

STATE OF GEORGIA
TIER 2 TMDL IMPLEMENTATION PLAN **REVISION 1**
 Little Tennessee River Watershed
 Tennessee River Basin
 April 28, 2006

Local Watershed Governments:
 Rabun County
 City of Mountain City
 City of Dillard
 City of Sky Valley

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.

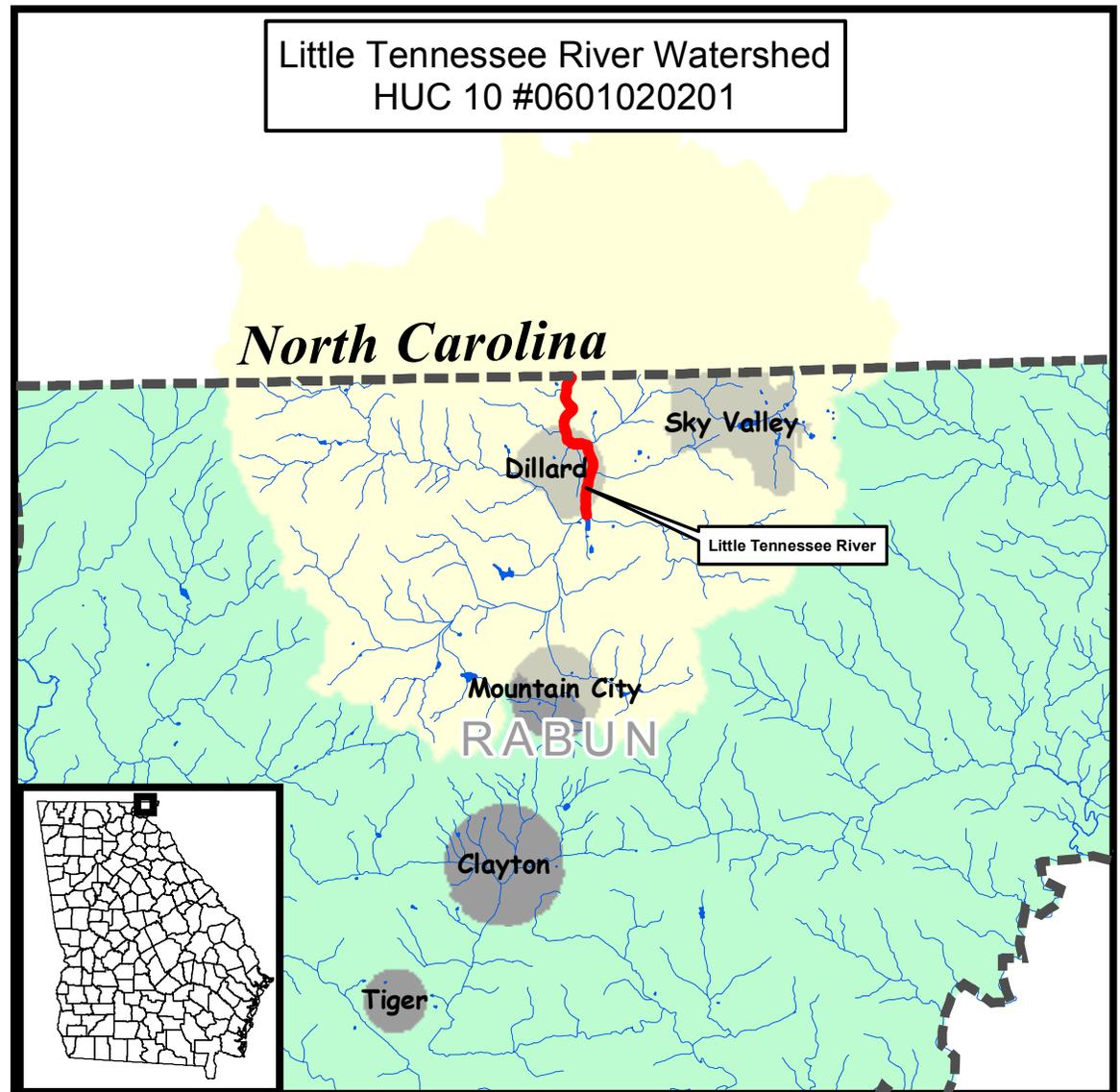


Table 1. IMPAIRMENTS

IMPAIRED STREAM SEGMENT	IMPAIRED SEGMENT LOCATION	IMPAIRMENT	TMDL ID
Little Tennessee River	Dillard to Stateline	Fecal Coliform	TEN0000015

II. GENERAL INFORMATION ABOUT THE WATERSHED

Write a narrative describing the watershed, HUC 10# 0601020201. 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 Little Tennessee River watershed covers 29,920 acres within Georgia and includes the cities of Dillard and Sky Valley, as well as portions of Mountain City. Using the Georgia National Land Cover Dataset from 1995, the TMDL identified forestlands (90.1%) and pasture/hay lands (7.4%) as accounting for 99% of the watershed area. Existing land use data was most recently collected in 2005 by the Georgia Mountains RDC and identifies a number of important land use changes since 1995. Most notably, agriculture, forestry, and conservation lands now account for 71% of the lands within the watershed. The amount of residential land has increased dramatically and currently accounts for 6,108 acres (20.6%). Residential development continues to play a progressively more important role in the overall watershed characteristics, and is primarily motivated by housing demand from part-time homeowners and the retirement community.

Existing Land Use: Little Tennessee River Watershed (Rabun County)

Land Use Description	Unincorporated Rabun County	Dillard	Mountain City	Sky Valley	Total		
	Acres	Acres	Acres	Acres	Acres	Percent	
Agriculture/Forestry	8,778	617	130	333	9,859	33.3	
Commercial	137	85	80	34	335	1.1	
Industrial	694	0	0	0	694	2.3	
Park/Recreation/Conservation	1,790	0	10	336	2,135	7.2	
Park/Recreation/Conservation, Forest Service Lands	9,028	0	0	0	9,028	30.5	
Public/Institutional	142	10	20	11	183	0.6	
Residential	4,945	260	554	349	6,108	20.6	
Transportation/Communication/Utilities	61	6	1	0	68	0.2	
Undeveloped	237	12	300	684	1,234	4.2	
					Total	29,644	100

The HUC 10 supports a wide variety of activities including conservation lands, farm and forestry activity, and residential, commercial, and industrial uses. Much of the headwaters of the watershed is managed by the USDA Forest Service and is primarily used as passive recreational and conservation land. Numerous farms are located in the low elevation areas of the watershed and include cattle, poultry, and equestrian operations as well as row cropping. Residential land uses are dispersed throughout the watershed and are accounting for an increasing percentage of the land use in the HUC 10. Full time, part time, and rental housing units are common throughout the watershed. Commercial activity is focused along the U.S. 441 corridor, which runs north to south through the center of the watershed, and includes services, retail, and wholesale trade. A limited number of industries are located within the watershed including National Textiles and Rabun Apparel. Vulcan Materials operates a quarry that produces asphalt and concrete aggregate, rip rap, and manufactured sand. The City of Dillard has a small sewer system with a treatment plant located in Dillard, while Mountain City is connected to the Clayton-Rabun Water and Sewer Authority's sewer system. NPDES permitted facilities in the HUC 10 include National Textiles, Rabun Apparel, Dillard WPCP, and Vulcan Materials.

Activities occurring within the watershed relevant to water quality include water quality monitoring by the Little Tennessee Watershed Association and land conservation through The Land Trust for the Little Tennessee and the development of two mitigation banks in the HUC 10. The Little Tennessee Watershed Association has been actively conducting biomonitoring, streambank restorations, and educational outreach activities. The Land Trust for the Little Tennessee provides rural land conservation, land stewardship promotion, and outreach and education to citizens and landowners in the Little Tennessee River watershed. The Hambidge Center and the Rabun Gap-Nacoochee School are both developing mitigation banks within the HUC 10. The Hambidge Center's mitigation bank is located along Betty's Creek, one of the main tributaries of the Little Tennessee River. The Rabun Gap-Nacoochee School is developing a mitigation bank along Jerry Branch.

Little Tennessee 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
Little Tennessee River	Dillard to Stateline (Rabun County)	3	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

PARAMETER 1	WQ STANDARD	SOURCES OF IMPAIRMENT	NEEDED REDUCTION FROM TMDL
Fecal Coliform	-Geometric mean of 200 per 100ml (May-October) -Geometric mean of 1,000 per 100 ml (November-April) -Single sample geometric mean of 4,000 per 100ml (November-April)	Urban Runoff	69%
		Agricultural 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.

Identification and ranking of potential sources or causes of impairment were performed through a visual survey of the watershed and involvement of the stakeholder group. The visual survey was conducted on December 30, 2005 and covered the entire extent of the Little Tennessee's watershed within Georgia (Appendix C). Images were recorded that represented existing stream channel and land use conditions. A total of four stakeholder meetings were held for the development of the Little Tennessee River TMDL Implementation Plan. Discussion with the stakeholder group to identify potential sources of pollution was provided during the first two meetings (Appendix D). During the first stakeholder meeting, general background information on the TMDL process was provided and a watershed characterization using the images collected during the field survey was performed. This watershed characterization provided an opportunity for open discussion regarding potential causes of impairment. During the second stakeholders meeting, locations of potential sources of impairment were identified as "hot spots" on a map of the watershed (Appendix D). Ranking impairment sources was found to be difficult without additional monitoring data. Because of the limited data available, consensus regarding the estimated portion of contribution for each potential source could not be reached.

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 Activity	Medium	3	Medium	Unknown	Unknown
Septic Systems (Residential Development)	Widespread	5	Medium	Unknown	Unknown
Sewer Systems (Commercial and Residential Developments)	Scattered	1	Medium	Unknown	Unknown
Industrial Sources	Scattered	1	Unknown	Unknown	Unknown
Wildlife/Forestry Activity	Widespread	5	Unknown	Unknown	Unknown

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 identified through knowledge from previous planning initiatives in Rabun County, including the Comprehensive Plan update that was performed during 2005. Private stakeholders such as land and business owners were also identified during the field survey. Participating stakeholders represented a diverse group of government representatives, business and landowners, members of the general public, and local environmental groups. Attendance varied between 7 and 15 stakeholders per meeting with 19 members attending in total. Four meetings were held in the Dillard City Hall for the development of the Little Tennessee River TMDL Implementation Plan. The first meeting provided background information on the TMDL process, identified the water quality impairment for the Little Tennessee River, and a characterization of the watershed was performed using images collected during the field survey. The second meeting focused on discussion regarding the potential pollution sources and identification of management measures needed to be implemented to improve water quality. Outreach activities and the identification of additional management measures were discussed at the third meeting. The final meeting provided a review of the draft TMDL Implementation Plan.

Stakeholder meetings provided for the identification of potential fecal coliform sources. The stakeholder group noted five major categories of fecal coliform contribution, including agricultural activity, failing residential septic systems, potential impairment from sewer systems within the watershed, the possibility of illicit discharges from industrial sources, and wildlife inputs. The grazing of cattle and horses and the distribution of a limited amount of chicken litter from poultry operations within the watershed are all fecal coliform sources associated with agricultural activity. Many of these agricultural activities are occurring nearby, or directly within, waterbodies in the Little Tennessee River watershed. Agricultural BMPs are used extensively throughout the watershed, yet continued cooperation between agricultural landowners and agencies such as the NRCS and Extension Service are required to provide additional protection to surface waters.

Malfunctioning private septic systems have been identified as a potential source of fecal coliform impairment within the watershed. Housing units with an age over 15 years are most commonly scattered throughout the watershed; however, a limited number of older, moderate density, neighborhoods also exist in the watershed and provide a concentration of aged homes. Septic systems require maintenance on approximately a 5 year schedule. Many older homes have septic systems that have not been properly maintained, are functioning improperly, and are releasing wastewater into nearby streams. Recent residential development within the watershed is also of concern as a large portion of development is occurring on moderate to steep slopes. Many of these areas have thin soils and are in close proximity to bedrock, making the placement of on-site septic systems difficult. The Rabun County Health Department continuously monitors the permitting of new septic systems. However, there are no effective measures in place to assess the operational performance of either old or new septic systems within the Little Tennessee watershed. Septic system overload may also be cause of poor septic system operation in this watershed and can occur in all residential systems as a result of increased input or use, from the construction of an additional bedroom or bathroom, without additional capacity upgrades.

Sewer systems located within the Little Tennessee watershed include the Clayton-Rabun Water and Sewer Authority (CRWSA) and the City of Dillard sewer system. The stakeholders assessed the City of Dillard's sewer system to be performing adequately, as statistics from EPA's ECHO records indicate that no violations have been recorded in numerous years. Several leaks have been identified in the CRWSA's sewer system in neighboring watersheds, and although only a small portion of the CRWSA's service area is located in the Little Tennessee River watershed, it is likely that this system's failure is contributing to lowered water quality in the Little Tennessee River. Similarly, biological monitoring of the Little Tennessee River by the Little Tennessee River Watershed Association has indicated declined aquatic habitat in close proximity to the discharge point for the Rabun Apparel plant. Therefore, it is recommended that continued NPDES monitoring be performed at this site and regulatory action should take place, where appropriate.

Wildlife has also been identified as a potential source of fecal coliform pollution. The extent and concentration of natural fecal coliform contributions within the watershed is poorly understood. Future monitoring should identify the natural conditions found in the watershed. If the data indicates that contributions are from non-human sources, the data should be submitted to EPD so that fecal coliform standards can be adjusted to be compliant with natural conditions.

There is great uncertainty concerning the extent and impact of each of the potential pollution sources within the Little Tennessee River watershed. A stakeholder consensus regarding the potential source of fecal coliform impairment could not be formed due to a lack of monitoring data. Additional monitoring is required to properly identify pollution sources, identify appropriate management measures and develop a mitigation strategy, and acquire the necessary funding for implementation of restoration activities.

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
Mike Wilson Rabun Green	841 Taylors Chapel Road	Rabun Gap	GA	30568		rabungap@alltel.net
Linda Johnson						linda3010@alltel.net
Fletcher Holiday EMI						fholiday@eminc.biz
Malcolm Dillard Dillard City Council	305 Barnard Lane	Dillard	GA	30537	706-746-3154	
William G. Robinson Dillard	892 Franklin St.	Dillard	GA	30537		
Brent Martin Land Trust for the Little Tennessee	88 East Main Street P.O. Box 1148	Franklin	NC	28744	828-524-7400	bmartin@littl.org
Joe Gatins Georgia Forest Watch	2489 Glade Road	Clayton	GA	30526	706-782-9944	jgatins@alltel.net
Laurence Holden	260 Black Lane	Clayton	GA	30525		laurenceholden@alltel.net
Helen Meadors Georgia Forest Watch						morhel@alltel.net
Mf Meadors						morhel@alltel.net
Eston Melton Rabun County Commission	25 Courthouse Square, Suite 201	Clayton	GA	30525	706-782-5271	eston@alltel.net
Jon Barnwell Rabun County Board of Realtors					706-490-0326	jon@buyrabun.com
Manning Holmes Lake Burton Civic Association						
Jim Holmes Lake Burton Civic Association	3113 Blalock-Goldmine Rd	Clayton	GA	30525		jimholmes@alltel.net

Gary Crane National Textiles	815 John Beck Dockins Rd.	Rabun Gap	GA	30568	706-746-5004 ext 130	gary.crane@nationaltextiles.com
Rebecca Peterson Rabun Green	70 Sequoia Hills Ln.	Clayton	GA	30525	706-212-2038	
Jeff Aaron Rabun County Extension	41 Jo DotsonCircle Suite 1	Clayton	GA	30525		kdaaron@uga.edu
Mary Gazaway Georgia EPD	4220 International Parkway, Suite 101	Atlanta	GA	30354	404-675-1745	mary_gazaway@dnr.state.ga.us
Chris Ernst Georgia Mountains RDC	P.O. Box 1720	Gainesville	GA	30503	770-538-2626	cernst@gmrdc.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, Section 305(b) and 303(d)	USEPA, Georgia DNR/EPD, Rabun County Mountain City Dillard Sky Valley	The congressional objective of the CWA “is to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.” Section 305 (the <i>National Water Quality Inventory</i>) 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	5	4
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	5	3

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

MEASURE	RESPONSIBILITY	DESCRIPTION	SOURCES OF FUNDING & RESOURCES	STATUS CODE	TARGET DATE	EXTENT RATING (Area, #)	EFFECT. RATING (Reduction)
Georgia Water Quality Control Act (OCGA 12-5-20)	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. Law authorizing Georgia EPD to control water pollution, eliminate phosphate detergents and regulate sludge disposal; to require permits for agricultural ground and surface water withdrawals; to prohibit siltation of state waters by land disturbing activities and require undisturbed buffers along state waters; to require land-use plans that include controls to protect drinking water supply sources and wetlands; to require river basin management plans on a rotation schedule for all major river basins.	Federal, State, Rabun County Dillard Mountain City Sky Valley	A	Ongoing	5	3
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 Rabun County Dillard Mountain City Sky Valley	P	2006	5	2

MEASURES APPLICABLE TO SPECIFIC PARAMETER: FECAL COLIFORM.

MEASURE	RESPONSIBILITY	DESCRIPTION	POTENTIALSOURCES OF FUNDING & RESOURCES	STATUS	TARGET DATE	EXTENT RATING	EFFECT. RATING
New Development Ordinance Revisions	Rabun County Dillard Mountain City Sky Valley	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.	Rabun County Dillard Mountain City Sky Valley	P	2007	5	2
Local County Land Development Guidelines	Rabun County Dillard Mountain City Sky Valley	Includes storm water quantity and quality requirements for new developments. Requires post-development controls for storm water quantity and quality intended to reduce storm water pollution loads from new developments.	Rabun County Dillard Mountain City Sky Valley	P	2010	5	5
Regulation of On-Site Sewage Management Systems, IAW O.C.G.A. 290-5-26	Georgia DHR, Rabun County Board of Health	Rules and regulations for installation and repair of on-site sewage management systems.	State, Rabun County Board of Health	A	On-going	5	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	Rabun County Dillard Mountain City Sky Valley	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, alternative products, 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.	Rabun County Dillard Mountain City Sky Valley	P	2010	1	3
Storm Water BMP Guidance Document for Municipal Operations	Rabun County Dillard Mountain City Sky Valley	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.	Rabun County Dillard Mountain City Sky Valley	P	2011	1	3

MEASURES APPLICABLE TO SPECIFIC PARAMETER: FECAL COLIFORM.

MEASURE	RESPONSIBILITY	DESCRIPTION	POTENTIALSOURCES OF FUNDING & RESOURCES	STATUS	TARGET DATE	EXTENT RATING	EFFECT. RATING
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	On-going	5	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	On-going	3	4
Sanitary Sewer Maintenance Program	Dillard Mountain City	Sanitary sewer system inventory and inspection (mapping, television inspections); infiltration & inflow identification and reduction (flow monitoring, smoke testing); sewer line rehabilitation (pipe bursting, relining, cleaning) and manhole rehabilitation.	Local/County Water/	A	On-going	1	5

MEASURES 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	2008	2	5
Clean Water State Revolving Loan Fund	Georgia Environmental Facilities Authority	The Clean Water State Revolving Loan Fund (CWSRF) is a Federal loan program administered by the Georgia Environmental Facilities Authority (GEFA) for wastewater infrastructure projects. Eligible projects include a wide variety of water quality and wastewater treatment projects, such as constructing or expanding wastewater treatment plants, installing sewer lines and sewer rehabilitation projects, and correcting infiltration/inflow problems and/or combined sewer overflow (CSO) problems. Loans are available at a low interest rate for a maximum of twenty (20) years.	State	P	2008	2	5

MEASURES APPLICABLE TO SPECIFIC PARAMETER: FECAL COLIFORM.

MEASURE	RESPONSIBILITY	DESCRIPTION	POTENTIALSOURCES OF FUNDING & RESOURCES	STATUS	TARGET DATE	EXTENT RATING	EFFECT. RATING
Water and Waste Disposal Systems for Rural Communities	USDA	This USDA Rural Utilities Service program provides monies to provide basic human amenities, alleviate health hazards, and promote the orderly growth of the rural areas of the nation by meeting the need for new and improved rural water and waste disposal facilities. Funds may be used for the installation, repair, improvement, or expansion of a rural water facility including costs of distribution lines and well pumping facilities. Funds also support the installation, repair, improvement, or expansion of a rural waste disposal facility, including the collection and treatment of sanitary waste stream, stormwater, and solid wastes.	Federal	P	2009	2	5
Sensitive Lands Acquisition and Management	Environmental Organizations/Private Citizens	The acquisition of sensitive lands provides for protection and preservation of the quantity and quality of water through fee simple acquisition and the establishment of conservation easements.	Public groups and private citizens	P	2012	2	3

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 effective management actions to achieve local water quality goals, establish priorities for grant or loan programs (Section 319 (h), EQUIP, 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: 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 Activity	Unknown	Environmental Quality Incentives Program Section 319	Application of Environmental Quality Incentives Program and Section 319 Program should achieve a very large reduction (>75%) in pathogen loadings from site specific applications	
Septic Systems (Residential Development)	Unknown	New Development Ordinance Revisions /Local County and City Land Development Guidelines Mitigation Banking/Land Acquisition	Establishment, application, and enforcement of new development ordinance revisions and local county and city land development guidelines will minimize storm water runoff and result in a large reduction (>75%) in pathogen loadings from application sites Land acquisition and mitigation banking will provide site-specific reductions (>75%) in pathogen loadings.	
Sewer Systems (Commercial and Residential Developments)	Unknown	Clean Water State Revolving Loan Fund-Georgia Environmental Facilities Authority	Georgia Environmental Facilities Funding for the repair and restoration of sewer lines would result in a very large reduction (>75%) in pathogen loadings.	
Industrial Sources	Unknown	NPDES Permitting Program	Additional monitoring may be necessary.	
Wildlife	Unknown	UGA Extension Service Section 319	Funding will be necessary to determine if fecal coliform levels are occurring from exclusively non-human or natural conditions.	

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	
Biological Integrity/Habitat	Little Tennessee Watershed Association	Current	1990	Ongoing	Monitoring
Fecal Coliform	Little Tennessee Watershed Association	Proposed	2008	2013	Monitoring/Delisting
Fecal Coliform	UGA/Extension Service	Proposed	2008	2013	Delisting-Focus on Agricultural Activities

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
Georgia Mountains RDC	Complete plan outreach activities as specified in Section 106 grant funded contract.	Local governments, major stakeholders, public	June 1, 2006
Rabun Green	On-site septic system	General public	2007
League of Women Voters	Land Stewardship Training Workshops	General public	On-going
Extension Service	BMP Implementation/	Agricultural community	On-going
SKY 104 WRBM/WALH (am)/Newspaper (media)	Announcement of meetings, workshops, etc.	General Public- two daily radio shows.	On-going
GAEPD-TMDL Implementation	Showcasing communities that effectively implement TMDL plans.	Community leaders and decision makers.	Proposed

IX. MILESTONES/ MEASURES OF PROGRESS OF BMPs AND OUTREACH

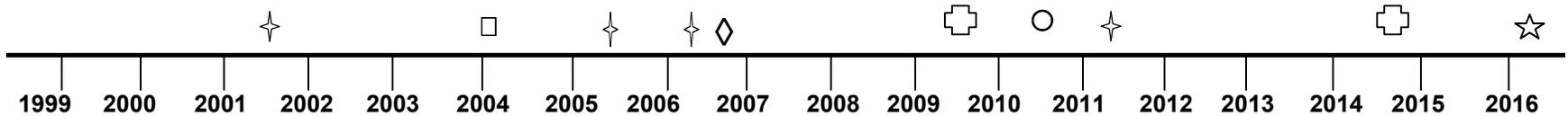
This table will be used to periodically track and report progress of significant management practices and activities identified or recommended in Tables 5A, 5B, and other sections of this plan, including outreach, additional monitoring and assessments, and the enhancement or installation of management 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	
Development of Little Tennessee River Water Quality Coalition	-Little Tennessee Land Trust -Little Tennessee Watershed Association -Georgia Mountains RDC	X		To promote interstate cooperation, implementation of water quality goals, and to provide a setting for the exchange of knowledge and ideas. Effectiveness will vary with level of participation.
Section 319 Nonpoint Source Implementation Grant	Georgia Mountains RDC/ Little Tennessee Watershed Association	X		To provide funding for water quality monitoring. Effectiveness is expected to be very high (>75%).
Mitigation Banking	The Hambidge Center		X	Currently being installed. Moderate effectiveness is expected.
Revision of County Ordinances	Rabun County	X		-To be completed in 2006-2007. -Revision should address the Environmental Planning Criteria. -Effectiveness is expected to be moderate.
Completion and Publication of Tennessee River Basin Management Plan	GADNR-EPD	X		To be completed in 2006. Moderate effectiveness is expected.
Environmental Quality Incentives Program	NRCS	X	X	On-going. Very high effectiveness is expected.

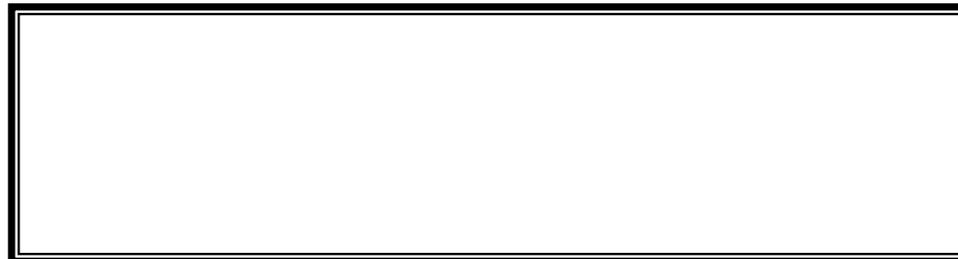
PROJECTED ATTAINMENT DATE

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:	



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.

Sam Breyfogle, Temple Inland Forests	208 Springdale Drive	LaGrange	GA	30240	706-884-8077	samuelbreyfogle@templeinland.com
Charlie Byers Vulcan Materials- Rabun Gap Quarry	2138 Kelly's Creek Rd.	Rabun Gap	GA	30568	706-746-5331	
Kim Waters The Hambidge Center	P.O. Box 339	Rabun Gap	GA	30568	706-746-5718	
Bill McLarney The Little Tennessee Watershed Association	197 Thomas Heights Rd	Franklin	NC	28734	828-369-6402	anaiinc@dnet.net
Allen Taylor Clayton-Rabun Water and Sewer Authority	99 North Church Street	Clayton	GA	30525		
Joe Riley Chestatee- Chattahoochee RC&D	170 Scoggins Drive	Demorest	GA	30535		
William Robinson City of Dillard	892 Franklin Street	Dillard	GA	30537	706-746-5891	cityofdillard@alltel.net
Dennis Martin Georgia Forestry Commission	3005 Atlanta Highway	Gainesville	GA	30507		
Eston Melton Rabun County Commission	25 Courthouse Square, Suite 201	Clayton	GA	30525	706-782-5271	
Roy Lovell Rabun County Code Enforcement	25 Courthouse Square, Suite 137	Clayton	GA	30525	706-782-2657	

Jeff Aaron Rabun County Cooperative Ext.	41 Jo Dotson Circle, Suite 1	Clayton	GA	30525	706-782-3113	jdaaron@uga.edu
Robert G. Farrell TVA-Little Tennessee Watershed Team	260 Interchange Park, Dr. LCB 1A-LCT	Lenoir City	TN	37772	865-632-1300	
Darrel Jones City of Sky Valley	3444 Highway 246	Dillard	GA	30537	706-746-2204	
Grace Watts City of Mountain City	P.O. Box 493	Mountain City	GA	30562	706-746-3513	
Charlene Breeden USFS Hydrologist	1755 Cleveland Hwy	Gainesville	GA	30501		
David Jensen USFS Tallulah Ranger District	806 Highway 441 South	Clayton	GA	30525		
John Hart Rabun Gap- Nacoochee School	339 Nacoochee Dr.	Rabun Gap	GA	30568	706-746-7467	
Garnett Hulsey Northeast Georgia Cattleman's Association	250 Whistle Top	Cornelia	GA	30531	706-778-5533	
Gary Crane National Textiles	815 John Beck Dockings Rd	Rabun Gap	GA	30568	706-746-5004	
Home Builders Association of Rabun County	P.O. Box 626	Clayton	GA	30525	706-782-9260	homebuildersrabunco@alltel.net
Georgia Power Company	P.O. Box 408	Clayton	GA	30525	706-782-4236	
Mary Ann Rich/ Jon Barnwell Rabun County Board of Realtors	P.O. Box 329	Clayton	GA	30525		
Keith Hastie North Georgia USFWS	West Park Center, Suite D	Athens	GA	30606	706-613-9493 ext 227	keith_hastie@fws.gov
Sandra Taylor Rabun County Health	19 Liberty Circle	Clayton	GA	30525		

Dept.						
Brian Sandven Georgia Foothills Trout Unlimited	245 East Water Street	Clarkesville	GA	30523	706-754-8458	bsandven@alltel.net
Doug Towery NRCS Blairsville Service Center	185 Wellborn St.	Blairsville	GA	30512	706-745-2794	
Mike Wilson Rabun Green	841 Taylors Chapel Road	Rabun Gap	GA	30568		rabungap@alltel.net
Linda Johnson	156 Taylors Chapel Road	Rabun Gap	GA	30568		
Joe Gatins Georgia Forest Watch	2489 Glade Rd.	Clayton	GA	30526		
Jim Holmes	3113 Blalock-Goldmine Rd	Clayton	GA	30525		
Laurence Holden	260 Black Lane	Clayton	GA	30525		laurenceholden@alltel.net
William G. Robinson City of Dillard	892 Franklin St.	Dillard	GA	30537	706-746-2204	
Rebecca Peterson Rabun Green	70 Sequoia Hills Ln.	Clayton	GA	30525	706-212-2038	
Mary Gazaway Georgia EPD	4220 International Parkway, Suite 101	Atlanta	GA	30354	404-675-1745	mary_gazaway@dnr.state.ga.us
Christopher Ernst Georgia Mountains RDC	P.O. Box 1720	Gainesville	GA	30503	770-538-2626	cernst@gmrdc.org

APPENDIX B.

UPDATES TO THIS PLAN

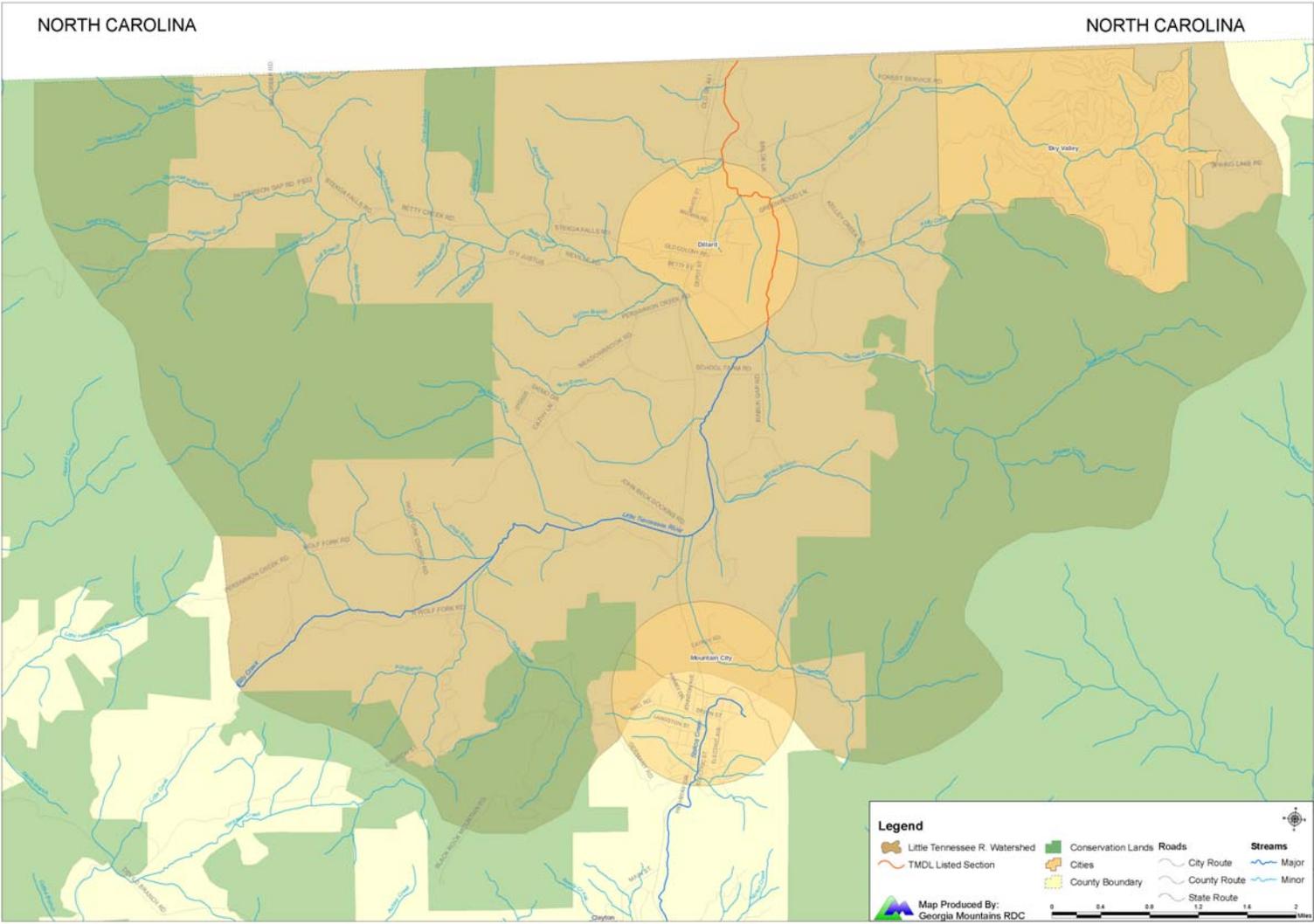
Describe any updates made to this plan. Include the date, section or table updated, and a summary of what was changed and why.

APPENDIX C.
Field Survey Form

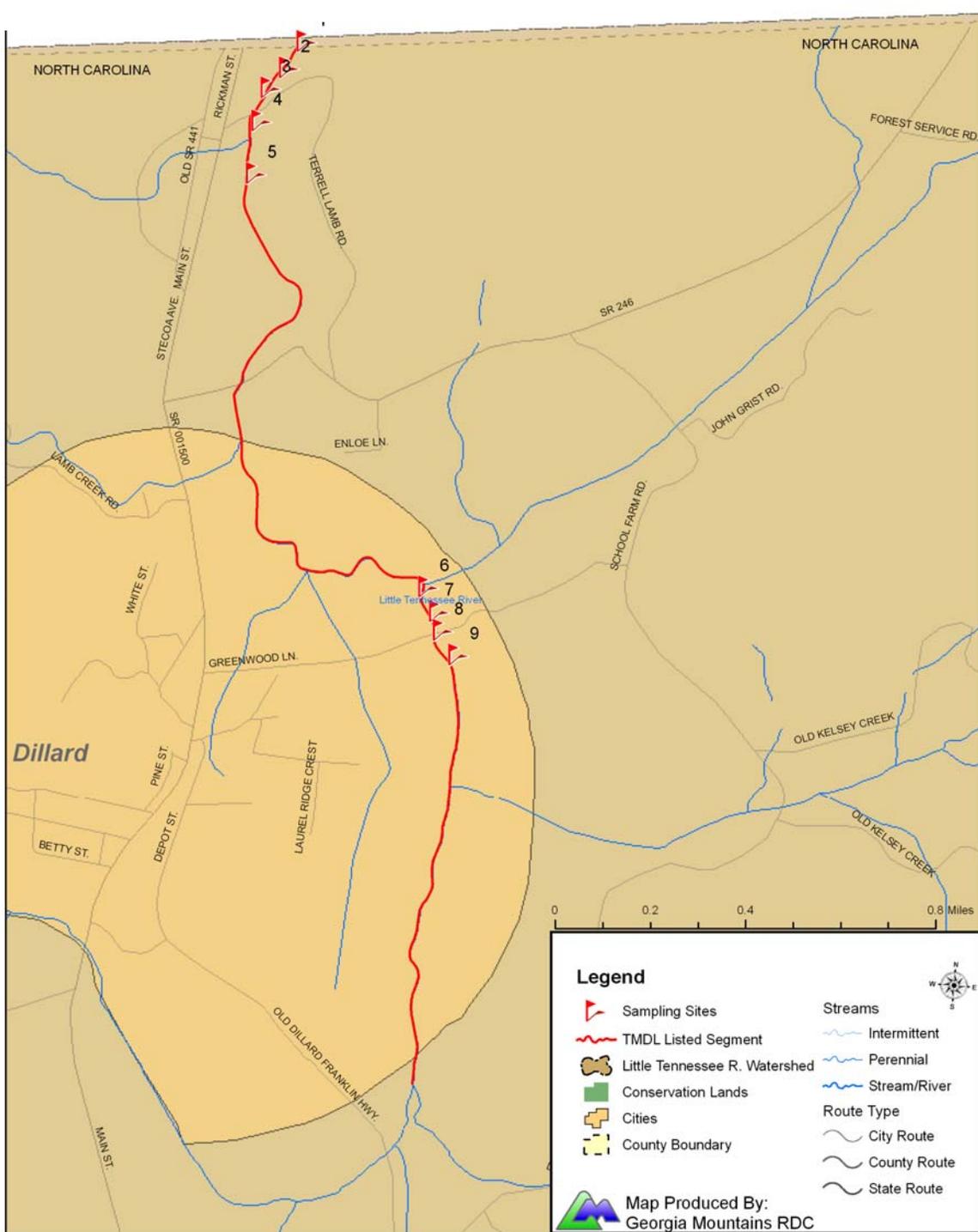
GEORGIA ADOPT-A-STREAM
Watershed Survey and Map Assessment
To be conducted at least once a year

AAS group name:	<u>Little Tennessee River Watershed</u>	Investigator(s):	<u>Chris Ernst</u>
Type of waterbody:	<u>stream / wetland / lake</u>		<u>Stream</u>
Water body name:	<u>Little Tennessee River Watershed</u>	County(ies):	<u>Rabun</u>
Approximate size of drainage/study area:	<u>30,000</u> acres		
Date:	<u>12/30/2005</u>	Time:	<u>10:30 AM</u> Picture/photo documentation? Yes

Map 1 Little Tennessee River Watershed Map



Map 2
Observation Site Location Map



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 survey identified a number of potential sources of impairment including agricultural activity, septic systems predominantly from residential developments and natural wildlife inputs.

Agricultural activity is widespread throughout the watershed and includes cattle grazing and a limited extent of poultry production. These agricultural activities are predominantly located on areas with flat to moderate slopes and are commonly in close proximity to waterbodies. Best management practices (BMPs) have been implemented throughout the watershed; however, a limited number of landowners would benefit from the use of additional BMPs to limit agricultural activity directly within waterbodies.

Residential development has occurred on over 50% of the Little Tennessee River's watershed. This development includes concentrated residential subdivisions and scattered residential housing units. Residential subdivisions are becoming more common within the watershed especially in areas such as Lamb Creek and Kelly Creek. Older subdivisions occur in Sky Valley and near Mountain City, within the Pit Branch watershed. Scattered residences are located throughout the watershed and include older (pre 1995) and newer (post 1995) housing units. Both residential subdivisions and scattered housing units mostly rely on septic systems for on-site wastewater treatment. The rate of failure and impact of failed septic systems on water quality is poorly understood in this area.

Finally, wildlife activity likely plays a strong role in the fecal coliform values in the Little Tennessee River. Approximately 5,000 acres of land in the watershed is managed by the Forest Service, and with the addition of open space from agriculture, forestry, and low density residential land uses, high densities of wildlife populations are supported within the watershed.

The majority of the Little Tennessee River's headwater tributaries are located within Rabun County Georgia. However, tributaries to Betty's Creek and Mud Creek originate in North Carolina. Visual verification of these headwater areas in North Carolina was performed to assess the overall land use character. However, because these areas are outside of GADNR/EPD's jurisdiction, no specific notes were assembled to for lands in North Carolina. Incidentally, the land use of the Little Tennessee River's headwaters that originate in North Carolina and subsequently flow through Georgia is predominantly forestland with a high percentage of this land being managed by the USDA National Forest Service. Thus, little fecal coliform input from man made sources is expected from these locations.

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"/>	<input type="checkbox"/>	_____
Large or extensive gullies	<input type="checkbox"/>	<input type="checkbox"/>	_____
Unpaved roads near or crossing streams	X	<input type="checkbox"/>	_____
Croplands	X	X	Row cropping and Pasture
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"/>	Some private forestry activity present
Extensive areas of streambank failure or enlargement	X	X	Noted near state line
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	_____
Highways and Parking Areas			
Shopping centers & commercial areas	X	<input type="checkbox"/>	Within Dillard city limits
Interstate and controlled access highways and interchanges	<input type="checkbox"/>	<input type="checkbox"/>	_____
Major highways and arterial streets	<input type="checkbox"/>	X	
Other extensive vehicle parking areas	<input type="checkbox"/>	X	U.S. 441 corridor and within Dillard city limits

Mining

Quarries with sediment basins in live flowing streams	<input type="checkbox"/>	X	Vulcan Materials-Kelly Creek
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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"/>	X	U.S. 441 Corridor, Mountain City, Dillard
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"/>	X	U.S. 441 Corridor-Rabun Gap
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	X	X	Rabun Apparel-Dillard
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	3
Dams	_____	Dredge spoils	_____
Bridges	3	Pipes	_____
Waterfalls	2	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	_____	60	feet or _____	mile or _____	%
Stream straightening	_____		feet or _____	mile or _____	%
Concrete streambank/bottom	_____		feet or _____	mile or _____	%
Dredging/channelization	_____		feet or _____	mile or _____	%
Riprap/gabion	_____	200	feet or _____	mile or _____	%
Cattle crossing		0	#		
Stream crossing (for vehicles)		0	#		

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.

**Note Map 2 for observation site locations.*

***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	60ft	Right bank. Site is at State Line.	Low stream flow (1 fps). Stream depth is approximately 2ft with weak thalweg located in center channel. Bed material is composed of silt and sands. Moderate and large woody debris located within stream channel. Stream banks are vegetated with grasses and light shrubbery. Some exposed soil present. Indications of channel instability with undercutting at outside of small bend in stream. Floodplains on both sides of the stream are active agricultural areas with row cropping. Right bank has no riparian area beyond stream bank, while left bank has approximately 20ft of riparian area composed of moderate density shrubbery.

2	40	Right bank. Site is 200 yards upstream of State Line	Low stream flow (1 fps). Substrate is composed of sand and silt. Stream banks are vegetated with small trees and heavy brush. Banks show some indication of slumping, with trees angling towards stream center. Moderate to large sized woody debris in stream channel. Bank height is approximately 10ft and the banks are moderately vegetated with grasses and shrubs. River right floodplain is used for row cropping with no riparian area while the left floodplain is composed of moderate density shrubbery.
3	40	Right bank. Site is 100 yards downstream of Lamb Rd. bridge.	Small island located near right bank. Most of the flow is constricted on left bank. Left bank indicates instability with undercutting and sedimentation. Right bank is more stable than left bank, but still has signs of instability. Flow rate is higher at this site than others. Stream depth varies from 1 to 3ft. Bank height is approximately 10 to 12ft and is vegetated with grasses and shrubs.
4	30ft	Right bank. Site is at Lamb Rd. bridge	Slight constriction due to bridge footing. Small shoals due to bedrock feature. The bed is composed of sand, pebbles, cobbles, and bedrock. Moderate flow rate. Banks appear stable and well vegetated.
5	100ft	Right bank. Site is 100 yards upstream of Lamb Rd. Bridge	Low flow rate. Some indications of bank instability from undercutting is evident. Left bank is vegetated and contains rock banks (possibly old rip rap) with densely vegetated riparian area of 100 ft. Right bank is vegetated. Floodplain is pastureland with small (20 ft.) wooded riparian buffer. Tree clearing activity is on going, removing buffer to bank escarpment.
6	50ft	Left bank. Site is 300 yards downstream of Greenwood Dr.	Stream is 2ft in depth with no distinct thalweg. Streambed is gravel to cobbles with no woody debris in channel. Stream banks are heavily vegetated with dense shrubbery. Banks are 8ft tall. Right bank is supported with riprap. Floodplain on left side is a large agricultural field (20 acres) used for row cropping with no riparian area beside stream bank. Right floodplain is wooded.

7	50ft	Left bank. Site is 100 yards downstream of Greenwood Dr.	Stream is shallow, 2ft in depth, with no distinct thalweg. Flow rate is moderate (2fps). Streambed is composed of gravel and cobbles and has no woody debris in channel. Stream banks are 8ft. tall and are composed of vegetated riprap on both sides of stream. Floodplain on left is a large agricultural field (20 acres) that is currently fallow. No riparian area remains between the field and riverbank. The right floodplain is light pastureland for horses, lamas, and cows, and contains a residential housing unit. A fence runs along the streambank.
8	60ft	Center. On Greenwood Dr. at John G. Kelly Bridge.	Stream is constricted due to bridge footings, resulting in a high flow rate (3 fps). Highest stream velocity is located at center of channel. Streambed is composed of a mix of sand, silt, gravel, and cobbles. Moderate sized woody debris has accumulated downstream of bridge footing on stream bank. Stream banks are lightly vegetated with grasses and shrubbery. Mature oak trees are scattered along banks. The banks are eight to twelve feet in height, near vertical.
9	50ft	Right bank. 100 yards upstream of Greenwood Dr. bridge.	Stream has moderate flow (2 fps) with even stream velocities across channel. Channel is composed of sand and silt with some small woody debris located in the stream. Banks are heavily vegetated with dense shrubbery and some mature oak trees. Floodplains on the right and left of streambanks are used for row cropping. The left floodplain is currently plowed, while the right floodplain is fallow. A warning sign for the use of pesticides is located at the entrance of the right streamside field.

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

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

First year conducting the Watershed Survey.

Appendix A
Observation Site Photographs

Site# 1



Site# 2



Site# 3



Site# 4



Site# 5



Site# 6



Site# 7



Site# 8



Site # 9



APPENDIX B
LITTLE TENNESSEE RIVER WATERSHED PHOTOGRAPHS



Photograph taken from bridge at SR 246 and the Little Tennessee River, facing south
Note the banks of the Little Tennessee River with channel instability, debris accumulation, and
unmaintained pipe-end in channel bank.



Photograph taken from downtown Dillard, facing north.
Note U.S 441 and moderate commercial development.



Mud Creek Watershed
Photograph taken from golf course in Sky Valley, facing west
Note moderate to high density residential development on moderate to steep slopes.



Kelly Creek Watershed
Photograph taken from Enloe Rd., facing east
Note cattle grazing activity and placement of hay bale away from waterbodies



Blacks Creek Watershed
Photograph taken from U.S 441 at Darnell Farms, facing southeast
Note intensive agricultural row cropping



Photograph taken from Wolf Fork Road at Billy Creek, facing east
Note cattle paths adjacent to and crossing Keener Creek



Photograph taken from West Fork Road, near Billy Creek, facing north
Note poultry houses and agricultural lands in close proximity. Indicates the possibility of chicken waste spreading on agricultural fields.



Betty Creek Watershed
Photograph taken of Patterson Gap Creek from Patterson Gap Road, facing east
Rental cabins



Betty Creek Watershed
Photograph taken from Betty Creek Rd. near Hambidge Center
Excellent habitat and riparian area (Betty Creek located near left edge of image).



Lamb Creek Watershed
Photograph taken from unnamed road in Lamb Creek watershed.
Ongoing residential development