

STATE OF GEORGIA
TIER 2 TMDL IMPLEMENTATION PLAN **REVISION 01**
 Bearmeat Creek Watershed
 Tennessee River Basin
 April 28, 2006

Local Watershed Governments:
 Towns County
 City of Hiwassee

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.

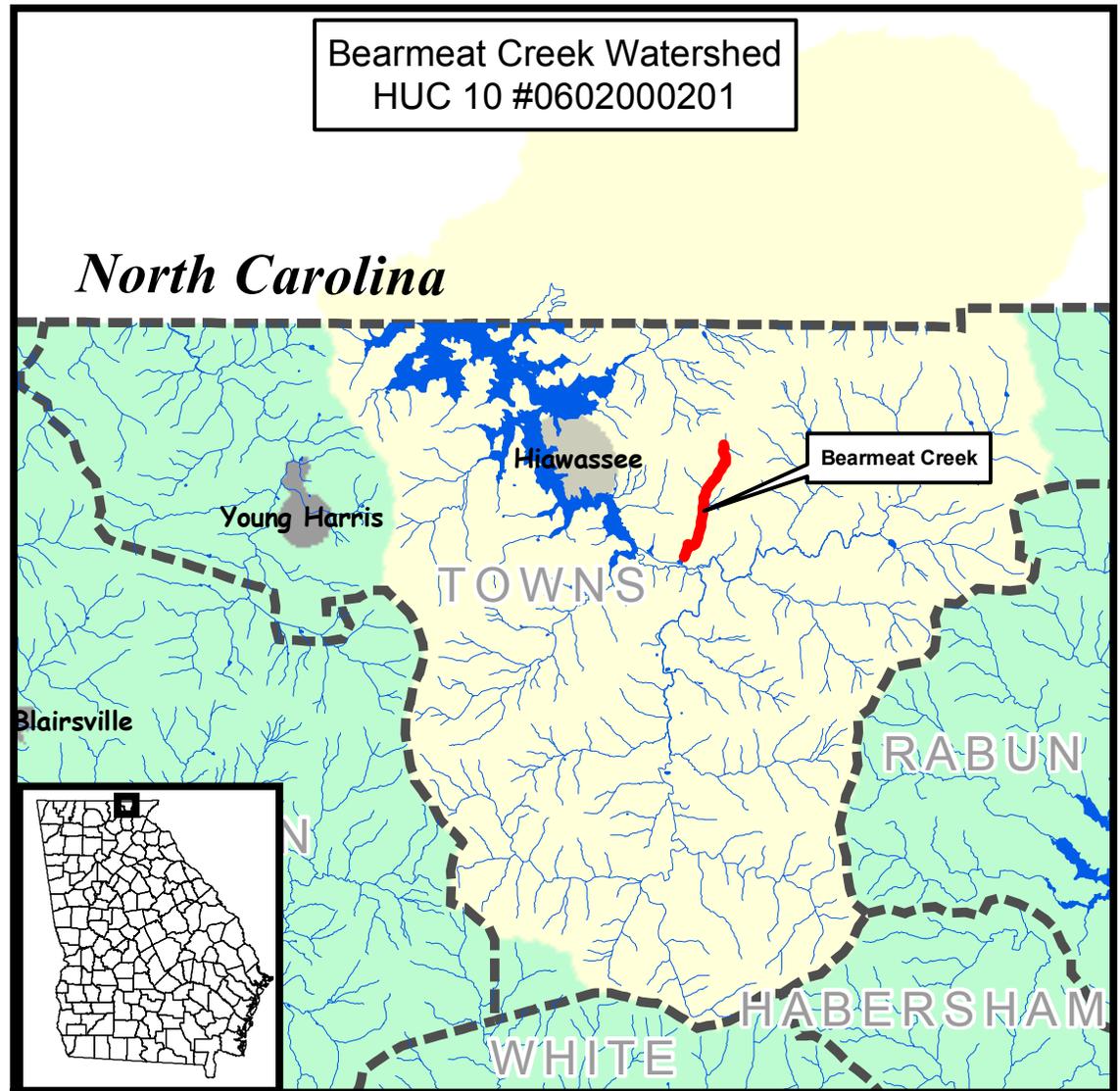


Table 1. IMPAIRMENTS

IMPAIRED STREAM SEGMENT	IMPAIRED SEGMENT LOCATION	IMPAIRMENT	TMDL ID
Bearmeat Creek	Tributary to Hiwassee River	Sediment (Biota Impacted)	TEN0000009

II. GENERAL INFORMATION ABOUT THE WATERSHED

Write a narrative describing the watershed, HUC 10#0602000201. 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.

HUC 10# 0602000201 is located in north Georgia and southwestern North Carolina, and covers a total extent of 121,000 acres. Approximately 90,330 acres of the watershed is located in Georgia, and includes the political jurisdictions of Towns County and the City of Hiawassee. Land use for the Georgia portion of the watershed was most recently collected in 2005 by the Georgia Mountains Regional Development Center, for the Towns County Comprehensive Plan update. A summary of the land use in acres is provided below:

Residential	Incorporated Areas	Water	Commercial	Industrial	Public Institutional	Transportation/Communication/Utilities
14,343	929	3,606	725	194	199	33

Park/Recreation/Conservation	Park/Recreation/Conservation/Forest Service Lands	Agriculture/Forestry	Undeveloped	Total
648	54,070	9,120	6,463	90,330

The TMDL identifies a number of potential non-point sources that may lead to excessive sedimentation including silviculture, agriculture, grazing areas, mining sites, roads, and urban development. As the 2005 land use data indicates, silviculture, agriculture, and grazing still account for a significant, although declining, land use in the HUC 10. A limited amount of silviculture activity is also ongoing in the lands managed by the Forest Service. The NRCS, Georgia Forestry Commission, RC&D, Forest Service, and numerous other groups are active in the HUC 10 to ensure that BMPs are implemented and maintained appropriately. Three mining sites are located in the HUC 10. All of these facilities are granite quarries and are located near the Hightower community, Fodder Creek, and Hiawassee. Other permitted facilities include the Hiawassee WPCP on the east end of Lake Chatuge and the Hiawassee WPCP located on the north shore of Lake Chatuge. Finally, two inactive landfills are in the HUC 10. The Hiawassee landfill is located to the east of Hiawassee, while the Towns County landfill is located adjacent to Burch Branch. Moderate urban development is occurring in Hiawassee. However, the greatest concern for water quality regarding development is associated with the increase of dispersed residential development across the HUC 10. In the past 20 years, Towns County and has experienced escalating population growth as

increasing numbers of citizens move to the area for its natural beauty and high quality of life. Due to a combination of complex terrain with high elevation mountains, steep slopes, and narrow river valleys in conjunction with a high percentage (60%) of lands managed by the USDA Forest Service, the selection of suitable construction site locations for residential or commercial developments is extremely limited. As a result, many sites are being located on marginal lands that are not suited for the associated land use activity. Continued development in these areas is resulting in water quality degradation through sedimentation. While the major roads in Towns County and the HUC 10 have changed little in past years, numerous small residential routes continue to be constructed to provide access to neighborhoods and individual residences. Many of these features are being constructed on moderate to steep slopes and are not designed to appropriately manage storm water.

The Hiawassee River Watershed Coalition (HRWC) 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 Upper Bell Creek, Upper Fodder Creek, Geisky Creek, Hightower Creek, Upper Hiawassee River, Hog Creek, Woods Creek, Scataway Creek, and Lower Shooting Creek. Restoration work is ongoing in numerous locations across the upper Hiawassee River watershed; however, there are no active restoration sites within HUC 10# 062000201. The coalition also provides educational outreach through numerous activities including classroom education, presentations for civic or governmental groups, and professional workshops.

The Tennessee Valley Authority monitors water quality throughout its service area. In addition, the TVA has established the Chickamauga/Hiawassee 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/Hiawassee Watershed Team actively participates with the Hiawassee River Watershed Coalition with the acquisition of monitoring data and installation of BMPs.

In place regulations include Erosion and Sedimentation Control Ordinances for both Towns County and Hiawassee, as well as a subdivision ordinance, building permits ordinance, and a Mountain Protection Ordinance in Towns County.

{Bearmeat 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
Bearmeat Creek	Tributary to Hiawassee River (Townsend Co)	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
Biota(Sediment)	No degradation of fish community	Row Crops (354.5 tons/yr)	73%
		Road (89.9 tons/yr)	
		Pasture/Hay (67.1 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.

Bearmeat Creek watershed is located in north central Towns County and covers approximately 1,700 acres. In 1993, the Hiwassee River Action Team conducted studies of macroinvertebrate populations in Bearmeat Creek. This study noted that the number of taxa collected (16 EPT) was well below the numbers found in similar watersheds of unimpaired stream sections (20-30 EPT). A Modified Rapid Bioassessment (MRB) of Bearmeat Creek was then conducted to evaluate ecological health of the stream. Bearmeat Creek was given an MRB score of 32, while similarly sized unimpaired watershed within the Blue Ridge Ecoregion had MRB scores ranging from 40 to 50. Because of low MRB and EPT scores, the TMDL identified Bearmeat Creek as having a poor biological population.

The evaluation of the extent and relative contributions from each impairment source was performed through a field survey of the watershed, review of existing land use data, and input from the stakeholder group. A field survey was performed on January 12, 2006, which included visual observations, photographic records of the watershed, and discussion with local landowners during the field survey (although interested, these landowners did not attend the stakeholder advisory group meetings) (Appendix C). Three stakeholder meetings were held for the Bearmeat Creek TMDL Implementation Plan. Specific discussion with local stakeholders regarding the potential sources of impairment was performed during the first and second stakeholder meetings.

The most recent land use data was collected by the Georgia Mountains Regional Development Center in 2005 for the Towns County Comprehensive Plan update. The Towns County existing land use map utilized Towns County parcel data in conjunction with a visual field survey that identified land use for each parcel within the County. The 2005 land use data varies significantly from the 1995 Georgia National Land Cover Dataset used in the TMDL. A comparison of the two datasets is provided below.

1995 Georgia National Land Cover Dataset:

Land Coverage	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/Hay	Row Cropping
Acres	1297	88	199	88	13

2005 Existing Land Use Dataset:

Land Use Description	Forest Service Management	Agriculture/Forestry	Residential	Undeveloped	Commercial	Water
Acres	975	488	273	58	2	1

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)	
Past Agricultural Activity	Low	1	Low	1	1
Existing Agricultural Activity	Negligible	.5	Negligible	.5	.25
Residential Development	Medium	3	Medium	3	9
Roads	Medium	3	Medium	3	9
Flooding	Medium	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 identified by notifying local governments and government agencies with jurisdictions concurrent with the watershed area, and notification of environmental, economic, and citizen based groups active in Towns County. Stakeholders were also identified in the field survey, and cold calls were made to residents in the watershed to inform them of the TMDL meetings. Attendance was lower than expected. Representatives of Towns County government accounted for the majority of attending stakeholders. Three meetings were held to provide background information on the TMDL program and its process, provide a characterization of the watershed, identify pollution sources, select appropriate management measures, develop a monitoring routine, and review the draft proposal.

Through the stakeholder meetings, it was determined that the sources of impairment have changed dramatically since the development of the TMDL. Most importantly, row-cropping activity has declined and only accounts for 5 to 10 acres within the entire watershed area. Pasturelands, hay fields, and passive forestry occupy the greatest percentage of land cover. As noted in the TMDL, sedimentation from pasturelands and forestlands accounted for a significant portion of Bearmeat Creek's sediment load. However, existing pasturelands and forestlands appear to be in good condition and do not account for Bearmeat Creek's high sediment load. New residential housing units are being constructed along the lower rim of the watershed and are located on moderate to steep slopes (15% slope or greater). Sedimentation due to land disturbing activity associated with these developments has potentially impacted water quality for the past 3-5 years. Efforts have been made to limit the environmental impact of residential development since 1995. Towns County has increased the minimum lot size from 3/4 of an acre to 1 1/4 acres and has adopted DNR's Mountain Protection Ordinance, although very little of the privately held lands within Bearmeat Creek meet the elevation criteria for mountain protection status. Continued construction of residential developments within Bearmeat Creek watershed is expected to continue for many years. Associated with an increase in residential development, the watershed has experienced a transition of unpaved road surfaces to paved road surfaces since 1993, which has likely reduced direct sediment inputs into the stream, but may be increasing stormwater runoff. Moderate channel stability is found throughout the listed stream section, however some channel bank instability has been noted at stream crossings. Two stream crossings exist in the watershed. Both of these locations are paved two-lane roads and channel bank instability is located directly at the culvert and continues downstream approximately 30 feet. Stakeholders attribute this channel instability to flooding that occurred in the late summer of 2004 and October 2005, but also note that natural restoration of these areas is occurring.

A number of actions were identified by the stakeholders that would improve water quality in Bearmeat Creek watershed. Updates to new development and subdivision regulations have been ongoing and are having positive results. Continued regulation updates are recommended, and should focus on minimizing impervious surfaces, conservation of vegetated areas on lots, and stormwater management. Similarly, greater attention needs to be given to the site planning and review process to minimize soil erosion on developments with steep slopes. Additional road maintenance is necessary to ensure proper ditch function and education should be provided to landowners on the importance and methods of maintaining private roads and ditches. It was also noted by the stakeholder group that, while Bearmeat Creek is identified as an impaired waterbody, changing conditions throughout the upper Hiawassee River watershed since the development of the TMDL has resulted in large increases of sedimentation in surrounding tributaries to the Hiawassee River. Thus, emphasis should be placed on the restoration of water quality conditions throughout the HUC 10.

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
Audi Bradly/ Blue Ridge Mtn. Cattlemen's Association		Hiawassee	GA	30546	897-3994	
Bethany Brown/ USDA/NRCS	185 Wellborn ST.	Blairsville	GA	30512	706-745-2794	bethany.brown@ga.usda.gov
Robyn Ledford/ USDA/NRCS	185 Wellborn ST.	Blairsville	GA	30512	706-745-2794 ext. 3	robyn.ledford@ga.usda.gov
J.S. Holmes/ Towns County	48 River Street	Hiawassee	GA	30546	706-896-3159	
Alisa Richards/ Towns County	P.O. Box 216	Hiawassee	GA	30546		
Henry Chambers/ Towns County	4601 Jay Tree Rd.	Hiawassee	GA	30546		
Christopher Ernst/ Georgia Mountains RDC	P.O. Box 1720	Gainesville	GA	30503	770-538-2621	cernst@gmrhc.org
Joan Crothers/ Towns Sentinel, Chamber of Commerce	P.O. Box 502	Hiawassee	GA	30546		townsnews@alltel.net

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)
Georgia Water Quality Control Act (OCGA 12-5-20)	Georgia Department of Natural Resources Environmental Protection Division	Makes it unlawful to discharge 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.	State	A	Ongoing	5	3
Federal Clean Water Act, Section 305(b) and 303(d)	USEPA, Georgia DNR/EPD, Towns County	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.	Contractors/Landowners	A	Ongoing	5	5

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

MEASURE	RESPONSIBILITY	DESCRIPTION	SOURCES OF FUNDING & RESOURCES	STATUS CODE	TARGET DATE	EXTENT RATING (Area, #)	EFFECT. RATING (Reduction)
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	5	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.	Contractors/Landowners	A	Ongoing	5	4
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	5	Varies with BMP applied

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

MEASURE	RESPONSIBILITY	DESCRIPTION	SOURCES OF FUNDING & RESOURCES	STATUS CODE	TARGET DATE	EXTENT RATING (Area, #)	EFFECT. RATING (Reduction)
GA Growth Planning Act (OCGA 12-2-8)	GA DNR, Department of Community Affairs, and local units of government.	Authorized GA DNR to develop minimum planning standards and procedures that local jurisdictions could adopt and enforce pertaining to the protection of river corridors, mountaintops, water supply, watersheds/reservoirs, groundwater recharge areas, and wetlands. Silvicultural activities may be exempted from permitting requirements provided the activity complies with BMPs.	State, Towns County	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, Towns County	P	2006	5	3
Georgia Erosion & Sedimentation Control Act, Construction Permit, 2003 Amendment	Towns 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, Towns County	P	Ongoing	5	5

GENERAL MEASURES APPLICABLE TO ALL PARAMETERS

MEASURE	RESPONSIBILITY	DESCRIPTION	SOURCES OF FUNDING & RESOURCES	STATUS CODE	TARGET DATE	EXTENT RATING (Area, #)	EFFECT. RATING (Reduction)
Shoreline Construction Permits	Tennessee Valley Authority	Shoreline construction permits are designed to ensure that construction along the shoreline and in waters of the Tennessee River system does not have a negative effect on the agency's management of the river system or its ability to carry out what the TVA Act describes as the "unified development and regulation of the Tennessee River."	Federal Government	A	Ongoing	2	5

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT.

MEASURE	RESPONSIBILITY	DESCRIPTION	POTENTIALSOURCES OF FUNDING & RESOURCES	STATUS	TARGET DATE	EXTENT RATING	EFFECT. RATING
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	5	5
Storm Water Management Audit/ Assessment	Towns County	Internal assessment of storm water pollution prevention plan (map of facility and responsibilities for upkeep): municipal operations, 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.	Towns County	P	2010	5	5
Storm Water BMP Guidance Document for Municipal Operations	Towns 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.	Towns County	P	2011	5	5

MEASURES APPLICABLE TO SPECIFIC PARAMETER: SEDIMENT.

MEASURE	RESPONSIBILITY	DESCRIPTION	POTENTIALSOURCES OF FUNDING & RESOURCES	STATUS	TARGET DATE	EXTENT RATING	EFFECT. RATING
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	P	2008	2	5
New Development Ordinance Revision	Towns 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.	Towns County	AE	2008	5	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	5	Effectiveness varies with the specific BMPs applied.

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: 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
Past Agricultural Activity	1	Natural Recovery	Natural recovery may be aided with additional streambank restoration efforts.	Section 319 Implementation Grant
Commercial Agriculture/ Hobby Farmer/ Gardener	.25	Environmental Quality Incentives Program Section 319(h) Nonpoint Source Implementation Grant	Application of EQIP and Section 319 programs are expected to result in moderate to large (50-75%) reductions in contaminant loads.	
Residential Development	9	Georgia Erosion and Sedimentation Control Act, Construction Permit, 2003 Amendment	Effectiveness of Erosion and Sedimentation Control Act amendment is expected to result in very large (>75%) reductions.	
		New Development Ordinance Revisions	Effectiveness of new development ordinance revisions will vary with the specific application and must be individually determined.	
Roads	9	Storm water Audit/Assessment Storm water BMP guidance document Maintenance of roads and stormwater structures on private and public roads	Application of stormwater controls are expected to achieve a very large (>75%) reduction in contaminant loads.	
Flooding	9	Natural Recovery	Natural recovery may be aided with additional streambank restoration efforts.	Section 319 Implementation Grant

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	2002	Ongoing	General monitoring. May be applied for delisting after submission of Sample Quality Assurance Plan.

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 Volunteer Monitoring	Local Landowners and concerned citizens	Ongoing
Hiwassee River Watershed Coalition/ Georgia Mountains RDC	Promote the establishment of a local EPA certified bacteria analysis lab.	Local Education Institutions	2010
Towns County Building Department and Towns County Environmental Regulations Department/ Georgia Mountains Regional Development Center	Education of developers and homeowners on erosion and sedimentation.	Developers and Homeowners	Ongoing
Towns County Keep America Beautiful	Restart program locally.	General Public	2008
Blue Ridge Soil and Water Conservation Commission	Essays on environmental issues for Towns, Union, and Fannin Counties.	Young Adults	Ongoing
Towns County Roads Department- Adopt A Road Program	Enlists citizen volunteer help to remove litter from county roadsides. The program provides recognition for participating companies and organizations, brings the environmental and monetary costs of littering into public awareness, and promotes civic responsibility and pride. Can be expanded to include visual monitoring and repair of roadway stormwater features.	Citizens, Companies, and Organizations	Ongoing (County Wide)
Trout Unlimited- Chattahoochee Nantahala Chapter	Public Education and conservation.	Local Landowners and concerned citizens	Ongoing

IX. MILESTONES/ MEASURES OF PROGRESS OF BMPs AND OUTREACH

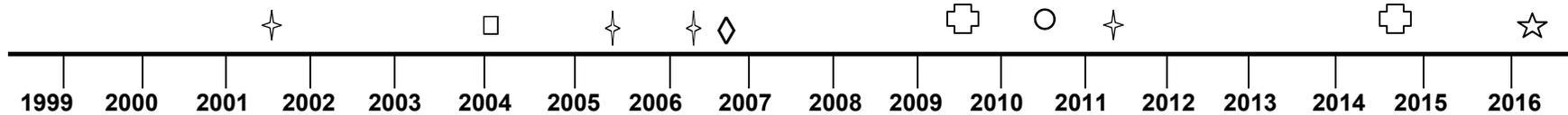
This table will be used to periodically track and report progress of significant management practices and activities identified or recommended in Tables 5A, 5B, and other sections of this plan, including outreach, additional monitoring and assessments, and the enhancement or installation of management 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	
New development ordinance revisions	Towns County	X		Target date of 2008 with additional revisions on a 3-5 year cycle.
Georgia Erosion & Sedimentation Control Act, Construction Permit, 2003 Amendment	State, Towns County	X		Implementation date of December 31, 2006.
Storm water audit and assessment	Towns County	X		Target date of 2010.
Development of storm water BMP guidance document	Towns County	X		Target date of 2011.
Tennessee River Basin Management Plan	Georgia DNR/EPD	X		Target date of 2006.

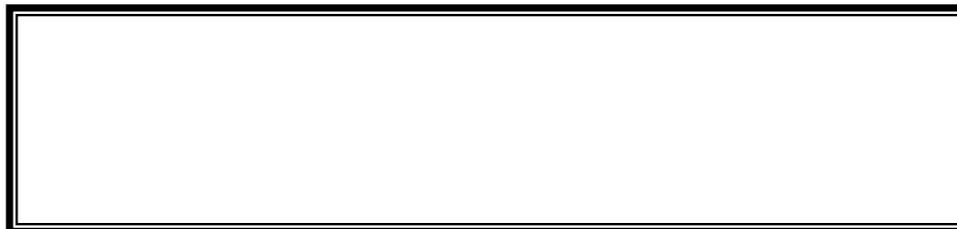
PROJECTED ATTAINMENT DATE

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		
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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.

NAME/ORG	ADDRESS	CITY	STATE	ZIP	PHONE	E-MAIL
Tracie Kenner	847 Bearmeat Rd.	Hiawassee	GA	30546		
Brad Wilson	375 Bearmeat Rd.	Hiawassee	GA	30546		
Sam Breyfogle Temple Inland Forest	208 Springdale Drive	LaGrange	GA	30240		
Callie Dobson Hiawassee River Watershed Coalition	87 Upper Peachtree Rd.	Murphy	NC	28906		
Dennis Martin Georgia Forestry Commission	3005 Atlanta Highway	Gainesville	GA	50507		
Douglas Towery USDA-NRCS Blairsville Service Center	185 Wellborn St.	Blairsville	GA	30512		
Charlene Breeden USFS Hydrologist	1755 Cleveland Hwy	Gainesville	GA	30501		
Alan Polk Brasstown Ranger District	1881 Highway 515 P.O. Bod 9	Blairsville	GA	30514		
Chestatee- Chattahoochee RC&D	170 Scoggins Dr.	Demorest	GA	30535		
Keith Gilmer Georgia Soil and Water Conservation Commission	700 East 2nd Ave. Suite J	Rome	GA	30161		
Bill Kendall Towns County	48 Rivers St. Suite B	Hiawassee	GA	30546		

Commission						
Robert Brewer, JR Towns County Agricultural Extension	67 Lakeview Circle	Hiawassee	GA	30546		
Keith Hastie U.S. Fish and Wildlife Service	105 West Park Drive Suite D	Athens	GA	30606		
Dr. Paul T. Arnold Young Harris College	Young Harris College Department of Biology	Young Harris	GA	30582		
Dr. Hartmut Ramm Young Harris College	Young Harris College Department of Physics and Physical Geography	Young Harris	GA	30582		
Steve McWilliams Georgia Forestry Commission	P.O. Box 1217	Forsyth	GA	31029		
C.W. Hill, Jr Blue Ridge Cattlemen's Association	1651 Deep South Rd.	Blairsville	GA	30512		
Evan R. Crews Tennessee Valley Authority	221 Old Ranger Rd. MLO 1A-MRN	Murphy	NC	28906		
J. Scott Lea Chickamauga/Hiawassee Watershed Team	11010 Market St. PSC 1E	Chattanooga	TN	37402		
Rick Hood GFC District 2	3021 Pat Colwell Rd.	Blairsville	GA	30512		

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: Bearmeat Creek

Investigator(s): Christopher Ernst

Type of waterbody: stream / wetland / lake

Stream

Water body name: Bearmeat Creek

County(ies): Towns

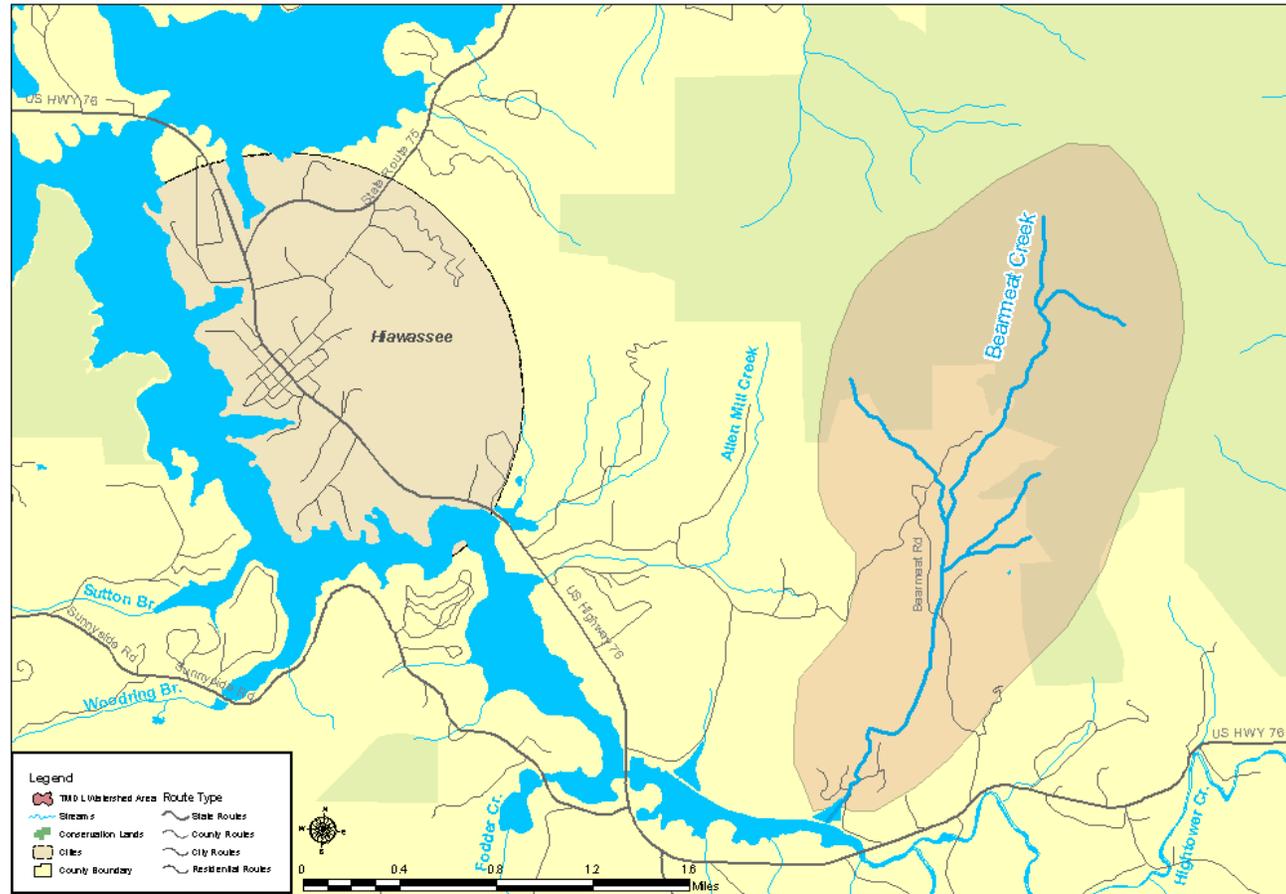
Approximate size of drainage/study area: 1,800 acres

Date: 10/12/2006 Time: 10:00am

Picture/photo documentation? Yes

I. CREATE A MAP OF YOUR WATERSHED

Bearmeat Creek TMDL Stream Segment



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 Bearmeat Creek watershed covers approximately 1,700 acres, and is located in northern Towns County. The headwaters of Bearmeat Creek is under the management of the Forest Service, and accounts for 55% of the watershed area. Of the private land holdings in the watershed, agriculture and forestry account for another 30% of the watershed. Residential lands are located along the lower quarter of the watershed and are situated along the ridge sides and ridgelines of Bearmeat Creek. Approximately 15% of the watershed can be described as residential land use. The watershed survey identified existing agricultural activity, historic residential activity, ongoing residential development, and runoff from the road system as the leading potential sources of impairment for Bearmeat Creek.

Lands under the management of the Forest Service seemed to be in good condition, although access was limited due to a lack of transportation routes in this area. No significant land disturbing activities, such as the existence of designated OHV trails, are located within the Bearmeat Creek watershed.

Existing agricultural activity accounts for approximately 30% of the watershed, yet the majority of this area is used for low intensity agricultural uses such as pasture and hay lands, which seem to be in good condition and likely do not yield high sediment loads. Intensive agriculture activity, such as row cropping, accounts for only a very small portion of the watershed (<10 acres). A limited amount of cattle grazing and equestrian boarding was noted, which is located along the river valley on flat to moderate slopes, and accounts for approximately 100 acres.

Historic agricultural activity may also be a leading source of water quality impairment in Bearmeat Creek watershed. Row cropping has likely decreased in past years, resulting in declining inputs of sediment from agriculture activity. However, legacy sediment within the stream system may still be present.

Residential development is the most likely cause for continued inputs of sediment into Bearmeat Creek. Residential development has been ongoing in this watershed for the past 10 years, and is located along the fringes of the watershed boundary; along ridge tops and moderate to steep slopes in close proximity to ridge tops. Ongoing development is predominantly located along Bearmeat Spur Road, and accounts for 20 to 30 acres.

The road system within Bearmeat Creek watershed also shows some indications of sedimentation that may be leading to water quality impairment. The road system is composed of both public and private routes. Public roads are generally paved and in good condition, while private roads and driveways are most commonly gravel. Some private roads are in moderate to poor condition, and are leading to some sedimentation. While public roads are generally in good condition, the two stream crossing points for Bearmeat Creek, on Bearmeat Road and Bearmeat Village Road both show signs of creating channel instability due to improper design and construction. Natural revegetation of these disturbed areas downstream from both culverts also indicates that the channel instability may be a result of infrequent storm events over the past two years.

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	Bearmeat Creek Spur Road- (20 acres)
Large or extensive gullies	<input type="checkbox"/>	<input type="checkbox"/>	_____
Unpaved roads near or crossing streams	<input type="checkbox"/>	X	_____
Croplands	<input checked="" type="checkbox"/>	X	_____
Pastures with cattle access to water bodies	<input checked="" type="checkbox"/>	X	Minimal impact from cattle access.
Commercial forestry activities including harvesting and site-preparation	<input type="checkbox"/>	<input type="checkbox"/>	_____
Extensive areas of streambank failure or channel enlargement	<input type="checkbox"/>	<input type="checkbox"/>	_____
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	<input type="checkbox"/>	<input type="checkbox"/>	_____
Interstate and controlled access highways and interchanges	<input type="checkbox"/>	<input type="checkbox"/>	_____
Major highways and arterial streets	<input type="checkbox"/>	<input type="checkbox"/>	_____
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"/>	_____

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	2	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	100	feet or _____	mile or _____	%
Cattle crossing	2	#		
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 images.

#	Width in feet	Location (Left bank, Right bank or N, S, E, W side of wetland or lake)	Characteristics and comments
1	5ft	Bridge, approximately 1/4 mile from National Forest lands on Hamilton Dr.	Stream seems to be in excellent condition. Substrate is composed of pebbles, cobbles, and boulders with little silt accumulations. Site is in a run, just before entering into culvert. One piece of plastic trash located in center stream. Banks are composed of grasses on right side and trees, shrubs, and grasses on left side. Bank height is approximately 4ft on right side and 5ft on left side, both are near vertical. Floodplain is pastureland on right side and residential/grass on left side. No indication of water quality impairment at this site.
2	6ft	Right side, approximately 105 yards downstream of Hamilton Dr.	Well defined riffle pool sequence, site is in a pool. Some sediment accumulation noted. Substrate is a mix of silt, sand, pebbles, and cobbles. No trash evident. Stream banks are 3-4 feet tall. Right bank is lightly vegetated with grasses. Bank vegetation

			has been cut to remove small trees and shrubs. Floodplain on right is used as pasture/hay although it was plowed in recent months. Left bank is heavily vegetated with trees and shrubs and is very stable. Riparian buffer beyond stream bank is not present. Floodplain is used as hay/pasturelands. Pasture is fenced directly at stream bank.
3	3ft	Bridge Bearmeat Rd.	Stream transitions from pool to riffle at bridge and necks down from 5 to 2ft. Increases velocity from moderate to high. Substrate is silt, sand, pebbles, and cobbles. Site is actively used as an access point for horses and some stream bank erosion is evident on right side. While the livestock could cross the stream with no difficulty, there is no indication that the animals use this point as a stream crossing. Bank height on right is approximately 2ft, and is gently sloping from animal traffic. Bank height on the left is approximately 3ft, and is near vertical. Bank material is predominantly exposed sand and silt on right side with dispersed grasses, and near complete covering of grasses on left bank. The floodplain on both stream sides is grass/pasture lands used for animal grazing.
4	5ft	Left	Riffle run pattern well established. This section is within a run, and is significantly more narrow than the pools, which are about 10-12 feet in width. The substrate is composed of sand cobbles and boulders. The flow rate is high all the way across the stream. The stream has a small bench that is about 6 inches above the stream level and is 3X12 feet in dimension. Some woody debris is located within this bench. The stream banks are 5ft in height. The right bank is composed of unvegetated boulders and has a near vertical angle, while the left bank is vegetated with grasses, shrubs, and small trees. The left bank is vertical and has accumulated woody debris from flood events. The floodplain on river right is composed of dense briars, while the floodplain on river left is a grassed residential field.
5	10ft	Bridge at Garland Rd.	Site is slightly downstream from old wooden bridge. Riffle pool sequence is maintained. Section is in pool. Significantly more silt at

			<p>this point than other sample points upstream. Substrate is also composed of cobbles and boulders. No trash or woody debris is present. Right bank is lightly vegetated with grasses, but is undercut and seems to be experiencing significant erosion. Left bank vegetated with mosses, ferns, grasses, vines and mature trees. Erosion is not evident on the left side. The floodplain on river right is composed of unmaintained grasses, while the floodplain on the left is an unmaintained pasture field with a fence running along riverbank.</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

Overall, the watershed is in good condition. Changes in land use activities may have resulted in significant environmental restoration since the development of the Bearmeat Creek TMDL.

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.

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	In Bearmeat Creek	Corrugated Galvanized Pipe	2 X 36"	Steady	Eroded	Recent maintenance on stream crossing. Possible pipe replacement
2	In Bearmeat Creek	Corrugated Galvanized Pipe	2 X 36"	Steady	Eroded	Erosion located downstream of culvert, on both sides of stream. Riprap placed on bank to stabilize roadway

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



APPENDIX B

BEARMEAT CREEK WATERSHED PHOTOGRAPHS



Photograph taken from end of Bearmeat Rd., facing east.
Bearmeat Creek runs from left to right along tree line slightly behind abandoned manufactured home.
Note passive agricultural lands, fenced access to stream, and small riparian buffer.



Photograph taken near intersection of Bearmeat Rd. and Bearmeat Spur, facing east.
Note row cropping in foreground, hay/pasture lands in near background and lands managed by the Forest Service in far background.



Photograph taken from crossing of Bearmeat Rd. and Bearmeat Creek, facing north.
Note light horse activity, unlimited access to Bearmeat Creek, and limited riparian area along stream.



Photograph taken from Bearmeat Rd. near crossing with Bearmeat Creek, facing west.
Note land disturbance from horse stables and intermittent stream located in left frame of image.



Photograph taken near crossing of Bearmeat Rd. and Bearmeat Creek.
Note recent maintenance work on culvert and paved road surface as well as additional erosion of gravel above culvert.



Photograph taken near Bearmeat Rd. and Ira Coleman Rd, facing south.
Note low intensity agricultural lands in Bearmeat Creek valley with residential development on ridgeline in background.



Photograph taken from Bearmeat Village Rd. at crossing of Bearmeat Creek,
facing down (stream flow from top to bottom).
Note moderate sediment deposition within stream channel



Photograph taken at crossing of Bearmeat Village Rd. and Bearmeat Creek, facing south.
Note extensive erosion and rip-rap along stream bank