

STATE OF GEORGIA
TIER 2 TMDL IMPLEMENTATION PLAN REVISION 01
Nottely River and Youngcane Creek Watershed
Tennessee River Basin
April 28, 2006

Local Watershed Governments:
Union County
City of Blairsville

I. INTRODUCTION

Total Maximum Daily Load (TMDL) Implementation Plans are platforms for evaluating and tracking water quality protection and restoration. These plans have been designed to accommodate continual updates and revisions as new conditions and information warrant. In addition, field verification of watershed characteristics and listing data has been built into the preparation of the plans. The overall goal of the plans is to define a set of actions that will help achieve water quality standards in the state of Georgia.

This implementation plan addresses the general characteristics of the watershed, the sources of pollution, stakeholders and public involvement, and education/outreach activities. In addition, the plan describes regulatory and voluntary practices/control actions (*management measures*) to reduce pollutants, milestone schedules to show the development of the management measures (*measurable milestones*), and a monitoring plan to determine the efficiency of the management measures.

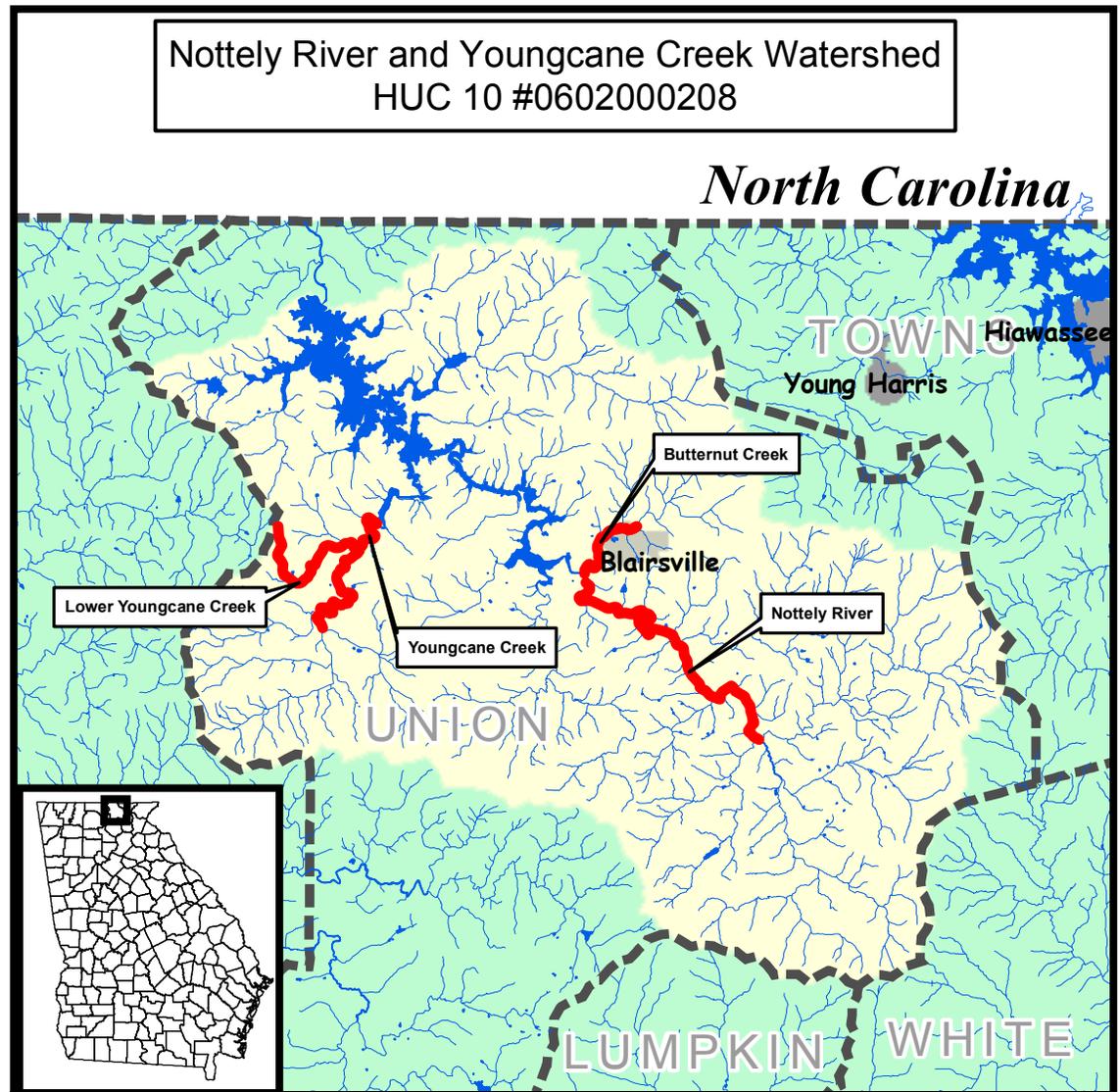


Table 1. IMPAIRMENTS

| IMPAIRED STREAM SEGMENT | IMPAIRED SEGMENT LOCATION | IMPAIRMENT | TMDL ID |
|-------------------------|--|-----------------|-------------|
| Butternut Creek | Blairsville | Bio(sediment) | TEN0000029 |
| Butternut Creek* | Blairsville* | Fecal Coliform* | TEN0000032* |
| Lower Youngcane Creek | Headwaters to Youngcane Creek | Bio(sediment) | TEN0000026 |
| Nottely River | US Hwy 19 to Lake Nottely | Fecal Coliform | TEN0000028 |
| Nottely River* | Right/Left Forks to US Hwy 19* | Fecal Coliform* | TEN0000030* |
| Youngcane Creek | Little Youngcane Creek to Nottely Lake | Fecal Coliform | TEN0000027 |

*Plans to be completed by EPD

II. GENERAL INFORMATION ABOUT THE WATERSHED

Write a narrative describing the watershed, HUC 10# 0602000208. Include an updated overview of watershed characteristics. Identify new conditions and verify or correct information in the TMDL document using the most current data. Include the size and location of the watershed, political jurisdictions, and physical features that could influence water quality. Describe the source and date of the latest land cover/use for the watershed. Describe and quantify major land uses and activities that could influence water quality. See the “Instructions for Completing the Georgia Total Maximum Daily Load (TMDL) Tier 2 Implementation Plan” for more information on what to include.

The Nottely River and Youngcane Creek Watershed (HUC10# 060200208) covers 136,748 acres, within which Butternut Creek, Lower Youngcane Creek, Nottely River, and Youngcane Creek have been identified as not meeting their water quality standards. The watershed is located in extreme north Georgia and covers approximately 67% of Union County and all of the City of Blairsville.

The HUC 10 has been experiencing moderate to rapid population growth in the past 25 years. Union County as a whole has nearly doubled its population since 1980, during which time the number of residents expanded from a population of 5,638 to a population of 9,319. This increase of population is expected to continue through the year 2030. The pleasant natural setting and high quality of life are the main factors for the increasing population throughout Union County. As such, many landowners are part time or seasonal residents and tourism can also increase population in the County during the peak season. The physical setting and spatial distribution of the population also plays an important role in Union County's water quality. The USDA Forest Service manages 57, 500 acres of land within Union County, which is approximately half of the total county land area. As a result, past and future growth is focused into a relatively small area of private lands. As developable lands become increasingly sparse, and land prices increase, development on unsuitable terrain becomes more common.

The most accurate land use data was collected in 2001 by the Tennessee Valley Authority. The following table identifies the land use type by its percent of total land use in the HUC 10.

| Description | Residential | Commercial | Industrial | Transportation | Row Crops (residue 0-10%) | Row Crops (residue >30%) |
|---------------------------|-------------|------------|------------|----------------|------------------------------|-----------------------------|
| Percent of Total Land Use | 5.99 | 0.75 | 0.16 | 0.43 | 0.33 | 0.13 |

| Row Crops Medium Residue (10-30%) | Good Pasture | Fair Pasture | Woodland Pasture | Heavily Overgrazed | Feedlot |
|---|--------------|--------------|---------------------|-----------------------|---------|
| 0.51 | 0.70 | 11.60 | 0.01 | 1.65 | 0.02 |

| Shrub and Brush | Forest Land | Clear Cut | Water | Total |
|--------------------|-------------|-----------|-------|--------|
| 0.57 | 73.07 | 0.51 | 3.22 | 99.14% |

A number of water quality related activities are ongoing in the HUC 10 including the implementation of numerous environmental regulations through local governments, monitoring and educational outreach through the Hiawassee River Watershed Coalition (HRWC), and water quality monitoring and research through the Tennessee Valley Authority.

Erosion and Sedimentation Control Ordinance and the Part V Environmental Planning Criteria are the most significant environmental regulations in the HUC 10. Both Union County and Blairsville participate in the Erosion and Sedimentation Control Ordinance as required by the Georgia Soil and Water Conservation Commission and GA EPD. Similarly, both the County and City are preparing for the certification requirements under HB 285, which become effective December 31, 2006.

Part V Environmental Planning Criteria are land use controls that have been developed by GA EPD and GA DCA for the protection of groundwater recharge areas, water supply watersheds, mountain protection, protected rivers, and wetlands because of the beneficial qualities that these natural feature have on the health, safety, and welfare of the public. The water supply watersheds and mountain protection elements are the two most important Environmental Planning Criteria that apply to the TMDL listed sections in this HUC 10. Union County adopted a mountain protection ordinance in 1997 and continues to enforce this regulation. Blairsville does not contain areas that fall within the classification for protected mountain status. Public drinking water intakes located within the HUC 10 includes Lake Nottely (Notla Water Authority intake) and the Nottely River intake, which is owned by the City of Blairsville and is located east of Blairsville. Union County is also in the process of developing a small water supply reservoir in the HUC 10. The Lake Nottely intake resides in a federal TVA lake, and as such, it does not require protection as identified by the Environmental Planning Criteria. Union County is currently considering adopting land use controls for the protection of the County's proposed water supply watershed and the Blairsville intake. If adopted, this regulation will satisfy the requirements for water supply watershed protection.

The Hiawassee River Watershed Coalition maintains a water quality monitoring program, coordinates stream restoration work, and provides general public outreach and environmental education throughout the upper Hiawassee River watershed. Currently the HRWC has established monitoring sites on eight streams in the HUC 10, including Anderson Creek, Arkaqua Creek, Butternut Creek, Conely Creek, Coosa Creek, Ivy Log Creek, Nottely River, and Youngcane Creek. Restoration work is ongoing in numerous locations across the upper Hiawassee River watershed; however, there are no active restoration sites within this HUC 10. The coalition also provides educational outreach through numerous activities including classroom education, presentations for civic or governmental groups, and professional workshops. The group also serves as the local Adopt-A-Stream affiliate.

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The Tennessee Valley Authority monitors water quality throughout its service area. In addition, the TVA has established the Chickamauga/Hiwassee Watershed Team, which supports TVA's Clean Water Initiative by developing partnerships with community residents, businesses, and government agencies to promote watershed protection. The Chickamauga/Hiwassee Watershed Team actively participates with the Hiwassee River Watershed Coalition with the acquisition of monitoring data and installation of BMPs.

A number of regulated point source dischargers are located within the watershed. Union County currently contracts with Appalachian Waste Services for the disposal of its solid waste. However, the County had maintained its own solid waste services until 1994. The site of Union County's landfill, which is now closed, is located one mile north of Blairsville, in the Butternut Creek watershed. Vulcan Construction Materials operates a granite quarry that is located east of Blairsville, near the Nottely River. A&B Creek Stone extracts fill material and is the only other mine in the HUC 10. A&B Creek Stone is located near the intersection of SR 180 and SR 129, in the upper watershed of Nottely River. Finally, three NPDES permit holders are located in the HUC 10. The Blairsville WPCP is located in the southwestern portion of Blairsville, and uses Butternut Creek as its receiving waters. Colwell Construction, located east of Blairsville, discharges into Lawrence Branch, a tributary of the Nottely River. Vogel State Park is located in the headwaters of the Nottely River, along the East Fork of Wolf Creek, and has a multipoint discharge permit associated with the park's overnight accommodations and visitor facilities.

{BUTTERNUT CREEK}

COMPLETE THE FOLLOWING TABLES FOR AND NARRATIVES ABOUT EACH IMPAIRED STREAM IN THE WATERSHED.

| STREAM SEGMENT NAME | LOCATION | MILES/AREA | DESIGNATED USE | PS/NS |
|---------------------|-------------|------------|----------------|-------|
| Butternut Creek | Blairsville | 2 | Fishing | PS |

III. SOURCES AND CAUSES OF STREAM SEGMENT IMPAIRMENT LISTED IN TMDLs

After reviewing the TMDLs written for this stream, complete the following tables with the information found in the TMDLs. List each parameter for which the stream segment is impaired and the water quality standard not met. See the “Instructions for Completing the Georgia Total Maximum Daily Load (TMDL) Tier 2 Implementation Plan” for the water quality standards. Enter the needed reduction from the TMDL. Describe the sources and causes of each impairment identified in the TMDLs.

Table 2. SOURCES OF IMPAIRMENT AS INDICATED IN TMDLs

| PARAMETER 1 | WQ STANDARD | SOURCES OF IMPAIRMENT | NEEDED REDUCTION FROM TMDL |
|-------------|-----------------------------------|----------------------------|----------------------------|
| Sediment | No degradation of fish community. | Row Crops (2137.3 tons/yr) | 76% |
| | | Roads (291.5 tons/yr) | |
| | | Pasture/Hay (119 tons/yr) | |
| | | Nonpoint Sources | |

IV. IDENTIFICATION AND RANKING OF POTENTIAL SOURCES OR CAUSES OF IMPAIRMENT

INVESTIGATE AND EVALUATE the extent and relative contributions from causes or sources of the impairment for each parameter listed in Table 2. Write a narrative describing efforts made or procedures used to verify the significance and extent of the sources or causes of each impairment listed in the TMDLs. Include: 1) involvement of stakeholder group; 2) review of land cover data; 3) field surveys; and 4) other pertinent sources of information consulted.

Butternut Creek watershed, located in eastern Union County, covers approximately 7,600 acres in both unincorporated Union County and the City of Blairsville. Although relatively small, this watershed hosts a number of different uses. Beasley Knob OHV area is a Forest Service managed recreational area within the headwaters of Butternut Creek. Downstream from Beasley Knob, the watershed is rural with agricultural lands dispersed between passive forestlands. Residential development is occurring throughout the watershed, with the highest rate of residential development being located near the Blairsville city limits. High intensity commercial and residential land uses occupy the lower 1/4 of Butternut Creek's watershed, especially within Blairsville city limits. The TMDL identified a number of land uses within the Butternut Creek watershed through analysis of Georgia's National Land Cover Dataset (1995), which are summarized below.

| Landuse Category | Open Water | Low Intensity Residential | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Deciduous Forest | Evergreen Forest | Mixed Forest | Pasture, Hay | Row Crops | Other Grasses | Total |
|-----------------------------|------------|---------------------------|----------------------------|---|------------------|------------------|--------------|--------------|-----------|---------------|--------|
| Percent of Total Land Cover | 0.03 | 1.30 | 0.41 | 2.52 | 69.27 | 4.15 | 10.79 | 9.02 | 1.80 | 0.70 | 100.00 |

The TVA, in cooperation with the Hiwassee River Watershed Coalition, collected land use data in 2001 for Butternut Creek watershed. This data indicates that only small shifts in land use have occurred within the watershed between 1995 and 2001. Discussion with the stakeholder group indicates that the percent of total land cover for residential and commercial land uses has increased significantly since the development of the 2001 TVA data.

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| Description | Residential | Commercial | Industrial | Transportation, Communication, Utilities | Row Crops (Residue 0- 10%) | Good Pasture | Fair Pasture | Heavily Overgrazed | Poultry Operation |
|-----------------------------------|-------------|------------|------------|--|----------------------------------|--------------|--------------|-----------------------|----------------------|
| Percent of Total Land Cover | 3.17 | 2.42 | 0.61 | 0.34 | 0.11 | 0.06 | 4.41 | 0.70 | 0.07 |

| Shrub and Bush | Forest Land | Clear Cut | Water | Strip Mines | Total |
|-------------------|-------------|-----------|-------|-------------|-------|
| 0.39 | 86.68 | 0.10 | 0.41 | 0.54 | 100 |

Methods of identifying and ranking potential sources or causes of impairment included a visual field survey of the watershed and discussion with members of the stakeholder group. A visual field survey was conducted for Butternut Creek to evaluate in-stream and watershed conditions (Appendix C). A stakeholder meeting schedule was established to provide local input for the development of the TMDL Implementation Plan. This schedule provided for three meetings. The first two meetings allowed for specific discussion of potential sources or causes of impairment. In the first meeting, selected images of the watershed were presented to the stakeholder group to provide a characterization of existing conditions within the watershed and to facilitate discussion regarding potential causes of impairment. The second meeting focused on local knowledge provided by the stakeholders to identify sources or causes of impairment through mapping exercises that identified "hot spots" or areas of specific concern on watershed maps (Appendix D). The information collected from the first two meetings was then used to rank potential sources of impairment. The draft implementation plan was reviewed during the final stakeholder meeting.

Combining information provided in the TMDL document, stakeholder knowledge, existing watershed assessments, and the watershed evaluation conducted for this plan, identify the potential sources or causes most likely to contribute to each identified impairment (parameter) in Table 3. If available information is inadequate to estimate the extent and relative contribution of significant potential sources or causes, recommend appropriate management actions (watershed assessments, monitoring, etc.) to determine the potential sources or causes and relative contributions. In Table 3, list the significant potential sources or causes of each impairment. Estimate the geographic extent of each potential source or cause as percent of the contributing watershed area, percent of stream miles affected, or number per square mile and enter the appropriate rating (from the following table) in the column entitled "Rating (A)". Estimate the relative contribution of each major source or cause to the pollutant causing the impairment and enter the appropriate rating (from the following table) in the column entitled "Rating (B)". Calculate a relative impact ratings for each source or cause by multiplying "Rating (A)" by "Rating (B)". Comments on the source of information used to determine the extent or contribution may be entered in the applicable columns in Table 3.

The following table provides guidance for rating the estimated extent and portion of the contribution from each potential source and cause.

| Estimated Geographic Extent of the Source or Cause in the Contributing Watershed (Percent of area or stream miles) | Estimated Contribution of the Source or Cause to the Pollutant Load Causing the Impairment (Percent of load) | Rating |
|---|---|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | 0.5 |
| Scattered or low (approximately 5-20%) | Scattered or low (approximately 5-20%) | 1 |
| Medium (approximately 20-50%) | Medium (approximately 20-50%) | 3 |
| Widespread or high (approximately 50% or more) | Widespread or high (approximately 50% or more) | 5 |
| Unknown | Unknown | UNK |

Table 3. CONCLUSIONS MADE OF POTENTIAL SOURCES OF STREAM SEGMENT IMPAIRMENT

PARAMETER 1: SEDIMENT

| POTENTIAL SOURCES OR CAUSES | ESTIMATED EXTENT OF CONTRIBUTION | | ESTIMATED PORTION OF CONTRIBUTION | | IMPACT RATING (A X B) |
|------------------------------------|---|-------------------|--|-------------------|------------------------------|
| | Comments | Rating (A) | Comments | Rating (B) | |
| Residential Development | Medium | 3 | Medium | 3 | 9 |
| Commercial Development | Scattered or low | 3 | Medium | 3 | 9 |
| Agricultural Activity | Scattered or low | 1 | Low | 1 | 1 |
| OHV Use | None or negligible | .5 | Negligible | .5 | .25 |

V. STAKEHOLDERS

PUBLIC INVOLVEMENT AND THE ACTIVE PARTICIPATION OF STAKEHOLDERS is essential to the process of preparing TMDL implementation plans and improving water quality. Stakeholders can provide valuable information and data regarding their community, impaired water bodies, potential causes of impairments, and management practices and activities which may be employed to reduce the impacts of the causes of impairment.

Describe outreach activities to advise and engage stakeholders in the TMDL implementation plan preparation process. Describe the stakeholder group employed or formed to address the impaired segments in the watershed. Summarize the results of the number of attendees and meetings and describe major findings, recommendations, and approvals.

Thirty-four key stakeholders were notified through a mailed announcement that provided a description of the meeting purpose, meeting schedule, and location. Notified stakeholders included local government officials, regional representatives, state and federal government agencies, environmental organizations, educational institutions, and businesses within the watershed. Citizens and business owners were also approached during the field survey in an effort to promote additional participation. Additional outreach was provided through the Upper Hiawasse River Watershed Coalition (UHRWC), who publicized the TMDL stakeholder meetings in its monthly newsletter. The stakeholder meeting announcement and meeting schedule were also placed on the announcement board at the 4 Rivers Fly Shop in Blairsville. Three meetings were held to 1) provide background information regarding the TMDL process, describe the stream's impairment, and characterize the watershed, 2) identify additional sources of pollution and select management measures, and 3) develop milestones and comment on the draft implementation plan.

Discussions with the stakeholder group identified significant deviations between the sources of impairment as indicated in the TMDL and current conditions. While the TMDL identified row crops as a significant source of sedimentation in the watershed, residential and commercial development has occurred in the past 5 years, which has converted large portions of the agricultural lands to more urban uses, and has resulted in lower inputs of sediment from agricultural lands. The expansion of impervious surfaces is also contributing to higher storm discharges and is increasing channel instability.

While Butternut Creek's TMDL section is located completely within Blairsville city limits, sediment input is occurring throughout the watershed. Therefore, stakeholder recommendations were made for both Blairsville and Union County. Union County has established and enforces Erosion and Sedimentation Control Ordinance as well as the necessary Part V Criteria including Mountain Protection, River Corridor Protection, and Wetlands Ordinances. While these regulations have provided significant protection for Butternut Creek, additional measures are necessary to protect the stream system from sedimentation. Development of additional regulations would be financially burdensome to the local government. Instead, amendments to existing regulations as well as continued implementation of voluntary management measures should be promoted as the initial mechanism to improve water quality. Recommended measures include working closer with developers during the site planning and permitting process so that development on environmentally sensitive areas such as steep slopes and areas adjacent to Butternut Creek and its tributaries can be minimized and mitigated. Additional stormwater management BMPs should be implemented as identified in the Georgia Stormwater Management Manual and addendums to the Georgia Stormwater Management Manual can be developed to provide specific solutions to local challenges. The Georgia Mountains Regional Development Center (GMRDC), Natural Resources Conservation Service (NRCS), Georgia Forestry Commission, and the Hiwassee River Watershed Coalition (HRWC) will continue to pair funding, monitoring, restoration, and mitigation opportunities with appropriate landholders.

List the watershed stakeholder advisory group committee members, described in Project Task #1 of the Scope of Services, in following table.

Table 4. STAKEHOLDER ADVISORY GROUP MEMBERS

| NAME/ORG | ADDRESS | CITY | STATE | ZIP | PHONE | E-MAIL |
|---|------------------|-------------|--------------|------------|----------------|--------------------------|
| Matthew Wilcox/ Blairsville WPCP | | Blairsville | GA | | (706) 781-2000 | mwilcox101@hotmail.com |
| Bud Hill/ Cattlemen's Association | | Blairsville | GA | | (706) 745-5714 | bud@hillvue.com |
| Chris Ernst/ GMRDC | P.O. Box 1720 | Gainesville | GA | 30501 | (770) 538-2621 | cernst@grmdc.org |
| Keith Ledford Union County Board of Education | 10 Hughes Street | Blairsville | GA | 30512 | 706-745-2322 | kledford@union.k12.ga.us |

In Appendix A, list the names, addresses, telephone numbers, and e-mail addresses for local governments, agricultural or commercial forestry organizations, significant landholders, businesses and industries, and local organizations including environmental groups and individuals with a major interest in this watershed, as described in Project Task #1 of the Scope of Services.

VI. MANAGEMENT MEASURES AND ACTIVITIES

Identify and list in Table 5A the significant management measures or activities which have or will be taken in the contributing watershed to address sources or causes of the impairment(s). List significant management measures and activities in Column 1 and responsible organizations in Column 2. Describe the measure or activity in Column 3 and sources of funding or resources in Column 4 (you may wish to adapt the generic language included in the “Standard Language for Management Measures and Activities” to local applications) In Column 5, enter one of the following codes describing the status of the measure or activity: (A) installed and active; (AE) active and **will be** enhanced or expanded; (R) required in the future by law, regulation or permit conditions; (P) currently proposed, but not required; and (N/R) **additional new recommended** or (N/E) **recommended enhanced** management measures and activities. In Column 6 enter the rating of the estimated existing or proposed extent of application of the measure or activity or percentage of individual sources to which the management actions have or will be applied (see the following table). In Column 7 enter a rating of the estimated effectiveness of the management measures and activities (see following table). Effectiveness may be estimated by local experts or derived from tables included in the “Standard Language for Management Measures and Activities”.

The following table provides guidance for rating the estimated extent and portion of the contribution for each significant potential source and cause.

| Estimated Extent of Application or Percentage of Individual Sources to Which the Mangement Measure or Activity Has or Will be Applied in the Contributing Watershed | Estimated Effectiveness or Percent Removal of Constituent (Percent of load) | Rating |
|--|--|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | .5 |
| Scattered or low (approximately 5-20%) | Low to medium (approximately 5-25%) | 1 |
| Medium (approximately 20-50%) | Medium to High (approximately 25-75%) | 3 |
| Widespread or high (approximately 50% or more) | High (approximately 75% or more) | 5 |
| Unknown | Unknown | UNK |

Table 5A. MANAGEMENT MEASURES AND ACTIVITIES

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| MEASURE | RESPONSIBILITY | DESCRIPTION | SOURCES OF FUNDING & RESOURCES | STATUS CODE | TARGET DATE | EXTENT RATING (Area, #) | EFFECT. RATING (Reduction) |
|-------------------------------------|---|--|--------------------------------|-------------|-------------|-------------------------|----------------------------|
| Federal Clean Water Act | USEPA, Georgia DNR/EPD | The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 305 requires states to report progress in restoring impaired waters to EPA on a biennial basis. Section 303(d) requires states to identify "impaired" waters, submit a list to EPA every two years, and develop TMDLs for these waters. | Federal, State | A | Ongoing | High (5) | Medium (3) |
| Federal Clean Water Act Section 404 | EPA (situations involving forestry are normally referred to the GFC to determine compliance with this regulation) | Requires normal ongoing agricultural and silvicultural practice to adhere to BMPs and 15 baseline provisions for road construction and maintenance in and across waters of the US including lakes, rivers, perennial and intermittent streams, wetlands, sloughs in order to qualify for the exemption from the permitting process. | Federal, State | A | Ongoing | High (5) | Medium-High (4) |
| Georgia Water Quality Control Act | Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 | Law prohibiting discharge of excessive pollutants (sediments, nutrients, pesticides, animal wastes, etc.) into waters of the State in amounts harmful to public health, safety, or welfare, or to animals, birds, or aquatic life or the physical destruction of stream habitats. | Federal, State, Union County | A | Ongoing | High (5) | Medium-High (4) |

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| | | | | | | | |
|--|--|--|--|---|---------|------------|-----------------|
| Georgia Planning Act | Union County, Blairsville | Coordinated Planning Program, managed by Georgia DCA, assigns local governments Environmental Planning Criteria (set by Georgia DNR) to include in local long-term comprehensive plans: Water Supply Watersheds, Groundwater, Wetlands, Protected Rivers, Protected Mountains. Program also requires local governments to identify Developments of Regional Impact (DRI) and develop plans to protect and manage Regional Impact Resources (RIR). | Union County, Blairsville | A | Ongoing | Low (2) | Medium-High (4) |
| Georgia River Basin Management Planning Act, Georgia Code Section 12-5-521 | Georgia DNR/EPD | River Basin Management Plans describe strategies and measures necessary for local governments, businesses, and citizen groups to educate the general public on matters involving the environmental and ecological concerns specific to the river basin; improve water quality and reduce pollution at the source; improve aquatic habitat and reestablish native species of fish; restore and protect wildlife habitat; and provide recreational benefits. | State, Union County, Blairsville | R | 2006 | High (5) | Medium (3) |
| Farm Bill 2002 | United States Department of Agriculture / National Resources Conservation Services | Enhances long-term quality of our environment and conservation of our natural resources. This bill provides several opportunities for receiving grants to improve water quality. | Federal Cost-Share and Incentive Programs. | A | Ongoing | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|--|--|---|--------|---------------|---------------|----------------|
| Erosion and Sedimentation Control Ordinance | Union County, Blairsville | Requires Erosion and Sedimentation Control Plan incorporating best management practices plus "Qualified Personnel" Training and Certification Program adopted from Georgia Soil and Water Conservation Commission. Certification of on-site "Qualified Personnel" to ensure proper design, construction and maintenance of standard E&S control measures and storm water management practices. | State, Union County, Blairsville | AE | Dec. 31, 2006 | High (5) | High (5) |
| Georgia Erosion & Sedimentation Control Act, Construction Permit, 2003 Amendment | Union County, Blairsville, Georgia DNR/EPD, Georgia Soil & Water Conservation Commission | Local/county government certified by Georgia EPD as Local Issuing Authority for land-disturbing activities. Requires Erosion & Sedimentation Control Plan incorporating best management practices plus "Qualified Personnel" Training and Certification Program adopted from Georgia Soil & Water Conservation Commission. Certification of on-site "Qualified Personnel" to ensure proper design, construction and maintenance of standard E & S control measures and storm water management practices. | State, Union County, Blairsville | R | Dec. 31, 2006 | High (5) | High (5) |
| Construction Storm Water Discharge NPDES Permit | Georgia DNR/EPD | General stormwater discharge permit for stand-alone construction sites; infrastructure projects; and common developments. Requires implementation of Erosion, Sedimentation and Pollution Control Plan plus monitoring of discharge for compliance with Georgia's in-stream water quality standards. | State | A | Ongoing | High (5) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|------------------------------|--|---|--------|---|---------------|----------------|
| Storm Water Management Audit/ Assessment | Union County Blairsville | Internal assessment of storm water pollution prevention plan (map of facility and responsibilities for upkeep): municipal operations, automobile maintenance, car washing, illegal dumping control, landscaping and lawn care, parking lot and street cleaning, roadway and bridge maintenance, septic system controls, storm drain system cleaning, storm water detention basins maintenance, hazardous materials storage, road salt application and storage, spill response and prevention, used oil recycling, materials management, leaking fluids from vehicles, and street sweeping. The county needs to ensure that they are meeting all applicable storm water requirements. | Union County, Blairsville | P | Union County: 2015 Blairsville 2011 | Low (2) | High (4) |
| Storm Water BMP Guidance Document for Municipal Operations | Union County, Blairsville | Following the audit/assessment, prepare a BMP procedures and guidance manual for county and the cities departments to minimize impact of municipal operations on storm water runoff. This document should address all of the activities identified in the audit/assessment and focus on any common problem areas identified. | Union County, Blairsville | P | Union County: 2016 Blairsville: 2012 | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|-------------------------------------|--|---|---|--------|-------------|---------------|----------------|
| New Development Ordinance Revisions | Union County, Blairsville | Review current local Erosion & Sediment Control ordinances and modify as appropriate. Include requirements for professionals involved in erosion and sediment control design and construction to be certified by the county. Require pollution prevention at the construction site through preparation of Erosion, Sedimentation & Pollution Control Plan to address issues such as trash, construction debris, leaking vehicles, storage of chemicals, etc. Subdivision ordinances addressing channel protection and conservation will provide further guidelines for construction activities. | Union County, Blairsville | P | 2007 | High (5) | High (5) |
| Georgia's Best Management Practices | Georgia Forestry Commission (matters involving enforcement are generally referred to GA EPD) | GFC program to inform landowners, foresters, timber buyers, loggers site preparation and reforestation contractors and others involved with silvicultural operations about commonsense, economical effective practices to minimize nonpoint source and thermal pollution. GFC encourages and monitors compliance and conducts a complaint resolution program. | State | A | Ongoing | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|---|--|--|---|--------|-------------|-------------------------------------|----------------|
| Georgia Forestry Commission Monthly BMP Assurance Examination | Georgia Forestry Commission (matters involving enforcement are generally referred to GA EPD) | In an effort to document “reasonable assurance” that water quality will be proactively protected during regular ongoing silvicultural operations, the GCF will offer a monthly BMP assurance examination of active sites. All active of ongoing sites will be identified either through monthly air patrol flights, courthouse records, riding the roads, notification or by landowners. Sites located within watersheds of specific biota (sediment) impaired streams will be given a higher priority to identify and conduct examinations. | Federal and State | A | Ongoing | Medium (3) | High (5) |
| Environmental Quality Incentives Program (EQIP) | Natural Resources Conservation Service | Voluntary program that provides technical and cost share assistance for protection of ground and surface water, erosion control, air quality, wildlife habitat, and plant health. | Federal 50% cost share with possible additional incentive payments | A | Ongoing | High (5) | High (5) |
| Section 319(h) Non-point Source Implementation Grant | Georgia DNR/EPD | Funds distributed through a competitive process to public agencies, regional development centers, state colleges and universities, and state agencies. Eligible projects include implementation of TMDL or Watershed Management Plans, BMP Demonstrations, and Information and Education Campaigns. | Federal, State | P | 2010 | 1-5 (depends on application extent) | High (5) |

The purpose of Table 5B is to initiate and guide a “first-cut” evaluation of the capacity of existing, currently proposed, and future required management measures and activities to achieve the load reductions specified in the TMDL (and meet water quality goals) and where needed, identify potential feasible and effective measures and practices which could be encouraged and supported to further reduce pollutant loadings from significant potential sources. Though completely voluntary, such recommendations would provide an effective local guide to management actions to achieve local water quality goals, establish priorities for grant or loan programs (Section 319 (h), EQIP, SRF), establish eligibility for grants for Tier plans and implementation, and identify priorities for local watershed assessments and protection plans.

In Columns 1 and 2 of Table 5B, enter each significant potential source and its’ corresponding impact ratings from Table 3. Review Table 5A and list significant management practices and activities applicable to each significant cause or source. Evaluate and compare the estimated extent and relative contribution of each significant cause or source with the extent and effectiveness of the applicable management measures and in conjunction with appropriate local stakeholders or organizations, make a best current determination of whether the existing or proposed management practices would achieve the load reductions needed to achieve the TMDL. Summarize conclusions and rationale in Column 4. If more information is needed to adequately determine the significant sources or causes and their relative contributions so note and recommend management actions needed to adequately identify sources such as monitoring, watershed assessments, or Tier 1 implementation plans in the last column. If the current, proposed and required management measures are judged inadequate to achieve the needed load reductions for significant sources, recommend, in consultation with the advisory groups, additional management activities, programs, and measures which would effectively reduce pollutant loads from the source. List such measures in the final column and list as a recommended activity in the milestones (Table 8).

TABLE 5B: EVALUATION OF MANAGEMENT MEASURES AND ACTIVITIES APPLIED TO SPECIFIC SOURCES OR CAUSES

APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT.

| SIGNIFICANT POTENTIAL SOURCE (S) OR CAUSE(S) (From Table 3) | IMPACT RATING (From Table 3) | EXISTING, CURRENTLY PROPOSED, OR REQUIRED MANAGEMENT MEASURES OR ENHANCEMENTS APPLICABLE TO EACH SIGNIFICANT SOURCE (From Table 5A) | EVALUATION: WILL THE ESTIMATED EXTENT OF APPLICATION AND EFFECTIVENESS OF EXISTING, CURRENTLY PROPOSED, AND REQUIRED MANAGEMENT MEASURES BE ADEQUATE TO ACHIEVE THE SOURCE REDUCTION SPECIFIED BY THE TMDL? | IF MANAGEMENT MEASURES ARE ESTIMATED TO BE INSUFFICIENT, RECOMMEND ADDITIONAL MANAGEMENT MEASURES AND ACTIVITIES WHICH COULD EFFECTIVELY REDUCE LOADS FROM SIGNIFICANT SOURCES |
|--|---------------------------------|---|---|--|
| Residential | 9 | Erosion and Sedimentation Control Certification Program Local/County Land Development Guidelines New Development Ordinance Revision | Application and enforcement of sedimentation control ordinances development guidelines should achieve a large (>75%) reduction in sediment loads delivered from new development. | |
| Commercial | 9 | Erosion and Sedimentation Control Certification Program Local/County Land Development Guidelines Storm Water Management Audit Assessment | Application and enforcement of sedimentation control ordinances, development guidelines, and assessment of storm water management practices should achieve a large (>75%) reduction in sediment loads delivered from new development. | Adoption of management practices described in the "Georgia Stormwater Management Manual" |
| Agriculture | 1 | Natural Resources Conservation Service- Environmental Quality Incentives Program Georgia EPD- Section 319 Nonpoint Source Implementation Grant Georgia Forestry Commission- Georgia's Best Management Practices -Monthly BMP Assurance Exams | The effectiveness of the agricultural management measures strongly relies on Federal and State funding. If adequately funding, these measures should achieve large (>75%) reductions in sediment loads from agricultural activities. | |
| Recreation (OHV use) | .25 | Volunteer Trail Maintenance | Continued collaboration between the Forest Service and user groups regarding maintenance of the Beasley Knob OHV will provide adequate protection for this recreational area. | |

VII. MONITORING PLAN

The purposes of monitoring are to obtain more data to determine the sources of pollution, describe baseline conditions, and evaluate the effects of management and activities on water quality. Describe any sampling activities or other surveys - active, planned or proposed (including monitoring required for watershed assessments, or stormwater permits) - and their intended purpose. Reference the development and submission of a Sample Quality and Assurance Plan (SQAP) if monitoring for listing decisions.

Table 6. MONITORING PLAN

| PARAMETER (S) TO BE MONITORED | ORGANIZATION | STATUS (CURRENT, PROPOSED, PLANNED) | TIME FRAME | | PURPOSE (If for delisting, date of SQAP submission) |
|---|---|---|------------|---------|---|
| | | | START | END | |
| Water temperature, stream discharge, dissolved oxygen, ammonia, nitrates, phosphates, turbidity, total solids, conductivity, alkalinity, pH, copper, lead, and zinc | Hiawasse River Watershed Coalition/ Tennessee Valley Authority | Current | 2003 | Ongoing | General Monitoring |

VIII. PLANNED OUTREACH FOR IMPLEMENTATION

List and describe outreach activities, including those described in the Scope of Services that will be conducted to support this plan and the implementation of it.

Table 7. PLANNED OUTREACH

| RESPONSIBILITY | DESCRIPTION | AUDIENCE | DATE |
|--|--|--|--------------|
| Hiwassee River Watershed Coalition | -Classroom Education -Presentations -Workshops | -General Public -Local Government Officials -Professionals | Ongoing |
| Natural Resources Conservation Service | -Education -EQIP Program | Agricultural Landowners | Ongoing |
| Resource Conservation and Development | -Education | Agricultural Landowners | Ongoing |
| Georgia Mountains RDC | Complete plan outreach activities as specified in Section 106 grant funded contract. | Local governments, major stakeholders, public | June 1, 2006 |

IX. MILESTONES/ MEASURES OF PROGRESS OF BMPs AND OUTREACH

This table will be used to periodically track and report progress of significant management practices and activities identified or recommended in Tables 5A, 5B, and other sections of this plan, including outreach, additional monitoring and assessments, and the enhancement or installation of management measures and activities. Identify and list significant planned or recommended activities and the target date of accomplishment. Provide room to comment on the effectiveness of the management measure, how much support the measure was given by the community, what was learned, how the measure might be improved in the future, and any other observations made. This table can be "pulled out" of this template and used to report and track progress.

Table 8. MILESTONES

| MANAGEMENT MEASURE OR ACTIVITY | RESPONSIBLE ORGANIZATIONS | STATUS | | COMMENT |
|---|---|----------|-----------|--|
| | | PROPOSED | INSTALLED | |
| Erosion and Sedimentation Control Certification Program | Union County Blairsville Developers | X | | To be installed December 31, 2006 |
| Revision of Local Land Development Guidelines | Union County Blairsville | X | | Proposed revision to be initiated by 2007 |
| Storm Water Management Audit Assessment | Union County | X | | Proposed assessment to be initiated by 2015 |
| Storm Water Management Audit Assessment | Blairsville | X | | Proposed assessment to be initiated by 2011. |

{LOWER YOUNGCANE CREEK}

COMPLETE THE FOLLOWING TABLES FOR AND NARRATIVES ABOUT EACH IMPAIRED STREAM IN THE WATERSHED.

| STREAM SEGMENT NAME | LOCATION | MILES/AREA | DESIGNATED USE | PS/NS |
|---------------------|-------------------------------|------------|----------------|-------|
| Lower Youngcane | Headwaters to Youngcane Creek | 2 | Fishing | PS |

III. SOURCES AND CAUSES OF STREAM SEGMENT IMPAIRMENT LISTED IN TMDLs

After reviewing the TMDLs written for this stream, complete the following tables with the information found in the TMDLs. List each parameter for which the stream segment is impaired and the water quality standard not met. See the “Instructions for Completing the Georgia Total Maximum Daily Load (TMDL) Tier 2 Implementation Plan” for the water quality standards. Enter the needed reduction from the TMDL. Describe the sources and causes of each impairment identified in the TMDLs.

Table 2. SOURCES OF IMPAIRMENT AS INDICATED IN TMDLs

Lower Youngcane Creek

| PARAMETER 1 | WQ STANDARD | SOURCES OF IMPAIRMENT | NEEDED REDUCTION FROM TMDL |
|-------------|----------------------------------|----------------------------|----------------------------|
| Sediment | No degradation of fish community | Row Crops (387.1 tons/yr) | 59% |
| | | Pasture/Hay (50.4 tons/yr) | |
| | | Roads (47.9 tons/yr) | |
| | | Nonpoint Sources | |

IV. IDENTIFICATION AND RANKING OF POTENTIAL SOURCES OR CAUSES OF IMPAIRMENT

INVESTIGATE AND EVALUATE the extent and relative contributions from causes or sources of the impairment for each parameter listed in Table 2. Write a narrative describing efforts made or procedures used to verify the significance and extent of the sources or causes of each impairment listed in the TMDLs. Include: 1) involvement of stakeholder group; 2) review of land cover data; 3) field surveys; and 4) other pertinent sources of information consulted.

Lower Youngcane Creek is located in western Union County. This small watershed is predominantly rural, with scattered low intensity residential development. Cattle grazing is the most common agricultural activity in this watershed, followed by poultry farming operations. The 1995 Georgia National Land Cover Dataset (NLCD) land use classification provided in the TMDL documented the distribution of land use types, as seen below.

| Landuse Category | High Intensity Commercial, Industrial, Transportation | Deciduous Forest | Evergreen Forest | Mixed Forest | Pasture, Hay | Row Crops | Total |
|------------------|---|------------------|------------------|--------------|--------------|-----------|-------|
| Acres | 26.5 | 1,240 | 160 | 428 | 467 | 55 | 2,387 |

Methods of identifying and ranking potential sources or causes of impairment included a visual field survey of the watershed and discussion with members of the stakeholder group. A visual field survey was conducted for Lower Youngcane Creek to evaluate in-stream and watershed conditions (Appendix E). A stakeholder meeting schedule was established to provide local input into the development of the TMDL Implementation Plan. This schedule provided for focused discussion regarding potential sources or causes of impairment during the first two meetings. During the first meeting, selected images of the watershed were presented to the stakeholder group to provide a characterization of existing conditions within the watershed and to facilitate discussion regarding potential causes of impairment. The second meeting focused local knowledge provided by the stakeholders to identify sources or causes of impairment or areas of specific concern. The information collected from the first two rounds of meetings was then used to rank potential sources of impairment.

Combining information provided in the TMDL document, stakeholder knowledge, existing watershed assessments, and the watershed evaluation conducted for this plan, identify the potential sources or causes most likely to contribute to each identified impairment (parameter) in Table 3. If available information is inadequate to estimate the extent and relative contribution of significant potential sources or causes, recommend appropriate management actions (watershed assessments, monitoring, etc.) to determine the potential sources or causes and relative contributions. In Table 3, list the significant potential sources or causes of each impairment. Estimate the geographic extent of each potential source or cause as percent of the contributing watershed area, percent of stream miles affected, or number per square mile and enter the appropriate rating (from the following table) in the column entitled “Rating (A)”. Estimate the relative contribution of each major source or cause to the pollutant causing the impairment and enter the appropriate rating (from the following table) in the column entitled “Rating (B)”. Calculate a relative impact ratings for each source or cause by multiplying “Rating (A)” by “Rating (B)”. Comments on the source of information used to determine the extent or contribution may be entered in the applicable columns in Table 3.

The following table provides guidance for rating the estimated extent and portion of the contribution from each potential source and cause.

| Estimated Geographic Extent of the Source or Cause in the Contributing Watershed (Percent of area or stream miles) | Estimated Contribution of the Source or Cause to the Pollutant Load Causing the Impairment (Percent of load) | Rating |
|---|---|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | 0.5 |
| Scattered or low (approximately 5-20%) | Scattered or low (approximately 5-20%) | 1 |
| Medium (approximately 20-50%) | Medium (approximately 20-50%) | 3 |
| Widespread or high (approximately 50% or more) | Widespread or high (approximately 50% or more) | 5 |
| Unknown | Unknown | UNK |

Table 3. CONCLUSIONS MADE OF POTENTIAL SOURCES OF STREAM SEGMENT IMPAIRMENT

PARAMETER 1: Sediment.

| POTENTIAL SOURCES OR CAUSES | ESTIMATED EXTENT OF CONTRIBUTION | | ESTIMATED PORTION OF CONTRIBUTION | | IMPACT RATING (A X B) |
|---|---|-------------------|--|-------------------|------------------------------|
| | Comments | Rating (A) | Comments | Rating (B) | |
| Residential Development | Widespread | 5 | Medium | 3 | 15 |
| Agricultural Practices (Past Channel Straightening) | Medium | 3 | High | 5 | 15 |
| Streambank Erosion | Scattered | 1 | Medium | 3 | 3 |
| Road Maintenance | Widespread | 5 | Medium | 3 | 15 |

V. STAKEHOLDERS

PUBLIC INVOLVEMENT AND THE ACTIVE PARTICIPATION OF STAKEHOLDERS is essential to the process of preparing TMDL implementation plans and improving water quality. Stakeholders can provide valuable information and data regarding their community, impaired water bodies, potential causes of impairments, and management practices and activities which may be employed to reduce the impacts of the causes of impairment.

Describe outreach activities to advise and engage stakeholders in the TMDL implementation plan preparation process. Describe the stakeholder group employed or formed to address the impaired segments in the watershed. Summarize the results of the number of attendees and meetings and describe major findings, recommendations, and approvals.

Stakeholders were notified through a mailed announcement that provided a description of the meeting purpose, meeting schedule, and location. Notified stakeholders included local government officials, regional representatives, state and federal government agencies, environmental organizations, educational institutions, and businesses within the watershed. Citizens and business owners were also approached during the field survey in an effort to promote additional participation. Additional outreach was provided through the Upper Hiwassee River Watershed Coalition (UHRWC), who publicized the TMDL stakeholder meetings in its monthly newsletter. The stakeholder meeting announcement and meeting schedule were also placed on the announcement board at the 4 Rivers Fly Shop in Blairsville. Three meetings were held to 1) provide background information regarding the TMDL process, describe the stream's impairment, and characterize the watershed, 2) identify additional sources of pollution and select management measures, and 3) develop milestones and comment on the draft implementation plan.

Lower Youngcane Creek's watershed has undergone significant land use changes since the TMDL was developed. Most importantly, agricultural activity is no longer as intensive as previously noted. The watershed is currently experiencing moderate residential development, which is located predominantly in forestlands. Sedimentation associated with land disturbance for residential developments was noted during the watershed survey and during stakeholder discussions. This land disturbance is a potential source of sediment for Lower Youngcane Creek. Row cropping activity, as noted in the TMDL, is no longer occurring in significant amounts, and remaining agricultural activity is scattered with moderate to low intensity cattle and horse grazing accounting for existing sediment inputs. Historic agricultural activities continue to cause problems within the watershed. Most notably, channels that have been straightened in the past are attempting to regain their natural meander. As this process continues, stream banks are becoming increasingly unstable and are slumping into the channel. It is likely that legacy sediment from past agricultural activities continues to progress downstream and will influence the watershed for years to come. A final sediment source identified during the stakeholder meetings was poorly designed and improperly maintained roadside ditches that allowed for the accumulation and rapid transport of large volumes of stormwater. Runoff from these ditches promoted sedimentation along roadsides. Extensive erosion was noted where ditches drained into streams. Recommendations include more stringent enforcement of the County's Erosion and Sedimentation Control Ordinance where residential development is occurring in this watershed, streambank restoration efforts to place Lower Youngcane Creek into its original channel or a simulated natural channel, and continued cooperation with the NRCS to provide funding opportunities to local farmers to minimize environmental degradation associated with cattle and horse grazing.

List the watershed stakeholder advisory group committee members, described in Project Task #1 of the Scope of Services, in following table.

Table 4. STAKEHOLDER ADVISORY GROUP MEMBERS

| NAME/ORG | ADDRESS | CITY | STATE | ZIP | PHONE | E-MAIL |
|---|-----------------------|-------------|-------|-------|----------------|-------------------------|
| Nancy Triestram Resident | 6723 Millie Circle | Blairsville | NC | | (706) 745-8429 | nanceet@alltel.net |
| Doug Triestram Resident | | | | | (706) 745-8429 | doug2@alltel.net |
| Callie Dobson Hiawassee River Watershed Coalition | 87 Upper Peachtree Rd | Murphy | NC | 28906 | (828) 837-5414 | hrwcoalition@brmemc.net |
| Mike Fann Resident | | | | | (706) 745-8505 | macfan@alltel.net |
| Leigh Fann/ Resident | | | | | (706) 745-8505 | lfan@alltel.net |
| Chris Ernst/ GMRDC | P.O. Box 1720 | Gainesville | GA | 30501 | (770) 538-2621 | cernst@grmdc.org |

In Appendix A, list the names, addresses, telephone numbers, and e-mail addresses for local governments, agricultural or commercial forestry organizations, significant landholders, businesses and industries, and local organizations including environmental groups and individuals with a major interest in this watershed, as described in Project Task #1 of the Scope of Services.

VI. MANAGEMENT MEASURES AND ACTIVITIES

Identify and list in Table 5A the significant management measures or activities which have or will be taken in the contributing watershed to address sources or causes of the impairment(s). List significant management measures and activities in Column 1 and responsible organizations in Column 2. Describe the measure or activity in Column 3 and sources of funding or resources in Column 4 (you may wish to adapt the generic language included in the “Standard Language for Management Measures and Activities” to local applications) In Column 5, enter one of the following codes describing the status of the measure or activity: (A) installed and active; (AE) active and **will be** enhanced or expanded; (R) required in the future by law, regulation or permit conditions; (P) currently proposed, but not required; and (N/R) **additional new recommended** or (N/E) **recommended enhanced** management measures and activities. In Column 6 enter the rating of the estimated existing or proposed extent of application of the measure or activity or percentage of individual sources to which the management actions have or will be applied (see the following table). In Column 7 enter a rating of the estimated effectiveness of the management measures and activities (see following table). Effectiveness may be estimated by local experts or derived from tables included in the “Standard Language for Management Measures and Activities”.

The following table provides guidance for rating the estimated extent and portion of the contribution for each significant potential source and cause.

| Estimated Extent of Application or Percentage of Individual Sources to Which the Mangement Measure or Activity Has or Will be Applied in the Contributing Watershed | Estimated Effectiveness or Percent Removal of Constituent (Percent of load) | Rating |
|--|--|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | .5 |
| Scattered or low (approximately 5-20%) | Low to medium (approximately 5-25%) | 1 |
| Medium (approximately 20-50%) | Medium to High (approximately 25-75%) | 3 |
| Widespread or high (approximately 50% or more) | High (approximately 75% or more) | 5 |
| Unknown | Unknown | UNK |

Table 5A. MANAGEMENT MEASURES AND ACTIVITIES

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| MEASURE | RESPONSIBILITY | DESCRIPTION | SOURCES OF FUNDING & RESOURCES | STATUS CODE | TARGET DATE | EXTENT RATING (Area, #) | EFFECT. RATING (Reduction) |
|-------------------------------------|---|--|--------------------------------|-------------|-------------|-------------------------|----------------------------|
| Federal Clean Water Act | USEPA, Georgia DNR/EPD | The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 305 requires states to report progress in restoring impaired waters to EPA on a biennial basis. Section 303(d) requires states to identify "impaired" waters, submit a list to EPA every two years, and develop TMDLs for these waters. | Federal, State | A | Ongoing | High (5) | Medium (3) |
| Federal Clean Water Act Section 404 | EPA (situations involving forestry are normally referred to the GFC to determine compliance with this regulation) | Requires normal ongoing agricultural and silvicultural practice to adhere to BMPs and 15 baseline provisions for road construction and maintenance in and across waters of the US including lakes, rivers, perennial and intermittent streams, wetlands, sloughs in order to qualify for the exemption from the permitting process. | Federal, State | A | Ongoing | High (5) | Medium-High (4) |
| Georgia Water Quality Control Act | Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 | Law prohibiting discharge of excessive pollutants (sediments, nutrients, pesticides, animal wastes, etc.) into waters of the State in amounts harmful to public health, safety, or welfare, or to animals, birds, or aquatic life or the physical destruction of stream habitats. | Federal, State, Union County | A | Ongoing | High (5) | Medium-High (4) |

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| | | | | | | | |
|--|--|--|--|---|---------|------------|-----------------|
| Georgia Planning Act | Union County | Coordinated Planning Program, managed by Georgia DCA, assigns local governments Environmental Planning Criteria (set by Georgia DNR) to include in local long-term comprehensive plans: Water Supply Watersheds, Groundwater, Wetlands, Protected Rivers, Protected Mountains. Program also requires local governments to identify Developments of Regional Impact (DRI) and develop plans to protect and manage Regional Impact Resources (RIR). | Union County | A | Ongoing | Low (2) | Medium-High (4) |
| Georgia River Basin Management Planning Act, Georgia Code Section 12-5-521 | Georgia DNR/EPD | River Basin Management Plans describe strategies and measures necessary for local governments, businesses, and citizen groups to educate the general public on matters involving the environmental and ecological concerns specific to the river basin; improve water quality and reduce pollution at the source; improve aquatic habitat and reestablish native species of fish; restore and protect wildlife habitat; and provide recreational benefits. | State, Union County | R | 2006 | High (5) | Medium (3) |
| Farm Bill 2002 | United States Department of Agriculture / National Resources Conservation Services | Enhances long-term quality of our environment and conservation of our natural resources. This bill provides several opportunities for receiving grants to improve water quality. | Federal Cost-Share and Incentive Programs. | A | Ongoing | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|---|--|---|--------|------------------|---------------|----------------|
| Erosion and Sedimentation Control Ordinance | Union County | Requires Erosion and Sedimentation Control Plan incorporating best management practices plus "Qualified Personnel" Training and Certification Program adopted from Georgia Soil and Water Conservation Commission. Certification of on-site "Qualified Personnel" to ensure proper design, construction and maintenance of standard E&S control measures and storm water management practices. | State, Union County | AE | Dec. 31, 2006 | High (5) | High (5) |
| Georgia Erosion & Sedimentation Control Act, Construction Permit, 2003 Amendment | Union County, Georgia DNR/EPD, Georgia Soil & Water Conservation Commission | Local/county government certified by Georgia EPD as Local Issuing Authority for land-disturbing activities. Requires Erosion & Sedimentation Control Plan incorporating best management practices plus "Qualified Personnel" Training and Certification Program adopted from Georgia Soil & Water Conservation Commission. Certification of on-site "Qualified Personnel" to ensure proper design, construction and maintenance of standard E & S control measures and storm water management practices. | State, Union County | R | Dec. 31, 2006 | High (5) | High (5) |
| Construction Storm Water Discharge NPDES Permit | Georgia DNR/EPD | General stormwater discharge permit for stand-alone construction sites; infrastructure projects; and common developments. Requires implementation of Erosion, Sedimentation and Pollution Control Plan plus monitoring of discharge for compliance with Georgia's in-stream water quality standards. | State | A | Ongoing | High (5) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|----------------|--|---|--------|--------------------|---------------|----------------|
| Storm Water Management Audit/ Assessment | Union County | Internal assessment of storm water pollution prevention plan (map of facility and responsibilities for upkeep): municipal operations, automobile maintenance, car washing, illegal dumping control, landscaping and lawn care, parking lot and street cleaning, roadway and bridge maintenance, septic system controls, storm drain system cleaning, storm water detention basins maintenance, hazardous materials storage, road salt application and storage, spill response and prevention, used oil recycling, materials management, leaking fluids from vehicles, and street sweeping. The county needs to ensure that they are meeting all applicable storm water requirements. | Union County | P | Union County: 2015 | Low (2) | High (5) |
| Storm Water BMP Guidance Document for Municipal Operations | Union County | Following the audit/assessment, prepare a BMP procedures and guidance manual for county and the cities departments to minimize impact of municipal operations on storm water runoff. This document should address all of the activities identified in the audit/assessment and focus on any common problem areas identified. | Union County | P | Union County: 2016 | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|-------------------------------------|--|---|---|--------|-------------|---------------|----------------|
| New Development Ordinance Revisions | Union County | Review current local Erosion & Sediment Control ordinances and modify as appropriate. Include requirements for professionals involved in erosion and sediment control design and construction to be certified by the county. Require pollution prevention at the construction site through preparation of Erosion, Sedimentation & Pollution Control Plan to address issues such as trash, construction debris, leaking vehicles, storage of chemicals, etc. Subdivision ordinances addressing channel protection and conservation will provide further guidelines for construction activities. | Union County | P | 2007 | High (5) | High (5) |
| Georgia's Best Management Practices | Georgia Forestry Commission (matters involving enforcement are generally referred to GA EPD) | GFC program to inform landowners, foresters, timber buyers, loggers site preparation and reforestation contractors and others involved with silvicultural operations about commonsense, economical effective practices to minimize nonpoint source and thermal pollution. GFC encourages and monitors compliance and conducts a complaint resolution program. | State | A | Ongoing | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|---|--|--|---|--------|-------------|---|----------------|
| Georgia Forestry Commission Monthly BMP Assurance Examination | Georgia Forestry Commission (matters involving enforcement are generally referred to GA EPD) | In an effort to document “reasonable assurance” that water quality will be proactively protected during regular ongoing silvicultural operations, the GCF will offer a monthly BMP assurance examination of active sites. All active of ongoing sites will be identified either through monthly air patrol flights, courthouse records, riding the roads, notification or by landowners. Sites located within watersheds of specific biota (sediment) impaired streams will be given a higher priority to identify and conduct examinations. | Federal and State | A | Ongoing | Medium (3) | High (5) |
| Environmental Quality Incentives Program (EQIP) | Natural Resources Conservation Service | Voluntary program that provides technical and cost share assistance for protection of ground and surface water, erosion control, air quality, wildlife habitat, and plant health. | Federal 50% cost share with possible additional incentive payments | A | Ongoing | High (5) | High (5) |
| Section 319(h) Non-point Source Implementation Grant | Georgia DNR/EPD | Funds distributed through a competitive process to public agencies, regional development centers, state colleges and universities, and state agencies. Eligible projects include implementation of TMDL or Watershed Management Plans, BMP Demonstrations, and Information and Education Campaigns. | Federal, State | P | 2010 | 1-5 (depends on extent of application) | High (5) |

The purpose of Table 5B is to initiate and guide a “first-cut” evaluation of the capacity of existing, currently proposed, and future required management measures and activities to achieve the load reductions specified in the TMDL (and meet water quality goals) and where needed, identify potential feasible and effective measures and practices which could be encouraged and supported to further reduce pollutant loadings from significant potential sources. Though completely voluntary, such recommendations would provide an effective local guide to management actions to achieve local water quality goals, establish priorities for grant or loan programs (Section 319 (h), EQIP, SRF), establish eligibility for grants for Tier plans and implementation, and identify priorities for local watershed assessments and protection plans.

In Columns 1 and 2 of Table 5B, enter each significant potential source and its’ corresponding impact ratings from Table 3. Review Table 5A and list significant management practices and activities applicable to each significant cause or source. Evaluate and compare the estimated extent and relative contribution of each significant cause or source with the extent and effectiveness of the applicable management measures and in conjunction with appropriate local stakeholders or organizations, make a best current determination of whether the existing or proposed management practices would achieve the load reductions needed to achieve the TMDL. Summarize conclusions and rationale in Column 4. If more information is needed to adequately determine the significant sources or causes and their relative contributions so note and recommend management actions needed to adequately identify sources such as monitoring, watershed assessments, or Tier 1 implementation plans in the last column. If the current, proposed and required management measures are judged inadequate to achieve the needed load reductions for significant sources, recommend, in consultation with the advisory groups, additional management activities, programs, and measures which would effectively reduce pollutant loads from the source. List such measures in the final column and list as a recommended activity in the milestones (Table 8).

TABLE 5B: EVALUATION OF MANAGEMENT MEASURES AND ACTIVITIES APPLIED TO SPECIFIC SOURCES OR CAUSES

APPLICABLE SPECIFIC PARAMATER: SEDIMENT.

| SIGNIFICANT POTENTIAL SOURCE (S) OR CAUSE(S) (From Table 3) | IMPACT RATING (From Table 3) | EXISTING, CURRENTLY PROPOSED, OR REQUIRED MANAGEMENT MEASURES OR ENHANCEMENTS APPLICABLE TO EACH SIGNIFICANT SOURCE (From Table 5A) | EVALUATION: WILL THE ESTIMATED EXTENT OF APPLICATION AND EFFECTIVENESS OF EXISTING, CURRENTLY PROPOSED, AND REQUIRED MANAGEMENT MEASURES BE ADEQUATE TO ACHIEVE THE SOURCE REDUCTION SPECIFIED BY THE TMDL? | IF MANAGEMENT MEASURES ARE ESTIMATED TO BE INSUFFICIENT, RECOMMEND ADDITIONAL MANAGEMENT MEASURES AND ACTIVITIES WHICH COULD EFFECTIVELY REDUCE LOADS FROM SIGNIFICANT SOURCES |
|--|---------------------------------|---|---|--|
| Residential | 15 | Erosion and Sedimentation Control Certification Program | Application and enforcement of sedimentation control ordinances and permit requirements for new developments should achieve a large reduction (>75%) in sediment loads delivered from new construction. | |
| | | Local/County Land Development Guidelines | The development and revision of land development guidelines should achieve a large reduction (>50%) in sediment loads delivered from new construction | |
| | | New Development Ordinance Revision | | |
| Agriculture | 15 | Natural Resources Conservation Service-Environmental Quality Incentives Program | The effectiveness of EQIP and Section 319 measures strongly relies on Federal and State funding allotments. If adequate funding is provided, these measures can result in large (>75%) reductions in agricultural sediment loads. | |
| | | Georgia EPD- Section 319 Nonpoint Source Implementation Grant | | |
| | | Georgia Forestry Commission- -Georgia's Best Management Practices -Monthly BMP Assurance Exams | | |

| SIGNIFICANT POTENTIAL SOURCE (S) OR CAUSE(S) (From Table 3) | IMPACT RATING (From Table 3) | EXISTING, CURRENTLY PROPOSED, OR REQUIRED MANAGEMENT MEASURES OR ENHANCEMENTS APPLICABLE TO EACH SIGNIFICANT SOURCE (From Table 5A) | EVALUATION: WILL THE ESTIMATED EXTENT OF APPLICATION AND EFFECTIVENESS OF EXISTING, CURRENTLY PROPOSED, AND REQUIRED MANAGEMENT MEASURES BE ADEQUATE TO ACHIEVE THE SOURCE REDUCTION SPECIFIED BY THE TMDL? | IF MANAGEMENT MEASURES ARE ESTIMATED TO BE INSUFFICIENT, RECOMMEND ADDITIONAL MANAGEMENT MEASURES AND ACTIVITIES WHICH COULD EFFECTIVELY REDUCE LOADS FROM SIGNIFICANT SOURCES |
|--|---------------------------------|---|---|--|
| Streambank Erosion | 3 | Streambank stabilization practices- Section 319 Nonpoint Source Implementation Grant | Streambank stabilization practices should achieve >75% reduction of sediment delivery from the extent of streambank to which applied. | |
| Road Maintenance | 15 | Storm Water Management Audit/Assessment | Effectiveness of storm water management audit and assessment will depend on the storm water controls implemented in the BMP guidance document. | |
| | | Stormwater BMP Guidance Document for Municipal Operations | Additional maintenance of public roads and associated stormwater structures should achieve a large (>75%) reduction in sediment loads. | |
| | | Maintenance of roads and stormwater structures on private and public roads | Public education and associated maintenance of private roads should result in a large (>75%) reduction in sediment loads. | |

VII. MONITORING PLAN

The purposes of monitoring are to obtain more data to determine the sources of pollution, describe baseline conditions, and evaluate the effects of management and activities on water quality. Describe any sampling activities or other surveys - active, planned or proposed (including monitoring required for watershed assessments, or stormwater permits) - and their intended purpose. Reference the development and submission of a Sample Quality and Assurance Plan (SQAP) if monitoring for listing decisions.

Table 6. MONITORING PLAN

| PARAMETER (S) TO BE MONITORED | ORGANIZATION | STATUS (CURRENT, PROPOSED, PLANNED) | TIME FRAME | | PURPOSE (If for delisting, date of SQAP submission) |
|---|---|---|------------|---------|---|
| | | | START | END | |
| Water temperature, stream discharge, dissolved oxygen, ammonia, nitrates, phosphates, turbidity, total solids, conductivity, alkalinity, pH, copper, lead, and zinc | Hiawasse River Watershed Coalition/ Tennessee Valley Authority | Current | 2003 | Ongoing | General Monitoring |

VIII. PLANNED OUTREACH FOR IMPLEMENTATION

List and describe outreach activities, including those described in the Scope of Services that will be conducted to support this plan and the implementation of it.

Table 7. PLANNED OUTREACH

| RESPONSIBILITY | DESCRIPTION | AUDIENCE | DATE |
|--|--|---|--------------|
| Hiwassee River Watershed Coalition | Education through monthly newsletter to members. | Members of the HRWC | Ongoing |
| Hiwassee River Watershed Coalition | Student education program for students in grades 4 through college. | Students | Ongoing |
| Hiwassee River Watershed Coalition | Civic and governmental education at request of organization | Civic or Governmental Groups | Ongoing |
| Hiwassee River Watershed Coalition | Site demonstrations, field tours, and workshops | Professionals or Governments | Ongoing |
| Natural Resources Conservation Service | -Education for the general public and -EQIP Program | Agricultural Landowners | Ongoing |
| Resource Conservation and Development | -Education | Agricultural Landowners | Ongoing |
| Georgia Mountains RDC | Complete plan outreach activities as specified in Section 106 grant funded contract. | Local governments, major stakeholders, public | June 1, 2006 |

IX. MILESTONES/ MEASURES OF PROGRESS OF BMPs AND OUTREACH

This table will be used to periodically track and report progress of significant management practices and activities identified or recommended in Tables 5A, 5B, and other sections of this plan, including outreach, additional monitoring and assessments, and the enhancement or installation of management measures and activities. Identify and list significant planned or recommended activities and the target date of accomplishment. Provide room to comment on the effectiveness of the management measure, how much support the measure was given by the community, what was learned, how the measure might be improved in the future, and any other observations made. This table can be "pulled out" of this template and used to report and track progress.

Table 8. MILESTONES

| MANAGEMENT MEASURE OR ACTIVITY | RESPONSIBLE ORGANIZATIONS | STATUS | | COMMENT |
|---|---|----------|-----------|---|
| | | PROPOSED | INSTALLED | |
| Georgia Basin Management Plan-Tennessee River Basin | GA DNR | X | | To be completed 2006 |
| Georgia Erosion and Sedimentation Permit Amendment | GA DNR, GA Soil and Water Conservation Commission, Union County | X | | To be initiated December 31, 2006 |
| Storm Water Audit and Assessment | Union County | X | | Proposed assessment to be initiated by 2015 |
| Storm Water BMP Guidance Document | Union County | X | | BMP guidance document to be completed after storm water assessment is complete |
| Revision of new development ordinances | Union County | X | | Proposed revision to be initiated by 2007 with additional revisions on a 3-5 year schedule. |

{NOTTELY RIVER}

COMPLETE THE FOLLOWING TABLES FOR AND NARRATIVES ABOUT EACH IMPAIRED STREAM IN THE WATERSHED.

| STREAM SEGMENT NAME | LOCATION | MILES/AREA | DESIGNATED USE | PS/NS |
|---------------------|---------------------------|------------|----------------|-------|
| Nottely River | US Hwy 19 to Lake Nottely | 8 | Fishing | NS |

III. SOURCES AND CAUSES OF STREAM SEGMENT IMPAIRMENT LISTED IN TMDLs

After reviewing the TMDLs written for this stream, complete the following tables with the information found in the TMDLs. List each parameter for which the stream segment is impaired and the water quality standard not met. See the “Instructions for Completing the Georgia Total Maximum Daily Load (TMDL) Tier 2 Implementation Plan” for the water quality standards. Enter the needed reduction from the TMDL. Describe the sources and causes of each impairment identified in the TMDLs.

Table 2. SOURCES OF IMPAIRMENT AS INDICATED IN TMDLs

Nottely River

| PARAMETER 1 | WQ STANDARD | SOURCES OF IMPAIRMENT | NEEDED REDUCTION FROM TMDL |
|----------------|---|------------------------|----------------------------|
| Fecal Coliform | May-October: 200 (counts/100ml) Geometric Mean November-April: 1000 (counts/100ml) Geometric Mean or; 4,000 (counts/100ml) Single Sample | Nonpoint Sources | 70% |
| | | Agricultural Livestock | |
| | | Urban Sources | |

IV. IDENTIFICATION AND RANKING OF POTENTIAL SOURCES OR CAUSES OF IMPAIRMENT

INVESTIGATE AND EVALUATE the extent and relative contributions from causes or sources of the impairment for each parameter listed in Table 2. Write a narrative describing efforts made or procedures used to verify the significance and extent of the sources or causes of each impairment listed in the TMDLs. Include: 1) involvement of stakeholder group; 2) review of land cover data; 3) field surveys; and 4) other pertinent sources of information consulted.

Methods of identifying and ranking potential sources or causes of impairment included a visual field survey of the watershed and discussion with members of the stakeholder group. A visual field survey was conducted for the Nottely River watershed, which included an evaluation of in-stream and watershed characteristics (Appendix F). A stakeholder meeting schedule was established to provide local input into the development of the TMDL Implementation Plan. This schedule allowed for three stakeholder meetings, which provided for focused discussion regarding the listed segment. During the first meeting, selected images of the watershed were presented to the stakeholder group to provide a characterization of existing conditions within the watershed and to facilitate discussion regarding potential causes of impairment. The second meeting focused local knowledge provided by the stakeholders to identify sources or causes of impairment through a mapping exercise that identified "hot spots" or areas of specific concern on a watershed map (Appendix G). The information collected from the first two meetings was then used to rank potential sources of impairment, which were presented to the stakeholder group for review and modification during the third and final stakeholder meeting. A description of the land use data used for the development of the TMDL Implementation Plan is provided below.

The Nottely River watershed upstream of Lake Nottely covers over 53,800 acres, of which 28,400 acres are under the management of the USDA Forest Service. A land use classification was performed for the development of the TMDL from the 1995 Georgia National Land Cover Dataset (NLCD), which identifies forest; pasture, hay; and row crops as being the predominant land uses within the watershed at that time.

1995 NLCD Land Use Data-Nottely River Watershed

| Landuse Category | Open Water | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Quarries, Strip Mines, Gravel Pits | Transitional | Forest | Row Crops | Pasture, Hay | Total |
|------------------|------------|----------------------------|---|------------------------------------|--------------|--------|-----------|--------------|--------|
| Acres | 32 | 51 | 33 | 69 | 9 | 50,500 | 453 | 2632 | 53,784 |

1995 NLDC Percent Total Land Cover-Nottely River Watershed

| Landuse Category | Open Water | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Quarries, Strip Mines, Gravel Pits | Transitional | Forest | Row Crops | Pasture, Hay | Total |
|--------------------------|------------|----------------------------|---|------------------------------------|--------------|--------|-----------|--------------|--------|
| Percent Total Land Cover | 0.06 | 0.09 | 0.06 | 0.13 | 0.02 | 93.89 | 0.84 | 4.89 | 100.00 |

The TVA collected the most accurate land use data for the Nottely River watershed in 2001. These data indicated substantial changes in the distribution of land use within the watershed. While each of the major land uses identified in the TMDL still account for significant portions of the land cover, low intensity residential developments are becoming increasingly common throughout the watershed and forestland is declining. Much of the residential development is occurring as a result of the construction of second home and vacation residential units, which are being located on moderate to steep slopes throughout the watershed. Agricultural activity relating to fecal coliform within the watershed includes abundant cattle grazing, equestrian activities, and a limited amount of swine production.

2001 TVA Land Use Data-Percent Total Land Cover-Nottely River Watershed

| Description | Residential | Commercial | Industrial | Row Crops (residue 0-10%) | Row Crops (residue >30%) | Row Crops Medium Residue | Good Pasture | Fair Pasture | Heavily Overgrazed |
|--------------------------|-------------|------------|------------|---------------------------|--------------------------|--------------------------|--------------|--------------|--------------------|
| Percent Total Land Cover | 3.87 | 0.28 | 0.13 | 0.53 | 0.16 | 0.81 | 0.14 | 7.23 | 1.65 |

| Feedlot | Orchards | Poultry Operation | Shrub and Brush | Forest Land | Clear Cut | Water | Strip Mines | Total |
|---------|----------|-------------------|-----------------|-------------|-----------|-------|-------------|-------|
| 0.01 | 0.13 | 0.05 | 0.33 | 84.05 | 0.19 | 0.24 | 0.2 | 100% |

Combining information provided in the TMDL document, stakeholder knowledge, existing watershed assessments, and the watershed evaluation conducted for this plan, identify the potential sources or causes most likely to contribute to each identified impairment (parameter) in Table 3. If available information is inadequate to estimate the extent and relative contribution of significant potential sources or causes, recommend appropriate management actions (watershed assessments, monitoring, etc.) to determine the potential sources or causes and relative contributions. In Table 3, list the significant potential sources or causes of each impairment. Estimate the geographic extent of each potential source or cause as percent of the contributing watershed area, percent of stream miles affected, or number per square mile and enter the appropriate rating (from the following table) in the column entitled “Rating (A)”. Estimate the relative contribution of each major source or cause to the pollutant causing the impairment and enter the appropriate rating (from the following table) in the column entitled “Rating (B)”. Calculate a relative impact ratings for each source or cause by multiplying “Rating (A)” by “Rating (B)”. Comments on the source of information used to determine the extent or contribution may be entered in the applicable columns in Table 3.

The following table provides guidance for rating the estimated extent and portion of the contribution from each potential source and cause.

| Estimated Geographic Extent of the Source or Cause in the Contributing Watershed (Percent of area or stream miles) | Estimated Contribution of the Source or Cause to the Pollutant Load Causing the Impairment (Percent of load) | Rating |
|---|---|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | 0.5 |
| Scattered or low (approximately 5-20%) | Scattered or low (approximately 5-20%) | 1 |
| Medium (approximately 20-50%) | Medium (approximately 20-50%) | 3 |
| Widespread or high (approximately 50% or more) | Widespread or high (approximately 50% or more) | 5 |
| Unknown | Unknown | UNK |

Table 3. CONCLUSIONS MADE OF POTENTIAL SOURCES OF STREAM SEGMENT IMPAIRMENT

PARAMETER 1: Fecal Coliform.

| POTENTIAL SOURCES OR CAUSES | ESTIMATED EXTENT OF CONTRIBUTION | | ESTIMATED PORTION OF CONTRIBUTION | | IMPACT RATING (A X B) |
|------------------------------------|---|-------------------|--|-------------------|------------------------------|
| | Comments | Rating (A) | Comments | Rating (B) | |
| Agricultural Practices | Widespread | 5 | High | 5 | 25 |
| Septic Systems | Widespread | 3 | Medium | 3 | 9 |

V. STAKEHOLDERS

PUBLIC INVOLVEMENT AND THE ACTIVE PARTICIPATION OF STAKEHOLDERS is essential to the process of preparing TMDL implementation plans and improving water quality. Stakeholders can provide valuable information and data regarding their community, impaired water bodies, potential causes of impairments, and management practices and activities which may be employed to reduce the impacts of the causes of impairment.

Describe outreach activities to advise and engage stakeholders in the TMDL implementation plan preparation process. Describe the stakeholder group employed or formed to address the impaired segments in the watershed. Summarize the results of the number of attendees and meetings and describe major findings, recommendations, and approvals.

Stakeholders were notified through a mailed announcement that provided a description of the meeting purpose, meeting schedule, and location. Notified stakeholders included local government officials, regional representatives, state and federal government agencies, environmental organizations, educational institutions, and businesses within the watershed. Citizens and business owners were also approached during the field survey in an effort to promote additional participation. Additional outreach was provided through the Upper Hiwassee River Watershed Coalition (UHRWC), who publicized the TMDL stakeholder meetings in its monthly newsletter. The stakeholder meeting announcement and meeting schedule were also placed on the announcement board at the 4 Rivers Fly Shop in Blairsville. Three meetings were held to 1) provide background information regarding the TMDL process, describe the stream's impairment, and characterize the watershed, 2) identify additional sources of pollution and select management measures, and 3) develop milestones and comment on the draft implementation plan. Stakeholder attendance was lower than expected with participation ranging from two to five stakeholders. In total, seven stakeholders participated in the development of the TMDL Implementation Plan. These stakeholders represented the Hiwassee River Watershed Coalition, TVA, City of Blairsville, the Georgia Mountains Regional Development Center, and the general public.

Stakeholders identified agricultural activity and improperly maintained septic systems within the Nottely River watershed as likely contributors to high fecal coliform loads in the stream. Cattle grazing is the most common agricultural use within the Nottely River watershed. Practices for minimizing fecal coliform inputs associated with cattle grazing should focus on cost efficient, voluntary management measures that can be adopted by local landowners. Continued outreach through the NRCS and the RC&D is essential. Residential developments are also likely sources of fecal coliform input into the Nottely River. Older residential housing units are scattered throughout the watershed. The maintenance of septic systems for these older houses is often neglected by property owners, resulting in poorly functioning septic systems and untreated discharge of effluent into nearby waterbodies. New residential developments have also been identified as possible sources for high fecal coliform levels in the Nottely River. Many new residences have been constructed on ridge tops and steep slopes. While the stakeholders noted that the County Health Department performs an admirable job during the septic system site inspection and permitting process, unforeseen site limitations such as depth to bedrock, unexpected soil characteristics, and slight changes in the placement and construction of septic systems and drainfields may be leading to fecal coliform pollution. Maintenance service providers for septic systems are also facing difficulty due to a lack of waste disposal sites. This is increasing prices for septic maintenance and results in fewer general maintenance calls and increased pollution from poorly functioning septic systems. Educational outreach programs focused towards homeowners with septic systems can be accomplished through the County Health Department, Georgia Mountains Regional Development Center, and other local or regional organizations.

List the watershed stakeholder advisory group committee members, described in Project Task #1 of the Scope of Services, in following table.

Table 4. STAKEHOLDER ADVISORY GROUP MEMBERS

| NAME/ORG | ADDRESS | CITY | STATE | ZIP | PHONE | E-MAIL |
|--|-------------------------|-------------|-------|-------|----------------|------------------------------|
| Chris Ernst Georgia Mountains RDC | P.O. Box 1720 | Gainesville | GA | 30501 | (770) 538-2621 | cernst@grmdc.org |
| Larry Stephens City of Blairsville | 1069 Nix Drive | Blairsville | GA | | (706) 745-2198 | blairsvillewater@hotmail.com |
| Scott Lea Tennessee Valley Authority | 101 Market St. PSC-1E | Chattanooga | TN | 37402 | (423) 876-6739 | jslea@tva.gov |
| Callie Dobson Hiwassee River Watershed Coalition | 87 Upper Peachtree Road | Murphy | NC | 28906 | (828) 837-5414 | hrwcoalition@brmemc.net |
| Nancy Triestram Citizen | 6723 Millie Circle | Blairsville | NC | 30512 | (706) 745-8429 | nanceet@alltel.net |
| Doug Triestram Citizen | 6723 Millie Circle | Blairsville | NC | 30512 | (706) 745-8429 | doug2@alltel.net |
| David Rathyen Citizen | | | | | (706) 745-0763 | |

In Appendix A, list the names, addresses, telephone numbers, and e-mail addresses for local governments, agricultural or commercial forestry organizations, significant landholders, businesses and industries, and local organizations including environmental groups and individuals with a major interest in this watershed, as described in Project Task #1 of the Scope of Services.

VI. MANAGEMENT MEASURES AND ACTIVITIES

Identify and list in Table 5A the significant management measures or activities which have or will be taken in the contributing watershed to address sources or causes of the impairment(s). List significant management measures and activities in Column 1 and responsible organizations in Column 2. Describe the measure or activity in Column 3 and sources of funding or resources in Column 4 (you may wish to adapt the generic language included in the “Standard Language for Management Measures and Activities” to local applications) In Column 5, enter one of the following codes describing the status of the measure or activity: (A) installed and active; (AE) active and **will be** enhanced or expanded; (R) required in the future by law, regulation or permit conditions; (P) currently proposed, but not required; and (N/R) **additional new recommended** or (N/E) **recommended enhanced** management measures and activities. In Column 6 enter the rating of the estimated existing or proposed extent of application of the measure or activity or percentage of individual sources to which the management actions have or will be applied (see the following table). In Column 7 enter a rating of the estimated effectiveness of the management measures and activities (see following table). Effectiveness may be estimated by local experts or derived from tables included in the “Standard Language for Management Measures and Activities”.

The following table provides guidance for rating the estimated extent and portion of the contribution for each significant potential source and cause.

| Estimated Extent of Application or Percentage of Individual Sources to Which the Mangement Measure or Activity Has or Will be Applied in the Contributing Watershed | Estimated Effectiveness or Percent Removal of Constituent (Percent of load) | Rating |
|--|--|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | .5 |
| Scattered or low (approximately 5-20%) | Low to medium (approximately 5-25%) | 1 |
| Medium (approximately 20-50%) | Medium to High (approximately 25-75%) | 3 |
| Widespread or high (approximately 50% or more) | High (approximately 75% or more) | 5 |
| Unknown | Unknown | UNK |

Table 5A. MANAGEMENT MEASURES AND ACTIVITIES

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| MEASURE | RESPONSIBILITY | DESCRIPTION | SOURCES OF FUNDING & RESOURCES | STATUS CODE | TARGET DATE | EXTENT RATING (Area, #) | EFFECT. RATING (Reduction) |
|-------------------------------------|---|--|---|-------------|-------------|-------------------------|----------------------------|
| Federal Clean Water Act | USEPA, Georgia DNR/EPD | The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 305 requires states to report progress in restoring impaired waters to EPA on a biennial basis. Section 303(d) requires states to identify "impaired" waters, submit a list to EPA every two years, and develop TMDLs for these waters. | Federal, State | AE | Ongoing | 5 (High) | Medium (3) |
| Federal Clean Water Act Section 404 | EPA (situations involving forestry are normally referred to the GFC to determine compliance with this regulation) | Requires normal ongoing agricultural and silvicultural practice to adhere to BMPs and 15 baseline provisions for road construction and maintenance in and across waters of the US including lakes, rivers, perennial and intermittent streams, wetlands, sloughs in order to qualify for the exemption from the permitting process. | Federal | A | Ongoing | High (5) | Medium-High (4) |
| Georgia Water Quality Control Act | Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 | Law prohibiting discharge of excessive pollutants (sediments, nutrients, pesticides, animal wastes, etc.) into waters of the State in amounts harmful to public health, safety, or welfare, or to animals, birds, or aquatic life or the physical destruction of stream habitats. | Federal, State, Union County, Blairsville | A | Ongoing | High (5) | Medium-High (4) |

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| MEASURE | RESPONSIBILITY | DESCRIPTION | SOURCES OF FUNDING & RESOURCES | STATUS CODE | TARGET DATE | EXTENT RATING (Area, #) | EFFECT. RATING (Reduction) |
|--|--|--|--|-------------|-------------|-------------------------|----------------------------|
| Georgia Planning Act | Union County, Blairsville | Coordinated Planning Program, managed by Georgia DCA, assigns local governments Environmental Planning Criteria (set by Georgia DNR) to include in local long-term comprehensive plans: Water Supply Watersheds, Groundwater, Wetlands, Protected Rivers, Protected Mountains. Program also requires local governments to identify Developments of Regional Impact (DRI) and develop plans to protect and manage Regional Impact Resources (RIR). | Union County, City of Blairsville | A | Ongoing | Medium (3) | Medium-High (4) |
| Georgia River Basin Management Planning Act, Georgia Code Section 12-5-521 | Georgia DNR/EPD | River Basin Management Plans describe strategies and measures necessary for local governments, businesses, and citizen groups to educate the general public on matters involving the environmental and ecological concerns specific to the river basin; improve water quality and reduce pollution at the source; improve aquatic habitat and reestablish native species of fish; restore and protect wildlife habitat; and provide recreational benefits. | State, Union County, City of Blairsville | R | 2006 | High (5) | Medium (3) |
| Farm Bill 2002 | United States Department of Agriculture / NRCS | Enhances long-term quality of our environment and conservation of our natural resources. This bill provides several opportunities for receiving grants to improve water quality. | Federal Cost-Share and Incentive Programs. | A | Ongoing | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: FECAL COLIFORM.

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|---|--|---|--------|---|---------------|-----------------|
| Storm Water Management Audit/ Assessment | Union County, Blairsville | Internal assessment of storm water pollution prevention plan (map of facility and responsibilities for upkeep): municipal operations, trend monitoring, source detection, septic system controls, storm drain system cleaning, storm water detention basins maintenance, spill response and prevention, materials management, leaking fluids from vehicles, and street sweeping. The county needs to ensure that they are meeting all applicable storm water requirements. | Union County City of Blairsville | P | Union County: 2015 Blairsville: 2011 | Low (2) | Medium-High (4) |
| Storm Water BMP Guidance Document for Municipal Operations | Union County, Blairsville | Following the audit/assessment, prepare a BMP procedures and guidance manual for county and the cities departments to minimize impact of municipal operations on storm water runoff. This document should address all of the activities identified in the audit/assessment and focus on any common problem areas identified. | Union County, City of Blairsville | P | Union County: 2016 Blairsville: 2012 | Medium (3) | Medium-High (4) |
| Environmental Quality Incentives Program (EQIP) | Natural Resources Conservation Services | Voluntary program that provides technical and cost share assistance for protection of ground and surface water, erosion control, air quality, wildlife habitat, and plant health. | Federal 50% cost share with possible additional incentive payments | A | Ongoing | High (5) | Medium-High (4) |

APPLICABLE TO SPECIFIC PARAMETER: FECAL COLIFORM.

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|---------------------------|--|---|--------|-------------|---------------------------------------|----------------|
| Section 319(h) Non-point Source Implementation Grant | Georgia DNR/EPD | Funds distributed through a competitive process to public agencies, regional development centers, state colleges and universities, and state agencies. Eligible projects include implementation of TMDL or Watershed Management Plans, BMP Demonstrations, and Information and Education Campaigns. | Federal, State | P | 2010 | 1-5 (depending on application extent) | High (5) |
| New Development Ordinance Revision | Union County, Blairsville | Review current local Erosion and Sedimentation Control ordinances and modify as appropriate. Include requirements for professionals involved in erosion and sediment control design and construction to be certified by the county. Require pollution prevention at the construction site through preparation of Erosion, Sedimentation & Pollution Control Plan to address issues such as trash, construction debris, leaking vehicles, storage of chemicals, etc. Subdivision ordinances addressing channel protection and conservation will provide further guidelines for construction activities. | Union County, City of Blairsville | P | 2007 | High (5) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETERS: FECAL COLIFORM.

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|-------------------------------------|--|---|--------|-------------|---------------|-----------------|
| Regulation of On-Site Sewage Management Systems, IAW O.C.G.A 290-5-26 | Georgia DHR, County Board of Health | Rules and regulations for installation and repair of on-site sewage management systems. | State, Union County Board of Health | A | Ongoing | High (5) | High (5) |
| Chapter 40-13-8 Animal Manure Handlers Rules of Georgia Department of Agriculture Animal Industry Division | Georgia Department of Agriculture | This requires that persons engaged in removing animal manure from livestock/poultry production areas, transporting animal manure on public roadways, or depositing animal manure to a premise other than its point of origin obtain a permit and follow rules to control animal disease, and outlines regulations for transportation, equipment and storage. | State | A | Ongoing | High (5) | Medium-High (4) |

The purpose of Table 5B is to initiate and guide a “first-cut” evaluation of the capacity of existing, currently proposed, and future required management measures and activities to achieve the load reductions specified in the TMDL (and meet water quality goals) and where needed, identify potential feasible and effective measures and practices which could be encouraged and supported to further reduce pollutant loadings from significant potential sources. Though completely voluntary, such recommendations would provide an effective local guide to management actions to achieve local water quality goals, establish priorities for grant or loan programs (Section 319 (h), EQIP, SRF), establish eligibility for grants for Tier plans and implementation, and identify priorities for local watershed assessments and protection plans.

In Columns 1 and 2 of Table 5B, enter each significant potential source and its’ corresponding impact ratings from Table 3. Review Table 5A and list significant management practices and activities applicable to each significant cause or source. Evaluate and compare the estimated extent and relative contribution of each significant cause or source with the extent and effectiveness of the applicable management measures and in conjunction with appropriate local stakeholders or organizations, make a best current determination of whether the existing or proposed management practices would achieve the load reductions needed to achieve the TMDL. Summarize conclusions and rationale in Column 4. If more information is needed to adequately determine the significant sources or causes and their relative contributions so note and recommend management actions needed to adequately identify sources such as monitoring, watershed assessments, or Tier 1 implementation plans in the last column. If the current, proposed and required management measures are judged inadequate to achieve the needed load reductions for significant sources, recommend, in consultation with the advisory groups, additional management activities, programs, and measures which would effectively reduce pollutant loads from the source. List such measures in the final column and list as a recommended activity in the milestones (Table 8).

TABLE 5B: EVALUATION OF MANAGEMENT MEASURES AND ACTIVITIES APPLIED TO SPECIFIC SOURCES OR CAUSES

APPLICABLE SPECIFIC PARAMETER: FECAL COLIFORM

| SIGNIFICANT POTENTIAL SOURCE (S) OR CAUSE(S) (From Table 3) | IMPACT RATING (From Table 3) | EXISTING, CURRENTLY PROPOSED, OR REQUIRED MANAGEMENT MEASURES OR ENHANCEMENTS APPLICABLE TO EACH SIGNIFICANT SOURCE (From Table 5A) | EVALUATION: WILL THE ESTIMATED EXTENT OF APPLICATION AND EFFECTIVENESS OF EXISTING, CURRENTLY PROPOSED, AND REQUIRED MANAGEMENT MEASURES BE ADEQUATE TO ACHIEVE THE SOURCE REDUCTION SPECIFIED BY THE TMDL? | IF MANAGEMENT MEASURES ARE ESTIMATED TO BE INSUFFICIENT, RECOMMEND ADDITIONAL MANAGEMENT MEASURES AND ACTIVITIES WHICH COULD EFFECTIVELY REDUCE LOADS FROM SIGNIFICANT SOURCES |
|--|---------------------------------|---|--|--|
| Agricultural Practices | 25 | Natural Resources Conservation Service-Environmental Quality Incentives Program | The effectiveness of the EQIP and Section 319 programs strongly relies on Federal and State funding and will be dependant on the extent of area to which they are applied. If adequate funding is provided, these measures will be effective. EQIP program should focus on streambank and water body protection and critical area planting, while Section 319 funding should include fecal coliform monitoring and septic tank failure detection, correction, and education. | |
| | | Georgia EPD- Section 319 Nonpoint Source Implementation Grant | | |
| Septic Systems | 9 | Educational Outreach-Union County Health Department/ Georgia Mountains RDC | Effectiveness will very on participation. | |
| | | Georgia Planning Act -Water Supply Watershed Protection | Adoption of Water Supply Watershed Protection measures that satisfy the requirements of GA DNR and GA DCA would provide additional streambank and water quality protection and should achieve a large (>75%) effectiveness to the area in which they are applied. | |

| SIGNIFICANT POTENTIAL SOURCE (S) OR CAUSE(S) (From Table 3) | IMPACT RATING (From Table 3) | EXISTING, CURRENTLY PROPOSED, OR REQUIRED MANAGEMENT MEASURES OR ENHANCEMENTS APPLICABLE TO EACH SIGNIFICANT SOURCE (From Table 5A) | EVALUATION: WILL THE ESTIMATED EXTENT OF APPLICATION AND EFFECTIVENESS OF EXISTING, CURRENTLY PROPOSED, AND REQUIRED MANAGEMENT MEASURES BE ADEQUATE TO ACHIEVE THE SOURCE REDUCTION SPECIFIED BY THE TMDL? | IF MANAGEMENT MEASURES ARE ESTIMATED TO BE INSUFFICIENT, RECOMMEND ADDITIONAL MANAGEMENT MEASURES AND ACTIVITIES WHICH COULD EFFECTIVELY REDUCE LOADS FROM SIGNIFICANT SOURCES |
|--|---------------------------------|---|---|--|
| Septic Systems (continued) | 9 | New Development Ordinance Revision | New development ordinance revisions are expected to provide a large (>75%) reduction in fecal coliform loadings. Revisions should occur on a 3-5 year schedule | |

VII. MONITORING PLAN

The purposes of monitoring are to obtain more data to determine the sources of pollution, describe baseline conditions, and evaluate the effects of management and activities on water quality. Describe any sampling activities or other surveys - active, planned or proposed (including monitoring required for watershed assessments, or stormwater permits) - and their intended purpose. Reference the development and submission of a Sample Quality and Assurance Plan (SQAP) if monitoring for listing decisions.

Table 6. MONITORING PLAN

| PARAMETER (S) TO BE MONITORED | ORGANIZATION | STATUS (CURRENT, PROPOSED, PLANNED) | TIME FRAME | | PURPOSE (If for delisting, date of SQAP submission) |
|---|--|---|------------|---------|---|
| | | | START | END | |
| Water temperature, stream discharge, dissolved oxygen, ammonia, nitrates, phosphates, turbidity, total solids, conductivity, alkalinity, pH, copper, lead, and zinc | Hiawassee River Watershed Coalition/ Tennessee Valley Authority | Current | 2003 | Ongoing | General Monitoring |
| Fecal Coliform | Hiawassee River Watershed Coalition | Proposed | 2009 | Ongoing | General monitoring and delisting where appropriate. |

VIII. PLANNED OUTREACH FOR IMPLEMENTATION

List and describe outreach activities, including those described in the Scope of Services that will be conducted to support this plan and the implementation of it.

Table 7. PLANNED OUTREACH

| RESPONSIBILITY | DESCRIPTION | AUDIENCE | DATE |
|---|--|---|--------------|
| Hiwassee River Watershed Coalition | Education through monthly newsletter to members. | Members of the HRWC | Ongoing |
| Hiwassee River Watershed Coalition | Student education program for students in grades 4 through college. | Students | Ongoing |
| Hiwassee River Watershed Coalition | Civic and governmental education at request of organization | Civic or Governmental Groups | Ongoing |
| Hiwassee River Watershed Coalition | Site demonstrations, field tours, and workshops | Professionals and Governmental Groups | Ongoing |
| Natural Resources Conservation Service | Education EQIP Program | Agricultural Landowners | Ongoing |
| Chestatee-Chattahoochee Resource Conservation and Development | Education | Agricultural Landowners | Ongoing |
| Union County Board of Health | Septic system maintenance education | Residential Landowners | Ongoing |
| Georgia Mountains RDC | Complete plan outreach activities as specified in Section 106 grant funded contract. | Local governments, major stakeholders, public | June 1, 2006 |

IX. MILESTONES/ MEASURES OF PROGRESS OF BMPs AND OUTREACH

This table will be used to periodically track and report progress of significant management practices and activities identified or recommended in Tables 5A, 5B, and other sections of this plan, including outreach, additional monitoring and assessments, and the enhancement or installation of management measures and activities. Identify and list significant planned or recommended activities and the target date of accomplishment. Provide room to comment on the effectiveness of the management measure, how much support the measure was given by the community, what was learned, how the measure might be improved in the future, and any other observations made. This table can be "pulled out" of this template and used to report and track progress.

Table 8. MILESTONES

| MANAGEMENT MEASURE OR ACTIVITY | RESPONSIBLE ORGANIZATIONS | STATUS | | COMMENT |
|--|--|----------|-----------|---|
| | | PROPOSED | INSTALLED | |
| Section 319 Nonpoint Source Implementation Grant | Hiwassee River Watershed Coalition and Georgia Mountains RDC | X | | Grant funding should provide assistance for fecal coliform monitoring and septic system failure detection. |
| Water Supply Watershed Protection Measures | Union County | X | | Adoption of a GA DNR and GA DCA approved water supply watershed ordinance should provide significant fecal coliform load reductions from stormwater runoff and septic system failure. |
| New Development Ordinance Revision | Union County, Blairsville | X | | Proposed revision to be initiated by 2007 with additional revisions on a 3-5 year schedule. |

{YOUNGCANE CREEK}

COMPLETE THE FOLLOWING TABLES FOR AND NARRATIVES ABOUT EACH IMPAIRED STREAM IN THE WATERSHED.

| STREAM SEGMENT NAME | LOCATION | MILES/AREA | DESIGNATED USE | PS/NS |
|---------------------|--|------------|----------------|-------|
| Youngcane Creek | Little Youngcane Creek to Nottely Lake | 4 | Fishing | NS |

III. SOURCES AND CAUSES OF STREAM SEGMENT IMPAIRMENT LISTED IN TMDLs

After reviewing the TMDLs written for this stream, complete the following tables with the information found in the TMDLs. List each parameter for which the stream segment is impaired and the water quality standard not met. See the "Instructions for Completing the Georgia Total Maximum Daily Load (TMDL) Tier 2 Implementation Plan" for the water quality standards. Enter the needed reduction from the TMDL. Describe the sources and causes of each impairment identified in the TMDLs.

Table 2. SOURCES OF IMPAIRMENT AS INDICATED IN TMDLs

Youngcane Creek

| PARAMETER 1 | WQ STANDARD | SOURCES OF IMPAIRMENT | NEEDED REDUCTION FROM TMDL |
|----------------|---|-----------------------|----------------------------|
| Fecal Coliform | May-October: 200 (counts/100ml) Geometric Mean November-April: 1000 (counts/100ml) Geometric Mean or; 4,000 (counts/100ml) Single Sample | Nonpoint Sources | 73% |
| | | Urban Sources | |
| | | Agricultural Sources | |
| | | | |

IV. IDENTIFICATION AND RANKING OF POTENTIAL SOURCES OR CAUSES OF IMPAIRMENT

INVESTIGATE AND EVALUATE the extent and relative contributions from causes or sources of the impairment for each parameter listed in Table 2. Write a narrative describing efforts made or procedures used to verify the significance and extent of the sources or causes of each impairment listed in the TMDLs. Include: 1) involvement of stakeholder group; 2) review of land cover data; 3) field surveys; and 4) other pertinent sources of information consulted.

Methods of identifying and ranking potential sources or causes of impairment included a visual field survey of the watershed and discussion with members of the stakeholder group. A visual field survey was conducted for Youngcane Creek watershed, which included an evaluation of in-stream and watershed characteristics (Appendix H). A stakeholder meeting schedule was established to provide local input into the development of the TMDL Implementation Plan. This schedule allowed for three stakeholder meetings, which provided for focused discussion regarding the listed segment. During the first meeting, selected images of the watershed were presented to the stakeholder group to provide a characterization of existing conditions within the watershed and to facilitate discussion regarding potential causes of impairment. The second meeting focused local knowledge through discussion with stakeholders to identify sources or causes of impairment. The information collected from the first two meetings was then used to rank potential sources of impairment, which were presented to the stakeholder group for review and modification during the third and final stakeholder meeting. A description of the land use data used for the development of the TMDL Implementation Plan is provided below.

The Youngcane Creek watershed covers 18,300 acres in southwestern Union County. A land use classification was performed for the development of the TMDL using the 1995 Georgia National Land Cover Dataset (NLCD). The land cover analysis identifies forest, pasture, and row crops as the predominant land uses in the watershed at that time.

1995 NLCD Land Use Data-Youngcane Creek Watershed

| Land Use Classification | Open Water | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Forest | Row Crops | Pasture, Hay | Total |
|-------------------------|------------|----------------------------|---|--------|-----------|--------------|--------|
| Acres | 4 | 2 | 39 | 15,562 | 243 | 2,459 | 18,309 |

1995 NLDC Percent Total Land Cover-Youngcane Creek Watershed

| Land Use Classification | Open Water | High Intensity Residential | High Intensity Commercial, Industrial, Transportation | Forest | Row Crops | Pasture, Hay | Total |
|--------------------------|------------|----------------------------|---|--------|-----------|--------------|-------|
| Percent Total Land Cover | 0 | 0 | 0.2 | 85 | 1.3 | 13.4 | 100% |

The most accurate land use data for Youngcane Creek watershed was collected by the TVA in 2001. These data indicated substantial changes in the distribution of land use within the watershed. While each of the major land uses identified in the TMDL still account for significant proportions of the land cover, the percentage of row crops have dropped and residential land uses have increased substantially. The visual field survey and stakeholder comments indicate that the proportion of residential lands continues to increase.

2001 TVA Land Use Data-Percent Total Land Cover-Youngcane Creek Watershed

| Description | Residential | Commercial | Transportation/Communication /Utilities | Row Crop (residue 0-10%) | Row Crop (residue >30%) | Row Crop (residue 10-30%) | Good Pasture | Fair Pasture | Woodland Pasture (10% or greater crown cover) |
|--------------------------|-------------|------------|---|--------------------------|-------------------------|---------------------------|--------------|--------------|---|
| Percent Total Land Cover | 3.40 | 0.21 | 0.34 | 0.02 | 0.23 | 0.20 | 1.06 | 11.15 | 0.02 |

| Heavily Overgrazed Pasture | Feedlot | Poultry Operation | Shrub and Brush | Forest Land | Clear Cut | Water | Total |
|----------------------------|---------|-------------------|-----------------|-------------|-----------|-------|--------|
| 1.91 | 0.01 | 0.28 | 0.18 | 79.36 | 0.28 | 1.35 | 100.00 |

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Combining information provided in the TMDL document, stakeholder knowledge, existing watershed assessments, and the watershed evaluation conducted for this plan, identify the potential sources or causes most likely to contribute to each identified impairment (parameter) in Table 3. If available information is inadequate to estimate the extent and relative contribution of significant potential sources or causes, recommend appropriate management actions (watershed assessments, monitoring, etc.) to determine the potential sources or causes and relative contributions. In Table 3, list the significant potential sources or causes of each impairment. Estimate the geographic extent of each potential source or cause as percent of the contributing watershed area, percent of stream miles affected, or number per square mile and enter the appropriate rating (from the following table) in the column entitled "Rating (A)". Estimate the relative contribution of each major source or cause to the pollutant causing the impairment and enter the appropriate rating (from the following table) in the column entitled "Rating (B)". Calculate a relative impact ratings for each source or cause by multiplying "Rating (A)" by "Rating (B)". Comments on the source of information used to determine the extent or contribution may be entered in the applicable columns in Table 3.

The following table provides guidance for rating the estimated extent and portion of the contribution from each potential source and cause.

| Estimated Geographic Extent of the Source or Cause in the Contributing Watershed (Percent of area or stream miles) | Estimated Contribution of the Source or Cause to the Pollutant Load Causing the Impairment (Percent of load) | Rating |
|---|---|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | 0.5 |
| Scattered or low (approximately 5-20%) | Scattered or low (approximately 5-20%) | 1 |
| Medium (approximately 20-50%) | Medium (approximately 20-50%) | 3 |
| Widespread or high (approximately 50% or more) | Widespread or high (approximately 50% or more) | 5 |
| Unknown | Unknown | UNK |

Table 3. CONCLUSIONS MADE OF POTENTIAL SOURCES OF STREAM SEGMENT IMPAIRMENT

PARAMETER 1: Fecal Coliform.

| POTENTIAL SOURCES OR CAUSES | ESTIMATED EXTENT OF CONTRIBUTION | | ESTIMATED PORTION OF CONTRIBUTION | | IMPACT RATING (A X B) |
|------------------------------------|---|-------------------|--|-------------------|------------------------------|
| | Comments | Rating (A) | Comments | Rating (B) | |
| Agricultural Practices | Widespread | 3 | Medium | 3 | 9 |
| Septic Systems | Widespread | 3 | Medium | 3 | 9 |
| | | | | | |

V. STAKEHOLDERS

PUBLIC INVOLVEMENT AND THE ACTIVE PARTICIPATION OF STAKEHOLDERS is essential to the process of preparing TMDL implementation plans and improving water quality. Stakeholders can provide valuable information and data regarding their community, impaired water bodies, potential causes of impairments, and management practices and activities which may be employed to reduce the impacts of the causes of impairment.

Describe outreach activities to advise and engage stakeholders in the TMDL implementation plan preparation process. Describe the stakeholder group employed or formed to address the impaired segments in the watershed. Summarize the results of the number of attendees and meetings and describe major findings, recommendations, and approvals.

Key stakeholders were notified through a mailed announcement that provided a description of the meeting purpose, meeting schedule, and location. Notified stakeholders included local government officials, regional representatives, state and federal government agencies, environmental organizations, educational institutions, and businesses within the watershed. Citizens and business owners were also approached during the field survey in an effort to promote additional participation. Additional outreach was provided through the Upper Hiawassee River Watershed Coalition (UHRWC), who publicized the TMDL stakeholder meetings in its monthly newsletter. The stakeholder meeting announcement and meeting schedule were also placed on the announcement board at the 4 Rivers Fly Shop in Blairsville. Three meetings were held to 1) provide background information regarding the TMDL process, describe the stream's impairment, and characterize the watershed, 2) identify additional sources of pollution and select management measures, and 3) develop milestones and comment on the draft implementation plan. Stakeholder attendance was lower than expected with participation ranging from one to five stakeholders. In total, eight stakeholders participated in the development of the TMDL Implementation Plan. These stakeholders represented the Hiawassee River Watershed Coalition, the Georgia Mountains Regional Development Center, and the general public.

Fecal coliform inputs on Youngcane Creek have likely decreased substantially since the development of the TMDL because a major poultry corporation removed Union County from its service area. This redistricting has resulted in a large decline in the number of poultry operations within the Youngcane Creek watershed. Nonetheless, many moderate to large poultry operations remain in the area. The dispersal of poultry litter over pastureland for fertilizer is the most likely method through which fecal coliform associated with poultry operations is entering into local waterbodies. After the litter is spread over the fields, it can be easily transported by stormwater into nearby streams and ponds, increasing pollution levels. The Youngcane Creek watershed is also experiencing significant residential development, much of which is located on steep slopes. This is of concern for fecal coliform loads because of the tendency of fecal coliform to bind to sediment particles and be transported long distances during storm events. Stakeholders recommend that educational outreach concerning agricultural activities associated with the spread of poultry litter be continued and site design and erosion control methods be considered during both the permitting process and during the construction phase of residential developments. Additional testing is required to identify fecal coliform loadings and source locations.

List the watershed stakeholder advisory group committee members, described in Project Task #1 of the Scope of Services, in following table.

Table 4. STAKEHOLDER ADVISORY GROUP MEMBERS

| NAME/ORG | ADDRESS | CITY | STATE | ZIP | PHONE | E-MAIL |
|--|-------------------------|-------------|-------|-------|----------------|-------------------------|
| Chris Ernst Georgia Mountains RDC | P.O. Box 1720 | Gainesville | GA | 30501 | (770) 538-2621 | cernst@grmdc.org |
| Mike Fann Resident | | | | | (706) 745-8505 | macfan@alltel.net |
| Leigh Fann/ Resident | | | | | (706) 745-8505 | lfan@alltel.net |
| Callie Dobson Hiawasse River Watershed Coalition | 87 Upper Peachtree Road | Murphy | NC | 28906 | (828) 837-5414 | hrwcoalition@brmemc.net |
| Nancy Triestram Citizen | 6723 Millie Circle | Blairsville | NC | 30512 | (706) 745-8429 | nanceet@alltel.net |
| Doug Triestram Citizen | 6723 Millie Circle | Blairsville | NC | 30512 | (706) 745-8429 | doug2@alltel.net |
| Tom O'Bryant Georgia Mountains RDC | P.O. Box 1720 | Gainesville | GA | 30501 | (770) 538-2621 | cernst@grmdc.org |
| Faith Jones Georgia Mountains RDC | P.O. Box 1720 | Gainesville | GA | 30501 | (770) 538-2621 | cernst@grmdc.org |

In Appendix A, list the names, addresses, telephone numbers, and e-mail addresses for local governments, agricultural or commercial forestry organizations, significant landholders, businesses and industries, and local organizations including environmental groups and individuals with a major interest in this watershed, as described in Project Task #1 of the Scope of Services.

VI. MANAGEMENT MEASURES AND ACTIVITIES

Identify and list in Table 5A the significant management measures or activities which have or will be taken in the contributing watershed to address sources or causes of the impairment(s). List significant management measures and activities in Column 1 and responsible organizations in Column 2. Describe the measure or activity in Column 3 and sources of funding or resources in Column 4 (you may wish to adapt the generic language included in the “Standard Language for Management Measures and Activities” to local applications) In Column 5, enter one of the following codes describing the status of the measure or activity: (A) installed and active; (AE) active and **will be** enhanced or expanded; (R) required in the future by law, regulation or permit conditions; (P) currently proposed, but not required; and (N/R) **additional new recommended** or (N/E) **recommended enhanced** management measures and activities. In Column 6 enter the rating of the estimated existing or proposed extent of application of the measure or activity or percentage of individual sources to which the management actions have or will be applied (see the following table). In Column 7 enter a rating of the estimated effectiveness of the management measures and activities (see following table). Effectiveness may be estimated by local experts or derived from tables included in the “Standard Language for Management Measures and Activities”.

The following table provides guidance for rating the estimated extent and portion of the contribution for each significant potential source and cause.

| Estimated Extent of Application or Percentage of Individual Sources to Which the Mangement Measure or Activity Has or Will be Applied in the Contributing Watershed | Estimated Effectiveness or Percent Removal of Constituent (Percent of load) | Rating |
|--|--|---------------|
| None or negligible (approximately 0-5%) | None or negligible (approximately 0-5%) | .5 |
| Scattered or low (approximately 5-20%) | Low to medium (approximately 5-25%) | 1 |
| Medium (approximately 20-50%) | Medium to High (approximately 25-75%) | 3 |
| Widespread or high (approximately 50% or more) | High (approximately 75% or more) | 5 |
| Unknown | Unknown | UNK |

Table 5A. MANAGEMENT MEASURES AND ACTIVITIES

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| MEASURE | RESPONSIBILITY | DESCRIPTION | SOURCES OF FUNDING & RESOURCES | STATUS CODE | TARGET DATE | EXTENT RATING (Area, #) | EFFECT. RATING (Reduction) |
|-------------------------------------|---|--|--------------------------------|-------------|-------------|-------------------------|----------------------------|
| Federal Clean Water Act | USEPA, Georgia DNR/EPD | The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Section 305 requires states to report progress in restoring impaired waters to EPA on a biennial basis. Section 303(d) requires states to identify "impaired" waters, submit a list to EPA every two years, and develop TMDLs for these waters. | Federal, State | AE | Ongoing | 5 (High) | Medium (3) |
| Federal Clean Water Act Section 404 | EPA (situations involving forestry are normally referred to the GFC to determine compliance with this regulation) | Requires normal ongoing agricultural and silvicultural practice to adhere to BMPs and 15 baseline provisions for road construction and maintenance in and across waters of the US including lakes, rivers, perennial and intermittent streams, wetlands, sloughs in order to qualify for the exemption from the permitting process. | Federal | A | Ongoing | High (5) | Medium-High (4) |
| Georgia Water Quality Control Act | Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6 | Law prohibiting discharge of excessive pollutants (sediments, nutrients, pesticides, animal wastes, etc.) into waters of the State in amounts harmful to public health, safety, or welfare, or to animals, birds, or aquatic life or the physical destruction of stream habitats. | Federal, State, Union County | A | Ongoing | High (5) | Medium-High (4) |

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

| MEASURE | RESPONSIBILITY | DESCRIPTION | SOURCES OF FUNDING & RESOURCES | STATUS CODE | TARGET DATE | EXTENT RATING (Area, #) | EFFECT. RATING (Reduction) |
|--|--|--|--|-------------|-------------|-------------------------|----------------------------|
| Georgia Planning Act | Union County, | Coordinated Planning Program, managed by Georgia DCA, assigns local governments Environmental Planning Criteria (set by Georgia DNR) to include in local long-term comprehensive plans: Water Supply Watersheds, Groundwater, Wetlands, Protected Rivers, Protected Mountains. Program also requires local governments to identify Developments of Regional Impact (DRI) and develop plans to protect and manage Regional Impact Resources (RIR). | Union County | A | Ongoing | Medium (3) | Medium-High (4) |
| Georgia River Basin Management Planning Act, Georgia Code Section 12-5-521 | Georgia DNR/EPD | River Basin Management Plans describe strategies and measures necessary for local governments, businesses, and citizen groups to educate the general public on matters involving the environmental and ecological concerns specific to the river basin; improve water quality and reduce pollution at the source; improve aquatic habitat and reestablish native species of fish; restore and protect wildlife habitat; and provide recreational benefits. | State, Union County | R | 2006 | High (5) | Medium (3) |
| Farm Bill 2002 | United States Department of Agriculture / NRCS | Enhances long-term quality of our environment and conservation of our natural resources. This bill provides several opportunities for receiving grants to improve water quality. | Federal Cost-Share and Incentive Programs. | A | Ongoing | Medium (3) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETER: FECAL COLIFORM.

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|---|--|---|--------|--------------------|---------------|-----------------|
| Storm Water Management Audit/ Assessment | Union County | Internal assessment of storm water pollution prevention plan (map of facility and responsibilities for upkeep): municipal operations, trend monitoring, source detection, septic system controls, storm drain system cleaning, storm water detention basins maintenance, spill response and prevention, materials management, leaking fluids from vehicles, and street sweeping. The county needs to ensure that they are meeting all applicable storm water requirements. | Union County | P | Union County: 2015 | Low (2) | Medium-High (4) |
| Storm Water BMP Guidance Document for Municipal Operations | Union County | Following the audit/assessment, prepare a BMP procedures and guidance manual for county and the cities departments to minimize impact of municipal operations on storm water runoff. This document should address all of the activities identified in the audit/assessment and focus on any common problem areas identified. | Union County | P | Union County: 2016 | Medium (3) | Medium-High (4) |
| Environmental Quality Incentives Program (EQIP) | Natural Resources Conservation Services | Voluntary program that provides technical and cost share assistance for protection of ground and surface water, erosion control, air quality, wildlife habitat, and plant health. | Federal 50% cost share with possible additional incentive payments | A | Ongoing | High (5) | Medium-High (4) |

APPLICABLE TO SPECIFIC PARAMETER: FECAL COLIFORM.

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|-----------------|--|---|--------|-------------|---------------------------------------|----------------|
| Section 319(h) Non-point Source Implementation Grant | Georgia DNR/EPD | Funds distributed through a competitive process to public agencies, regional development centers, state colleges and universities, and state agencies. Eligible projects include implementation of TMDL or Watershed Management Plans, BMP Demonstrations, and Information and Education Campaigns. | Federal, State | P | 2010 | 1-5 (depending on application extent) | High (5) |
| New Development Ordinance Revision | Union County | Review current local Erosion and Sedimentation Control ordinances and modify as appropriate. Include requirements for professionals involved in erosion and sediment control design and construction to be certified by the county. Require pollution prevention at the construction site through preparation of Erosion, Sedimentation & Pollution Control Plan to address issues such as trash, construction debris, leaking vehicles, storage of chemicals, etc. Subdivision ordinances addressing channel protection and conservation will provide further guidelines for construction activities. | Union County | P | 2007 | High (5) | High (5) |

MEASURES APPLICABLE TO SPECIFIC PARAMETERS: FECAL COLIFORM.

| MEASURE | RESPONSIBILITY | DESCRIPTION | POTENTIALSOURCES OF FUNDING & RESOURCES | STATUS | TARGET DATE | EXTENT RATING | EFFECT. RATING |
|--|-------------------------------------|--|---|--------|-------------|---------------|-----------------|
| Regulation of On-Site Sewage Management Systems, IAW O.C.G.A 290-5-26 | Georgia DHR, County Board of Health | Rules and regulations for installation and repair of on-site sewage management systems. | State, Union County Board of Health | A | Ongoing | High (5) | High (5) |
| Chapter 40-13-8 Animal Manure Handlers Rules of Georgia Department of Agriculture Animal Industry Division | Georgia Department of Agriculture | This requires that persons engaged in removing animal manure from livestock/poultry production areas, transporting animal manure on public roadways, or depositing animal manure to a premise other than its point of origin obtain a permit and follow rules to control animal disease, and outlines regulations for transportation, equipment and storage. | State | A | Ongoing | High (5) | Medium-High (4) |

The purpose of Table 5B is to initiate and guide a “first-cut” evaluation of the capacity of existing, currently proposed, and future required management measures and activities to achieve the load reductions specified in the TMDL (and meet water quality goals) and where needed, identify potential feasible and effective measures and practices which could be encouraged and supported to further reduce pollutant loadings from significant potential sources. Though completely voluntary, such recommendations would provide an effective local guide to management actions to achieve local water quality goals, establish priorities for grant or loan programs (Section 319 (h), EQIP, SRF), establish eligibility for grants for Tier plans and implementation, and identify priorities for local watershed assessments and protection plans.

In Columns 1 and 2 of Table 5B, enter each significant potential source and its’ corresponding impact ratings from Table 3. Review Table 5A and list significant management practices and activities applicable to each significant cause or source. Evaluate and compare the estimated extent and relative contribution of each significant cause or source with the extent and effectiveness of the applicable management measures and in conjunction with appropriate local stakeholders or organizations, make a best current determination of whether the existing or proposed management practices would achieve the load reductions needed to achieve the TMDL. Summarize conclusions and rationale in Column 4. If more information is needed to adequately determine the significant sources or causes and their relative contributions so note and recommend management actions needed to adequately identify sources such as monitoring, watershed assessments, or Tier 1 implementation plans in the last column. If the current, proposed and required management measures are judged inadequate to achieve the needed load reductions for significant sources, recommend, in consultation with the advisory groups, additional management activities, programs, and measures which would effectively reduce pollutant loads from the source. List such measures in the final column and list as a recommended activity in the milestones (Table 8).

TABLE 5B: EVALUATION OF MANAGEMENT MEASURES AND ACTIVITIES APPLIED TO SPECIFIC SOURCES OR CAUSES

APPLICABLE SPECIFIC PARAMATER: FECAL COLIFORM

| SIGNIFICANT POTENTIAL SOURCE (S) OR CAUSE(S) (From Table 3) | IMPACT RATING (From Table 3) | EXISTING, CURRENTLY PROPOSED, OR REQUIRED MANAGEMENT MEASURES OR ENHANCEMENTS APPLICABLE TO EACH SIGNIFICANT SOURCE (From Table 5A) | EVALUATION: WILL THE ESTIMATED EXTENT OF APPLICATION AND EFFECTIVENESS OF EXISTING, CURRENTLY PROPOSED, AND REQUIRED MANAGEMENT MEASURES BE ADEQUATE TO ACHIEVE THE SOURCE REDUCTION SPECIFIED BY THE TMDL? | IF MANAGEMENT MEASURES ARE ESTIMATED TO BE INSUFFICIENT, RECOMMEND ADDITIONAL MANAGEMENT MEASURES AND ACTIVITIES WHICH COULD EFFECTIVELY REDUCE LOADS FROM SIGNIFICANT SOURCES |
|--|---------------------------------|---|--|--|
| Agricultural Practices | 9 | Natural Resources Conservation Service-Environmental Quality Incentives Program | The effectiveness of the EQIP and Section 319 programs strongly relies on Federal and State funding and will be dependant on the extent of area to which they are applied. If adequate funding is provided, these measures will be effective. EQIP program should focus on streambank and water body protection and critical area planting, while Section 319 funding should include fecal coliform monitoring and septic tank failure detection, correction, and education. | |
| | | Georgia EPD- Section 319 Nonpoint Source Implementation Grant | | |
| Septic Systems | 9 | Educational Outreach- Union County Health Department/ Georgia Mountains RDC | Effectiveness will very on participation. | |
| | | New Development Ordinance Revision | New development ordinance revisions are expected to provide a large (>75%) reduction in fecal coliform loadings. Revisions should occur on a 3-5 year schedule | |

VII. MONITORING PLAN

The purposes of monitoring are to obtain more data to determine the sources of pollution, describe baseline conditions, and evaluate the effects of management and activities on water quality. Describe any sampling activities or other surveys - active, planned or proposed (including monitoring required for watershed assessments, or stormwater permits) - and their intended purpose. Reference the development and submission of a Sample Quality and Assurance Plan (SQAP) if monitoring for listing decisions.

Table 6. MONITORING PLAN

| PARAMETER (S) TO BE MONITORED | ORGANIZATION | STATUS (CURRENT, PROPOSED, PLANNED) | TIME FRAME | | PURPOSE (If for delisting, date of SQAP submission) |
|---|--|---|------------|---------|---|
| | | | START | END | |
| Water temperature, stream discharge, dissolved oxygen, ammonia, nitrates, phosphates, turbidity, total solids, conductivity, alkalinity, pH, copper, lead, and zinc | Hiawassee River Watershed Coalition/ Tennessee Valley Authority | Current | 2003 | Ongoing | General Monitoring |
| Fecal Coliform | Hiawassee River Watershed Coalition | Proposed | 2009 | - | General monitoring and delisting where appropriate. |

VIII. PLANNED OUTREACH FOR IMPLEMENTATION

List and describe outreach activities, including those described in the Scope of Services that will be conducted to support this plan and the implementation of it.

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|---|--|---|--------------|
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| Hiwassee River Watershed Coalition | Student education program for students in grades 4 through college. | Students | Ongoing |
| Hiwassee River Watershed Coalition | Civic and governmental education at request of organization | Civic or Governmental Groups | Ongoing |
| Hiwassee River Watershed Coalition | Site demonstrations, field tours, and workshops | Professionals and Governmental Groups | Ongoing |
| Natural Resources Conservation Service | Education EQIP Program | Agricultural Landowners | Ongoing |
| Chestatee-Chattahoochee Resource Conservation and Development | Education | Agricultural Landowners | Ongoing |
| Union County Board of Health | -Septic system maintenance education | Residential Landowners | Ongoing |
| Georgia Mountains RDC | Complete plan outreach activities as specified in Section 106 grant funded contract. | Local governments, major stakeholders, public | June 1, 2006 |

IX. MILESTONES/ MEASURES OF PROGRESS OF BMPs AND OUTREACH

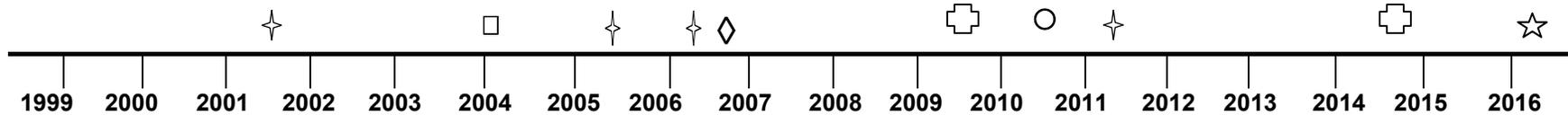
This table will be used to periodically track and report progress of significant management practices and activities identified or recommended in Tables 5A, 5B, and other sections of this plan, including outreach, additional monitoring and assessments, and the enhancement or installation of management measures and activities. Identify and list significant planned or recommended activities and the target date of accomplishment. Provide room to comment on the effectiveness of the management measure, how much support the measure was given by the community, what was learned, how the measure might be improved in the future, and any other observations made. This table can be "pulled out" of this template and used to report and track progress.

Table 8. MILESTONES

| MANAGEMENT MEASURE OR ACTIVITY | RESPONSIBLE ORGANIZATIONS | STATUS | | COMMENT |
|--|--|----------|-----------|--|
| | | PROPOSED | INSTALLED | |
| Section 319 Nonpoint Source Implementation Grant | Hiwassee River Watershed Coalition and Georgia Mountains RDC | X | | Grant funding should provide assistance for fecal coliform monitoring and septic system failure detection. |
| New Development Ordinance Revision | Union County, Blairsville | X | | Proposed revision to be initiated by 2007 with additional revisions on a 3-5 year schedule. |

PROJECTED ATTAINMENT DATE

The projected date to attain and maintain water quality standards in this watershed is 10 years from acceptance of the TMDL Implementation Plan by Georgia EPD.



- Scheduled EPD Basin Group Monitoring ✦
- TMDL Completed □
- Revised TMDL Implementation Plan Accepted ◇
- Plan Status Evaluation Report ⊕
- Plan Update or Revision, if Necessary ○
- Project Attainment for Plans Prepared in 2006 ☆

| | | | |
|-------------------------------|---|------------------|-------------------|
| Prepared By: | Christopher Ernst | | |
| Agency: | Georgia Mountains Regional Development Center | | |
| Address: | P.O. Box 1720 | | |
| City: | Gainesville | ST: GA | ZIP: 30503 |
| E-mail: | cernst@gmrdc.org | | |
| Date Submitted to EPD: | 03/31/2006 | Revision: | |

The preparation of this report was financed in part through a grant from the U.S. Environmental Protection Agency under the provisions of Section 106 of the Federal Water Pollution Control Act, as amended.

APPENDIX A.

STAKEHOLDERS

List the names, addresses, telephone numbers, and e-mail addresses for local governments, agricultural or commercial forestry organizations, significant landholders, businesses and industries, and local organizations including environmental groups and individuals with a major interest in this watershed.

| NAME/ORG | ADDRESS | CITY | STATE | ZIP | PHONE | E-MAIL |
|--|---------------------------------|-------------|-------|-------|-------|--------|
| Lamar Paris Union County | 114 Courthouse Street, Box 1 | Blairsville | GA | 30512 | | |
| Tom Murphy Union County Development Authority | P.O. Box 801 | Blairsville | GA | 30514 | | |
| Kirby Brown Union County Building and Development Permit Department | 55 Hughes Street, Suite B | Blairsville | GA | 30512 | | |
| Michael Plott Union County Septic Permit Department | 55 Hughes Street, Suite A | Blairsville | GA | 30512 | | |
| Rick Hood Georgia Forestry Commission | 3021 Pat Colwell Rd. | Blairsville | GA | 30512 | | |
| USDA-NRCS Blairsville Service Center | 185 Wellborn St. | Blairsville | GA | 30512 | | |
| Joe Riley Chestatee- Chattahoochee RC&D | 170 Scoggins Dr. | Demorest | GA | 30535 | | |
| Danny Young Notla Water Authority | P.O. Box 609 | Blairsville | GA | 30512 | | |
| Renai Brock Blairsville-Union County Chamber of Commerce | P.O Box 789 | Blairsville | GA | 30514 | | |
| Mickey Cummings | 185 Wellborn St. | Blairsville | GA | 30512 | | |

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| | | | | | | |
|---|--------------------------------|-------------|----|-------|----------------|--|
| Union County Extension Service | Box 5 | | | | | |
| Callie Dobson Hiwassee Watershed Coalition | 87 Upper Peachtree Rd. | Murphy | NC | 28906 | | |
| Wayne Jenkins Georgia Forest Watch | 15 Tower Rd. | Ellijay | GA | 30540 | | |
| Howard Markel Georgia Forest Watch | 10694 Happy Hollow Circle | Suches | GA | 30572 | (706) 781-5418 | |
| Ray Potts City of Blairsville | P.O. Box 307 | Blairsville | GA | 30514 | | |
| Charlene Breeden Chattahoochee-Oconee National Forest | 1755 Cleveland Highway | Gainesville | GA | 30501 | | |
| Alan Polk Chattahoochee-Oconee National Forest: Brasstown Ranger District | P.O. Box 9 | Blairsville | GA | 30514 | | |
| Myrta McCarter Union County Board of Education | 10 Hughes Street | Blairsville | GA | 30512 | | |
| Blairsville Water and Sewer Department | P.O. Box 305 | Blairsville | GA | 30512 | | |
| Northeast Georgia Board of Realtors | P.O. Box 723 | Hiwassee | GA | 30546 | | |
| Sam Breyfogle Temple Inland Forest | 208 Springdale Dr. | LaGrange | GA | 30204 | | |
| Keith Hastie U.S. Fish and Wildlife Service | 105 West Park Drive Suite D | Athens | GA | 30606 | | |
| C.W. Hill, Jr. Blue Ridge Cattlemen's Association | 1651 Deep South Rd. | Blairsville | GA | 30512 | | |
| Keith Gilmer Georgia Soil and Water Conservation Commission | 700 East 2nd Avenue Suite J | Rome | GA | 30161 | | |

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| | | | | | | |
|---|--------------------------|--------------|----|-------|--------------|--------------------|
| Joe Satterfield Blue Ridge Mountain EMC | P.O. Box 9 | Young Harris | GA | 30582 | | |
| Harvey Cohen Lake Nottely Improvement Association, INC | P.O. Box 2033 | Blairsville | GA | 30514 | | |
| Jane Bryant Union-Towns Home Builders Association | P.O. Box 913 | Young Harris | GA | 30582 | | |
| Carleen Douchette Nottely Marina | P.O. Box 773 | Blairsville | GA | 30514 | | |
| Larry Culpepper North Georgia Technical College-Blairsville Campus | 434 Meeks Ave. | Blairsville | GA | 30512 | | |
| Dan Verger Vulcan Materials Company | P.O. Box 413 | Blairsville | GA | 30514 | | |
| Honorable Chip Pearson State Senate District 51 | P.O. Box 38 | Dawsonville | GA | 30534 | | |
| Honorable Charles Jenkins Georgia House of Representatives District 8 | P.O. Box 909 | Blairsville | GA | 30514 | | |
| Jon Donnelly Citizen | 1780 Butternut Creek Rd. | Blairsville | GA | 30512 | | |
| Doug Triestram Citizen | | | | | 706-715-8429 | dougt2@alltel.net |
| Nancy Triestram Citizen | | | | | 706-715-8429 | nanceet@alltel.net |
| Mike Fann Citizen | | | | | 706-745-8505 | macfan@alltel.net |
| Leigh Fann Citizen | | | | | 706-745-8505 | lfann@alltel.net |
| Larry Stephens City of Blairsville | P.O. Box 305 | Blairsville | GA | 30512 | 706-745-0763 | |

Plan for Nottely River and Youngcane Creek Watershed
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| | | | | | | |
|--|------------------------------|-------------|----|-------|--------------|--------------------------|
| David Raythyen Citizen | | | | | 706-745-0763 | |
| Scott Lea Tennessee Valley Authority | 1101 Market Street PSC-1E | Chattanooga | TN | 37402 | 423-876-4016 | jslea@tva.gov |
| Keith Ledford Union County Board of Education | 10 Hughes Street | Blairsville | GA | 30512 | | kledford@union.k12.ga.us |
| Mathew Wilcox City of Blairsville WPCP | | Blairsville | GA | 30512 | 706-781-2000 | mwilcox101@hotmail.com |
| Christopher Ernst Georgia Mountains Regional Development Center | P.O. Box 1720 | Gainesville | GA | 30503 | 770-538-2626 | cernst@gmrdc.org |

APPENDIX B.

UPDATES TO THIS PLAN

Describe any updates made to this plan. Include the date, section or table updated, and a summary of what was changed and why.

APPENDIX C

BUTTERNUT CREEK FIELD SURVEY

GEORGIA ADOPT-A-STREAM

Watershed Survey and Map Assessment

AAS group name: Butternut Creek Investigator(s): Christopher Ernst

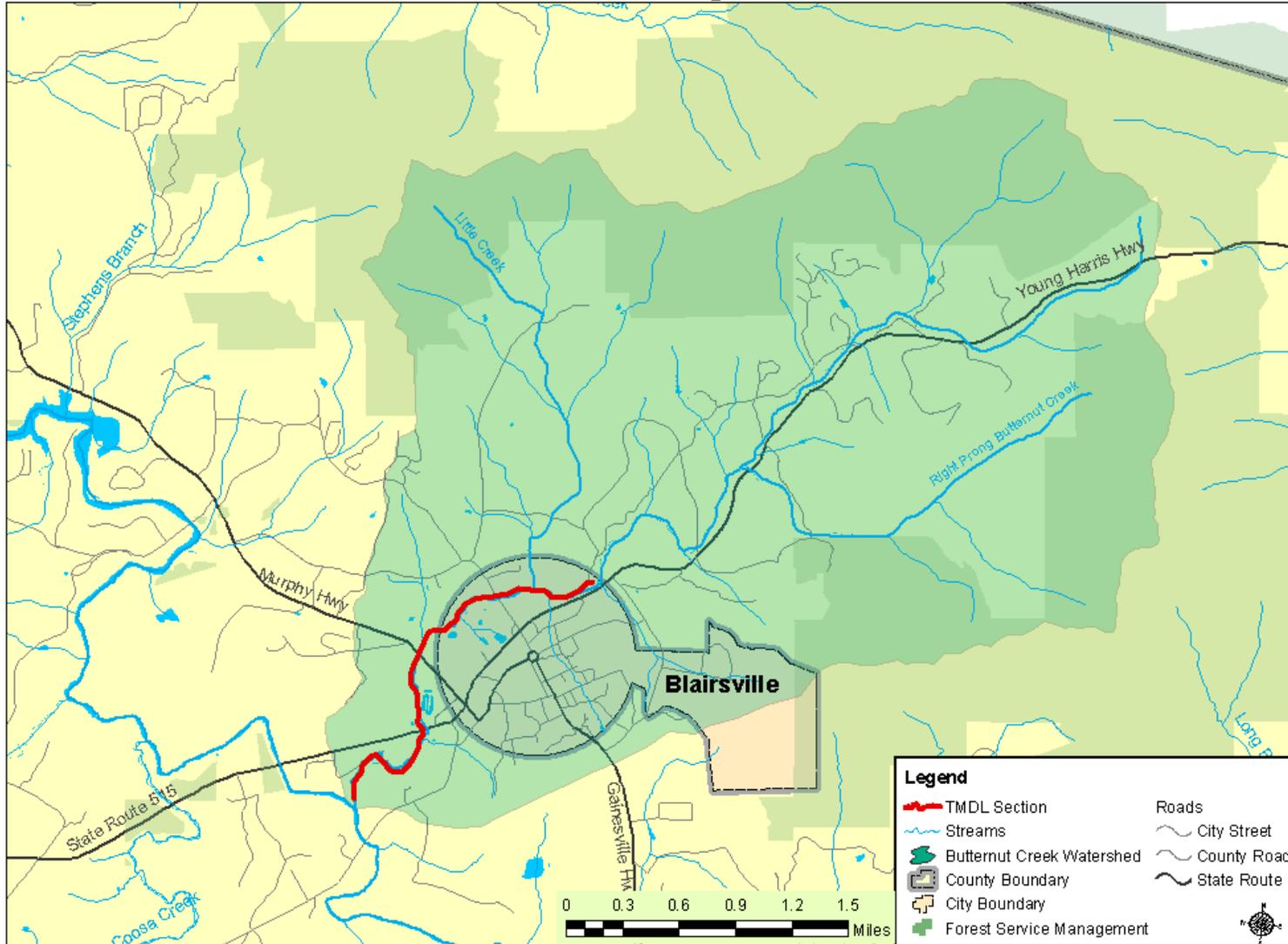
Type of waterbody: stream / wetland / lake Stream

Water body name: Butternut Creek County(ies): Union

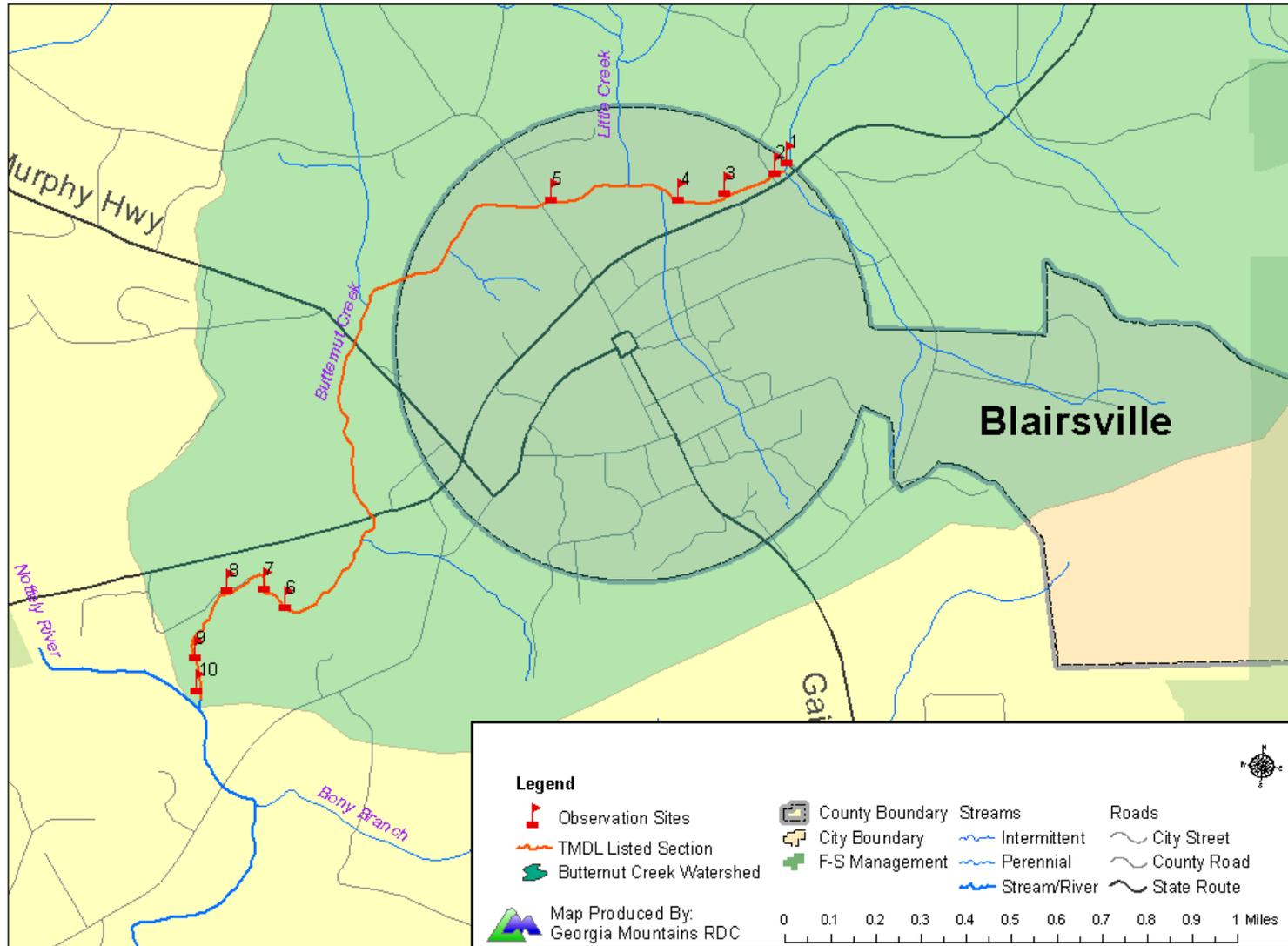
Approximate size of drainage/study area: 7,600 acres

Date: March 15,
2006 Time: 5:00pm Picture/photo documentation? Yes

Butternut Creek TMDL Stream Segment



**Butternut Creek
Observation Site Locations**



II. LAND USES/ACTIVITIES AND IMPERVIOUS COVER

1. Identify land uses and activities in the watershed which have the highest potential to impact water bodies:

Check all boxes that apply, describe the location of the activity(ies) under Notes on Location & Frequency of Activities and also mark the locations on your map. If too frequently occurring to record locations, so note. If you don't know some of the information below, write DK under Notes.

Please indicate if you: surveyed only adjacent to the waterbody
 surveyed the whole watershed
 Provide notes as necessary

The watershed field survey included an evaluation of in-stream and watershed conditions. In-stream conditions were identified along the TMDL listed segment at the sites identified in the Butternut Creek Observation Site Location Map and in Section III. Images of the observation site locations are provided in Appendix A. Because nonpoint source pollution commonly originates from activities relating to land use, the Butternut Creek watershed was also surveyed to note existing land use types and intensities. Selected images of the watershed survey can be found in Appendix B.

The watershed survey identified a number of potential sediment sources including residential and commercial development, agricultural activity, and OHV use. Residential development is occurring most notably north of Blairsville and is occupying lands with steep slopes due to the mountain views that are afforded with these sites. Sedimentation is occurring during the development process as large quantities of land are being disturbed. Sedimentation decreases on established neighborhoods that have reached the post construction phase, however, evidence of high velocity stormwater runoff is apparent on stream banks that are becoming undercut and stream channels that are experiencing scouring. Commercial development in Butternut Creek watershed seems to be producing similar results as residential lands, except that these areas are generally located on moderate slopes and have Best Management Practices (BMPs) installed to mitigate much of the negative effects of stormwater runoff.

Agricultural activity in the watershed consists of hay and pastureland. A limited amount of cattle grazing is occurring. Lands that support cattle grazing appear to be in good to moderate condition and BMPs are commonly found throughout agricultural lands in the watershed. A limited number of sites did provide cattle with unlimited access to waterbodies, which increases the rate of sedimentation.

The Beasley Knob OHV area is located in the headwaters of Butternut Creek. Access to this area is difficult. However, tributary streams leaving the OHV area appeared to be in fair to good condition.

Plan for Nottely River and Youngcane Creek Watershed
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| Land Disturbing Activities & Other Sources of Sediment | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|---|--------------------------|--------------------------|--|
| Extensive areas disturbed by land development or construction of utilities, roads & bridges | X | X | Scattered throughout watershed. |
| Large or extensive gullies | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Unpaved roads near or crossing streams | X | X | Lands managed by Forest Service often cross stream. |
| Croplands | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Pastures with cattle access to water bodies | X | X | Little Creek watershed |
| Commercial forestry activities including harvesting and site-preparation | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Extensive areas of streambank failure or channel enlargement | X | <input type="checkbox"/> | Entire length of Butternut Creek |
| Other Agricultural Activities | | | |
| Confined animal (cattle or swine) feeding operations and concentrations of animals | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Animal waste stabilization ponds | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Poultry houses | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Highways and Parking Areas | | | |
| Shopping centers & commercial areas | X | X | Along Hwy 515, within Blairsville city limits. |
| Interstate and controlled access highways and interchanges | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Major highways and arterial streets | X | X | HWY 515 |
| Other extensive vehicle parking areas | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Mining

Quarries with sediment basins in live flowing streams _____

Transportation and Motor Vehicle Services

Adjacent to Water In Watershed Notes on location & frequency of activity _____

Truck cleaning services _____

Public and private automobile repair facilities _____

Car washes and large auto dealers _____

Rail or container transfer yards _____

Airports with fuel handling/aircraft repair _____

Business & Industry, General

Activities with exterior storage or exchange of materials. X Old Smokey Mountain Rd.

Activities with poor housekeeping practices indicated by stains leading to streams or storm drains or on-site disposal of waste materials _____

Heavy industries such as textiles & carpet, pulp & paper, metal, and vehicle production or fabrication _____

Dry cleaners/outside chemical storage _____

Food & Kindred Products

Fertilizer production plants _____

Feed preparation plants _____

Meat and poultry slaughtering or processing plants _____

Construction Materials

Wood treatment plants _____

Concrete and asphalt batch plants _____

| Waste Recycling, Movement & Disposal | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|--|--------------------------|--------------------------|--|
| Junk and auto salvage yards | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Solid waste transfer stations | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Landfills and dumps (old & active) | <input type="checkbox"/> | X | Union County Landfill (inactive) near Little Creek |
| Recycling centers | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Drum cleaning sites | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Illicit Waste Discharges* | | | |
| Sanitary sewer leaks or failure | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Overflowing sanitary sewer manholes due to clogging or hydraulic overloading | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Bypasses at treatment plants or relief valves in hydraulically overloaded sanitary sewer lines | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Domestic or industrial discharges | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Extensive areas with aged/malfunctioning septic tanks | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Dry-weather flows from pipes (with detectable indications of pollution) | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Streamside areas of illegal dumping | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

* If found (most likely during stream surveys), these activities should be immediately reported to the local government or the EPD regional office. These phone numbers are listed in Chapter 4.

III. GENERAL WATERBODY AND WATERSHED CHARACTERISTICS

This information will be gathered from your wetland, lake or stream segment.

1. Note the number of hydrologic modifications on your waterbody: structures that alter water flow

| | | | |
|------------|-------|---------------|-------|
| None | _____ | Beaver dams | _____ |
| Dams | _____ | Dredge spoils | _____ |
| Bridges | 6 | Pipes | _____ |
| Waterfalls | _____ | Other | _____ |

2. Note the approximate length of the stream that is affected by the following: if assessing a wetland, lake or pond, some of the following may also affect your waterbody

| | | | | | | |
|--------------------------------|-------|---------|-------|---------|-------|--------------------|
| Stream culvert | 180 | feet or | _____ | mile or | _____ | % of stream length |
| Stream straightening | _____ | feet or | _____ | mile or | _____ | % |
| Concrete streambank/bottom | 50 | feet or | _____ | mile or | _____ | % |
| Dredging/channelization | 300 | feet or | _____ | mile or | _____ | % |
| Cattle crossing | _____ | # | | | | |
| Stream crossing (for vehicles) | _____ | # | | | | |

3. Note extent of vegetative buffer along the banks: at a minimum of 5 sites*, at regular intervals (every 500 ft. in a 1/2 mile. section) note the following

*See Appendix A for site observation photographs

| # | Width in feet | Location (Left bank, Right bank or N, S, E, W side of wetland or lake) | Characteristics and comments |
|---|---------------|--|---|
| 1 | 15ft | Behind Rib Country, on left. | Stream has high velocity throughout its width and a substrate of pebbles and cobbles with very little woody debris. Trash is hanging from overhanging brush that was deposited during high flows. The right bank is vertical and has a light grass covering and shows indications of undercutting and general bank instability. The left bank is 8 ft tall and has a 60 degree slope that is composed of small rip rap and gravel. The slope has a light vegetation covering of shrubs, small trees, and briars. The slope is generally stable, but the fence at the top is angled at about 15 degrees, indicating some slump or earth movement. The floodplain on river right is an agricultural field that has been used for row cropping. A distance of 50 feet from the streambank has recently been cleared of heavy brush and will probably be used for row cropping. The floodplain on river left is a |

| | | | |
|---|------|--|---|
| | | | paved parking lot for Rib Country and Butternut Creek Ice Cream Parlor and Mini Golf. |
| 2 | 30ft | Bridge at Weaver Rd. | This site is located in a pool, so there is a very low flow velocities and depth varies from 3ft to 1ft. Substrate is composed of sand, silt, pebbles, and some cobbles. Some small woody debris is present. Tributary enters from river left through a manmade channel. Right bank is composed of briars and weeds with a near vertical slope of 2 ft. Left bank is composed of kudzu with vertical banks of 5ft. that show some indications of undercutting. |
| 3 | 15ft | Right, at the Home Depot Parking Lot, just downstream of the entrance. | Stream has a medium velocity flow and is contained in a cast cement channel, which is associated with the bridge structure that is approximately 20 ft upstream. Channel bed is cement, but silt, sand, pebbles, cobbles, and boulders all compose the bed structure here. The banks are cast cement orientated vertically with a height of 8 to 10 feet. The river right floodplain is composed of grass. There is no river left floodplain, as the cement leads to a grassed 30 degree slope that leads to HWY 515. No woody debris is present. |
| 4 | 30ft | Right, at Ingles entrance | Stream has high velocity and a substrate of cobbles and boulders. A sewer line is partially exposed creating a knick point in the stream just up stream of the site. The stream banks are 3 to 4ft tall, are vertical and are vegetated with grasses and reeds. Streambank instability is notable on both sides of the creek, and it appears the exposed sewer line creates channel bank scour during periods of high discharge. Significant amounts of human trash, as well as leaves and branches have been caught in nearby shrubs, to a height of 4ft above the current water line. Floodplain on right is grassed area approximately 30 feet wide between stream and rise to Ingles parking lot. |
| 5 | 15ft | Adams Family and Cosmetic Dentistry | Stream has low velocity throughout its width. Substrate is silt with some boulders and some broken concrete pieces. Banks are densely vegetated with shrubs and river cane and are nearly vertical with a height of |

| | | | |
|----------|------------|---|--|
| | | | approximately 5ft. The river right floodplain is a pasture that is also being used as a deposit for construction dirt and broken cement slabs. The river left floodplain is only 15 feet wide and is composed of grass and briars. Beyond the river left floodplain, a rip rap rise of 10 ft leads to the parking lot of Adams Family Dentistry. |
| | Meeks Park | | |
| 6 | 30ft | Right, at baseball fields | Stream velocity is high as it has just crossed a bedrock feature approximately 2ft tall. The highest stream velocities are located at the center of the channel. Algae covers stream bottom, which is composed of silt, sand, pebbles, cobbles, and boulders. Some small woody debris is located in the channel. The right bank is heavily rip rapped at a slope of 30 degrees. Only sparse grass is located within the rip rap. The floodplain is accessed after a 4ft vertical rise in water levels. The left stream bank is gently sloping (15 degrees) for approximately 10 feet at which time the bank rises steeply (50 degrees) to a total elevation of 6ft above the existing water line. The floodplain is located completely on the right side, and the left side continues to rise to a forested ridge. |
| 7 | 20ft | Right along access road. | Stream velocity is very low as water is in a pool. Substrate is silt, sand, pebbles, and cobbles. No woody debris is present. Banks are both sloped and approximately 4-5 ft tall. The river right bank is dirt with small rip rap and is lightly vegetated with moss and small grasses. Bank slope angle is 30 degrees. The left bank has two parts. The lower part is composed of sand, is lightly vegetated with moss, and is angled at 25 degrees. The upper bank is near vertical and shows signs of undercutting. Little vegetation is present here except mosses and exposed roots. A wooded forest is located beyond the bank and acts as the primary floodplain. |
| 8 | 10ft | Right side at Bobby Franklin Memorial Shelter | Stream has high velocity as it is forced from the far left side of the channel to the center |

| | | | |
|-----------|------|--|---|
| | | | <p>due to a large root ball from a live tree. Substrate is sand, pebbles, and cobbles. Dark green algae is in the main current and covers entire stream bottom while a bright red algae is located on the bank where a small pipe exits into stream. Floating green algae is located where the red and green algae meet. The right bank is 4ft tall and has some undercutting occurring half way between the current water level and the top of the bank. The left bank is highly eroded and shows signs of undercutting beneath root balls of previously standing trees. The bank has no vegetation on it, and will likely continue eroding in the future.</p> |
| 9 | 15ft | Right side at .25 mile marker | <p>Stream has low to moderate flow velocity. Site is located at strong left hand bend of stream. Substrate is composed of sands, pebbles, cobbles, and boulders. Right side bank is lined with heavy rip rap, is vegetated with mature trees, and is sloped at 55 degrees. Woody litter has accumulated at base of rip rap and water line. Left side bank is sloped at 30 degrees with a vegetation cover of cane, vines, and mature trees.</p> |
| 10 | 10ft | Right side, Meeks Park, near confluence with Hiawassee River | <p>Moderate streamflow with highest velocities and volumes near center of stream. Substrate is composed of silt, sand, pebbles, cobbles, and boulders. Little to no woody debris in stream channel. Stream banks are 8 to 10ft near vertical. Right stream bank is highly eroded and has no vegetation on it, and has cut back approximately 6 to 8 ft. Left stream bank shows signs of moderate erosion but still has shrubs located 4ft above current water line.</p> |

4. Check the categories that best describe the general appearance of the waterbody:

Litter:

- No litter visible
- Small litter occasionally (i.e., cans, paper)
- Small litter common
- Large litter occasionally (i.e., tires, pallets, shopping carts)
- Large litter common

Special Problems:

- Spills of chemicals, oil, etc.
- Fish kills
- Wildlife, waterfowl kills

Erosion:

- No bank erosion or areas of erosion very rare; no artificial stabilization
- Occasional areas of bank erosion
- Areas of bank erosion common
- Artificial bank stabilization (i.e., riprap) present

5. Comments on general waterbody and watershed characteristics: (e.g. date and size of fish kill, increased rate of erosion evident, litter most evident after storms)

* Fish kills should be immediately reported to DNR Wildlife Resources Division at 770-918-64

Tributaries to Butternut Creek appear to be in good condition. The main stem of Butternut Creek is experiencing geomorphic transition to adjust to an increasingly urbanized watershed. Bank instability is common, deposits of trash and woody debris indicates much higher peak flows than surrounding streams, and channel bed incision is common in the upper reaches of Butternut Creek.

6. Summarize notable changes that have taken place since last year (if this is not your first year conducting the Watershed Survey).

This is the first watershed survey.

IV. PIPE AND DRAINAGE DITCH INVENTORY

In this section, provide information on pipes and drainage ditches found on the banks or in the waterbody. These pipes/ditches can be abandoned or active. Note the information for each pipe or drainage ditch you observe. *Make additional copies as necessary.*

| Pipe # | Location | Type | Size | Flow | Waterbody condition | Comments |
|--------|--|------|-------|----------------|--|----------|
| 1 | Meeks Park- Right side at Bobby Franklin Memorial Shelter | PVC | 3inch | <1 gpm, steady | Poor. Heavy algae accumulations are located in the pipe, and in Butternut Creek, the pipe's receiving waters | |

1. **Number each pipe/ditch** for mapping/locating purposes
2. **Location of pipe/ditch:** note whether in water, bank, near waterbody or other. Describe location.
3. **Identify type of pipe (list all that apply):** PVC, iron, concrete, galvanized; industrial outfall, sewage treatment plant outfall, storm drain, combined sewer overflow; agricultural field drainage, paddock or feedlot drainage, settlement basin/pond drainage, parking lot drainage, unknown, other
4. **Size: measure approximate diameter of pipe:** inches or centimeters
5. **Describe the discharge flow:** Rate of flow: none, intermittent, trickle, steady, heavy
Appearance: clear, foamy, turbid, oily sheen, color, other
Odor: none, rotten eggs/sewage, chemical, chlorine, other
7. **Waterbody condition: describe the bank/waterbody below pipe or drainage ditch:** no problem evident, eroded, sewage litter (e.g. toilet paper), litter (e.g. bottles, cans), lots of algae, other
8. **Comments of pipes and drainage ditches:** Use this space to explain or expand on information provided on pipes and discharges you have identified above. For example, you may want to identify particular facilities, or discuss in more detail the condition of the waterbody below the discharge. Use separate page if necessary.

APPENDIX A

SITE OBSERVATION PHOTOGRAPHS

Site# 1



Site# 2



Site# 3



Site# 4



Site# 5



Site# 6



Site# 7



Site# 8



Site# 9



Site# 10



APPENDIX B

IMAGES OF WATERSHED SURVEY



Picture taken at Beasley Knob OHV Area, facing south
Note well maintained trail with erosion breaks.



Photograph taken from shopping center on SR 515, facing south
Note expansive impervious cover.



Photograph taken near Bowling Alley on SR 515, facing south
Note channel incision with unstable banks.



Photograph taken from Old Zebulon Gap Rd., facing south
Note development on steep slopes and ridgelines.



Photograph taken from Smokey Estates Rd., facing north
Note cleared vegetation along right stream bank with low cut grass along streambank and bank erosion.



Photograph taken from Weaver Rd., facing east
Note land disturbing activity, hydro-seeded banks, and well vegetated incline in background.



Photograph taken from Mamory Gardens Dr. and Butternut Creek, facing south
Note bank instability.



Butternut Creek at Meeks Park, facing south.
Note channel bank instability.

APPENDIX E

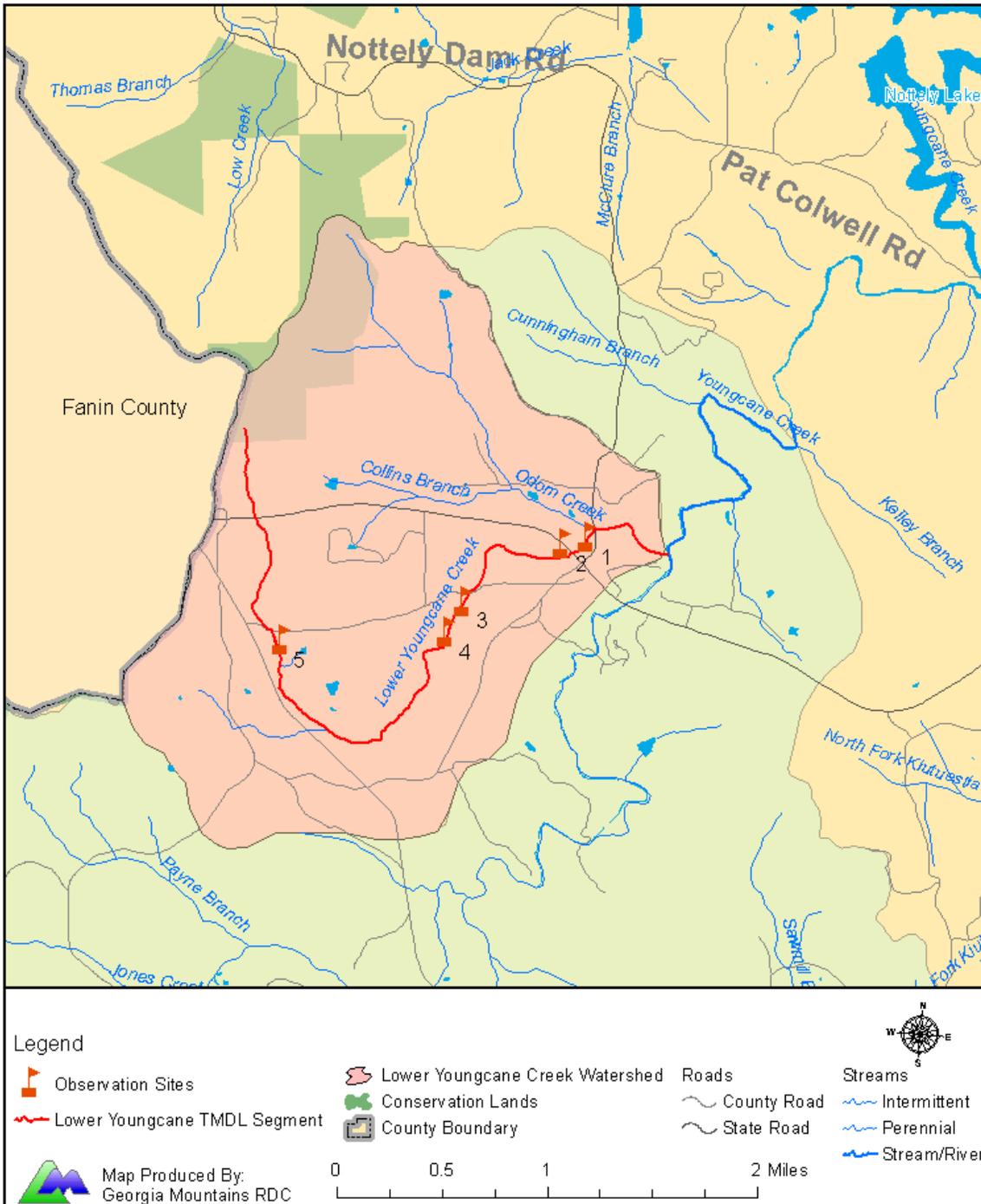
LOWER YOUNGCANE CREEK FIELD SURVEY

GEORGIA ADOPT-A-STREAM

Watershed Survey and Map Assessment

| | | | |
|--|--------------------------------|------------------|--|
| AAS group name: | <u>Lower Youngcane Creek</u> | Investigator(s): | <u>Christopher Ernst</u> |
| Type of waterbody: | <u>stream / wetland / lake</u> | | <u>Stream</u> |
| Water body name: | <u>Lower Youngcane Creek</u> | County(ies): | <u>Union County</u> |
| Approximate size of drainage/study area: | <u>2,390</u> acres | | |
| Date: | <u>March 16, 2006</u> | Time: | <u>5:00pm</u> Picture/photo documentation? Yes |

Lower Youngcane Creek Observation Site Locations



II. LAND USES/ACTIVITIES AND IMPERVIOUS COVER

1. Identify land uses and activities in the watershed which have the highest potential to impact water bodies:

Check all boxes that apply, describe the location of the activity(ies) under Notes on Location & Frequency of Activities and also mark the locations on your map. If too frequently occurring to record locations, so note. If you don't know some of the information below, write DK under Notes.

Please indicate if you: surveyed only adjacent to the waterbody
 surveyed the whole watershed
 Provide notes as necessary

The watershed field survey included an evaluation of in-stream and watershed conditions. In-stream conditions were identified along the TMDL listed segment at the sites identified in the Lower Youngcane Creek Observation Site Location Map and Section III. Images of the observation site locations are provided in Appendix A. Because nonpoint source pollution commonly originates from activities relating to land use, Lower Youngcane Creek watershed was also surveyed to note existing land use types and intensities. Selected images of the watershed survey can be found in Appendix B.

Residential development, agricultural practices, streambank erosion, and road maintenance are the leading potential sources of sedimentation in the watershed. Residential development is occurring throughout the watershed. While much of the watershed has low to moderate slopes, sedimentation from construction activities is still occurring. Agricultural practices in Lower Youngcane Creek include cattle grazing and a limited extent of row cropping. Streambank erosion is occurring throughout the watershed and seems to be coming predominantly from increased storm water runoff from residential developments and roadways. Lower Youngcane Creek also shows indications that certain reaches have been channelized in the past. The channel is now seemingly modifying its shape to a more natural meander pattern. This geomorphic shift is creating excessive sediment inputs into the stream system.

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| Land Disturbing Activities & Other Sources of Sediment | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|---|--------------------------|---------------------|---|
| Extensive areas disturbed by land development or construction of utilities, roads & bridges | <input type="checkbox"/> | | X Scattered |
| Large or extensive gullies | <input type="checkbox"/> | | X Roadside ditches |
| Unpaved roads near or crossing streams | X | | <input type="checkbox"/> Sandalwood Rd. |
| Croplands | <input type="checkbox"/> | | X Lightly dispersed |
| Pastures with cattle access to water bodies | <input type="checkbox"/> | | <input type="checkbox"/> _____ |
| Commercial forestry activities including harvesting and site-preparation | <input type="checkbox"/> | | <input type="checkbox"/> _____ |
| Extensive areas of streambank failure or channel enlargement | X | | <input type="checkbox"/> Downstream of eastern crossing of Sandalwood Rd. |
| Other Agricultural Activities | | | |
| Confined animal (cattle or swine) feeding operations and concentrations of animals | <input type="checkbox"/> | | <input type="checkbox"/> _____ |
| Animal waste stabilization ponds | <input type="checkbox"/> | | <input type="checkbox"/> _____ |
| Poultry houses | <input type="checkbox"/> | | <input type="checkbox"/> _____ |
| Highways and Parking Areas | | | |
| Shopping centers & commercial areas | X | | X Along SR 515 corridor |
| Interstate and controlled access highways and interchanges | X | | X SR 515 |
| Major highways and arterial streets | X | | X SR 515 |
| Other extensive vehicle parking areas | <input type="checkbox"/> | | <input type="checkbox"/> _____ |
| Mining | | | |
| Quarries with sediment basins in live flowing streams | <input type="checkbox"/> | | <input type="checkbox"/> _____ |

Transportation and Motor Vehicle Services

| | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|---|--------------------------|--------------------------|---|
| Truck cleaning services | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Public and private automobile repair facilities | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Car washes and large auto dealers | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Rail or container transfer yards | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Airports with fuel handling/aircraft repair | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Business & Industry, General

| | | | |
|---|--------------------------|--------------------------|-------|
| Activities with exterior storage or exchange of materials. | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Activities with poor housekeeping practices indicated by stains leading to streams or storm drains or on-site disposal of waste materials | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Heavy industries such as textiles & carpet, pulp & paper, metal, and vehicle production or fabrication | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Dry cleaners/outside chemical storage | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Food & Kindred Products

| | | | |
|--|--------------------------|--------------------------|-------|
| Fertilizer production plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Feed preparation plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Meat and poultry slaughtering or processing plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Construction Materials

| | | | |
|-----------------------------------|--------------------------|--------------------------|-------|
| Wood treatment plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Concrete and asphalt batch plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Plan for Nottely River and Youngcane Creek Watershed
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| Waste Recycling, Movement & Disposal | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|--|--------------------------|--------------------------|--|
| Junk and auto salvage yards | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Solid waste transfer stations | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Landfills and dumps (old & active) | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Recycling centers | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Drum cleaning sites | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Illicit Waste Discharges* | | | |
| Sanitary sewer leaks or failure | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Overflowing sanitary sewer manholes due to clogging or hydraulic overloading | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Bypasses at treatment plants or relief valves in hydraulically overloaded sanitary sewer lines | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Domestic or industrial discharges | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Extensive areas with aged/malfunctioning septic tanks | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Dry-weather flows from pipes (with detectable indications of pollution) | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Streamside areas of illegal dumping | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

* If found (most likely during stream surveys), these activities should be immediately reported to the local government or the EPD regional office. These phone numbers are listed in Chapter 4.

III. GENERAL WATERBODY AND WATERSHED CHARACTERISTICS

This information will be gathered from your wetland, lake or stream segment.

1. Note the number of hydrologic modifications on your waterbody: structures that alter water flow

| | | | |
|------------|----------|---------------|-------|
| None | _____ | Beaver dams | _____ |
| Dams | _____ | Dredge spoils | _____ |
| Bridges | <u>5</u> | Pipes | _____ |
| Waterfalls | _____ | Other | _____ |

2. Note the approximate length of the stream that is affected by the following: if assessing a wetland, lake or pond, some of the following may also affect your waterbody

| | | | | |
|--------------------------------|------------|---------------|---------------|--------------------|
| Stream culvert | <u>75</u> | feet or _____ | mile or _____ | % of stream length |
| Stream straightening | <u>200</u> | feet or _____ | mile or _____ | % |
| Concrete streambank/bottom | _____ | feet or _____ | mile or _____ | % |
| Dredging/channelization | _____ | feet or _____ | mile or _____ | % |
| Riprap/gabion | _____ | feet or _____ | mile or _____ | % |
| Cattle crossing | _____ | # | | |
| Stream crossing (for vehicles) | _____ | # | | |

3. Note extent of vegetative buffer along the banks: at a minimum of 5 sites*, at regular intervals (every 500 ft. in a 1/2 mile. section) note the following

*See Appendix A for observation site photographs

| # | Width in feet | Location (Left bank, Right bank or N, S, E, W side of wetland or lake) | Characteristics and comments |
|---|---------------|--|--|
| 1 | 5ft | Left bank, looking upstream, at intersection of Saddle Club Rd. and | Stream velocity is high (3 fps) with a thalweg located at river right. Substrate is sand, pebbles, cobbles, and boulders. Some woody debris is present in channel and is composed of leaf litter and small sticks. Right bank is 3ft tall and is densely vegetated with shrubs. Slope angle is approximately 35 percent. River right bank is composed of a small bench located 1ft above the water line and extends 2.5ft towards the right bank. The main component of the right bank is moderately vegetated with dispersed shrubs, grasses, and dispersed trees. Bank angle is approximately 60 degrees. Floodplains are located on both sides of the bank. The right floodplain is densely vegetated with small trees and shrubs, while the left bank is grassed. No buffer is present between the grass and bank. |

Plan for Nottely River and Youngcane Creek Watershed
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| | | | |
|---|-----|--|--|
| 2 | 4ft | Center, looking upstream from upstream end of 515 overpass | Stream velocity is high (3 fps) with flow concentrated near the center of the stream. Substrate is composed of sand, pebbles, and cobbles. Some woody debris, including sticks and leaves are present. Stream banks are near vertical with a height of 2.5ft and are vegetated with grasses. The floodplains are densely vegetated with mature trees and brush. |
| 3 | 6ft | Right, looking upstream from bridge at Sandalwood Rd. | Stream velocity is high (3 fps) with highest flow focused near center of the channel. Substrate is composed of sand, pebbles, cobbles, and boulders. Woody debris is located in channel and is composed of sticks and leaves. Significant accumulations of leaves are present at intersection of bank and stream channel. Banks are 3ft in height and are gently sloped (25 degrees), are covered with leaves, and are lightly vegetated with typical woodland covering of mature trees, laurel, and some grasses near the water. Recent road maintenance has occurred on bridge due to road instability associated with undercutting of bridge structure on downstream side of bridge. |
| 4 | 5ft | Right, looking upstream. Access point located from the first dip in graveled powerline access road at Sandalwood Rd and Copperhead Rd. | Stream velocity is high (3 fps) with the highest flow focused near center of the channel. Substrate is composed of sand, pebbles, cobbles, and boulders. Woody debris is located in channel and is composed of leaf litter and sticks. Leaf litter is also caught in branches of overhanging laurel to an elevation of 4 ft above the stream level. The banks are vertical and are slightly undercut, especially on the river left bank, yet are still vegetated with grasses and roots from nearby trees and shrubs. The floodplain is wooded on both sides of the stream with mature forests. The left floodplain only has mature vegetation for 20ft from the stream, after which the land has been cleared for the powerline right of way. |
| 5 | 2ft | Center, looking downstream from Copperhead Rd. | Stream velocity is high (3 fps) and channel is very constricted. Little to no woody debris is present. Substrate is composed of silt, sand, pebbles, and a few dispersed cobbles. Banks are vertical to near vertical with a height of 4-5ft, and are grassed. Significant |

Plan for Nottely River and Youngcane Creek Watershed
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| | | | |
|--|--|--|---|
| | | | bank erosion is occurring. Floodplain is grassed pasture land with no riparian buffer or fencing along creek. Site characteristics indicate that the stream channel has been straightened in the past and is currently reverting to a natural meander pattern, resulting in bank erosion. |
|--|--|--|---|

4. Check the categories that best describe the general appearance of the waterbody:

Litter:

- No litter visible
- Small litter occasionally (i.e., cans, paper)
- Small litter common
- Large litter occasionally (i.e., tires, pallets, shopping carts)
- Large litter common

Special Problems:

- Spills of chemicals, oil, etc.
- Fish kills
- Wildlife, waterfowl kills

Erosion:

- No bank erosion or areas of erosion very rare; no artificial stabilization
- Occasional areas of bank erosion
- Areas of bank erosion common
- Artificial bank stabilization (i.e., riprap) present

5. Comments on general waterbody and watershed characteristics: (e.g. date and size of fish kill, increased rate of erosion evident, litter most evident after storms)

* Fish kills should be immediately reported to DNR Wildlife Resources Division at 770-918-64

Waterbody and watershed appear to be in fair to good condition, with exception to limited development pressures and ongoing natural channel straightening recovery.

6. Summarize notable changes that have taken place since last year (if this is not your first year conducting the Watershed Survey).

First year watershed survey was conducted.

APPENDIX A

OBSERVATION SITE PHOTOGRAPHS

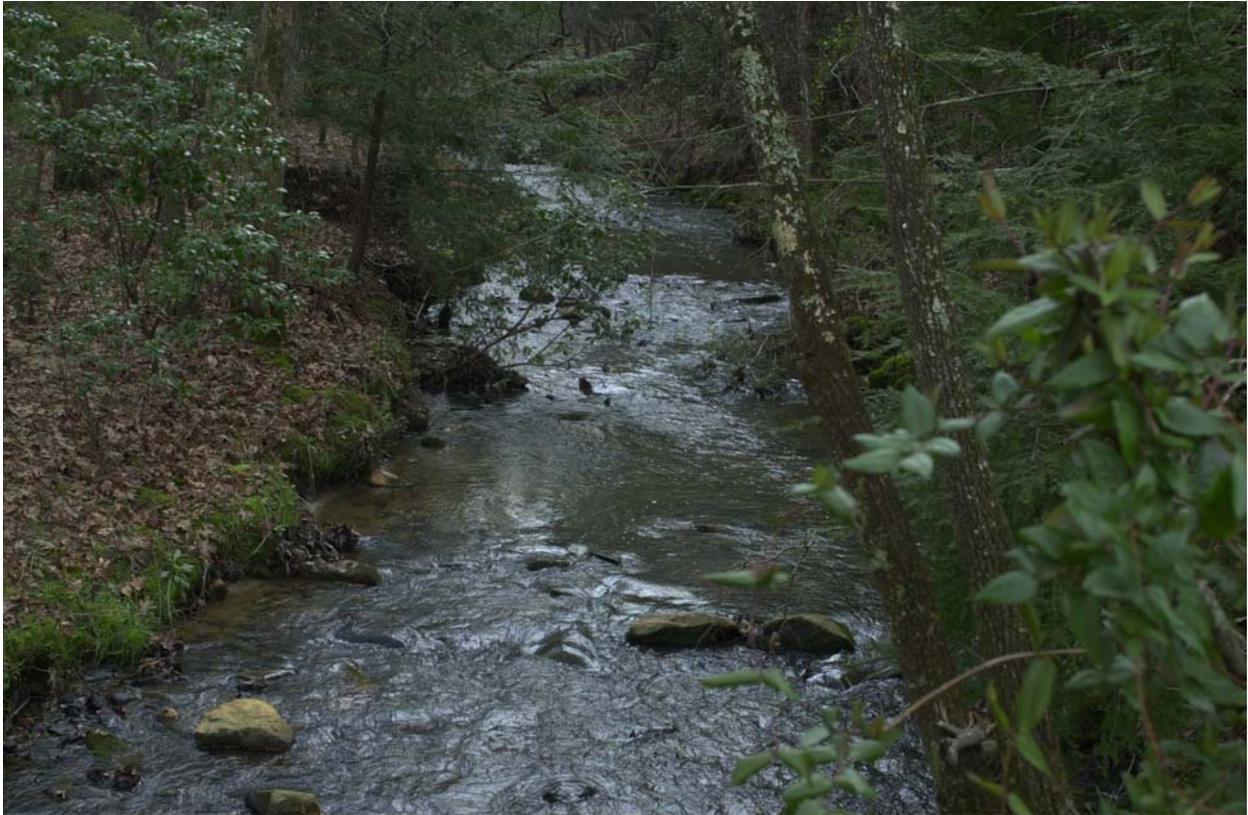
Site# 1



Site# 2



Site# 3



Site# 4



Site# 5



APPENDIX B

IMAGES OF WATERSHED SURVEY



Photograph taken at western crossing of SR 515 over Lower Youngcane Creek, facing north
Note low intensity pasturelands in headwaters of Lower Youngcane Creek watershed.



Photograph taken from crossing of Sandalwood Rd. over Lower Youngcane Creek, facing south
Note channel straightening and reestablishment of natural meander pattern.



Westwoods subdivision near Sandalwood Rd., facing west
Note heavy sedimentation from residential development.



Sandalwood Rd. near eastern crossing over Youngcane Creek, facing east
Note road bank instability and poor ditch maintenance.



Nottely Dam Rd. at SR 515, facing north
Note commercial development and high extent of impervious surfaces.

APPENDIX F

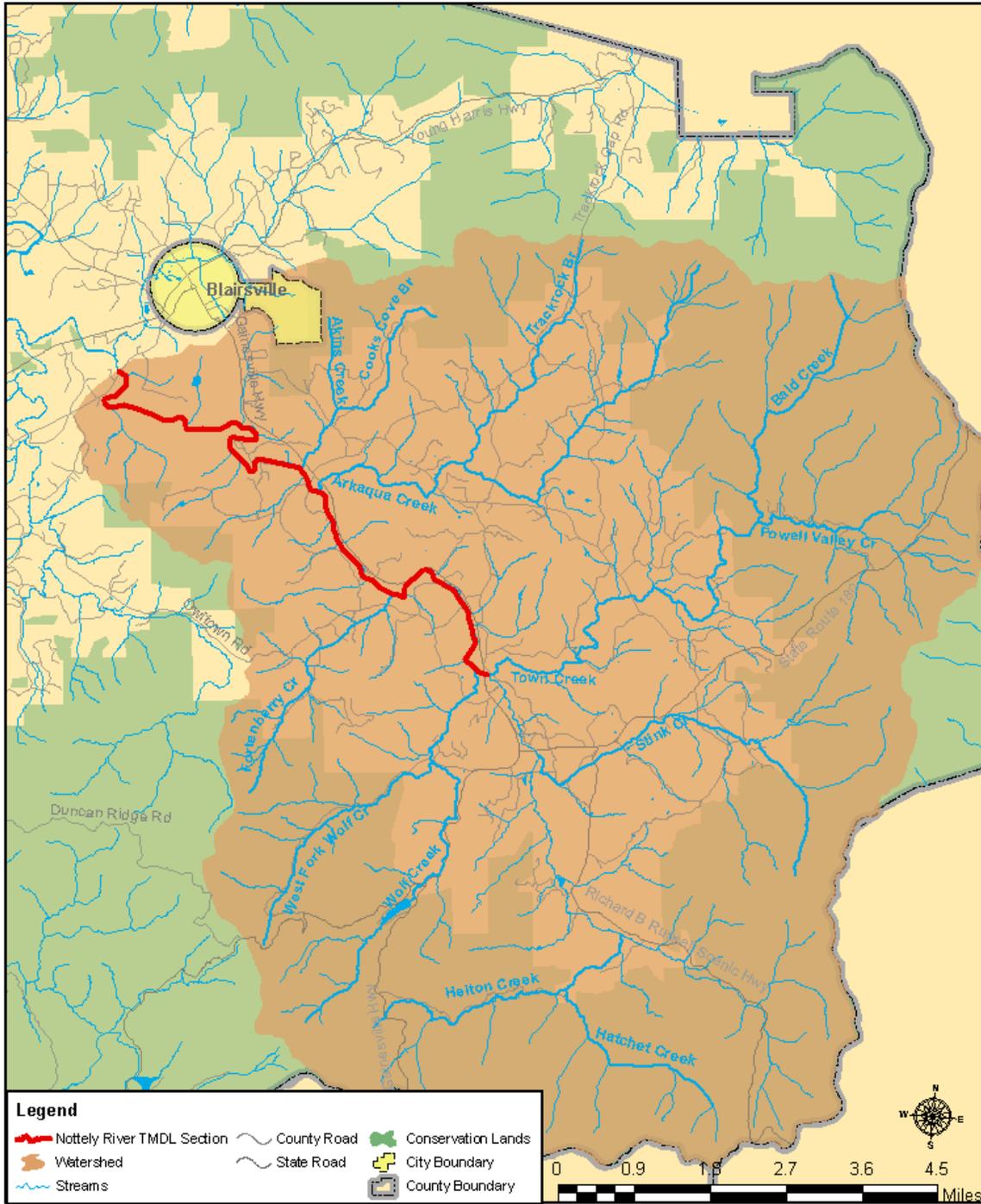
NOTTELY RIVER FIELD SURVEY

GEORGIA ADOPT-A-STREAM

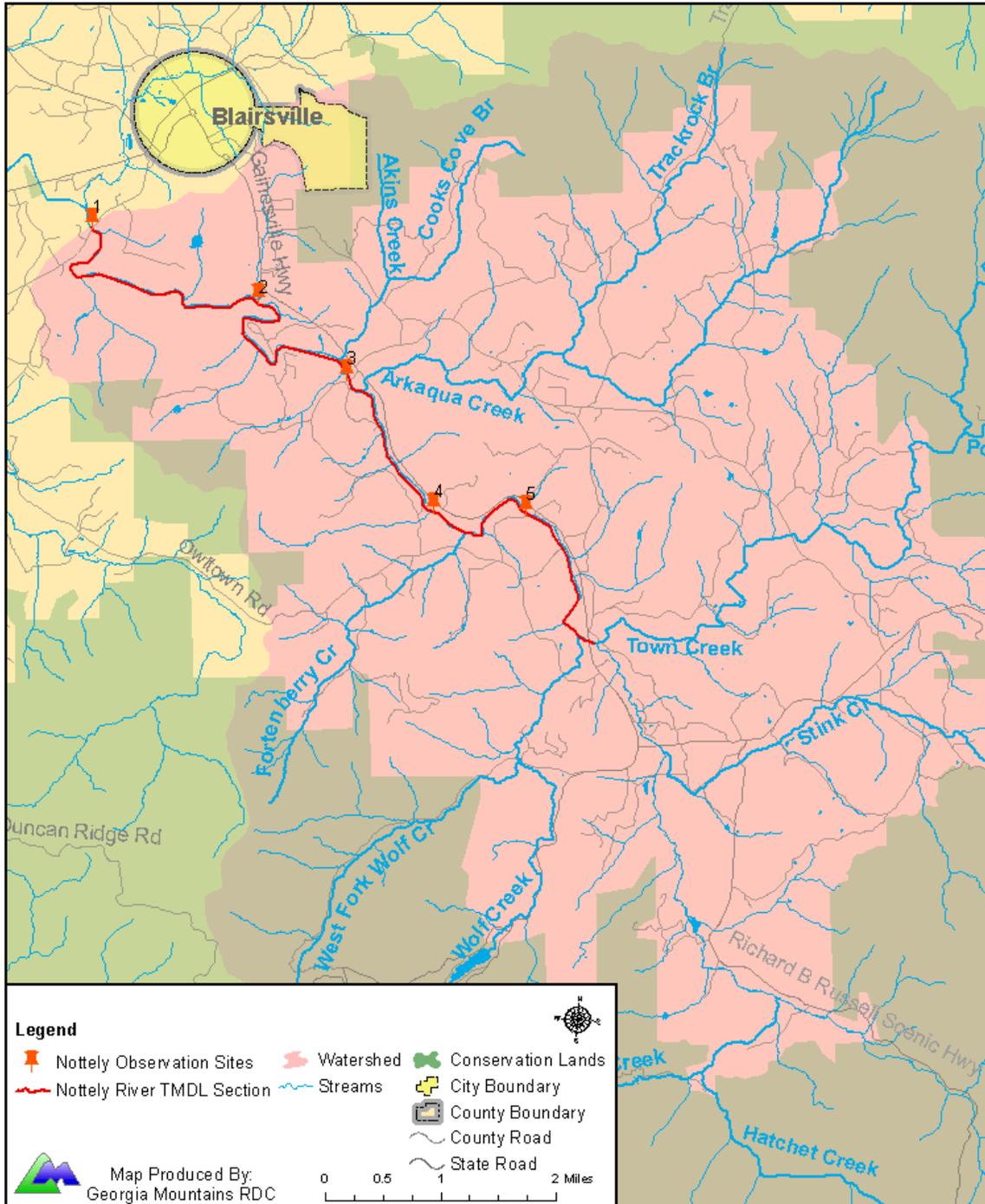
| | | | |
|--|--|------------------|---|
| AAS group name: | <u>Nottely River</u> | Investigator(s): | <u>Christopher Ernst</u> |
| Type of waterbody: | stream / wetland / lake | | <u>Stream</u> |
| Water body name: | <u>Nottely River</u> <u>US HWY 19 to Lake</u> <u>Nottely</u> | County(ies): | <u>Union County</u> |
| Approximate size of drainage/study area: | <u>53,784</u> | acres | |
| Date: | <u>March 24,</u> <u>2006</u> | Time: | <u>6:00pm</u> Picture/photo documentation? Yes |

Watershed Survey and Map Assessment

Nottely River TMDL Stream Segment



Nottely River Observation Site Locations



II. LAND USES/ACTIVITIES AND IMPERVIOUS COVER

1. Identify land uses and activities in the watershed which have the highest potential to impact water bodies:

Check all boxes that apply, describe the location of the activity(ies) under Notes on Location & Frequency of Activities and also mark the locations on your map. If too frequently occurring to record locations, so note. If you don't know some of the information below, write DK under Notes.

Please indicate if you: surveyed only adjacent to the waterbody
 surveyed the whole watershed
 Provide notes as necessary

The watershed field survey included an evaluation of in-stream and watershed conditions. In-stream conditions were identified along the TMDL listed segment at the sites identified in the Nottely River Observation Site Location Map and Section III. Images of the observation site locations are provided in Appendix A. Because nonpoint source pollution commonly originates from activities relating to land use, the Nottely River watershed was also surveyed to note existing land use types and intensities. Selected images of the watershed survey can be found in Appendix B.

Agricultural practices and improperly functioning septic systems from residential developments are likely causes of fecal coliform loadings in the Nottely River. Agriculture is widespread in the river basin because of vast expanses of flat to gently rolling lands. Cattle grazing and hay production were identified in the field survey as being the primary agricultural activities in the watershed, but poultry production, equestrian activities, and row cropping were also noted. Sources of fecal coliform inputs to the Nottely River from agricultural practices include direct discharge of animal waste into waterbodies and overland transport of animal waste material during stormflows to perennial waterbodies. Agricultural best management practices are used throughout the watershed; however, many farmlands still allow direct access of animals to waterbodies.

Residential housing units include both older and new structures. New residential developments are being constructed on steep slopes and ridgelines to take advantage of the area's scenic views. These sites commonly require additional septic design requirements to perform correctly on steep slopes and thin soils. Aged residential housing units are also common throughout the watershed and may be contributing to fecal coliform loadings due to a lack of maintenance and repair.

Plan for Nottely River and Youngcane Creek Watershed
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| Land Disturbing Activities & Other Sources of Sediment | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|--|----------------------|-----------------|---|
| Extensive areas disturbed by land development or construction of utilities, roads & bridge | X | X | Upper Stink Cr., Upper Town Cr., Fortenberry Cr. |
| Large or extensive gullies | □ | □ | _____ |
| Unpaved roads near or crossing streams | X | □ | Lands managed by the Forest Service |
| Croplands | X | X | Too frequent to note |
| Pastures with cattle access to water bodies | X | □ | Stink Creek Town Creek Fortenberry Creek Arkaqua Creek |
| Commercial forestry activities including harvesting and site-preparation | □ | □ | _____ |
| Extensive areas of streambank failure or channel enlargement | □ | □ | _____ |
| Other Agricultural Activities | | | |
| Confined animal (cattle or swine) feeding operations and concentrations of animals | □ | □ | _____ |
| Animal waste stabilization ponds | □ | □ | _____ |
| Poultry houses | □ | X | Owltown Rd. |
| Highways and Parking Areas | | | |
| Shopping centers & commercial areas | □ | □ | _____ |
| Interstate and controlled access highways and interchanges | □ | □ | _____ |
| Major highways and arterial streets | □ | □ | _____ |
| Other extensive vehicle parking areas | □ | □ | _____ |
| Mining | | | |
| Quarries with sediment basins in live flowing streams | □ | □ | _____ |

Transportation and Motor Vehicle Services

| | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|---|--------------------------|--------------------------|---|
| Truck cleaning services | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Public and private automobile repair facilities | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Car washes and large auto dealers | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Rail or container transfer yards | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Airports with fuel handling/aircraft repair | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Business & Industry, General

| | | | |
|---|--------------------------|--------------------------|-------|
| Activities with exterior storage or exchange of materials. | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Activities with poor housekeeping practices indicated by stains leading to streams or storm drains or on-site disposal of waste materials | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Heavy industries such as textiles & carpet, pulp & paper, metal, and vehicle production or fabrication | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Dry cleaners/outside chemical storage | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Food & Kindred Products

| | | | |
|--|--------------------------|--------------------------|-------|
| Fertilizer production plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Feed preparation plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Meat and poultry slaughtering or processing plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Construction Materials

| | | | |
|-----------------------------------|--------------------------|--------------------------|-------|
| Wood treatment plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Concrete and asphalt batch plants | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

| Waste Recycling, Movement & Disposal | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|--|--------------------------|--------------------------|---|
| Junk and auto salvage yards | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Solid waste transfer stations | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Landfills and dumps (old & active) | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Recycling centers | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Drum cleaning sites | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Illicit Waste Discharges* | | | |
| Sanitary sewer leaks or failure | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Overflowing sanitary sewer manholes due to clogging or hydraulic overloading | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Bypasses at treatment plants or relief valves in hydraulically overloaded sanitary sewer lines | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Domestic or industrial discharges | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Extensive areas with aged/malfunctioning septic tanks | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Dry-weather flows from pipes (with detectable indications of pollution) | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Streamside areas of illegal dumping | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

* If found (most likely during stream surveys), these activities should be immediately reported to the local government or the EPD regional office. These phone numbers are listed in Chapter 4.

III. GENERAL WATERBODY AND WATERSHED CHARACTERISTICS

This information will be gathered from your wetland, lake or stream segment.

1. Note the number of hydrologic modifications on your waterbody: structures that alter water flow

| | | | |
|------------|-------|---------------|-------|
| None | _____ | Beaver dams | _____ |
| Dams | _____ | Dredge spoils | _____ |
| Bridges | 10 | Pipes | _____ |
| Waterfalls | _____ | Other | _____ |

2. Note the approximate length of the stream that is affected by the following: if assessing a wetland, lake or pond, some of the following may also affect your waterbody

| | | | | |
|--------------------------------|-------|---------------|---------------|--------------------|
| Stream culvert | 150 | feet or _____ | mile or _____ | % of stream length |
| Stream straightening | _____ | feet or _____ | mile or _____ | % |
| Concrete streambank/bottom | _____ | feet or _____ | mile or _____ | % |
| Dredging/channelization | _____ | feet or _____ | mile or _____ | % |
| Riprap/gabion | _____ | feet or _____ | mile or _____ | % |
| Cattle crossing | _____ | # | | |
| Stream crossing (for vehicles) | _____ | # | | |

3. Note extent of vegetative buffer along the banks: at a minimum of 5 sites*, at regular intervals (every 500 ft. in a 1/2 mile. section) note the following

| # | Width in feet | Location (Left bank, Right bank or N, S, E, W side of wetland or lake) | Characteristics and comments |
|---|---------------|--|--|
| 1 | 100ft | Center, taken from Old Blue Ridge Rd. bridge. | Stream velocity is high (3 fps), with the thalweg located on river left. River depth varies from 1-3ft. The substrate is composed of silt and sand in the calm areas located on river right and behind the bridge footings, with cobbles and boulders located in the remaining area of the stream channel. Woody debris was only located the banks, at the water line, and consisted of small sticks and leaf litter. The right bank is gently sloping (10 degrees) and is composed of large boulders (not rip rap). Vegetation consists of moss, grass, and mature trees. The right bank is severely undercut and bank failure is widespread. Bank height is 12ft and little vegetation is present. The left floodplain is completely wooded. |
| 2 | 150ft | Center, image taken from Martin Rd. bridge, facing downstream | Stream velocity is high (3 fps), with the main stream flow located on the left side of the river. River depth is 1-2ft and the substrate is composed of some silt and sand located |

| | | | |
|----------|-------|--|--|
| | | | <p>near the right bank, but predominantly cobbles and boulders composing the rest of the channel bottom. The right bank is 1ft tall and is vegetated with moss and grasses. The floodplain on river right is wooded with mature trees. A steep wooded hillside drops directly to the stream surface on river left and is densely vegetated with laurel and mature trees.</p> |
| 3 | 100ft | Center, image taken from Owl Town Rd., facing upstream | <p>Stream velocity is moderate to high (2-3 fps), with an even stream velocity across the stream channel. Stream depth is 1-3ft and the substrate is composed of sand, pebbles, cobbles, and boulders. Little woody vegetation is found in the channel. The right stream bank is 3ft tall and vegetated with grass and moss with many roots from nearby trees. The floodplain on river right is well vegetated with dense stands of river cane and scattered mature trees. The bank on river left is 3ft tall and slightly undercut. Nonetheless, the bank is well vegetated with grasses and moss with a dense network of roots from nearby trees. The bank on river left leads to a steep slope (35 percent) that climbs to a ridge. This slope is well vegetated with mature trees.</p> |
| 4 | 75ft | Center, image taken from bridge on Hutson Rd., looking downstream | <p>Stream velocity is high (3 fps) and depth is varies from 1-3ft. Substrate is composed of pebbles, cobbles, and boulders. No woody vegetation is present. The highest stream velocities are located along the left bank. The left bank is 2ft in height and is slightly undercut, but remaining intact due to grass and moss vegetation and additional support from nearby mature trees. A steep ridgeline comes directly to the bank, and is vegetated with mature trees. The river right bank is 1ft in height and is vegetated with grass and moss. A gentle slope (10 degrees) leads to the floodplain. Both the slope and floodplain are vegetated with mature trees.</p> |
| 5 | 75ft | Center, image taken from bridge on Jimmy Nicholson Rd., facing downstream. | <p>Stream velocity is high (3+ fps) and depth varies from 1-3ft. Substrate is composed of cobbles and boulders on river right, transitioning to silt, sand, pebbles, and cobbles towards the left bank. No woody debris is located in the channel. The right</p> |

| | | | |
|--|--|--|---|
| | | | <p>bank is steep (60 degrees) and composed of riprap that has been vegetated with moss and scattered small trees. The floodplain on river right is commercial tourist site, which includes river tubing (note manikin hanging from rope above river, stop sign, and steps leading from river to shops). The left bank is partially undercut and some trees have nearly fallen into stream. The bank is 5ft in height and vegetation is located only at the top of the bank. The floodplain on the river left has a 20ft vegetated buffer of forestland, leading to a grassed field.</p> |
|--|--|--|---|

4. Check the categories that best describe the general appearance of the waterbody:

Litter:

- No litter visible
- Small litter occasionally (i.e., cans, paper)
- Small litter common
- Large litter occasionally (i.e., tires, pallets, shopping carts)
- Large litter common

Special Problems:

- Spills of chemicals, oil, etc.
- Fish kills
- Wildlife, waterfowl kills

Erosion:

- No bank erosion or areas of erosion very rare; no artificial stabilization
- Occasional areas of bank erosion
- Areas of bank erosion common
- Artificial bank stabilization (i.e., riprap) present

5. Comments on general waterbody and watershed characteristics: (e.g. date and size of fish kill, increased rate of erosion evident, litter most evident after storms)

* Fish kills should be immediately reported to DNR Wildlife Resources Division at 770-918-64

Visually, the Nottely River and its watershed appear to be in good overall condition.

6. Summarize notable changes that have taken place since last year (if this is not your first year conducting the Watershed Survey).

First year of watershed study.

APPENDIX A

OBSERVATION SITE PHOTOGRAPHS

Site# 1



Site# 2



Site# 3



Site# 4



Site# 5



APPENDIX B

IMAGES OF WATERSHED SURVEY



Nottely River Headwaters
Photograph taken at Helton Creek Falls, facing south
Note lands managed by Forest Service



Nottely River Headwaters
Photograph taken near intersection of Richard Russell Scenic Highway
and Craig Rd., facing west.
Note row cropping activity.



Stink Creek Watershed
Photograph taken from residential neighborhood near Burt Nix Rd., facing west.
Note residential development on steep slopes.



Stink Creek Watershed
Photograph taken from end of Cedar Mountain Trout Farm Rd., facing east.
Note high intensity residential and recreational housing.



Stink Creek Watershed
Photograph taken from Burt Nix Rd., facing south.
Note high intensity cattle grazing and well placed feed structure away from all waterbodies.



Stink Creek Watershed

Photograph taken from Wolfstake Rd. W. at the Choestoe Falls R.V. Park, facing north.
Note resident Canada Geese (center frame) and domestic pets (far right frame)
directly in and within close proximity to waterbodies.



Wolf Fork Watershed
Photograph taken from Lake Trahlyta Dam, facing southwest.
Note intensive recreational area (Vogel State Park).



Wolf Fork Watershed
Photograph taken from West Wolf Creek Rd., facing east



Arkaqua Creek Watershed
Photograph taken from Town Creek School Rd., facing west
Note low intensity agricultural land use.

APPENDIX H
YOUNGCANE CREEK FIELD SURVEY

GEORGIA ADOPT-A-STREAM

Watershed Survey and Map Assessment

| | |
|--|---|
| AAS group name: <u>Youngcane Creek</u> | Investigator(s): <u>Christopher Ernst</u> |
| Type of waterbody: stream / wetland / lake | <u>Stream</u> |
| Water body name: <u>Youngcane Creek</u> | County(ies): <u>Union County</u> |
| Approximate size of drainage/study area: <u>18,300</u> acres | |
| Date: <u>03/15/06</u> Time: <u>5:00</u> | Picture/photo documentation? Yes |

Youngcane Creek Observation Site Locations



II. LAND USES/ACTIVITIES AND IMPERVIOUS COVER

1. Identify land uses and activities in the watershed which have the highest potential to impact water bodies:

Check all boxes that apply, describe the location of the activity(ies) under Notes on Location & Frequency of Activities and also mark the locations on your map. If too frequently occurring to record locations, so note. If you don't know some of the information below, write DK under Notes.

Please indicate if you: surveyed only adjacent to the waterbody
 surveyed the whole watershed
 Provide notes as necessary

The watershed field survey included an evaluation of in-stream and watershed conditions. In-stream conditions were identified along the TMDL listed segment at the sites identified in the Youngcane Creek Observation Site Location Map and Section III. Images of the observation site locations are provided in Appendix A. Because nonpoint source pollution commonly originates from activities relating to land use, the Youngcane Creek watershed was also surveyed to note existing land use types and intensities. Selected images of the watershed survey can be found in Appendix B.

Although rather inconclusive, agricultural practices and improperly functioning residential septic systems were noted in the field survey as the likely sources of fecal coliform loading in the watershed. Agricultural activity covers a significant portion of the watershed and consists primarily of pasture and hay lands. High intensity grazing of pasturelands is not found in great abundance within Youngcane Creek watershed. A number of poultry houses were also noted. It is possible that the spread of chicken manure as fertilizer on pasturelands is a potential source of fecal coliform; however, the extent to which this practice occurs could not be determined through the field survey.

The fringes of the watershed is experiencing significant residential development. Improperly functioning septic systems could increase Youngcane Creek's level of fecal coliform significantly. As with the agricultural activity the extent to which septic systems influence water quality in the watershed could not be determined by the field survey.

Plan for Nottely River and Youngcane Creek Watershed
HUC 10 #:0602000208

| Land Disturbing Activities & Other Sources of Sediment | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|---|--------------------------|--------------------------|---|
| Extensive areas disturbed by land development or construction of utilities, roads & bridges | <input type="checkbox"/> | X | Headwaters |
| Large or extensive gullies | <input type="checkbox"/> | X | Residential areas |
| Unpaved roads near or crossing streams | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Croplands | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Pastures with cattle access to water bodies | X | X | Youngcane Creek- upstream of Little Youngcane Creek |
| Commercial forestry activities including harvesting and site-preparation | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Extensive areas of streambank failure or channel enlargement | X | <input type="checkbox"/> | Downstream of Little Youngcane Creek |
| Other Agricultural Activities | | | |
| Confined animal (cattle or swine) feeding operations and concentrations of animals | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Animal waste stabilization ponds | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Poultry houses | <input type="checkbox"/> | X | Youngcane Creek- upstream of Little Youngcane Creek |
| Highways and Parking Areas | | | |
| Shopping centers & commercial areas | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Interstate and controlled access highways and interchanges | X | X | SR 515 |
| Major highways and arterial streets | X | X | SR 515 |
| Other extensive vehicle parking areas | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Mining

Quarries with sediment basins in live flowing streams

Transportation and Motor Vehicle Services

Adjacent to Water

In Watershed

Notes on location & frequency of activity

Truck cleaning services

Public and private automobile repair facilities

Car washes and large auto dealers

Rail or container transfer yards

Airports with fuel handling/aircraft repair

Business & Industry, General

Activities with exterior storage or exchange of materials.

Activities with poor housekeeping practices indicated by stains leading to streams or storm drains or on-site disposal of waste materials

Heavy industries such as textiles & carpet, pulp & paper, metal, and vehicle production or fabrication

Dry cleaners/outside chemical storage

Food & Kindred Products

Fertilizer production plants

Feed preparation plants

Meat and poultry slaughtering or processing plants

Construction Materials

Wood treatment plants

Concrete and asphalt batch plants

| Waste Recycling, Movement & Disposal | Adjacent to Water | In Watershed | Notes on location & frequency of activity |
|--|--------------------------|--------------------------|---|
| Junk and auto salvage yards | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Solid waste transfer stations | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Landfills and dumps (old & active) | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Recycling centers | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Drum cleaning sites | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Illicit Waste Discharges* | | | |
| Sanitary sewer leaks or failure | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Overflowing sanitary sewer manholes due to clogging or hydraulic overloading | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Bypasses at treatment plants or relief valves in hydraulically overloaded sanitary sewer lines | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Domestic or industrial discharges | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Extensive areas with aged/malfunctioning septic tanks | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Dry-weather flows from pipes (with detectable indications of pollution) | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Streamside areas of illegal dumping | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

* If found (most likely during stream surveys), these activities should be immediately reported to the local government or the EPD regional office. These phone numbers are listed in Chapter 4.

III. GENERAL WATERBODY AND WATERSHED CHARACTERISTICS

This information will be gathered from your wetland, lake or stream segment.

1. Note the number of hydrologic modifications on your waterbody: structures that alter water flow

| | | | |
|------------|-------|---------------|-------|
| None | _____ | Beaver dams | _____ |
| Dams | _____ | Dredge spoils | _____ |
| Bridges | 6 | Pipes | _____ |
| Waterfalls | _____ | Other | _____ |

2. Note the approximate length of the stream that is affected by the following: if assessing a wetland, lake or pond, some of the following may also affect your waterbody

| | | | | |
|--------------------------------|-------|---------------|---------------|--------------------|
| Stream culvert | _____ | feet or _____ | mile or _____ | % of stream length |
| Stream straightening | _____ | feet or _____ | mile or _____ | % |
| Concrete streambank/bottom | _____ | feet or _____ | mile or _____ | % |
| Dredging/channelization | _____ | feet or _____ | mile or _____ | % |
| Riprap/gabion | _____ | feet or _____ | mile or _____ | % |
| Cattle crossing | _____ | # | | |
| Stream crossing (for vehicles) | _____ | # | | |

3. Note extent of vegetative buffer along the banks: at a minimum of 5 sites*, at regular intervals (every 500 ft. in a 1/2 mile. section) note the following

| # | Width in feet | Location (Left bank, Right bank or N, S, E, W side of wetland or lake) | Characteristics and comments |
|---|---------------|--|--|
| 1 | 10ft | Center, looking upstream from bridge at Blueridge Hwy. | Stream velocity is high (3 fps) with constant flow rate across channel. The substrate is composed of sand, pebbles, cobbles, and boulders. Woody debris is composed of small sticks and some leaf litter. The banks are 5ft tall, nearly vertical, and densely vegetated with shrubs and mature trees. The left floodplain has a 10ft vegetated buffer of mature trees, followed by a grassed residential yard. The right floodplain is vegetated with dense brush and mature trees. |
| 2 | 20ft | Center from Bridge at Youngcane Creek Rd, looking downstream. | Stream velocity is high with the flow meandering around boulders in stream. Substrate is composed of sand, pebbles, cobbles, and large boulders (5ftx3ft). Woody debris has accumulated on rocks on river left and is composed of small to moderate sized sticks and leaves. The left bank is vertical, 8ft in height, yet well vegetated with dense shrubbery and stable. Beyond the bank, the |

| | | | |
|---|------|--|---|
| | | | left floodplain is a grassed residential yard. The right bank is gently sloping (10 percent) and leads to wooded floodplain. |
| 3 | 12ft | Right at end of John Abernathy Rd | Stream velocity is moderate to high (2-3 fps) with several significant flow paths across channel. The substrate is composed of silt, sand, pebbles, cobbles, boulders, and bedrock features. Silt and sand has been deposited behind bedrock outcrops (which are the features causing the split flow patterns), while pebbles, cobbles, and boulders are the predominant bed feature in areas with higher flow velocities. The right bank is 2 ft in height and vertical. A limited amount of undercutting has occurred, but has not caused vegetative loss. The bank is vegetated with grasses, moss, and roots from nearby trees. The river right floodplain is entirely covered in mature forest cover. The river left floodplain is nonexistent as a wooded ridge rises directly from the stream channel. |
| 4 | 25ft | Center at bridge of John Abernathy Rd., looking upstream | Stream velocity is moderate to slow (2-1 fps) and the flow rate is constant across the channel. The substrate is composed of thick deposits of silt and sand. The banks are severely undercut and numerous trees have fallen into the stream. The root wads from these trees are currently acting as obstruction to the stream flow and diverting the current into the bank, creating additional channel instability. Woody debris is located near the stream banks and is composed of large, mature trees. Bank height is 10ft. and lightly vegetated with grasses, moss, and mature trees. Both left and right floodplains are forested with mature trees. |
| 5 | 15ft | Left at end of Ridge Crest Drive | Stream velocity is moderate (2 fps) and the flow rate is constant across the stream channel. The substrate is composed of thick deposits of sand. The banks are severely undercut and numerous trees have fallen into the stream channel. Root wads from these trees are obstructing the stream flow along the banks and forcing divergent water into the banks, further destabilizing the banks. The banks are 10-12ft tall and are lightly vegetated with grasses and mature trees on |

| | | | |
|--|--|--|---|
| | | | <p>the left bank and nearly completely devoid of vegetation on the right bank. The river right floodplain is a pasture with a small (5ft) vegetated buffer adjacent to the stream. This buffer is vegetated with mature trees, which are actively being undercut. The river left floodplain is composed of a 5ft buffer of mature trees. A gravel road occupies the remaining floodplain.</p> |
|--|--|--|---|

4. Check the categories that best describe the general appearance of the waterbody:

Litter:

- No litter visible
- Small litter occasionally (i.e., cans, paper)
- Small litter common
- Large litter occasionally (i.e., tires, pallets, shopping carts)
- Large litter common

Special Problems:

- Spills of chemicals, oil, etc.
- Fish kills
- Wildlife, waterfowl kills

Erosion:

- No bank erosion or areas of erosion very rare; no artificial stabilization
- Occasional areas of bank erosion
- Areas of bank erosion common
- Artificial bank stabilization (i.e., riprap) present

5. Comments on general waterbody and watershed characteristics: (e.g. date and size of fish kill, increased rate of erosion evident, litter most evident after storms)

* Fish kills should be immediately reported to DNR Wildlife Resources Division at 770-918-64

The watershed appears to be in good condition with land cover being predominantly forestland and low intensity agricultural lands. Some areas indicate high stormwater discharge rates in stormwater structures (ditches, etc) and small tributaries. Youngcane Creek appears to be in good condition from its headwaters to the confluence with Little Youngcane Creek. From Little Youngcane Creek to Nottely Lake, streambank erosion becomes very apparent.

6. Summarize notable changes that have taken place since last year (if this is not your first year conducting the Watershed Survey).

This is the first watershed survey.

APPENDIX A

OBSERVATION SITE PHOTOGRAPHS

Site# 1



Site# 2



Site# 3



Site# 4



Site# 5



APPENDIX B
IMAGES OF WATERSHED SURVEY



Photograph taken from Elisha Payne Rd., facing west
Note large land disturbing activity and poor erosion control practices.



Photograph taken from Elisha Payne Rd., facing north
Note low intensity residential development on low to moderate slopes.



Photograph taken from Huckleberry Hills Rd., facing west
Note low intensity cattle grazing.



Photograph taken from Philadelphia Church Rd., facing west
Note moderate intensity cattle grazing.



Photograph taken from Blueridge Highway at Little Youngcane Creek, facing west
Note indication bank erosion from high stormwater discharge.



Photograph taken at Youngcane Creek and Ridge Crest Dr., facing north
Note intensive bank erosion.