants readily observable within the watershed. However, because of the waterway's location within a wldlife refuge, fecal bacteria from wildlife is an obvious potential source of impairment. Stakeholders have indicated that leaking septic systems located upstream of the impaired segment in neighboring Jasper County could also potentially be a contributing source of impairment. Similarily, the nearby community of East Juliette could provide sources of potential contamination.

There are no visible residences or structures in close proximity to the waterway and the adjoining land is heavily forested, making access to the creek extremely limited. Bridge crossings at Jarrell Plantation Road,

[4] U.S. Environmental Protection Agency, Polluted Runoff (Nonpoint Source Pollution), http://www.epa.gov/owow/nps/qa.html.

Hitchiti Road, Caney Creek Road and Round Oak Juliette Road provide the only points of easy access. Additional information related to targeted monitoring and sampling results are found in Appendix B.

The identified potential NPS causes, including leaking septic systems, agricultural livestock-animal grazing, and wildlife, are described below in further detail.

Leaking Septic Systems

The greatest concern is the Town Creek portion of the watershed where there are likely older septic systems that are prone to leaking effluent, and thus create a potential source of fecal coliform contamination. There is less concern around Rum Creek because most of the area is heavily forested. The residential dwellings within the urbanized section are served by a centralized sanitary sewer system.

Estimate Number of Septic Systems in the Ocmulgee River Basin – Monroe County			
Existing Septic Systems (2004)	Existing Septic Systems (2009)	Number of Septic Systems Installed (2005 to 2009)	Number of Septic Systems Repairs (2005 to 2009)
8413	9624	1211	141

Source: http://www.gaepd.org/Files_PDF/techguide/wpb/TMDL/Ocmulgee/EPD_Final_Ocmulgee_Fecal_TMDL_2012.pdf.

Agricultural Livestock - Animal Grazing

Within this segment of the Rum Creek watershed, there are scattered areas of livestock grazing on pastureland, with the greatest concentration located off Maynard Church Road and Blue Store Road. Waste deposited by these animals poses a low risk of fecal contamination to this segment of the Rum Creek watershed.

2009 Estimate Agricultural Livestock Populations in the Ocmulgee River Basin – Monroe County								
Beef Cattle	Dairy Cattle	Swine	Sheep	Horses	Goats	Chickens-Layers	Chickens-Broilers Sold	Chickens-Breeders
3,850	200	-	40	300	1,200	-	10,898,349	-

Source: http://www.gaepd.org/Files_PDF/techguide/wpb/TMDL/Ocmulgee/EPD_Final_Ocmulgee_Fecal_TMDL_2012.pdf.

Wildlife

According to the Wildlife Resources Division (WRD) of Georgia DNR the animals which spend a large portion of their time in and around aquatic habitats are the most significant wildlife sources of fecal coliform. Ducks and geese are considered to be the greatest contributors as they are typically found on

the water surface in large numbers. Other contributing animals include raccoons, beavers and muskrats. White-tailed deer also add to fecal coliform levels but to a lesser extent than other animals since a greater portion of their time is spent in terrestrial habitats.[5]

All of these animals, among others, are present in the forest and wetland areas that comprise this segment of the Rum Creek watershed. These animals contribute to the fecal coliform impairment by depositing their feces either directly in the water or on the land surface where the fecal coliform is introduced to the streams through a rain event. These areas also provide ideal conditions for the sport of hunting. Animal wastes are sometimes deposited near the stream crossings by hunters, thus leading to higher fecal coliform counts in these locations.

[5] Total Maximum Daily Load Evaluation for Seven Stream Segments in the Ocmulgee River Basin for Fecal Coliform, Georgia Department of Natural Resources, Environmental Protection Division, January 2012, *3.2.1 Wildlife,* http://www.gaepd.org/Files_PDF/techguide/wpb/TMDL/Ocmulgee/EPD_Final_Ocmulgee_Fecal_TMDL_2012.pdf.

Load Reductions Needed

The Rum Creek 2009 TMDL estimates that a FC load reduction goal of 83% from nonpoint sources is needed. According to the Rum Creek TMDL, the load allocation (LA) is 3.44E+13 and the TMDL is 3.82+13. There are no wasteload allocations (WLA) for municipal and industrial wastewater discharges or storm water outfalls (WLAsw). Wasteload allocations are assigned by Georgia EPD during the NPDES (National Pollutant Discharge Elimination System) permitting process.

As an 83% reduction is large and may not be feasible to attain in a short time-frame, it is recommended that an initial load reduction goal of 50% be implemented to achieve within a five-year timeframe. Continued targeted monitoring will determine the need for further load reduction once this initial 50% load reduction is achieved. Load reduction is already being addressed through a number of Best Management Practices (BMPs) implemented as part of the TMDL aimed at reducing FC loads in Rum Creek. The current BMPs being implemented include:

- Septic tank installation and review by the Monroe County Health Department. This includes the review of location and plans for new septic tanks to ensure State regulations are met. On-site inspection of new septic tanks is conducted to ensure proper installation.

- Georgia Agricultural Best Management Practices by Agribusinesses and Farms, which are voluntary measures in which agricultural operations follow best management practices to ensure the preservation of clean water. These measures are designed to protect riparian buffers along the stream, preserve wetlands, and manage nutrients coming from the agricultural areas.

- Agricultural Education and Technical Assistance by UGA Cooperative Extension, Georgia Soil and Water Conservation Commission (GASWCC), and USDA Natural Resource Conservation Service (NRCS) to include educational and technical assistance to agribusinesses and farm operators in order to improve water quality.

- Hunter Education by Georgia Department of Natural Resources-Wildlife Resources Division (DNR-WRD), Volunteer Instructors. Residents and non-residents of the State of Georgia born on or after January 1, 1961, must successfully complete a Hunter Education course prior to purchasing a season hunting license. This course usually includes discussion on the proper disposal of animal waste.

According to the Rum Creek Partnership Advisory Committee, these BMPs are being successfully implemented in an ongoing manner. These and additional management measures aimed at further reducing NPS impairments are discussed in greater detail in the following section.

Management Measures

There is no single management measure that can be installed to achieve load reductions. Input on appropriate and realistic management measures was sought from stakeholders including the Georgia Forestry Commission, USDA-NRCS, logging industry landowners, DNR Fish and Wildlife (Rum Creek Management), Georgia Power Company/Plant Scherer on Lake Juliette.

The stakeholders noted that there are no agricultural croplands or feedlots located within the watershed area. In addition to the Rum Creek Wildlife Management Area, the primary land uses are forestry, residential, and a small amount of agricultural pasture lands.

Other stakeholders include the Georgia Soil and Water Conservation Commission, which is the designated lead agency for agricultural Nonpoint Source Management by the Georgia EPD, and the three organizations tasked with the primary responsibility of working with farmers to promote soil and water conservation and to protect water quality:

- University of Georgia (UGA) - Cooperative Extension Service. UGA faculty, County Cooperative Extension Agents and technical specialists provide services relating to agricultural impacts on water quality.
- Georgia Soil and Water Conservation Commission (GSWCC). GSWCC was formed to protect, conserve and improve the soil and water resources of the State of Georgia. The Commission develops nonpoint source management programs and conducts educational activities to promote conservation and protection of land and water devoted to agricultural uses
- Natural Resources Conservation Service (NRCS).[6] The NRCS works with federal, state, and local governments to provide financial and technical assistance to farmers. The NRCS develops standards and specifications for BMPs that are to be used to improve, protect, and/or maintain our State's natural resources. In addition, every five years, the NRCS conducts the National Resources Inventory (NRI). The NRI is a statistically based sample of land use and natural resource conditions and trends that covers non-federal land in the United States.

Best management practices (BMPs) are used to protect and conserve water resources, wildlife habitat, and land resources from degradation. A BMP is defined as a practice or combination of practices determined to be the most effective practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.[7] A variety of structural (waste lagoons, terraces, sediment basins, or fencing) and/or managerial (rotational grazing, nutrient management, pesticide management, or conservation tillage) BMPs can be implemented to address NPS

[6] Georgia Department of Natural Resources, Environmental Protection Division, *Total Maximum Daily Load Evaluation for Seven Stream Segments in the Ocmulgee River Basin for Fecal Coliform*, January 2012, http://www.gaepd.org/Files_PDF/techguide/wpb/TMDL/Ocmulgee/EPD_Final_Ocmulgee_Fecal_TMDL_2012.pdf

[7] Georgia Soil and Water Conservation Commission, *Best Management Practices for Georgia Agriculture*, http://www.gaepd.org/Files_PDF/techguide/wpb/Agriculture_Best_Management_Practices_March_2007.pdf page 1.1.

pollution sources.[8] Successful BMPs require ongoing management to be effective in achieving NPS pollution reductions. BMPs should function to:

- Minimize availability of pollutants;
- Retard the transport and/or delivery of the pollutant, either by reducing water transported and thus the amount of the pollutant transported, or through deposition of the pollutant; or
- Remediate or intercept the pollutant before or after it is delivered to the water resource through chemical or biological transformation.[9]

Within the Rum Creek watershed, fecal coliform is the containment. According to a stakeholder with the Georgia Department of Natural Resources, the recent drought conditions and resulting low flow in streams significantly increased levels of fecal coliform. DNR staff noted that in 2013, Georgia is finally returning to normal rainfall events and normal flow, which should corresponded to a decrease in fecal coliform levels. As fecal coliform levels are naturally variable due to weather and seasonal influences, along with establishing BMPs, long-term water quality monitoring will need to be performed to evaluate effectiveness and establish a decreasing trend.

Current Practices and Active Management Measures

The majority of the Rum Creek Stakeholder organization has established BMPs and will continue active implementation of these management measures.

Monroe County: Buffer strips along waterways. Monroe County maintains a 25' buffer regulation along waterways, whereby no development is permitted within the buffer.

Monroe County Health Department, Environmental Health: New Septic Tank Installation review and provide educational materials when new systems are installed. Environmental Health formerly provided educational materials to all customers, including those undertaking septic system repairs. Budget cuts have required Environmental Health to limit its provision of educational materials to customers installing new systems. Environmental Health is currently issuing more permits for repairs than new systems, with a majority of the repairs being issued due to the age of systems.

Georgia Power: Streamside Management Zone (SMZ) Harvest Policy. Georgia Power has an internal policy to leave all SMZs intact with no logging permitted in any SMZ. Georgia Power staff also noted that company foresters do not use any type of fertilizer. Within the Rum Creek area, Georgia Power is responsible for harvesting the timber; however, all other management responsibilities, including burnings, are conducted by Georgia DNR.

NRCS/Environmental Quality Incentives Program (EQIP): Assistance to Farmers. NRCS only provides assistance at landowner request. NRCS helps the farmer from start to finish. Staff prepares a Conservation Plan which identifies resource concerns, outlines recommended management measures and includes

[8] North Carolina State University, Introduction to BMPs, http://www.soil.ncsu.edu/publications/BMPs/intro.html
[9] Ibid.

design practices including standards and specifications. If EQIP funds are used, farmers must follow NRCS construction specifications. NRCS makes a site visit after measure is installed to ensure the design standards are met and to check out final project. EQIP is a competitive, reimbursement program and the farmers are paid a set amount per unit. EQIP is for farmers only, it is part of the Farm Bill. Land must be eligible for agricultural production and follow Schedule F, which means the farm must be operating as agricultural production with permanent fencing; have livestock and generate at least $1,000 of agricultural production per year. NRCS also produces nutrient management plans for poultry broilers.

NRCS notes that the EQIP program serving Monroe County is competitive among six other counties. Within the past 5 years, there have been only two requests in the Rum Creek area. These requests were for:

- Restoring pasture land/planning/nutrient management and stream crossings
- Fencing at ponds

Georgia Forestry Commission: Sustainable Forestry Initiative (SFI) and Georgia Forestry Commission BMPS.

- *Sustainable Forestry Initiative*. The Georgia Forestry Commission's (GFC) Sustainable Forestry Initiative (SFI) has been very effective in monitoring the activities of loggers. Through SFI all loggers must have a Timber Harvester's License and obtain continuing education credits to remain qualified. The GFC also monitors logging activities near all TMDLs. *(Obtain and include GFC region maps and district maps from Harold West)*

- *Georgia Forestry Commission BMPs.* If landowners have chosen to follow the Georgia Forestry Commission's (GFC) BMPs, then, within impaired watersheds, Forestry conducts 100% monitoring on all known forestry operations from the beginning to end. GFC has a water quality coordinator within each district. GFC conducts a bi-annual BMP survey which provides a snapshot of loggers operations. These surveys indicate that logger operations rate in the high 90% for implementation and compliance. GFC BMPs are in place, have data about them, ongoing implementation and monitoring. Forestry does not have enforcement power but coordinates with those that do.

Georgia DNR: Hunter Education. The DNR Law Enforcement section provides hunter education in conjunction with issuing hunting licenses, throughout the State.

Recommended New Management Measures

- Adoption of NRCS Conservation Practices. NRCS and Monroe County to encourage landowners to adopt conservation practices in conservation tillage, crop nutrient management, weed and pest management and conservation buffers.

- Adoption of Local Ordinances. Monroe County should consider adopting a Septic Discharge Ordinance to address local water quality.

- Public Education. Establish property owner and public education efforts on the sources of fecal coliform and common sense approaches to lessen the impact of this contaminant on surface waters.

- Ongoing Monitoring. Creation of Adopt-a-Stream program by Georgia DNR-EPD, City of Forsyth, and volunteers. This would be a new program to conduct targeted monitoring of fecal coliform. Lack of interest by local volunteers has previously been an obstacle to this initiative.

- Establish an Existing Septic Tank Evaluation Program. Establish a program to identify and remediate failing septic systems which should include proactive measures to repair existing systems, install/replace systems, and promote usage of alternative waste treatment systems. Monroe County currently does not have any such program due to budget constraints and only provides education when homeowners contact Environmental Health as problems arise.

- Agricultural BMPs. Application of BMPs appropriate to agricultural land uses, specifically pasture management, where applicable, to reduce amount of fecal coliform bacteria transported to surface waters from agricultural sources.

Criteria to Measure Progress

The Criteria used to measure BMP success and load reduction achievement are from Georgia's Water Use Classification and Water Quality Standards. EPD's Water Quality Assurance Manual provides guidance to ensure the validity of measurements, analysis, and representativeness of samples collected.

Georgia EPD classifies the Rum Creek Watershed as "Fishing," which is defined as "propagation of Fish, Shellfish, Game and other Aquatic Life; secondary contact in recreation in and on the water; or for any use requiring a lower quality." The State of Georgia sets forth specific Water Use Classifications and Water Quality Standards (391-3-6.-03).[10] Specific criteria for water usage classified as "Fishing" must adhere to the following sampling procedures and fecal coliform levels:

May through October:

a. Samples will not exceed a geometric mean of 200 colonies/100mL
b. Minimum of 4 samples from each sampling site at intervals not less than 24-hours over a 30-day period.

November through April:

a. Samples will not exceed a geometric mean of 1,000 colonies/100mL
b. Samples not to exceed a maximum of 4,000 colonies/100mL for any sample
c. Minimum of 4 samples from each sampling site at intervals not less than 24 hours over a 30-day period.

[10] Rules and Regulations of the State of Georgia, Water Use Classifications and Water Quality Standards, 391-3-6.-03 (6)(c)(iii), Specified criteria for classified water usage, fishing, fecal coliform, http://rules.sos.state.ga.us/docs/391/3/6/03.pdf.

Information/Education Component

The EPA recommends that ongoing outreach and education to the target audience should be objectives that are SMART – specific, measurable, achievable, relevant and time-specific. Watershed improvement depends on providing information, increasing awareness and encouraging action among property owners, stakeholders and other interested parties. The goals of the information and education component are to:

1) Raise public awareness and build public support for improving water quality;
2) Educate the public and property owners to increase knowledge of non-point source pollution prevention and encourage behavioral changes, and
3) Coordination among organizations, residents, local and state agencies and private entities on educational outreach, information dissemination and support for long-term solutions.

At the County level, there are no available staff to dedicate solely as an educational provider for this initiative. Educational capacity will continue to depend largely on the agencies currently providing educational and public outreach. Monroe County should, however, include outreach and educational information about general water quality best practices, specific initiatives, and updates on WMP implementation at regularly scheduled Board of Commissioners meetings.

Monroe County will also work closely with statewide programs and established education and public outreach programs initiated by other agencies. Monroe County is represented by two Board of Commission members at NRCS District meetings. These District meetings provide a regular forum for ongoing information-sharing about the Rum Creek WMP and improvement initiatives.

Information and educational outreach methods and materials will vary by activity. For example, if Monroe County chooses to move forward on establishing a Septic Discharge Ordinance to address local water quality, then newspaper articles, briefing of the news media and civic groups, public informational meetings, and public hearings are types of outreach that will be conducted. If funding is secured to support the implementation of septic tank educational outreach and inspection activities, then Monroe County and partner organizations will target property owners, one-on-one, in addition to targeted outreach materials, media coverage and workshops for the property owners within the Rum Creek area.

Current and Ongoing Educational Initiatives

The roles of the groups and programs which are collectively contributing to the public outreach efforts in the Rum Creek Watershed are summarized in no particular order below:

Georgia Soil Water Conservation Commission (GASWCC)/Towaliga Soil & Water Conservation District (SWCD)[11]

The Towaliga SWCD holds monthly meetings to discuss conservation concerns. Monthly meetings also feature a progress report concerning National Resources Conservation Service activities within the District. Monroe County is represented by two representatives from the Board of Commissioners. The monthly meetings are a source of information sharing between the NRCS, GASWCC and Counties that comprise the Towaliga SWCD. In addition to monthly meetings, the SWCD undertakes:

- Workshops and conservation activities related to soil stewardship, micro-irrigation, and protection of soil and water resources.
- Reviews, promotes and sets priorities for the NRCS EQIP program.
- Participates in Regional Water Councils.
- Erosion and Sedimentation Control plans for local governments in the district, in conjunction with the Two Rivers Resource Conservation and Development (RC&D) Council.
- Partners for Fish and Wildlife Program.
- Educational/informational material to schools, landowners, and other groups to promote the need for management and protection of soil and water resources.
- Operates District programs, such as no-till drill, hay scale and aerator.

USDA-NRCS District Office

The NRCS State Office communicates directly with NRCS Service Center Offices on issues. Monroe County is served by the NRCS Service Center Office in Barnesville, GA. NRCS hosts regular workshops which are open to anyone and publicized through mailings, newspaper, and word-of-mouth.

- Grazing Lands Conservation Initiative (GLCI) is a nationwide collaborative process of individuals and organizations working together to maintain and improve the management, productivity, and health of the Nation's privately owned grazing land. NRCS has funds to be used directly for technical assistance and public awareness activities to support conservation activities on private grazing lands. NRCS assists with public awareness activities to inform the public on the values and benefits of private grazing land.[12]
- EQIP Program – Provides educational and direct financial/project support to landowners who meet program requirements. Through a competitive process, EQIP provides funds to eligible landowners for the implementation of conservation practices such as installing fencing along streams and ponds; nutrient management plans and conservation plans. The EQIP program can

[11] Towaliga Soil and Water Conservation District, Fiscal Year 2012 Annual Report, Accomplishments, http://gaswcc.georgia.gov/sites/gaswcc.georgia.gov/files/Towaliga_Annual_Report_FY2012.pdf.
[12] USDA, Natural Resources Conservation Service, Grazing Lands Conservation Initiative (GLCI), http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/people/partners/glci/.

provide assistance with Forestry Planning, and USDA/NRCS coordinates closely with the Forestry Commission, which determines needed practices and recommendations that are imported into the EQIP-funded conservation plans for landowners.

Georgia Forestry Commission

- Forestry Best Management Practices, which is a model program for land practitioners to emulate.
- Sustainable Forestry Initiative (SFI) in Georgia provides financial and staff support for the Georgia "Master Timber Harvester," a logger education program offered by the University of Georgia's Center for Forest Business. The program objective is to foster improvement in the professionalism of wood producers, and it satisfies the logger education suggested in the Sustainable Forestry Initiative Program.[13]

Georgia Power

- Environmental Programs for Grades K-5. Programs are focused on environmental awareness in essential areas such as: Recycling, Water Use, Habitats, Air Quality, and Energy Resource Management. The programs have been developed by educators to address the State's educational standards. These programs are all done by Georgia Power volunteers, Georgia Youth Science Technology Centers, and many Keep Georgia Beautiful affiliates.[14]

GDNR, Game and Fish Division

- Georgia Power has a lease agreement with Game and Fish Division of Georgia Department of Natural Resources to manage Lake Juliette and some surrounding lands for a total of approximately 8,500 acres. The Game and Fish Division conducts programs on an as-requested basis for teachers/classes. Programs are a cooperative effort between fisheries, game management, and law enforcement.
- If requested, GDNR will also have an informational table/booth at local festivals and events.

Two Rivers Resource Conservation and Development (RC&D) District

- Partners with NRCS/Towaliga SWCD to provide certification training (and re-certifications) in Erosion and Sediment Control for local government staff and officials

[13] Sustainabile Forestry Initaitive, http://sfi-georgia.org/for-loggers/sfi-for-loggers/.
[14] Environmental Education in Georgia, Georgia Power, http://eeingeorgia.org/net/org/info.aspx?s=6425.0.0.4863.

New Outreach and Educational Initiatives

There are a couple of obstacles to conducting new outreach and educational initiatives within Monroe County. These obstacles include the lack of a local watershed advisory organization or an Adopt-A-Stream group focusing on Rum Creek, and the lack of funding available to implement these activities. As such, a combination of broad-scale, County-wide education on water quality and more focused education of affected property owners is recommended. Activities with minimal cost that will reach a broad audience, such as newspaper articles, should be undertaken first to provide information and generate interest.

As all of the homeowners within the watershed are on septic systems, it is critical that homeowners receive ongoing education and information about best practices, including maintenance schedules and pump outs. There is also a need for a strong outreach campaign to educate real estate agents about sewage system issues, particularly on warning signs of system failure and septic system "do's and don'ts." Seeking funding support to conduct targeted outreach initiatives focused on educating landowners within the Rum Creek watershed on best practices, water quality and septic tank maintenance should also be a priority.

Potential Educational Initiative #1

Topic: Public Awareness Campaign.

Overview: All residents and people who visit and work in Monroe County need to be made aware of water quality issues. Ongoing education on water quality and how individual actions can contribute to enhancing a community's water quality can be achieved through no-and-low-cost means. At this time, Monroe County does not send out mass information to all 20,000+ property owners due to funding constraints.

Solution: A broad-based, County-wide outreach/education on water quality issues with a focus on Rum Creek. Utilization of news media and the County website to disseminate information. New media coverage can be generated through press releases, letters to the editor and feature articles on BMP implementation, program activities and goals/milestones.

Potential Educational Initiative #2

Topic: Targeted Outreach to key groups on water quality issues and non-point source pollution.

Overview: Informing specific segments of the population on water quality issues and how their actions impact water quality is another method that can be employed to increase knowledge and understanding. Targeted outreach to property owners, school-age children and teens, business owners, community groups and other stakeholders can

help to generate interest and support for minimizing nonpoint source pollution and enhancing water quality.

Solution: Develop targeted outreach materials (i.e. fact sheets, fliers, posters) relevant to specific audiences (i.e. school children and teenagers, residents, visitors, local employers, etc.) Make the outreach materials available at public buildings, such as the Monroe County Courthouse and Administration Building, Forsyth City Hall, Library, Welcome Center and Schools.

Potential Educational Initiative #3

Topic: On-site Wastewater Treatment Systems Education.

Overview: There are over 20,000 property owners living in unincorporated Monroe County which are not served by sewer. Monroe County Environmental Health currently does not have any means to send out mass information to all 20,000 property owners. Environmental Health used to provide a folder of information when issuing a permit of any kind (new system, repairs, expansions), which included a list of do's/don't, diagrams and other key educational information. Now these packets are only issued for new systems. Due to State budget cuts Environmental Health cannot afford to provide educational packets to everyone who is granted a permit. They make an effort to talk to people about "do's and don'ts" when customers call about a permit or with questions.

Solution: Grant funding to design, print and mail a brochure and provide information on the Monroe County Health Department website.

Potential Educational Initiative #4

Topic: Direct property-owner education on non-point source pollution and sedimentation.

Overview: Property-owners need to be engaged in a direct way to share information about septic-tank maintenance, animal impacts on FC levels in Rum Creek and sedimentation issues. In addition, when land changes ownership, there is no mechanism in place at the County level to inform new owners of issues associated with owning land with stream access. Property owners need to be aware of the impact of allowing horses and other animals in the stream, and that what owners do on their property can have repercussions on someone else's property downstream.

Solution: Identify a mechanism to track and educate existing and future property owners within the Rum Creek Watershed about non-point sources pollution and erosion/sedimentation best practices. One possible solution is to mail reminder letters on an annual basis to all property owners in the Rum Creek watershed. Coordination with the Tax Assessor's Office to include a letter in the annual tax bills,

may be a possibility. Another option would be to establish a system whereby when property in the Rum Creek watershed transfers ownership, the Tax Assessor's system would flag the property and send out an immediate informational letter to the new property owner about non-point source pollution and erosion information. Other solutions could be aimed at increasing water quality awareness County-wide, such as linking the provision of information related to non-point source pollution and soil/sedimentation/erosion control to the re-zoning and/or building permits process. Monroe County will need to coordinate with various partners to determine the best solution(s).

At this time, the County does not have staff time to dedicate to one-on-one education. If an Adopt-A-Stream Program is established in Monroe County, then one-on-one meetings with property owners may be possible with the help of AAS volunteers.

All of the new educational initiatives and outreach efforts should be supported by the Stakeholder group which aided in the formulation of this plan. Ongoing efforts to inform and engage property owners in stakeholder meetings and in all educational initiatives should be a priority.

Technical and Financial Assistance Needed

A significant amount of technical and financial assistance is needed to accomplish plan implementation. The lack of staff capacity at the County level and the absence of a dedicated watershed oversight group create implementation challenges. Potential funding sources for technical and financial assistance for implementation were identified during plan development, which include, but are not limited to, the following:

- Federal Clean Water Act Section 319 (h) Grants
- USDA: Environmental Quality Incentives Program (EQIP), USDA Wildlife Habitat Incentive Program (WHIP) and Conservation Reserve Program (CRP)
- Georgia Clean Water State Revolving Fund
- Georgia Environmental Protection Division, Adopt-A-Stream Program
- Two Rivers RC&D – Georgia Better Backroads Program

Federal Clean Water Act Section 319 (h) Grants. The Environmental Protection Agency (EPA) provides grants to states so the states can control non-point sources of water pollution, including septic systems that no longer are working correctly. Grant must address nonpoint sources of pollution, and may include: TMDL implementation, watershed restoration, technical and financial assistance, building local capacity, certain local enforcement programs not under NPDES permits, water quality monitoring, demonstration projects, groundwater activities, updating nonpoint source pollution initiatives, and lake protection projects. According to the EPA, Section 319 funds may be used to construct, repair, or improve private septic systems in states "where on-site systems have been identified as a significant source of pollution." Go to the EPA Section 319 website for more information about the application process. http://water.epa.gov/polwaste/nps/cwact.cfm.

USDA – NRCS. Provides conservation technical assistance and has a number of financial assistance programs, including:

- Agricultural Management Assistance
- Agricultural Water Enhancement
- Conservation Innovation Grants (A business or local government must be the applicant.)
- Environmental Quality Incentives Program (EQIP)
- Wildlife Habitat Incentive Program (WHIP)
- Conservation Reserve Program (CRP)

Georgia Clean Water State Revolving Fund. The Clean Water State Revolving Fund (CWSRF) is a federal loan program administered by the Georgia Environmental Finance Authority (GEFA) that provides funding for a variety of wastewater infrastructure and pollution prevention projects. Eligible projects include water quality, water conservation and wastewater treatment projects, such as constructing new wastewater treatment plants, repairing and replacing sewer, stormwater control projects and implementing water conservation projects and programs. GEFA also offers low-interest loans for energy-efficiency and renewable energy projects at wastewater treatment facilities. Loans are available at a low interest rate for a maximum of 20 years. Financing is also available through the CWSRF Land Conservation Loan Program which achieves the objectives of the Georgia Land Conservation Program and the federal Clean Water Act.[15]

Georgia Environmental Protection Division, Adopt-A-Stream Program. The Adopt-A-Stream Program is funded by a Section 319 (h) grant and housed in the Non-Point Source Pollution Program of the Water Protection Branch of Georgia EPD. The goals of Georgia Adopt-A-Stream are to (1) increase public awareness of the State's nonpoint source pollution and water quality issues, (2) provide citizens with the tools and training to evaluate and protect their local waterways, (3) encourage partnerships between citizens and their local government, and (4) collect quality baseline water quality data. The AAS program provides valuable training to local watershed groups and individual citizens interested in conducting water quality monitoring. If a local AAS group is established in Monroe County, the organization will be able to receive training and technical assistance directly from EPD's AAS program.[16]

Two Rivers RC&D – Georgia Better Backroads Program. The Backroads Program began out of County Commissioner concerns about increased costs for maintaining unpaved roads and the potential for water quality impacts and fines caused by the sediment leaving the dirt roads. The Program was made possible through a Grant from the Georgia EPD and a statewide partnership with the NRCS Field Offices, Georgia RC&D Councils, Georgia Soil and Water Conservation Districts, Georgia DOT, Georgia ACCG and the Georgia Chapter of the American Public Works Association. The project consists of three components: 1.) Statewide demonstration sties; 2.) Statewide training seminars and 3.) Publication of an unpaved roads maintenance manual. This program may be a means of increasing citizen awareness of water quality issues and impacts community actions have on water quality.[17]

EPD also operates an annually updated searchable website, Catalogue of Federal Funding Sources for Watershed Protection, which provides information for watershed practitioners and others on nearly 100 federal funding sources that might be available to help fund various watershed-related projects including outreach programs.[18].

[15] Clean Water State Revolving Fund, https://www.gefa.org/Index.aspx?page=80.
[16] Georgia Environmental Protection Division, Adopt-A-Stream Program, http://www.georgiaadoptastream.com/db/about.asp.
[17] Two Rivers Resource Conservation and Development Council, Inc., Georgia Better Backroads Program, http://www.tworiversrcd.org/index.php/redshop/ga-better-back-roads.
[18] U.S. Environmental Protection Agency, Catalogue of Federal Funding Sources for Watershed Protection, www.epa.gov/watershedfunding.

Projects Requiring Assistance

Financial assistance is needed to conduct ongoing targeted water quality monitoring activities, implement information and education initiatives, and to fund inspections and data collection related to septic system maintenance, failures of existing systems and new system installations in the Rum Creek watershed.

Education/Outreach. The new and ongoing education and outreach efforts will require funding, including:

- Public information outreach on water quality, non-point sources pollution and prevention, and sedimentation/erosion in stream banks. Funding required for development of information packages, brochures and direct mailing.
- Education Programs and direct technical support targeted for specific groups, particularly landowners.
- Septic System:
    - Education. Funding for workshops, informational packages, brochures, targeted mailings to property owners within the watershed is needed.
    - Evaluation. Funding is also needed to evaluate septic system functionality for all properties within the Rum Creek Watershed, create a GIS map of system location and to explore the possibility of establishing a pilot program that requires property owners to have regular inspections (i.e. every 5 to 10 years) by a qualified professional.

Ongoing Targeted Monitoring. Ongoing targeted monitoring requires committed volunteers. If no volunteers are available, funds may be needed to hire an outside entity such as the Regional Commission or Headwaters, Inc. to conduct monitoring. Funding is required for equipment and testing supplies, trainings and potentially to pay for monitoring services. Any volunteers from Monroe County will attend GaEPD Adopt-A-Stream trainings. The possibility of engaging 5th graders at K. B. Sutton Elementary, located adjacent to Rum Creek, to do some testing was discussed at Stakeholder meetings. Safe access to the stream would need to be determined and funding for testing supplies would be required. The validity of testing conducted by young students may be an issue; however, it would be a valuable educational experience nonetheless.

Implementation Schedule / Interim Milestones

Rum Creek is a small watershed with much of the FC contamination most likely arising from wildlife. Another reason there have been high indicators of FC could be due to the drought conditions that Georgia has been experiencing recently. Currently, however, Georgia is in an upward trend of rainfall and appears to be coming out of its drought. Ongoing targeted monitoring will be critical to identify whether additional BMPs are needed.

The end goals of implementation activities is restored water quality of Rum Creek and removal from Georgia's Section 303(d) list. Achieving these goals is dependent on stakeholder participation as implementation capacity will be limited somewhat by the lack of specifically dedicated personnel to oversee projects and activities. Every citizen, organization and interested party is encouraged to become involved in implementation, particularly those residents living in the watershed. It will also be essential for the local government to be involved, as researchers with the University of Wisconsin's Four Corners Watershed Innovative Initiative found that, "the governmental role is generally critical to successful watershed approaches, particularly if plans and solutions proposed by watershed groups are to be implemented."[19] Adjustments and changes in operations, programs and ordinances will be required to address issues and restore water quality.

The implementation program will support the ongoing goal of achieving measurable changes in water quality. The implementation of a targeted monitoring program will be required to evaluate the progress in achieving load reduction goals. Water quality will be assessed through an ongoing monitoring program to collect water quality data and information.

In addition to BMPs and ongoing targeting monitoring, residential educational and outreach programs are needed since education is an important factor in improving water quality. Outreach programs should focus on increasing the awareness among residents and property owners of how upstream activities have the potential to impact the critical habitats at the Rum Creek WMA. Educational activities, which expand residents' understanding of daily care and maintenance to ensure property functionality of private sewage systems, are also needed. Homeowners benefit economically from increased knowledge related to system maintenance aimed at extending the life of the systems, as those costs are significantly less than major repairs and total system replacement. Monroe County Environmental Health is a great resource for homeowners and would benefit from grant funding to expand its existing septic tank assistance program, as noted in the Information/Education section above.

At this time, Monroe County Environmental Health only has the capacity to provide technical assistance over the phone and to inspect new systems. To fully address Rum Creek's current water quality impairments and prevent future ones, a more robust septic system management program is required. EPA data shows that at least 20 percent of septic systems nationwide are malfunctioning to some degree, and in most cases, the homeowner is not aware of a system failure until sewage backs up in the home or

[19] U.S. Environmental Protection Agency, *Getting in Step; Engaging and Involving Stakeholders in Your Watershed*, http://www.epa.gov/owow/watershed/outreach/documents/stakeholderguide.pdf, page 60.

breaks out on the ground surface.[20] The EPA further notes that "few systems receive proper maintenance…most regulatory programs do not require homeowner accountability for system performance." To address these issues, the EPA recommends incorporation of a comprehensive, life-cycle management program into the approval process and ongoing operation of septic systems. At minimum, EPA recommends that communities inventory existing systems and their level of performance to establish baseline data and identify potential areas of concern. In its *Voluntary National Guidelines for Management of Onsite and Clustered Wastewater Treatment Systems,* the EPA provides five customizable management models as a guide for communities to ensure the "accountability and competency of regulators and service providers through certification and continuing education, owners through education and/or inspection requirements, and third party managers through contract and permit stipulations to achieve their goals."

EPA recommends that decentralized wastewater treatment systems (i.e. individual onsite or clustered wastewater systems) be managed under a central management entity with enforceable program requirements. While this approach may not be feasible to institute in Monroe County, a combination of EPA Management models should be considered for implementation.

Interim Milestones

As discussed in the Load Reductions section, Rum Creek requires an 83% reduction of FC from nonpoint sources. To measure progress, an interim milestone of achieving a 50% load reduction within five years is recommended. Targeted monitoring will be utilized to determine if this initial target value is being achieved though BMP implementation. Monitoring activities will determine whether watershed loading reduction goals are being met. If monitoring data does not indicate progress is being made toward achieving the interim milestone, then reevaluation will be necessary by the community and stakeholders to modify, add or change BMPs.

The majority of the activities listed in the Implementation table below indicate both the year to begin as well as a year to evaluate progress. The evaluation year serves will assist the responsible party and Rum Creek Stakeholders in tracking progress and performance of the management measures. The evaluation year will be critical to determining if any programmatic and implementation adjustments are required.

Summary

Progress toward end goals will be measured through tracking BMP installation and continued water quality monitoring. Implementation of BMPs will be ongoing. Changing behaviors and conditions within the watershed will take time and a true measure of implementation results may not be immediately apparent. It is recommended that the implementation program be evaluated every five (5) years to determine continued applicability and usefulness as well as to determine future strategy. Outside the Wildlife Management Area, land uses within the Rum Creek Watershed will likely change over time.

[20] U.S. Environmental Protection Agency, *Voluntary National Guidelines for Management of Onsite and Clustered Wastewater Treatment Systems,* http://www.epa.gov/owm/septic/pubs/septic_guidelines.pdf, pages 9-10.

Increases in pasture land, new agricultural uses (such as crops) as well as additional residential uses requiring on-site septic systems all have the potential to change nonpoint source pollution levels. As such, it will be necessary to remain aware of changing land uses and associated potential impacts to the Rum Creek Watershed.

Additional resources for volunteers, public education and outreach initiatives, model ordinance, implementation activities and technical assistance are listed in Appendix C.

Implementation Schedule / Interim Milestones					
Goal	Actions	Responsible	Year to Begin	Year to Evaluate/ Make Necessary Adjustments	Year to Complete
1. Implement BMPs	New septic tank Installation Review.	Monroe County Health Department	2013	2018	Ongoing
	Soil/Sedimentation Control Ordinance continued implementation.	Monroe County, NRCS	2013	2018	Ongoing
	Utilize NRCS Conservation Practices.	Monroe County/Property Owners	2013	2018	Ongoing
	Forestry BMP Implementation.	Georgia Forestry Commission, GA EPD	2013	2018	Ongoing
2. Long-Term Water Quality Monitoring Program	Establish Adopt-A-Stream Group.	Monroe County/Citizens	2014	2018	2018
	Conduct targeted monitoring.	Monroe County/Citizens	2014	2018	2018
3. Agricultural Education and Technical Assistance	Education and technical assistance to agribusinesses, farmer operators to improve water quality.	UGA Cooperative Extension, GASWCC, USDA-NRCS	2013	2018	Ongoing
4. Application of Georgia Agricultural Best Management Practices	Educate, inform and encourage property owners to apply BMPs, specifically pasture management techniques.	USDA-NRCS, GASWCC	2013	2018	Ongoing
	One-on-one technical assistance to property owners.	USDA-NRCS, GASWCC	2013	2018	Ongoing
5. Adopt Ordinances to improve water quality.	Research potential Septic Discharge Ordinance and consider adoption to	Monroe County	2015	N/A	2016

		address local water quality.				
6.	Eliminate disposal of animals in Rum Creek.	Distribute materials to individuals in Hunter Safety Education classes.	Department of Natural Resources-Wildlife Resources Division	2013	N/A	Ongoing
7.	Increase Public Awareness of Water Quality Issues and Non-Point Source Pollution.	Develop and implement a county-wide education and outreach program that utilizes news media/ County website to disseminate information on water quality, non-point source pollution. Potential activities include: • Press Releases, letters to the editor, feature articles on BMP implementation, program activities, and goals/ milestones. • Adopt-A-Stream / Rivers Alive table at the Forsythia Festival.	Monroe County, Volunteers of Local Adopt-A-Stream group (when established).	2014	2018	2014-2018
8.	Targeted Outreach Education Materials/Activities on Water Quality/Non-Point Source Pollution	Develop facts sheets, fliers and posters relevant to specific audiences (school-age children/teens, property owners, business owners, etc.)	Monroe County, Volunteers, Local Adopt-A-Stream group (when established).	2014	2018	2018
9.	Identify and remediate failing systems.	Create GIS map locations of septic tank systems within watershed (property boundaries, system locations, political boundaries, parcel size,	Monroe County, Volunteers, Local Adopt-A-Stream group (when established).	2015	N/A	2016

	length of frontage on rum creek, etc.).				
	Evaluate septic system functionality for all properties within the Rum Creek Watershed.	Monroe County, Monroe County Health Department, Volunteers	2016	N/A	2017
	Establish a system to track systems (age, repairs, and inspections) and conduct outreach to new property owners on septic system/erosion.	Monroe County, Monroe County Health Department, Volunteers	2017	N/A	2018
	Evaluate the potential of establishing a pilot program requiring regular septic tank inspections by a qualified professional.	Monroe County, Monroe County Health Department, Volunteers	2016	N/A	2016
10. Educate Property Owners on Best Practices for On-site Wastewater Treatment Systems.	Design, print and mail informational brochures on Septic System "do's and don'ts" to all property owners within the watershed.	Monroe County, Monroe County Health Department, Volunteers	2015	N/A	Ongoing
11. Direct Property Owner Education on Non-Point Source Pollution and Sedimentation	Develop a mechanism for ongoing property owner education/awareness about non-point source pollution and erosion/ sedimentation best practices.	Monroe County, Monroe County Health Department, Volunteers	2014	2017	Ongoing
	Informational workshop on septic system best management practices	Monroe County, Monroe County Health Department, Volunteers			

Monitoring Component

To evaluate the effectiveness of the implementation over time, the Rum Creek Watershed should receive ongoing, targeted monitoring. All targeted monitoring should take place for a number of years to obtain long-term data about the watershed, evaluate BMP implementation success and gauge when/if adjustments to BMPS are needed. Targeted monitoring of Escherichia coli (E. coli) bacteria with methods approved and promulgated by EPD's Adopt-A-Stream program will be undertaken by volunteers. Sampling process and plating will be accomplished in accordance with EPD Adopt-A-Stream protocols.

In addition to targeted monitoring of water quality, land use changes should also be noted. It is also critical that all major changes or events such as droughts, storm events/floods and any septic system failures that may occur are documented as these can significantly impact monitoring results. Documenting changes will aid in addressing issues and activities that may impact water quality. A septic system failure, for example will yield high FC results and be a false indicator that other BMPs and implementation activities are not working.

Monitoring Details

Data Collection Responsibilities: Monroe County/Volunteers

Sampling frequency: The sampling schedule for E.coli is 16 samples, 4 samples collected within a thirty (30) day period at least 24 hours apart, over 4 calendar quarters to calculate 4 geometric means. The thirty (30) day sampling period will not overlap the month of April/May and October/November due to changes in the in – stream water quality standard for bacteria. The turnaround time for sample results is a minimum of 24 hours.

Field sampling measurements will also include time, date, weather conditions and rainfall to help track basic water quality.

Monitoring sites:

1. Highway 23 Bridge
2. Dames Ferry Road Bridge
3. Juliette Road Bridge
4. Blue Store Road Bridge
5. State Route 83

Monitoring results: Will be reported in the format outlined on the following page.

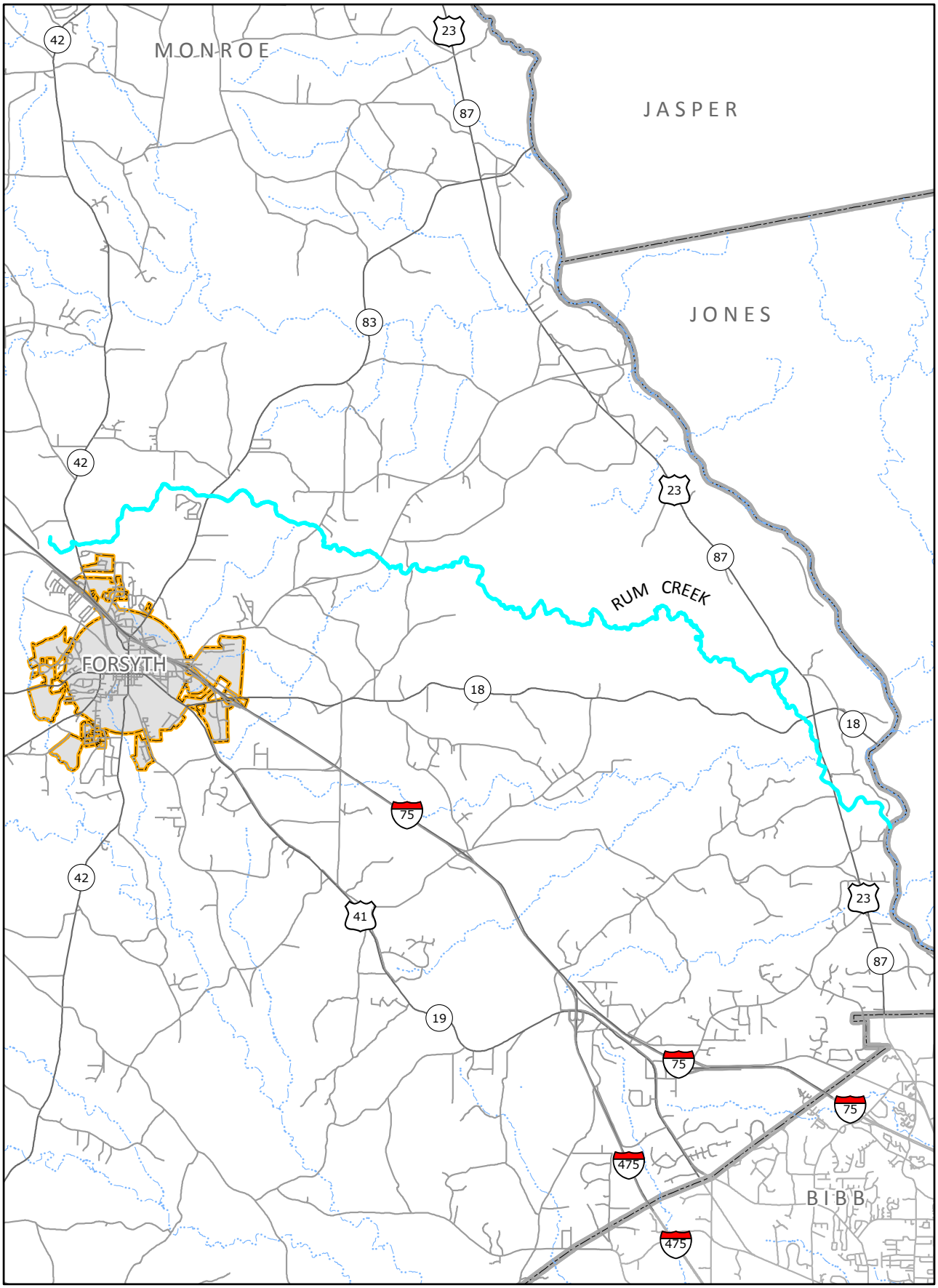
Rum Creek Targeted Monitoring (E.coli)					
Sampling Location	**Sample #**	**Sample Date/Time**	**Weather Conditions at Time of Sampling**	**Rainfall in Last 24 Hours (Yes/No)**	**CFU/100 ML**
Area 1 - Highway 23 Bridge	1				
	2				
	3				
	4				
Area 2 - Dames Ferry Road	1				
	2				
	3				
	4				
Area 3 - Juliette Road	1				
	2				
	3				
	4				
Area 4 - Blue Store Road	1				
	2				
	3				
	4				
Area 5 - State Route 83	1				
	2				
	3				
	4				

Notes on any land use changes, major events: _____
_____
_____

APPENDIX A

Maps

Rum Creek Watershed Management Plan
Location



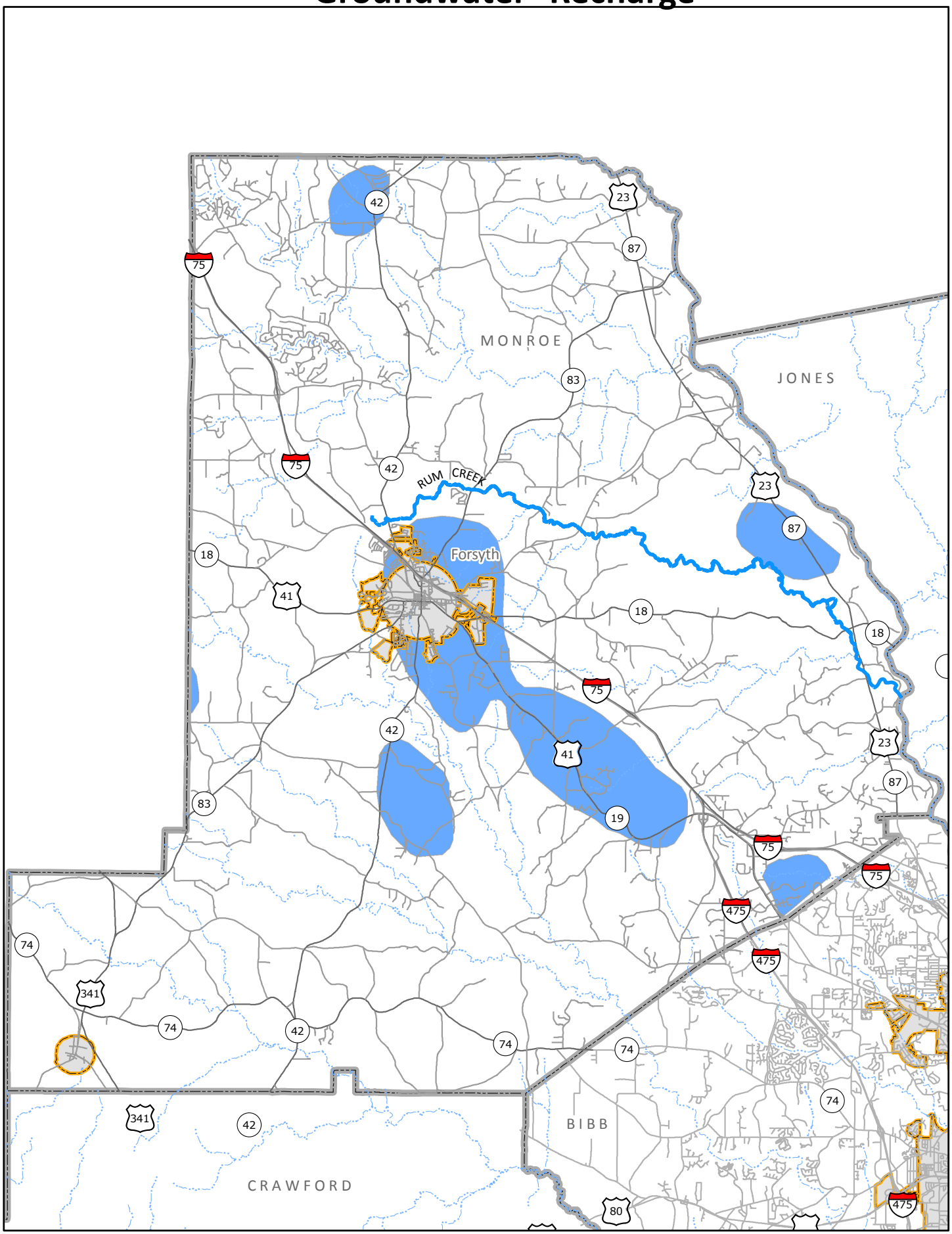
September 2013

0 2.5 5 Miles

Prepared by:

Middle Georgia Regional Commission

Rum Creek Watershed Management Plan
Groundwater Recharge



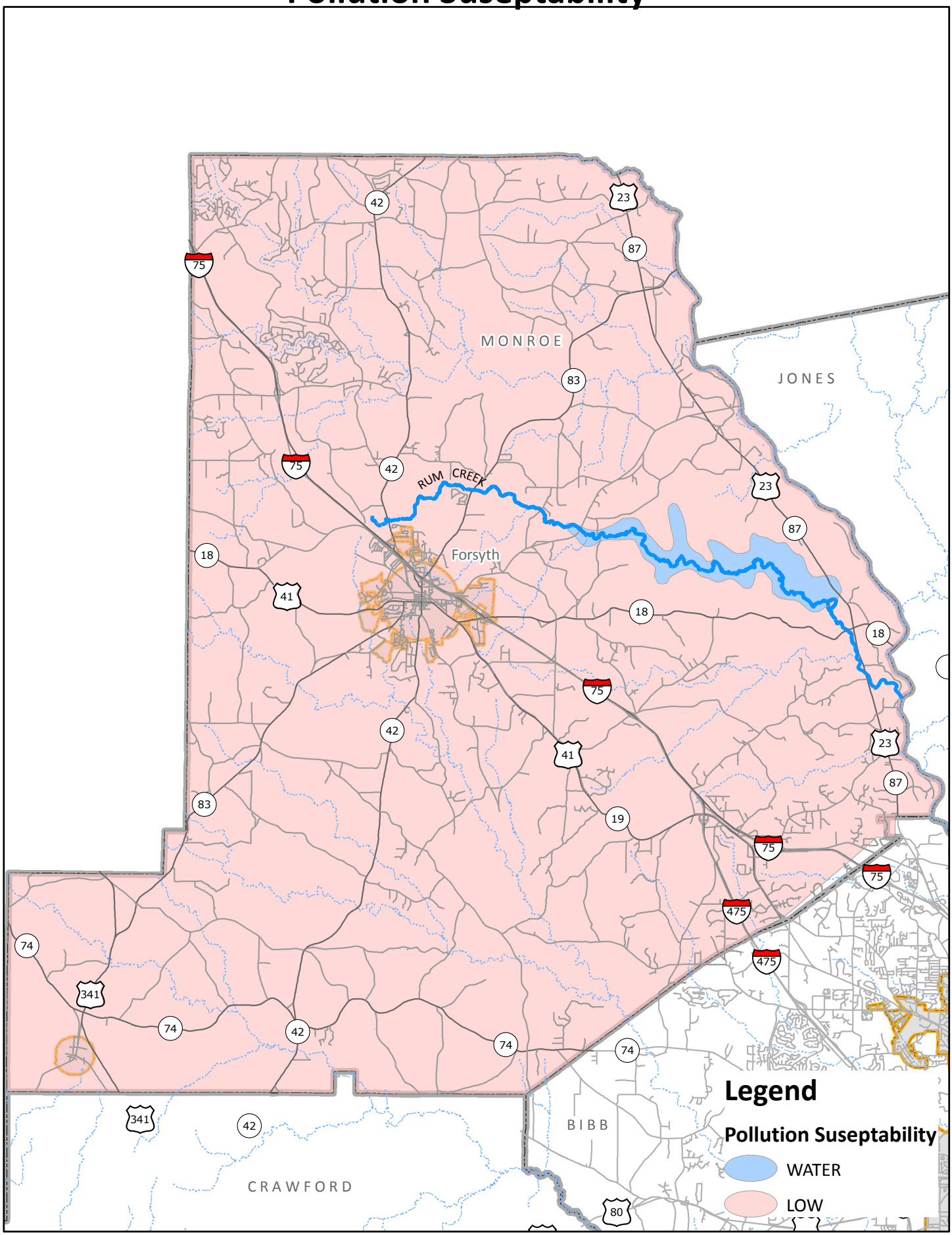
September 2013

0 3 6 Miles

Prepared by:

Middle Georgia Regional Commission

Rum Creek Watershed Management Plan
Pollution Suseptability



September 2013

Prepared by:

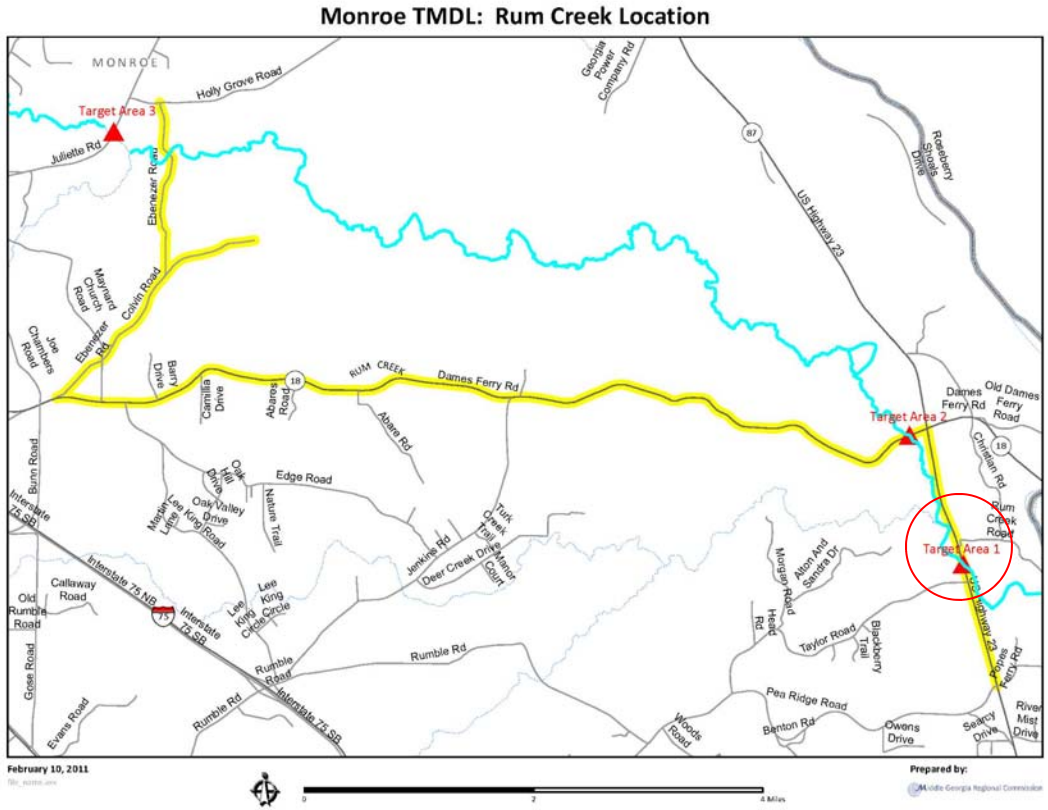
Middle Georgia Regional Commission

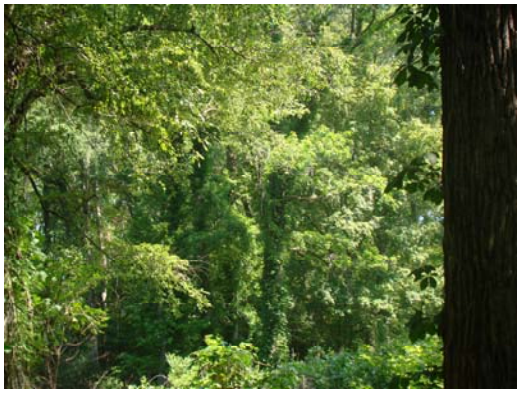
APPENDIX B

Monitoring Summary, Survey Forms and Targeted Monitoring Data Report

Test Area 1

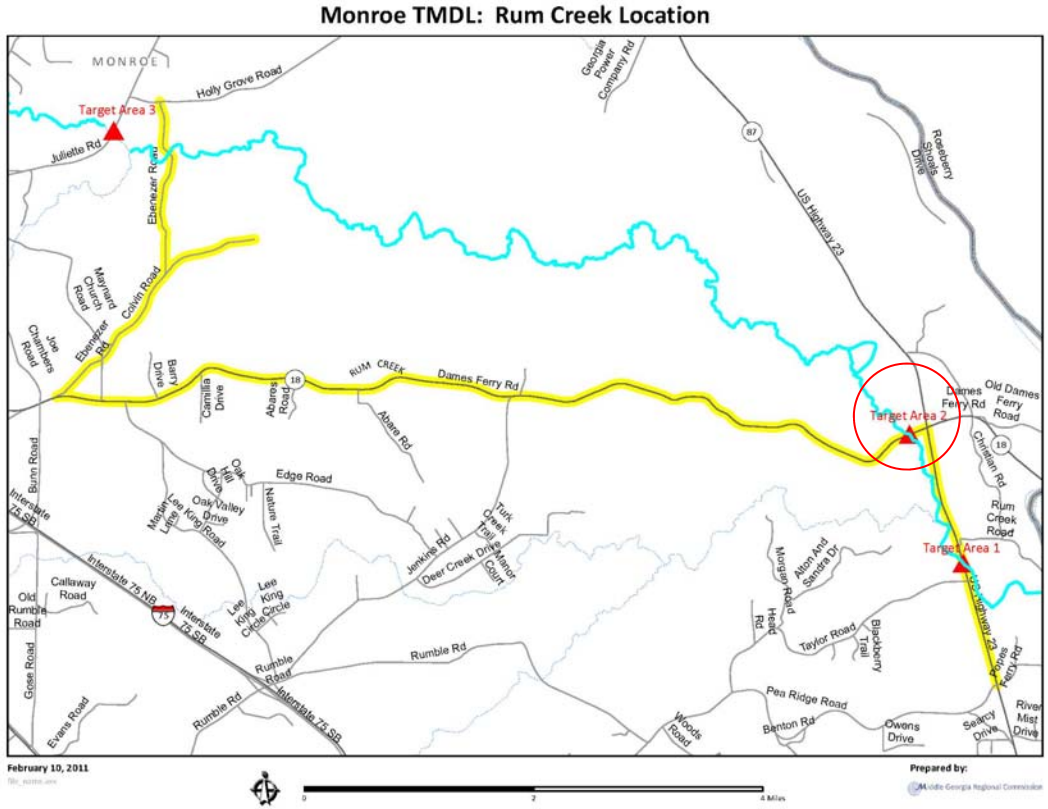
- Surrounded by forestland and heavily traveled road
- Testing Area was just off Hwy 23 Bridge
- Significant sources of E-coli detected in April but not prevalent throughout the year





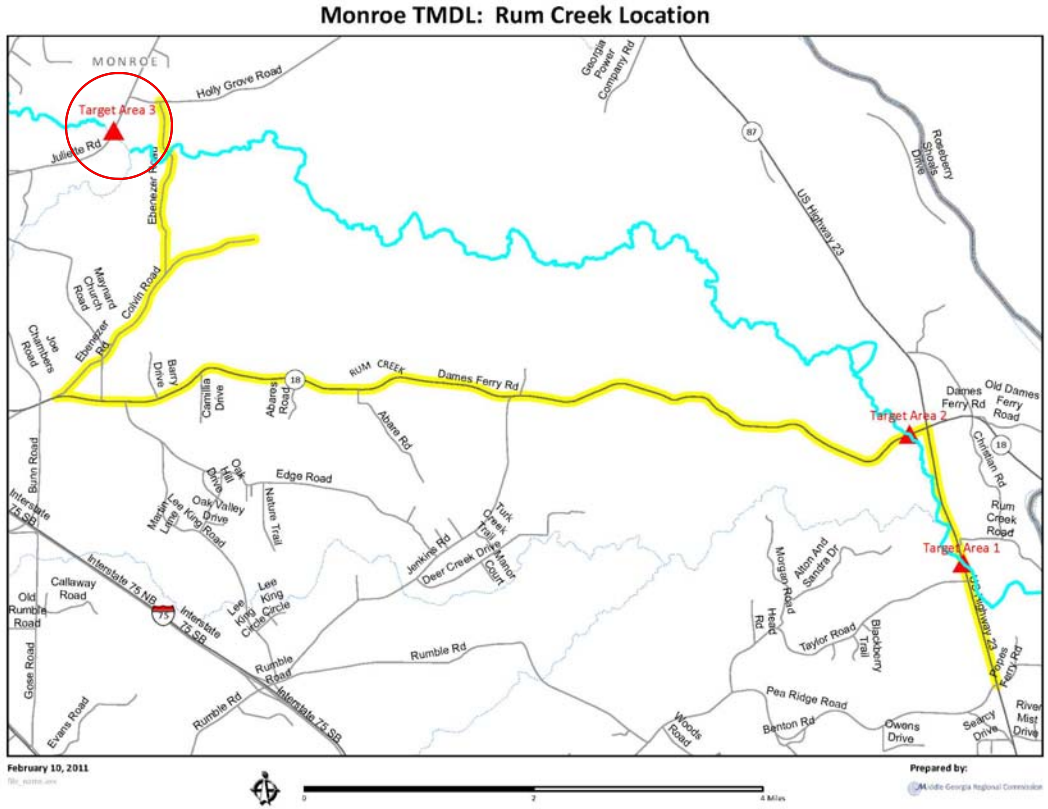
Test Area 2

- Surrounded by forest land and residential housing
- Testing Area was just off Dames Ferry Road
- No Significant sources of E-coli detected



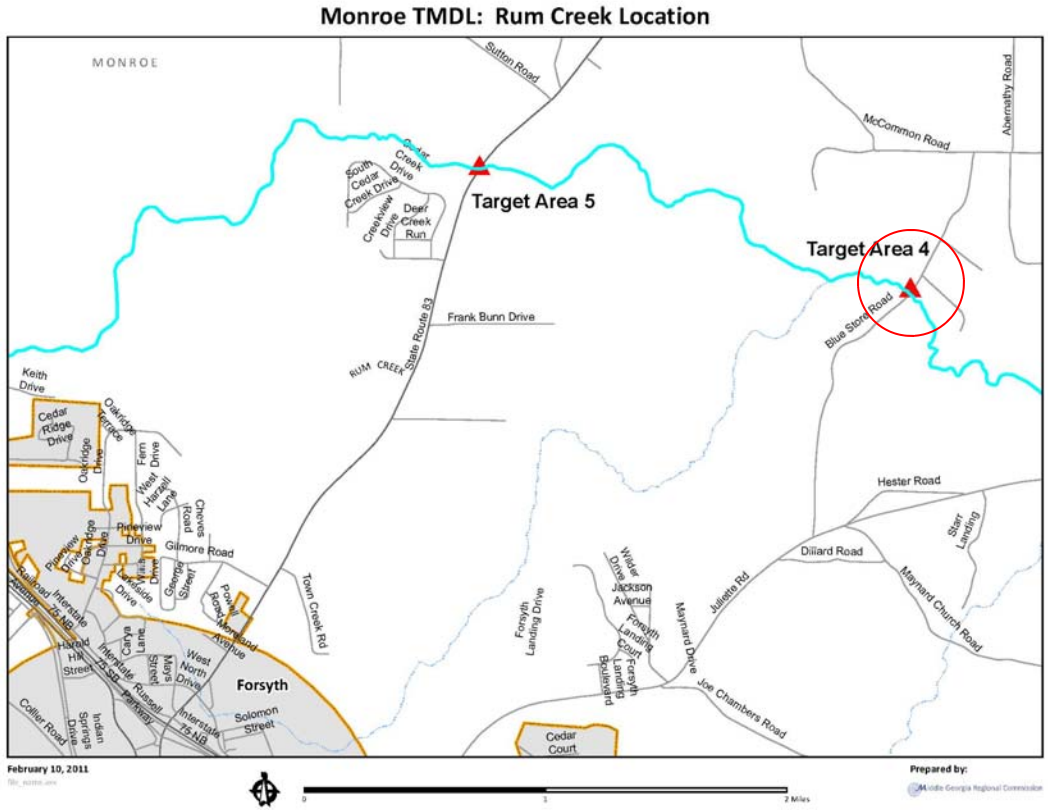
Test Area 3

- Surrounded by forestland with Georgia Power's Plant Scherer located less than 10 miles away
- Testing Area was just off the bridge at Juliette Road
- No Significant sources of E-coli detected



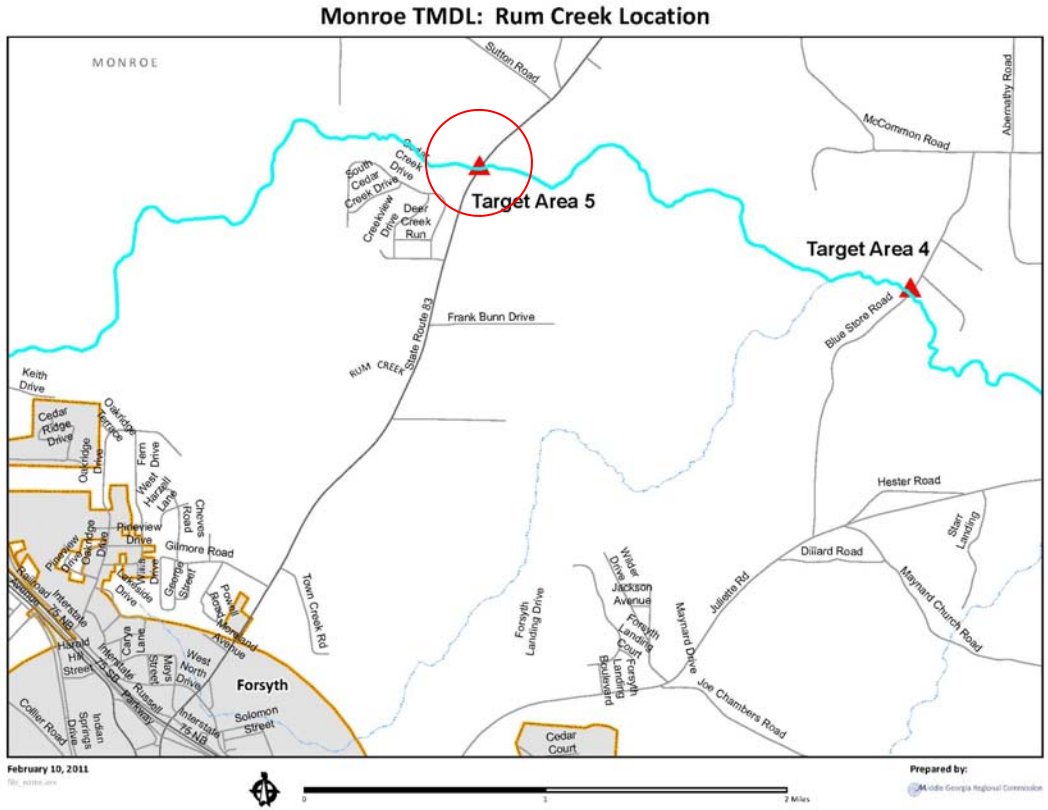
Test Area 4

- Surrounded by farmland and forestland
- Testing Area on the bridge at Blue Store Road
- No Significant sources of E-coli detected



Test Area 5

- Surrounded by forestland and residential housing
- Testing Area was just off Hwy 83
- No Significant sources of E-coli detected



2-14-11

GEORGIA ADOPT-A-STREAM

Physical/Chemical Data Form

To be conducted every month

Return to: GA AAS
4220 International Parkway
Suite 101
Atlanta, GA 30354

Use this form and the Adopt-A-Stream methods to record important information about the health of your stream. By keeping accurate and consistent records of your physical/chemical tests, you can document current conditions and changes in water quality.

AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Hayson	**Registered participants:** 1
Unregistered participants: Harry Jones	**Number of participants:** 2
Stream name: Rum Creek	
Date: 2-14-10 **Time:** 2:00	**Time Spent Monitoring (min):** 120 **Photo Documentation?** (yes)/no
Site/location Description: Test Area 3 (Juliette Road) - Bridge	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☑ none

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☑ partly cloudy ☐ clear/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	1	0	0				(1 / 3) x 100 =	33/100

Time in	Start / Min Temperature	End Time	End / Max Temperature
Feb 14, 2011	4:30 / 35 Cel	Feb 15 2011	4:30 / 35 Cel

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

D- 14-11

GEORGIA ADOPT-A-STREAM
Physical/Chemical Data Form
To be conducted every month

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AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Layson	**Registered participants:** 1
Unregistered participants: Larry Jones	**Number of participants:** 2
Stream name: Rum Creek	
Date: **Time:**	**Time Spent Monitoring (min):** 120 **Photo Documentation?** (yes)/no
Site/location Description: Test Area 1 (U.S. Highway 23 Rum Creek Bridge)	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ ✓ none

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☑ partly cloudy ☐ clear/sunny

Amount of rain, if known? 0 inches in last 48 hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	1	1	1				(3 / 3) x 100 =	100 / 100mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
February 14 2011	4:30 / 35 Celsius	Feb 15 2011	4:30 / 35 Celsius

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

2-14-11

GEORGIA ADOPT-A-STREAM

Physical/Chemical Data Form

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AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Lawson	**Registered participants:** 1
Unregistered participants: Larry Jones	**Number of participants:** 2
Stream name: Rum Creek	
Date: 2-14-10 **Time:** 2:00	**Time Spent Monitoring (min):** 120 **Photo Documentation?** (yes)/no
Site/location Description: Test Area 2 - Dames Ferry Road (Bridge)	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☑ none

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☑ partly cloudy ☐ clear/sunny

Amount of rain, if known? 0 inches in last 48 hours/days

BASIC TESTS	Test 1	Test 2	Units	ADVANCED TESTS	Test 1	Test 2	Units
Air Temp			(°C)	Nitrate Nitrogen			(mg/L or ppm)
Water Temp			(°C)	Ortho-phosphate			(mg/L or ppm)
PH			(1-14)	Salinity			(ppt)
Dissolved Oxygen			(mg/L or ppm)	Chlorophyll A			(mg/L or ppm)
Conductivity			(µS/cm)	Fecal Coliform			(cfu /100 mL)
				Escherichia coli			(cfu /100 mL)
OTHER TESTS							

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	0	0	0				(0 / 3) x 100 =	0 / 100mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
2-14-11	4:30 / 35 Celsius	2-15-11	4:30 / 35 Celsius

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

4-22-11

GEORGIA ADOPT-A-STREAM

Physical/Chemical Data Form

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Atlanta, GA 30354

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AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Hayson	**Registered participants:** 1
Unregistered participants: Harry Jones	**Number of participants:** 2
Stream name: Rum Creek	
Date: 4/22/11 **Time:** 10:00 **Time Spent Monitoring (min):** 120	**Photo Documentation?** yes/(no)
Site/location Description: Area 1 - U.S. Highway 23 Rum Creek Bridge	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☑ ~~none~~

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☐ partly cloudy ☑ ~~clear/sunny~~

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	3	3	7	13			(13 / 3) x 100 =	433/100mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
4-22-11	2:00 P.M / 35c	4-23-11	3:00 P.M. / 35c

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

Saturday

4-22-11

GEORGIA ADOPT-A-STREAM

Physical/Chemical Data Form

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Atlanta, GA 30354

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AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Hayson	**Registered participants:** 1
Unregistered participants: Larry Jones	**Number of participants:** 2
Stream name: Rum Creek	
Date: 4-22-11 **Time:** 10:00 **Time Spent Monitoring (min):** 120	**Photo Documentation?** yes/(no)
Site/location Description: Area 2 - Dames Ferry Road Bridge	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ (✓) none

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☐ partly cloudy ☑ clear/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	1	0	4	(5)			(5 / 3) x 100 =	166/100

Time in	Start / Min Temperature	End Time	End / Max Temperature
4-22-11	2:00 PM / 35°	4-23-11	3:00 P.M / 38°

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

4-22-11

GEORGIA ADOPT-A-STREAM
Physical/Chemical Data Form
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AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Hayson	**Registered participants:** 1
Unregistered participants: Larry Jones	**Number of participants:** 2
Stream name:	
Date: 4-22-11 **Time:** 10:00 **Time Spent Monitoring (min):**	**Photo Documentation?** yes/(no)
Site/location Description: Test Area 3 (Juliette Road - Bridge)	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☑ ~~none~~

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☐ partly cloudy ☑ clear/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	1	1	3				(5 / 3) x 100 =	166/100 mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
4-22-11	2:00 P.M / 35°	4-23-11	3:00 P.M / 35°

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

6-14-11

GEORGIA ADOPT-A-STREAM

Physical/Chemical Data Form

To be conducted every month

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Atlanta, GA 30354

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AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Lawson	**Registered participants:** 1
Unregistered participants: Larry Jones	**Number of participants:** 2
Stream name:	
Date: / **Time:**	**Time Spent Monitoring (min):** 120 / **Photo Documentation?** yes/no
Site/location Description:	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☑ none

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☐ partly cloudy ☑ clear/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	1	1	3				(5 / 3) x 100 =	166/100mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
June 14-11	3:00 / 35Cel	June 15-11	3:00 / 35Cel

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

6-14-11

2

GEORGIA ADOPT-A-STREAM

Physical/Chemical Data Form

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Atlanta, GA 30354

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AAS group name:	**County:** Monroe
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Lawson	**Registered participants:** 1
Unregistered participants: Larry Jones	**Number of participants:** 2
Stream name: Dames Ferry Road Bridge (Test Area 2)	
Date: / **Time:** / **Time Spent Monitoring (min):** 120	**Photo Documentation?** (yes)/no
Site/location Description:	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ ~~none~~

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☐ partly cloudy ☑ ~~clear~~/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	0	0	0				(0 / 3) x 100 =	0/100

Time in	Start / Min Temperature	End Time	End / Max Temperature
June 14-11	3:00 / 35Cel	June 15-11	3:00 / 35Cel

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

6-14-11 3

GEORGIA ADOPT-A-STREAM

Physical/Chemical Data Form

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AAS group name:	**County:**
Group ID number:	**Topo Map Quadrant:** ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Ladson	**Registered participants:** 1
Unregistered participants: Harry Jones	**Number of participants:** 2
Stream name: Rum Creek	
Date: **Time:**	**Time Spent Monitoring (min):** 120 **Photo Documentation?** yes/no
Site/location Description: Test Area 3 (Juliette Road) Bridge	

Rain in last 24 hours
☐ heavy rain ☐ steady rain
☐ intermittent rain ☑ none

Present conditions
☐ heavy rain ☐ steady rain ☐ intermittent rain
☐ Overcast ☐ partly cloudy ☑ clear/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	1	0	3				(4 / 3) x 100 =	133/100mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
6-14-11	3:00 / 35 C	6-15-11	3:00 / 35 C

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

6-17-11

GEORGIA ADOPT-A-STREAM
Physical/Chemical Data Form
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AAS group name:	County: Monroe
Group ID number:	Topo Map Quadrant: ------N/A------
AAS Site ID number:	
Certified QAQC Investigators: Chan Lawson	Registered participants: 1
Unregistered participants: Larry Jones	Number of participants: 2
Stream name: Rum Creek	
Date: / Time: / Time Spent Monitoring (min): 200	Photo Documentation? (yes)/no
Site/location Description: Location 4 - Blue Stole Road	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ intermittent rain ☑ none

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☐ partly cloudy ☑ clear/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	2	3				Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli		0	1	0				(1 / 3) x 100 =	33/100mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
6-17-11	3:00 PM / 35° Celsius	6-18-11	4:00 P.M. / 35° Celsius

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

6-17-11

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AAS group name:	County: Monroe
Group ID number:	Topo Map Quadrant: -----N/A-----
AAS Site ID number:	
Certified QAQC Investigators: Clan Layson	Registered participants: 1
Unregistered participants: Larry Jones	Number of participants: 2
Stream name: Bear Creek	
Date: Time:	Time Spent Monitoring (min): 200 Photo Documentation? (yes)/no
Site/location Description: Location 5 - State Route 83	

Rain in last 24 hours: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ none

Present conditions: ☐ heavy rain ☐ steady rain ☐ intermittent rain ☐ Overcast ☐ partly cloudy ☑ clear/sunny

Amount of rain, if known? _____ inches in last _____ hours/days

BASIC TESTS	Test 1	Test 2	Units
Air Temp			(°C)
Water Temp			(°C)
PH			(1-14)
Dissolved Oxygen			(mg/L or ppm)
Conductivity			(µS/cm)
OTHER TESTS			

ADVANCED TESTS	Test 1	Test 2	Units
Nitrate Nitrogen			(mg/L or ppm)
Ortho-phosphate			(mg/L or ppm)
Salinity			(ppt)
Chlorophyll A			(mg/L or ppm)
Fecal Coliform			(cfu /100 mL)
Escherichia coli			(cfu /100 mL)

SPECIAL LAB ANALYSIS: Name of lab performing tests:

Run 3 tests for each site, plus run one blank (plate 0)

3M Petrifilm method	blank	Plate 1	Plate 2	Plate 3	Find AVG # of colonies (total # colonies / total # of plates)	cfu /100 mL
Escherichia coli	0	0	4	0	(4 / 3) x 100 =	133 /100 mL

Time in	Start / Min Temperature	End Time	End / Max Temperature
6-17-11	3:00 P.M. / 35°	6-18-11	4:00 P.M. / 35°

Note: *E. coli* must be incubated for 24 hours at 35 degrees Celsius, +/- 1 degree

COMMENTS:

Targeted Monitoring Data Report

Introduction

The focus of this report is to present the results on the Rum Creek E. coli targeted monitoring for the Watershed Improvement Plan - Phase I.

Sampling Process

A sample was taken by using a long rope with a weighted bucket attached at the end. Before taking the sample, the bucket was rinsed out three (3) times with sample water. The pole was extended into the fast flowing section of the water. Once the bucket was filled it was pulled up for sampling. A sterile bag was labeled and used to collect a sample from the bucket. Using the two white tabs to pull it open, without touching the inside, the bag was filled with the water from the bucket. The ends of the twist bag were used to whirl the bag shut and securely close the seal. The sample was then placed in a cooler of ice and transported back to the Regional Commission office for further examination.

Plating

Once the samples were collected and transported back to the Regional Commission office, plating occurred. Four 3M Petrifilms were used for each of the samples (one was the blank). These Petrifilms were placed on a level surface. Lifting the top film and using a 1ml fixed volume pipette, a sample was dispensed on the center bottom film. Once the pipette was completely emptied, the sample was plated and slightly tilted to spread the sample evenly. The top film was then placed down slowly to prevent trapping air bubbles. Each sample was placed in a 35° Celsius incubator with the clear side up. Samples were removed after a 24-hour time period. In order to determine E. coli colonies, the number of blue colonies with gas were counted on each plate and recorded.

Sampling Sites

The sites selected for E. coli targeted monitoring were:

1. Highway 23
2. Dames Ferry Road Bridge
3. Juliette Road Bridge
4. Blue Store Road Bridge
5. State Route 83

Rum Creek TMDL Sampling Results				
Sampling Location	**Date/Time of Sample**	**Weather Conditions at Time of Sampling**	**Rainfall in Last 24 Hours**	**CFU/100 ML**
Area 1 - Highway 23 Bridge	Feb 14, 2011/2:00 P.M.	Sunny	None	100/100 ml
	April 11, 2011/10:00 A.M.	Sunny	None	433/100 ml
	June 14, 2011/10:15 A.M.	Sunny	None	166/100 ml
Area 2 - Dames Ferry Road	Feb 14, 2011/2:30 P.M.	Sunny	None	0/100 ml
	April 11, 2011/10:30 A.M.	Sunny	None	166/100 ml
	June 14, 2011/10:45 A.M.	Sunny	None	0/100 ml
Area 3 - Juliette Road	Feb 14, 2011/3:00 P.M.	Sunny	None	33/100 ml
	April 11, 2011/11:00 A.M.	Sunny	None	166/100 ml
	June 14, 2011/11:30 A.M.	Sunny	None	133/100 ml
Area 4 - Blue Store Road	June 17, 2011/3:00 P.M.	Sunny	None	33/ 100 ml
Area 5 - State Route 83	June 17, 2011/3:00 P.M.	Sunny	None	133/100 ml

Recreational E. Coli Standards For Recreational Waters				
	Designated Swimming	Moderate Swimming	Light Swimming Area	Infrequent Swimming
E. coli (cfu/100 ml)	<235	<298	<410	<576

APPENDIX C

Water Quality Resources

Adopt-a-Stream: Volunteer Water Sampling and Monitoring Program, http://www.georgiaadoptastream.org

Center for Watershed Protection (webcasts, information, online watershed library and watershed 101), www.cwp.org

EPA – A Homeowner's Guide to Septic Systems, http://www.epa.gov/npdes/pubs/homeowner_guide_long.pdf

Georgia Association of Water Professionals: Student and Teacher Resources, http://www.gawponline.org.

Georgia EPD Materials, Pollution Prevention Assistance Division, Pollution prevention guidance for businesses and industry, http://www.p2ad.org.

Georgia Outdoors: Public Broadcasting Television Show to Inform about Preserving Georgia's Natural Resources, http://www.gpb.org

Georgia Project WET – Water Education Resources for K-12 Teachers, www.Gaprojectwet.org.

The Homeowners Lawn Care Water Quality Almanac, http://www.gardening.cornell.edu/lawn/almanac/index.html

North Georgia Water, Model Ordinances: http://www.northgeorgiawater.org/stormwater/model-ordinances

NRCS, Outreach/Educational Information for Teachers and Students, http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/people/teachstudent/?atype=TeachersandStudents

Rivers Alive: Annual Volunteer Waterway Cleanup, http://www.riversalive.com

River of Words: Poetry, Writing and Art Program for K-12, http://gaprojectwet.org/gawet_row.html

University of Georgia (UGA) Urban Agriculture, http://ugaonsite.com/

U.S. Environmental Protection Agency: Stormwater Outreach Materials and Reference Documents, http://cfpub.epa.gov/npdes/stormwatermonth.cfm

The Following Resources are from EPA's, "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns," available at http://www.epa.gov/owow/watershed/outreach/documents/getnstep.pdf.

Getting in Step: Engaging Stakeholders in Your Watershed
This guide provides the tools needed to effectively engage stakeholders to restore and maintain healthy watersheds through community support and cooperative action. Available online at *www.epa.gov/nps/toolbox* (select "Getting in Step Outreach Series").

Nonpoint Source News-Notes
EPA's Nonpoint Source News-Notes is an occasional bulletin dealing with the condition of the water-related environment. To download the newsletter and search back issues, visit the website at *www.epa.gov/newsnotes*.

Nonpoint Source Outreach Toolbox
EPA's Nonpoint Source (NPS) Outreach Toolbox is a searchable database that houses TV, radio, and print ads and other outreach products focused on NPS pollution or stormwater runoff. Permission information for using the cataloged products is provided for each product. Find ready-made materials you can use in your watershed outreach campaign at *www.epa.gov/nps/toolbox*.

> *The core of the Toolbox is its searchable database of more than 700 viewable and/or audible TV, radio, and print ads and other outreach products. On the "Featured Products" page you can find some of Toolbox's best products across six key topics: general stormwater and storm drain awareness; lawn and garden care; pet care; septic system care; motor vehicle care; and household chemicals and waste. You can search by media type (e.g.,TV, radio, or print ad), by topic or by keyword or phrase. Permissions for using the cataloged products are disclosed (and in most cases, granted) by the product owners, and contact information, campaign websites, and other pertinent details are provided. The Toolbox also includes surveys of public attitudes and perceptions regarding NPS problems and solutions, and evaluations of the effectiveness of some local NPS media campaigns.*

River Advocates Fundraising Guide
This free online fundraising guide includes case studies, examples, how-to information and resources for getting and maintaining the funding that makes watershed work possible. Available at *www.rivernetwork.org/rn/fundraisingguide*.

APPENDIX D

Stakeholders List

Chairman Mike Bilderback, Monroe County Commission

Ms. Anita Cauthen, Monroe County Clerk/Administrator

Mayor John T. Howard II, City of Forsyth

Mr. Thomas White, City Administrator, City of Forsyth

Ms. Gina Smith, Monroe County Health Department (District 5, Unit 2, North Central Georgia Public Health District), Environmental Health Division

Bunn Logging, Inc.

Cornerstone Propane LP

Georgia Department of Natural Resources, Wildlife Management Section – Nongame Conservation Section Office

Georgia Department of Natural Resources**,** Wildlife Resources Division, West Central Region Office (Region 4), Monroe County Conservation Rangers, Corporal Tony Wynne & Ranger First Class Keith Page, Wildlife Resources Division, Region IV Law Enforcement

Georgia Environmental Protection Division West Central District

Loblolly Investments & White Horse Partners, LLLP

Kevin Farrell, Assistant Branch Chief, Georgia Environmental Protection Division, Middle Ocmulgee Regional Water Planning Council,
Keegan Malone, Georgia Soil and Water Conservation Commission, Region IV,

Mr. Danny Morton, Plant Manager,Georgia Power-Plant Scherer

Newton Timber Company, LTD

Mr. John Pope, Monroe County Extension Office

Property Owners

Mr. Bud Queen (local environmentalist/water quality expert)

Resource Conservation & Development Program (RC&D), Two Rivers RC&D Council, Inc.

Gina Rogers, Conservation Issues Coordinator, Georgia Wildlife Federation

Ms. Anna Smith, Florida Rock Properties, Inc., Vulcan Materials

Carmen Westerfield, District Conservationist, Georgia Soil and Water Conservation Commission, Towaliga SWCD (Monroe County),

Mr. Ben Williams, Water Quality Forester, Georgia Forestry Commission