HICKAHALA CREEK WATERSHED IMPLEMENTATION PLAN

REVISED
August 10, 2009

HICKAHALA CREEK WATERSHED IMPLEMENTATION PLAN

Prepared for

Yazoo River Basin Team
Mississippi Department of Environmental Quality

Developed by

Hickahala Creek Watershed Implementation Team

Prepared by

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Goals and Actions For Hickahala Creek Watershed In The Coming Basin Management Cycle

Reduce organic matter loads, nutrient loads, achieve state dissolved oxygen standards, achieve Fish and Wildlife support designated use	MSWCC, SWCDs	Improve water quality and protect high quality waters through the implementation of selected BMPs in the targeted areas of the watershed	Entire Watershed	2004-2007	Mark Gilbert, MSWCC 601-354-7645 Tate Co. SWCD 662-560-9001 ext. 3 Panola Co SWCD 662-578-8045 ext. 3
		Apply Best Management Practices (BMPs) to agricultural lands in the project area so as to reach the desired outcome of reduced runoff, sedimentation and cattle access to the streams		2004-2007	
		Inform and educate the public about Best Management Practices that benefit water quality		2004-2007	
	MDEQ	Water Quality sampling	Hickahala Creek	??	Alice Dossett, MDEQ 601-961-5664
	MSWCC, USDA NRCS, MSU Cooperative Extension Service, USACE	Continue existing programs and projects related to farmer education, BMP implementation, and habitat conservation.	Entire Watershed	2004-2008	Mark Gilbert, MSWCC 601-354-7645 Scott Richie, NRCS 662-560-9001 ext. 3 Terry Myers, NRCS 662-578-8045 ext. 3 Judd Gentry, MSU-ES 662-563-6260 Robby Swayze,USACE 601-631-5154

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I. MISSION STATEMENTS

The Mississippi Department of Environmental Quality (MDEQ) mission is to safeguard the health, safety, and welfare of present and future generations by conserving and improving Mississippi's environment and fostering wise economic growth through focused research and responsible regulations. Restoration of Hickahala Creek water quality will not only contribute directly to the environmental aspect of MDEQ's mission, but also contribute to economic viability within the watershed.

The Mississippi Soil and Water Conservation Commission (MSWCC) mission is to effectively guide and promote the conservation, development, protection and proper utilization of the soil, water and related resources of the state.

II. HICKAHALA CREEK WATERSHED IMPLEMENTATION TEAM

A. Members, Organizations and Agencies *(Acronyms)*

Robin McKay- Mississippi Department of Health (MSDH)
Roger Whittington- Mississippi Department of Health (MSDH)
Mark Slocum- Tate County Soil and Water Conservation District (SWCD)
Terry Snider- Natural Resources Conservation Service (NRCS)
Scott Richey- Natural Resources Conservation Service (NRCS)
Terry Myers- Natural Resources Conservation Service (NRCS)
Walter Rodgers- Landowner
Haywood Green- Landowner
Robert Swayze- United States Army Corp of Engineers (COE)
Rick Robertson- United States Army Corp of Engineers (COE)
George Rowland- Resource Conservation and Development (RC&D)
Judd Gentry- Mississippi State University- Extension Service (MSU-ES)
Reed Morris- City of Senatobia
Ronn Killebrew- Mississippi Department of Environmental Quality (MDEQ)
Pradip Bhowal- Mississippi Department of Environmental Quality (MDEQ)
Laura Beiser- Mississippi Department of Environmental Quality (MDEQ)
Andy Whittington- Mississippi Farm Bureau (MFBF)
Mark Gilbert- Mississippi Soil and Water Conservation Commission (MSWCC)
Brad Shedd- Mississippi Soil and Water Conservation Commission (MSWCC)
Patrick Vowell- Mississippi Soil and Water Conservation Commission (MSWCC)

III. HICKAHALA CREEK WATERSHED

A. Watershed Description

Hickahala Creek drains approximately 149,190 acres of the Yazoo River basin in Tate, Panola, and Marshall counties in northwestern Mississippi (Figure 3.1) (MDEQ 2002a). We estimate that approximately 20,000 people lived in this watershed in 2000 (based on Census 2000 data). Portions of the cities of Senatobia, Coldwater, and Como are in the Hickahala Creek watershed. Other towns and cities in the watershed include Barr and Wyatte. Senatobia is the largest town in the watershed (DeLorme 1998). This watershed is not affected by any communities that are not located in the watershed boundaries. In 1993 land use in the watershed was primarily pasture (59%), cropland (21%), and forest (15%) (see Figure 3.2) (MDEQ 2002a). This watershed has always been primarily agricultural, but is starting to become urbanized due to growth of surrounding counties.

The watershed is underlain by thick loess soil. The topography of the watershed is gently rolling hills and plains (MDEQ 2000). Table 3.1 is a list of the major soils in the watershed and their characteristics. The watershed is located primarily in the Mississippi Valley Loess Hills ecoregion, extending to the North Central Hills ecoregion (MDEQ 2000, MARIS online mapping accessed 8/10/04). Native vegetation in the watershed includes oak, hickory, magnolia, poplar, red oak, and shortleaf pine (MARIS online mapping accessed 6/26/04). There have been no significant changes to this watershed to this point, but there is talk that the new bypass of Highway 4 will come through the watershed.

Named creeks in the watershed include Hickahala Creek, Senatobia Creek, Basket Creek, and Nelson Creek. Two major canals in the watershed are the Old Senatobia Canal and the James Wolf Canal. There are numerous small impoundments in the watershed (DeLorme 1998). Hickahala Creek is a tributary of Arkabutla Lake. Approximately 4,000 acres of wetlands occur along Hickahala Creek (MDEQ 2002a). There are approximately 17 public water supply wells in the watershed (MDEQ 2000). Public water supply is primarily provided from deep, confined aquifers that are generally

protected from contamination. Home water wells mainly pump from shallow aquifers, which can be susceptible to contamination (MDEQ 2000).

Table 3.1. Major soil associations in Hickahala Creek watershed (MARIS online map accessed 8/10/04, SCS 1967).

Soil Association	Description
Collins-Falaya	Nearly level, somewhat poor to moderately well drained silty soils
Loring-Grenada	Gentle slope to sloping ridgetops, moderately well drained silty upland soils that have a fragipan
Memphis	Deep, well drained silty soils in the uplands, gentle to very steep slopes, located in the Western part of the county, but not in the Delta

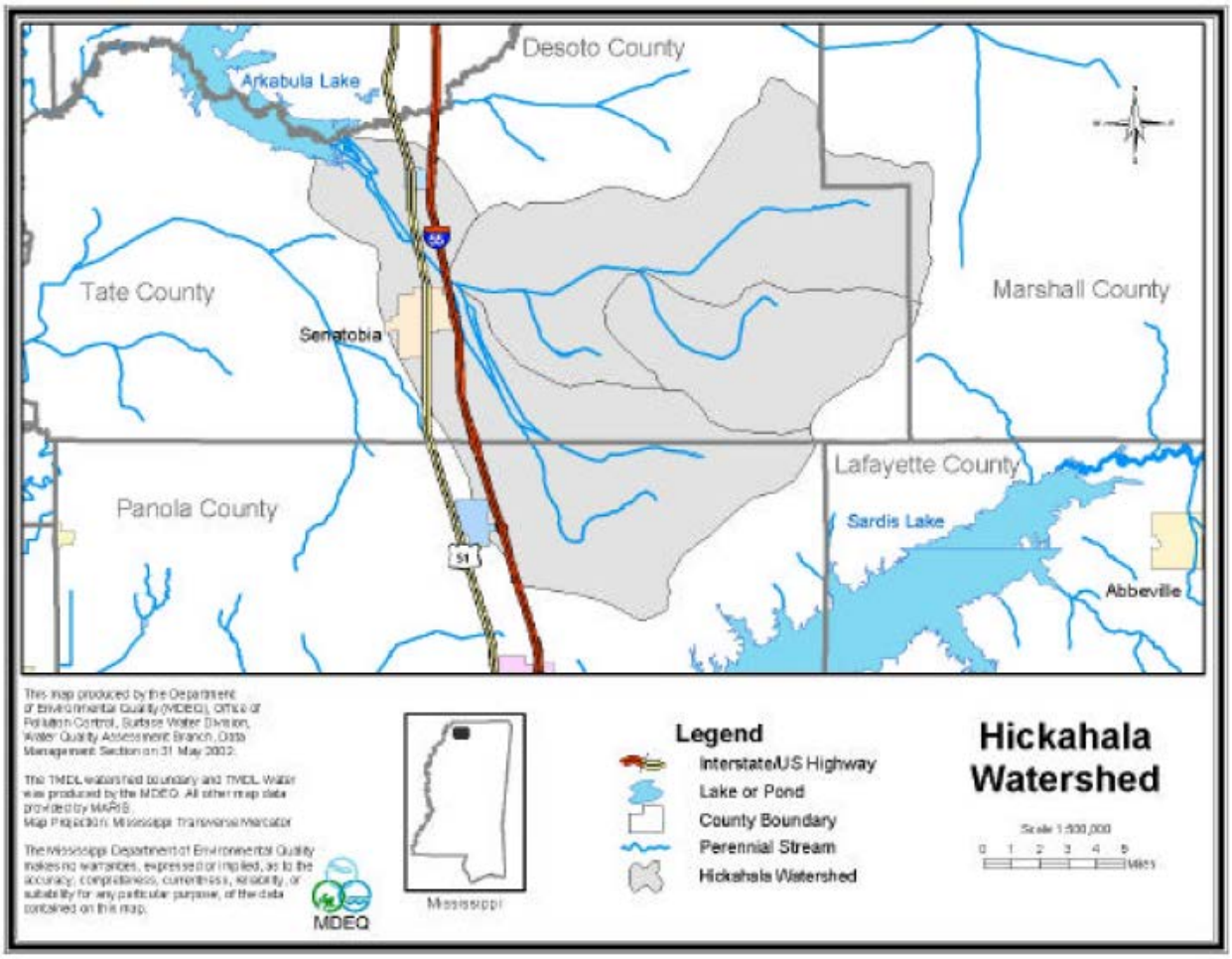

Figure 3.1. Hickahala Creek watershed.

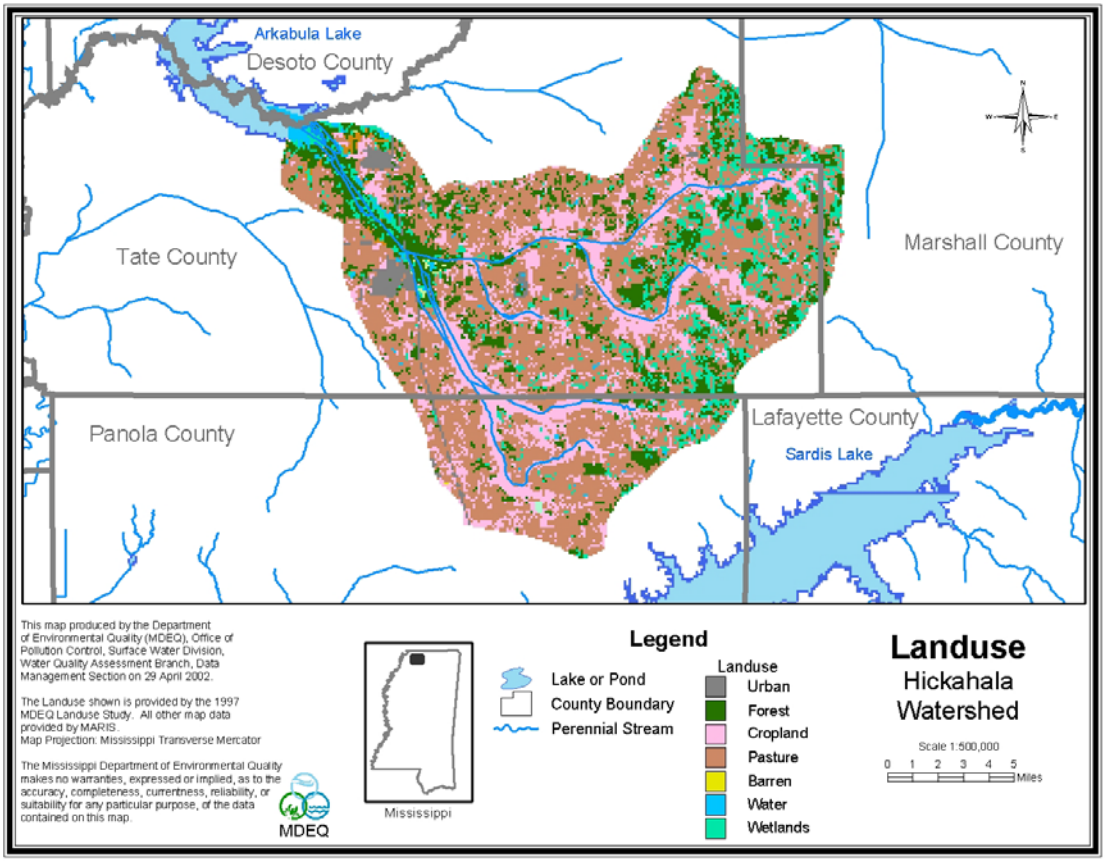

Figure 3.2. 1993 Land use in Hickahala watershed

B. Stakeholder Interests and Concerns

Hickahala Creek watershed was selected for implementation of restoration activities based on the 303(d) listing of water bodies in the watershed, and the high level of stakeholder interest (Appendix C, MDEQ 2004b). Table 3.2 is a listing of stakeholder concerns that includes suspected causes, locations, and extent of the problems identified. Organic enrichment/low DO and pH are excluded from the list of concerns based on the results of the TMDL studies addressing these pollutants (Section 3.2.3).

Table 3.2. Detailed listing of stakeholder concerns.

Concern:	Pathogens in surface water
Causes:	Failing on-site wastewater treatment systems, discharges of untreated wastewater from direct pipes and combined storm/sewer system overflows, animals in streams, pasture runoff, failing sewer lines
Location:	Impairment occurs in Hickahala Creek from headwaters to confluence with James Wolf Creek, and from confluence with Senatobia Canal to Arkabutla Lake flood pool; in James Wolf Creek from headwaters to confluence with Hickahala Creek; and in Senatobia Creek from headwaters to confluence with Hickahala Creek
Extent:	

Concern:	Nutrients
Causes:	Point source discharges, agricultural runoff, animals in streams, silviculture, atmospheric deposition, failing septic systems, direct discharges untreated wastewaters, failing sewer lines, urban runoff, catfish pond discharges
Location:	Potential for impairment in Hickahala Creek from Senatobia north outfall to headwaters, and in Senatobia Creek from headwaters to confluence with Hickahala Creek
Extent:	Over 17 miles of Hickahala Creek, and over 13 miles of Senatobia Creek

Concern:	Sedimentation
Causes:	Soil and stream bank erosion on all lands and streams in the watershed due to the highly erodable nature of the soils in the watershed
Location:	All land located in the watershed
Extent:	Entire watershed

Concern:	Water infiltration into sewer system and storm water
Causes:	Broken pipes through manholes, water running off rooftops, and impervious surfaces
Location:	Urban areas in the city limits of Senatobia
Extent:	City of Senatobia

Concern:	Closed landfills and illegal dumping
Causes:	Old unidentified landfills covered up and water filtering through the trash carrying contaminants into the groundwater
Location:	Occur in different sites and some that are not identified
Extent:	Entire watershed

Concern:	Flooding of low lying areas (wells)
Causes:	Water wells that have been drilled in low lying areas that are in flood plains flooding and contaminating the wells and the aquifer
Location:	Occur in the rural areas due to no community water
Extent:	Entire watershed

Concern:	Kudzu
Causes:	
Location:	Located on most rural land in the watershed
Extent:	Entire watershed

Concern:	Beaver Control
Causes:	Disturbing the flow of water causing backups and flooding of low lying areas killing timber and flooding other agricultural lands
Location:	Creeks, streams and roadside ditches in the rural areas
Extent:	Entire watershed

Concern:	Loss of Quail Habitat
Causes:	Herbicide drift, Invasive weed species, and urbanization
Location:	Located in all areas of the watershed
Extent:	Entire watershed

C. Wildlife Resources

The important recreational species in the watershed include deer, turkey, all small game, bream, catfish, crappie, and largemouth bass. These species and their habitat occur throughout the watershed. No threatened or endangered species are listed for Tate or Panola Counties in the Mississippi Natural Heritage Inventory (http://museum.mdwfp.com/science/ms_endangered_species.html, 6/29/04). There are three plant species included in the Natural Heritage Inventory as species of special concern for Tate County, but no animal species of special concern. Several plant and

animal species are included in the Natural Heritage Inventory as species of special concern for Panola County (http://museum.mdwfp.com/science/ms_endangered_species.html, 08/25/09). A list of the Species of Special Concern by county is given in Appendix A.

D. Water Quality

1. Standards

The designated use class for all surface waters of this watershed stated in the Mississippi water quality regulations is Fish and Wildlife Support. Designated beneficial uses for these waters are Aquatic Life Support and Secondary Contact Recreation (http://www.deq.state.ms.us/MDEQ.nsf/page/WMB_yazoodesignate?OpenDocument). Table 3.3 lists the numeric water quality criteria applicable to Hickahala Creek watershed surface waters (MDEQ 2002).

Table 3.3. Water quality criteria for Hickahala Creek watershed.

Parameter	Criteria
Dissolved Oxygen	5.0 mg/L daily average, 4.0 mg/L instantaneous
PH	Between 6.0 and 9.0 su
Temperature	32.2 deg C
Fecal coliform	May – October: geometric mean of 200 per 100 mL, 400 per 100 mL less than ten percent (10%) of the time during a 30 day period. November – April: geometric mean of 2000 per 100 mL, 4000 per 100 mL less than ten percent of the time during a 30 day period.
Specific conductance	1000 uohms/cm
Dissolved Solids	750 mg/L monthly average, 1500 mg/L instantaneous

Mississippi's water quality standard for sediment is narrative and reads as follows: "Waters shall be free from materials attributed to municipal, industrial, agricultural or other discharges producing color, odor, taste, total suspended or dissolved solids, sediment, turbidity, or other conditions in such degree as to create a nuisance, render the waters injurious to public health, recreation or to aquatic life and wildlife or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated use" (MDEQ 2002).

MDEQ uses an Index of Biotic Integrity (M-BISQ) to determine if water bodies are achieving their aquatic life support designated use (MDEQ 2003). The aquatic life support attainment threshold M-BISQ score for the bioregion associated with Hickahala Creek is 52.29.

2. Current Condition

a. Surface Water Quality

There is not a MDEQ ambient monitoring site on Hickahala Creek nor its tributaries. However, MDEQ, as well as the Corps of Engineers, US Geological Survey, and USDA-ARS have conducted water quality studies on Hickahala, James Wolf, and Senatobia Creeks. Information on the sampling dates and parameters sampled by the various agencies at various locations in the watershed is provided in the Yazoo River Basin Compendium of Water Quality Information (MDEQ 2003) and in the TMDL for Hickahala, James Wolf, and Senatobia Creeks (MDEQ 2002a, 2003a).

Segments of Hickahala, James Wolf, and Senatobia Creeks were placed on the 1998 Section 303(d) list for impairment of aquatic life support and secondary contact recreation designated uses. For Hickahala and Senatobia Creeks pollutant issues noted in the 303(d) list included nutrients, organic enrichment/low DO, biological impairment, sediment/siltation, metals, pH, pesticides, and pathogens. For James Wolf Creek, pollutant issues noted in the 303(d) list included nutrients, organic enrichment/low DO, pesticides, sediment/siltation, pH, and pathogens. In the 2002 303(d) list, these segments are slated for removal from the 303(d) list due to completion of TMDL studies, and reevaluation of data indicating no impairment (MDEQ 2004a).

b. Groundwater Resources

The majority of drinking water use in this watershed is supplied by groundwater from the deep aquifer. Irrigation water comes primarily from the shallow aquifer (MDEQ 2000). No issues have yet been raised with regard to the quality or quantity of groundwater in this watershed.

3. TMDLs

Segments of Hickahala, James Wolf, and Senatobia Creeks were included on the 1998 303(d) list (MDEQ 2002, 2003a). Total maximum daily load studies (TMDLs) related to these listed segments have been completed, addressing several of the listed parameters.

A TMDL addressing organic enrichment/low dissolved oxygen and nutrients has been completed and approved by U.S. EPA (MDEQ 2003a). There are currently no numeric criteria for nutrient concentrations in Mississippi surface waters, so a TMDL for nutrients was not developed. However, nutrient contributions to oxygen demand were included in the dissolved oxygen analysis. Table 3.4 lists the target total maximum daily loads for the Hickahala Creek watershed. Estimated existing TBODu load to the watershed is approximately an order of magnitude less than the TMDL shown in Table 3.4, therefore, no reductions in oxygen demand load were recommended for the watershed (MDEQ 2003a).

Table 3.4 Hickahala organic enrichment/low DO TMDL (MDEQ 2003a).

Load Type	Load (lbs/day TBODu)
Waste Load Allocation	683.2
Load Allocation	678.8
Margin of Safety	(explicit)
TMDL	1317.0

A TMDL addressing pathogens in Hickahala, James Wolf, and Senatobia Creeks has also been completed and approved by U.S. EPA. Both point and nonpoint sources pathogen sources are of concern in the listed stream segments. Potential nonpoint pathogen sources that were considered in the study included failing septic systems, animal access to streams, direct discharges of untreated wastewater, runoff from urban areas, and failing sewer lines. Waste load allocations were set based on the assumption that NPDES permitted discharges will be treated to meet water quality standards for fecal

coliform at the end of pipe. Load allocations were set using a load duration curve. Approximately 50% to 76% reductions in fecal coliform loads were recommended in the TMDL study (MDEQ 2002a).

A TMDL addressing low pH in Senatobia Creek has been completed and approved by U.S. EPA. The TMDL study did not identify specific sources causing the low pH conditions, but suggested that this could be a natural condition. The TMDL recommended that any future NPDES permits and nonpoint source discharges meet the state pH water quality standards (MDEQ 2003c).

IV. WATERSHED IMPLEMENTATION PLAN

A. Goal

The underlying principle of this watershed implementation plan (and the Basin Management Program itself) is adaptive management. The goals and objectives of this plan reflect this principle. The goal for this watershed implementation plan is to reduce pathogen loads to the water bodies in the watershed included on the 1998 303(d) list so they will attain their designated uses of Aquatic Life Support and Secondary Contact Recreation, and achieve the state water quality standards within five years. Goals related to other existing or potential issues in this watershed will be included in future implementation plans for this watershed. The following actions will need to be taken to meet the watershed implementation plan goal:

- Agriculture Best Management Practices (BMPs)
- Restoration of Bobwhite Quail Habitat

B. Management Actions

Below are detailed descriptions of management actions planned for the next basin management cycle. Note that the values shown for load reductions, number of management practices to be installed, and costs are planning estimates and subject to change.

1. Agriculture BMPs

a. Desired Benefits

The objective of this action is to apply best management practices to agricultural lands in the watershed that will result in reduced nonpoint source pollutant loadings.

b. Actors

The Mississippi Soil and Water Conservation Districts, Mississippi State University Cooperative Extension Service, USDA Farm Services Agency, and Natural Resources Conservation Service are potential sources of technical assistance related to these practices. Landowners, Natural Resources Conservation Service, and Soil and Water Conservation Districts will bear primary responsibility for getting these measures installed.

c. Activities

A project has been funded under Section 319 of the Clean Water Act for the installation of Best Management Practices on agricultural lands in the watershed. This project is being implemented by the Mississippi Soil and Water Conservation Commission. The estimated numbers and types of BMPs to be installed are contained in the 319 project workplan included in Appendix E. BMPs will be installed on selected sites determined by current land use maps and the willingness of landowners to participate. The installation and maintenance of installed BMPs will be the responsibility of the landowners. A number of practices are eligible for funding in the watershed through the USDA Environmental Quality Incentives Program (EQIP). The estimated funding from EQIP over the next 3 years is $250,000.
(http://www.ms.nrcs.usda.gov/programs/MS%20CountyEQIP%20Information.html).

d. Budget

The following budget will be used for the implementation of the Hickahala Creek Watershed 319 Project. MSWCC will implement the project on the state level. The Tate and Panola County Soil and Water Conservation Districts will implement the project on the local level.

Table 4.1 Budget for Hickahala Creek Watershed 319 Project

Best Management Practice	Unit Cost	Number of Units	Total Cost
Critical Area Planting	$250/acre	100 acres	$25,000
Grade Stabilization Structure	$1,700/ea	70 structures	$119,000
Diversions	$1.66/ft	20,000 feet	$33,200
Ponds	$2,500/ea	22 ponds	$55,000
Tree Planting	$122.20/ac	1,500 acres	$183,300
Stream Crossing	$6,000/ea	20 crossings	$120,000
Water and Sediment Control Basin	$2,500/ea	50 basins	$125,000
Fencing	$.80/ft	100,000 feet	$80,000
Pasture and Hayland Planting	$160/ac	400 acres	$64,000
Total			**$804,500**

e. Schedule

This project began in 2004 and is scheduled to end in August 2007. The following milestones have been developed for the project:

1. Sign grant contract with MS Department of Environmental Quality. (Month 0)
2. Issue policies and procedures for implementing the project to the SWCD office. (Month 1)
3. Meet with the board of SWCD commissioners to get their understanding of their responsibilities and participation. (Month 2)
4. In conjunction with the local SWCD, establish a locally led watershed advisory group to assist with implementation activities. (Month 2-3)
5. Provide training to district staff. (Month 2-3)

6. Assist in establishing an evaluation system in conjunction with the MS Department of Environmental Quality to indicate the benefits of the project. (Month 2-3)
7. Conduct a landowner meeting to inform potential participants about the project. (Month 3)
8. Secure commitments from several landowners and operators who are willing to participate in the project. (Month 3-4)
9. Assist participants in developing a conservation plan and applying best management practices. (Month 4-12)
10. Establish at least one demonstration farm. (Month 4-12)
11. Document pre-existing site conditions. (Month 2-12) (Before and after photo documentation will be conducted).
12. Accelerate conservation planning and application assistance. Special effort will be made to complete conservation plans during this time frame. (Month 13-24)
13. Conduct at least one informational field day/tour to inform the public about the project. (Month 13-24)
14. Establish at least one demonstration farm. (Month 13-24)
15. As requested, assist MDEQ with evaluations. (Month 0-36)
16. Assemble data on the amount of soil saved. (Month 0-36)
17. Erect project roadside signs which designate where water quality practices are in progress or have been completed. (Month 4-36)
18. Provide continued conservation planning and application assistance to participants. (Month 25-36)
19. Review the status of applying best management practices to reach the objectives of the project. (Month 25)
20. Based upon the needs and finding of milestone 18, assistance in planning and/or application will be redirected and/or accelerated. (Month 25-36)
21. Publish at least four articles about the project. (Month 0-36)
22. Publicity of the project will be increased; at least one field day/tour will be conducted and at least 1,000 fact sheets will be developed and distributed. (Month 25-36)

23. Bi-annual reports will be made to MDEQ. (Month 0-36)
24. Make Final report to MDEQ. (Month 36)

MSWCC will conduct routine BMP inspections in conjunction with MDEQ to ensure the project is progressing in a timely manner and to ensure that installed BMPs are being maintained properly.

2. Restoration of Bobwhite Quail Habitat

a. Desired Benefits

The objective of this action is to increase the habitat of the Northern Bobwhite Quail with the installation of Habitat Buffers for Upland Birds. The loss of quail habitat has caused a large decline in the population numbers of quail. The loss of habitat is being contributed to urbanization, loss of native grasses, intensive agriculture, and a transitioning of once grassy fields into forests.

b. Actors

The Mississippi Department of Wildlife, Fisheries, and Parks; Mississippi Fish and Wildlife Foundation; Delta Wildlife Inc.; Mississippi State University, Forest and Wildlife Research Center; USDA Farm Service Agency; USDA Natural Resources Conservation Service; US Fish and Wildlife Service; and Wildlife Mississippi are potential sources of technical assistance related to this management action. Landowners, USDA Natural Resources Conservation Service, and USDA Farm Service Agency bear the primary responsibilities for the installation of these buffers.

c. Activities

The USDA Farm Service Agency has a conservation practice available called CP33: Habitat Buffers for Upland Birds that is available to farmers across

the state of Mississippi. This practice provides food and cover for bobwhite quail in cropland areas. This conservation practice involves natural regeneration of native grasses and forbs or planting of native warm season grasses, legumes, wildflowers, and limited shrub and tree planting. This Conservation Practice is limited to 9,400 acres statewide and is on a first come, first served basis if the criteria for the program are met.

d. Budget

The actual cost for this conservation practice will vary for each landowner and situation. There are cost share and incentive payments available with this conservation practice. The cost share and incentives are as follows:

- Signing incentive payments of up to $100 per acre,
- Annual rental payments and maintenance costs,

(receive rental payments for ten years; the payment is a weighted average of the county specific rental rate for comparable land, plus practice maintenance)

- Cost-share of up to 50% of eligible reimbursable practice costs,
- Practice incentive payments of up to 40% of eligible establishment cost.

e. Schedule

The sign-up for this conservation practice ends December 31, 2007 or when all 9,400 acres in the state of Mississippi have been enrolled into the program.

V. EDUCATION STRATEGY-DESIRED BENEFITS

The overall objective of community education in the Hickahala Creek watershed is to develop an atmosphere that promotes sustained, long-term protection and improvement of aquatic resources in the watershed. Specific objectives of education efforts in the watershed include the following:

- Increase public awareness of the value of clean water.
- Increase public awareness of how common activities affect water quality and critical flora and fauna.
- Increase public awareness of how BMPs can be used to reduce negative water quality and habitat affects.
- Increase public awareness of the long term environmental and economic advantages of protecting and improving water quality and habitat in the Hickahala Creek watershed.
- Reduce organic matter loads, nutrient loads, achieve state dissolved oxygen standards, and achieve Fish and Wildlife support designated use.

A. Signage

Signs identifying the BMPs that have been installed will be erected in areas where they will be visible and landowners will allow the signs to be erected.

Primary partners- Mississippi Soil and Water Conservation Commission, Mississippi Department of Environmental Quality, Panola County Soil and Water Conservation District, Tate County Soil and Water Conservation District, Natural Resources Conservation Service, and Environmental Protection Agency.

1. Indicators

There will be field days held to show other landowners and the interested these BMPs and participants will be counted at these field days.

2. Schedule

The BMP signs will be erected as practices are completed and the signs are requested by the landowners throughout the life of the project.

3. Budget

Table 5.1 Projected Costs for Signage.

Item	Unit	Cost	Total Cost
Signs	20	$25.00	$500.00
Total			**$500.00**

B. Field Days

There will be at least two field days held to highlight the BMPs that have been installed during the project period. This will allow other landowners and the interested public to view some of the practices that are being installed to benefit water quality in the watershed.

Primary partners- Mississippi Soil and Water Conservation Commission, Mississippi Department of Environmental Quality, Panola County Soil and Water Conservation District, Tate County Soil and Water Conservation District, Natural Resources Conservation Service ,and Environmental Protection Agency

1. Indicators

Attendance at these field days will be documented and reported to MDEQ.

2. Schedule

Field days in the watershed will take place in 2006-2007.

3. Budget

Table 5.2 Projected Costs for Field Days.

Item	Units	Cost	Total Cost
Event Flyers	100	.30/each	$30.00
Mailing/Delivery	100	.39/each	$39.00
Miscellaneous	1	$950.00	$950.00
Total			**$1,019.00**

C. Fact Sheets

A fact sheet will be developed at the end of the project. This fact sheet will contain information about the watershed, the number and type of BMPs that were installed, the number of tons of soil being saved, and the number of acres impacted by the BMPs.

Primary Partners- Mississippi Soil and Water Conservation Commission, Tate County Soil and Water Conservation District, Panola County Soil and Water Conservation District, and Natural Resources Conservation Service.

1. Indicators

Fact sheets will be handed out at the final field day and will also be available in the district offices.

2. Schedule

The fact sheet will be developed once all BMPs are in place to get a total on all tons of soil saved and the correct number of BMPs installed.

3. Budget

Table 5.3 Projected Costs for Fact Sheets.

Item	Unit	Cost	Total Cost
Printing	1,000	.30/each	$300.00
Total			**$300.00**

D. Adopt-A-Stream

Adopt-A-Stream is a program that promotes environmental stewardship through training workshops outdoor field activities, and by introducing participants to watershed action projects. One and Two-day workshops inform participants about watershed topics such as stream health, stream ecology, aquatic life and water chemistry.

Primary Partners- Mississippi Department of Environmental Quality and Mississippi Wildlife Federation.

1. Indicators

The number of participants for the workshop will be documented. Also, the number of participants that move forward with the stream stewardship project will be documented.

2. Schedule

This workshop will take place before August 2007.

3. Budget

Table 5.4 Projected Costs for Adopt-A-Stream Workshop.

Item	**Unit**	**Cost**	**Total Cost**
Adopt A Stream Workshop	1 day workshop	$1,500.00	$1,500.00
Total			**$1,500.00**

E. Project Learning Tree

Project Learning Tree (PLT) is an award winning education program designed for teachers and other educators, parents, and community leaders working with youth from pre-K to 8th grade. PLT activity guides and modules are not sold, but are earned by educators who attend a six-hour workshop. The PLT activity guide is a 400 page book containing 96 activities written in the form of lesson plans. PLT's goal is to "teach students HOW to think, not WHAT to think about environmental issues."

Primary Partners- Mississippi Department of Environmental Quality and Mississippi Forestry Commission.

1. Indicators

The number of participants for the workshop will be documented.

2. Schedule

This workshop will take place before August 2007.

3. Budget

Table 5.5 Projected Costs for Project Learning Tree.

Item	Unit	Cost	Total Cost
PLT Workshop	1 workshop	$1,350.00	$1,350.00
Total			**$1,350.00**

F. Watershed Harmony Puppet Show

Watershed Harmony is a musical puppet performance aligning with the fourth and fifth grade Mississippi Framework and National Science Standards. Audiences of all ages will delight in environmental stewardship through this toe tapping musical. Performances are not only enjoyed by school groups, but also by adults attending teacher workshops, civic clubs, and conferences. This program serves to inform, excite, and enlist the help of citizens in an ongoing effort to promote water quality in their communities.

Primary Partners- Mississippi Department of Environmental Quality and Bayou Town Productions.

1. Indicators

The number of participants will be documented and submitted to MDEQ.

2. Schedule

Watershed Harmony was presented on May 10, 2006 at Northwest Mississippi Community College in Senatobia, Mississippi. There were 450 students present and 20 teachers for the performance.

3. Budget

Table 5.6 Projected Costs for Watershed Harmony Puppet Show

Item	Unit	Cost	Total Cost
Watershed Harmony Puppet Show	1 show	$500.00	$500.00
Total			**$500.00**

G. Storm Drain Marking Project

The Storm Drain Marking Project is a project where storm drains in urban areas are labeled to make people aware of where the water and trash thrown down goes. There are also door hangers given to homeowners in the area to create awareness of the project and explains some of the things they can do as homeowners to help keep our water clean.

Primary Partner- Mississippi Department of Environmental Quality.

1. Indicators

The number of participants participating in the storm drain marking, the number of storm drains marked, a map with the storm drain locations marked, and a record of trash collected at the storm drains will be recorded.

2. Schedule

This project will take place before August 2007.

3. Budget

Table 5.7 Projected Costs for Storm Drain Marking.

Item	Unit	Cost	Total Cost
Storm Drain Marking	1 Project	$500.00	$500.00
Total			**$500.00**

H. Total Education Strategy Budget

Table 5.8 Projected Costs for Education.

Item	Unit	Cost	Total Cost
Signage			$500.00
Field Days			$1,019.00
Fact Sheets			$300.00
Adopt-A-Stream			$1,500.00
Project Learning Tree			$1,350.00
Watershed Harmony Puppet Show			$500.00
Storm Drain Marking Project			$500.00
Total			**$5,669.00**

VI. EVALUATION

A. Monitoring

The monitoring that will take place on this project will include the following:

- Before and after photo documentation on a representative sample of the BMPs installed,
- Before and after soil loss collection on each BMP installed, and
- An R5 Load estimation Model Field Data Entry Sheet completed on each BMP installed.

B. Assessment of Progress

Agencies responsible for implementing management activities will track implementation and provide annual reports to the Basin Group II Coordinator. Progress will be assessed based on meeting the scheduled management activity milestones outlined in Chapter IV. Success of Section 319 funded projects in the watershed will be evaluated based on the criteria specified in the project proposals (Appendix E).

During 2008, the Assessment year of the Basin Group II Basin Management Cycle, progress towards the goals of this watershed implementation plan will be assessed. Water quality data, as well as information on activities occurring in the watershed and stakeholder concerns collected during the period from 2004 through 2007, will be utilized. The criterion that will be used to determine progress toward plan goals is achievement of all state water quality criteria in previously impaired stream segments. Not meeting this criterion warrants investigation of the effectiveness of implementation of management practices, and/or the effectiveness of the management practices.

C. Plan Evaluation Procedure

This watershed implementation plan will be evaluated and revised every five years or on an as needed basis. The evaluation of this plan will be organized by the Hickahala Creek Implementation Team (see Chapter II). At this time, the Implementation Team will develop a detailed schedule for review and revision of

this watershed implementation plan. The Implementation Team members will be responsible for notifying their stakeholders of the opportunity to propose changes to the watershed implementation plan. One month will be allowed for notification of stakeholders.

The plan will be evaluated by the Team, or their designee, and any interested stakeholders. One month will be allowed for evaluation and submittal of comments. Therefore, comments will be due two months after the evaluation procedure is initiated. The plan will be evaluated in two ways. First, to determine if the plan goals have been achieved, and second, to determine if it reflects the current condition of the watershed, state of science, and issues in the watershed.

D. Plan Revision Procedure

After evaluation, MDEQ will prepare a revised watershed implementation plan incorporating the changes requested by the reviewers. At this point it may be necessary to call a meeting to reconcile any conflicting comments or requests for change.

If the evaluation criteria are all being met in Hickahala Creek surface waters, the watershed implementation plan will be revised to address a different restoration issue or issues, or to protect the water quality of the watershed. If the evaluation criteria for the watershed are not being met, the approach for restoring Hickahala Creek watershed will be revised based on the knowledge that has been gained since 2004.

The draft watershed implementation plan will be submitted to the Implementation Team, and all others who submitted comments. Within two weeks of receiving the draft watershed implementation plan, the Implementation Team will notify their stakeholders of the availability of the revised watershed implementation plan for stakeholder review. One month will be allowed for review of the draft. Comments will be due at the end of this review period.

Within a month after the comments on the draft watershed implementation plan are received, MDEQ will prepare a DRAFT watershed implementation plan. The DRAFT watershed implementation plan will be submitted to the

Implementation Team for review and approval. After the DRAFT watershed implementation plan has been approved, the Implementation Team will notify their stakeholders of the completion and availability of the DRAFT plan for use as a guide to watershed restoration and protection activities.

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APPENDIX A

Natural Heritage Inventory Species of Special Concern

Plant Species of Special Concern for Tate County.

Scientific Name	Common Name
HYDRASTIS CANADENSIS	GOLDEN SEAL
OSMORHIZA LONGISTYLIS	SMOOTHER SWEET-CICELY
TRIOSTEUM ANGUSTIFOLIUM	NARROW-LEAF FEVER ROOT

Plant Species of Special Concern for Panola County.

Scientific Name	Common Name
CAMASSIA SCILLOIDES	WILD HYACINTH
CHELONE GLABRA	WHITE TURTLEHEAD
CHELONE OBLIQUA	RED TURTLEHEAD
PANAX QUINQUEFOLIUS	AMERICAN GINSENG
PYCNANTHEMUM PILOSUM	HAIRY MOUNTAINMINT

Animal Species of Special Concern for Panola County.

Scientific Name	Common Name
ARCIDENS CONFRAGOSUS	ROCK POCKETBOOK
CYCLEPTUS ELONGATUS	BLUE SUCKER
CYPRINELLA WHIPPLEI	STEELCOLOR SHINER
MACROCHELYS TEMMINCKII	ALLIGATOR SNAPPING TURTLE
PANDION HALIAETUS	OSPREY
PETROCHELIDON PYRRHONOTA	CLIFF SWALLOW
POLYODON SPATHULA	PADDLEFISH

APPENDIX B

Stressors

DESCRIPTION OF STRESSORS

Status	Description
Stressor:	Malfunctioning on-site wastewater treatment units.
Justification:	Failing on-site wastewater treatment units have the potential to contribute fecal coliform, nutrients, and organic matter to surface waters.
Location:	Not yet been surveyed.
Extent:	Not yet been surveyed.
Stressor:	Discharges of untreated wastewater from direct pipes and combined storm/sewer system overflows.
Justification:	Untreated wastewater has the potential to contribute fecal coliform, nutrients, organic matter, and other pollutants to surface waters.
Location:	Undetermined.
Extent:	Undetermined.
Stressor:	Animals in streams.
Justification:	Animals, especially livestock, with access to streams can contribute nutrients and fecal coliform by depositing waste into streams. Livestock also damage stream habitat when they have access to streams.
Location:	See Figure 2.2 for locations of pastures adjacent to streams.
Extent:	Undetermined.
Stressor:	Runoff from agricultural lands, pastures.
Justification:	Runoff from pastures has the potential to contain nutrients and organic matter from animal waste deposited by grazing animals and used as fertilizer, as well as sediment. Runoff from croplands has the potential to contribute sediment, nutrients, organic matter, and pesticides to surface waters.
Location:	See Figure 2.2 for the locations of pastures and croplands in the watershed.
Extent:	Approximately 31,000 acres of cropland and 88,000 acres of pasture in the watershed in 1993.
Stressor:	Failing sewer lines.
Justification:	Failing sewer lines have the potential to contribute fecal coliform, nutrients, and organic matter to surface waters.
Location:	Undetermined.
Extent:	Undetermined.

Status	Description
Stressor:	NPDES point source discharges.
Justification:	NPDES point source discharges contribute fecal coliform, nutrients, and organic matter to streams in Hickahala Creek watershed.
Location:	NPDES point source discharges are located primarily in the lower watershed near Senatobia, Como, and Coldwater.
Extent:	There are approximately 15 NPDES permitted point source discharges in the watershed.
Stressor:	Runoff from silvaculture.
Justification:	Silviculture operations have the potential to contribute sediment and nutrients to surface waters.
Location:	Silvaculture operations that do not utilize erosion control BMPs. See Figure 2.2 for the locations of forest lands adjacent to streams.
Extent:	Different locations throughout the watershed.
Stressor	Runoff from urban areas.
Justification	Urban runoff has the potential to contribute nutrients, organic matter, sediment, and pesticides to surface waters.
Location	Senatobia, Como, Coldwater.
Extent:	Approximately 3,000 acres of urban land use were reported in the watershed as of 1993.

APPENDIX C

History of the Hickahala Creek Watershed Implementation Plan

HISTORY OF THE HICKAHALA CREEK WATERSHED IMPLEMENTATION PLAN

In 1998 the Mississippi Department of Environmental Quality implemented the Basin Management Approach (BMA) to Water Quality to carry out the mandates of the Clean Water Act. This approach brings together state, federal, and local agencies to improve and maintain the quality of Mississippi's water resources on a basin wide scale through comprehensive long range water quality planning and management strategies. The BMA is based on a repeating, five-year management cycle, with each year dedicated to a different management activity (Figure C.1). This document is an implementation plan from year five.

The BMA is implemented on a basin scale. The nine major watershed basins in Mississippi were combined into five basin groups (Figure C.2). Hickahala Creek is located in basin group II, the Yazoo River basin. Each basin group is managed by a Basin Team. The agencies on the Basin Group II Basin Team are listed in Table C.1. The goal of this team is to develop and implement management plans for its Basin Group.

Table C.1. Yazoo Basin (Basin Group II) Team Members.

Natural Resources Conservation Service	Mississippi Soil and Water conservation Commission
U.S. Fish & Wildlife Service	Mississippi Department of Health
MDEQ Field Services Division	Delta F.A.R.M.
MDEQ OLWR	U.S. Army Corps of Engineers Vicksburg District
MDEQ SRF and DWI Loan Programs	U.S. Geological Survey
MDEQ TMDL Section	USDA Cooperative Extension Service
MDEQ NPS Program	Yazoo Water Management District
Mississippi Department of wildlife, Fisheries, and Parks	Mississippi Farm Bureau
Mississippi Farm Services Agency	The Nature Conservancy
Ducks Unlimited	

In 2004, Basin Group II is in year five of its management cycle. The basin management plan is being developed, and Hickahala Creek watershed was selected for implementation of restoration activities. A ranking system was used to select watersheds for implementation.

The first step in the ranking process was to calculate prioritization scores for waterbodies. In this first round of ranking only waterbodies for which TMDLs had been completed were prioritized. The prioritization score was based on evaluation of the water quality data available for the water body, the method used to develop the TMDL, and the resource value of the water body based on its designated uses and the presence of threatened or endangered species. The water body scores were then aggregated into watershed scores. Eight-digit hydrologic unit codes were used to define watershed in the Delta portion of the basin, and 10-digit hydrologic unit codes were used to define watersheds in the Bluff Hills (MDEQ 2004).

The second step in the ranking process was to calculate a targeting score for each watershed. The targeting score was based on evaluation of local and agency support for restoration projects in the watershed; restoration and conservation projects that were active, planned, or had been completed in the watershed; and the value of water bodies in the watershed with regard to quality of life issues such as recreation and aesthetics (MDEQ 2004). The prioritization scores and targeting scores for the watersheds were combined in the final ranking score. At a Basin Team meeting in July 2004, the Team designated approximately 15 of the highest ranked watersheds as high priority watersheds for restoration and development of Watershed Implementation Plans. Watershed Implementation Teams for these high priority watersheds were also formed. Table C.2 lists members of the Hickahala Creek Watershed Implementation Team.

Table C.2. Watershed Implementation Team Members.

Mississippi Soil and Water Conservation Commission	Mississippi Department of Environmental Quality
Local Landowners	Natural Resources Conservation Service
City of Senatobia	Unites States Army Corp of Engineers
Mississippi State University Extension Service	Mississippi Farm Bureau Federation
North Central RC&D coordinator	Mississippi Department of Health
Tate County Soil and Water Conservation District	Panola County Soil and Water Conservation District

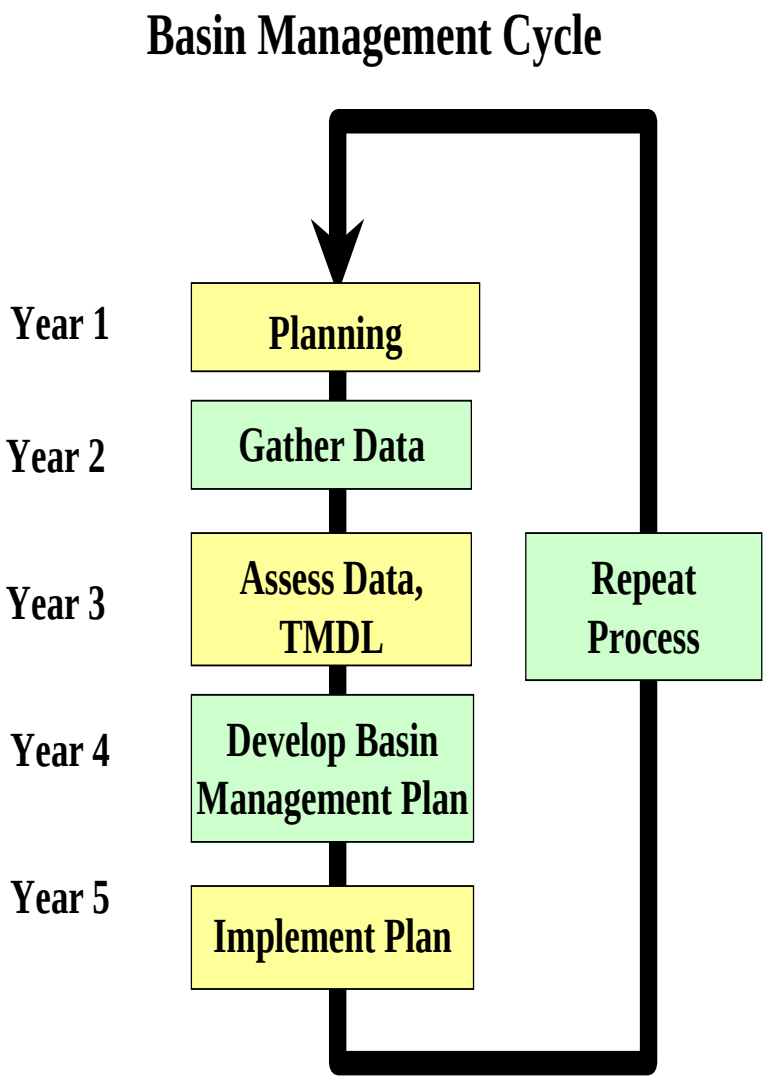
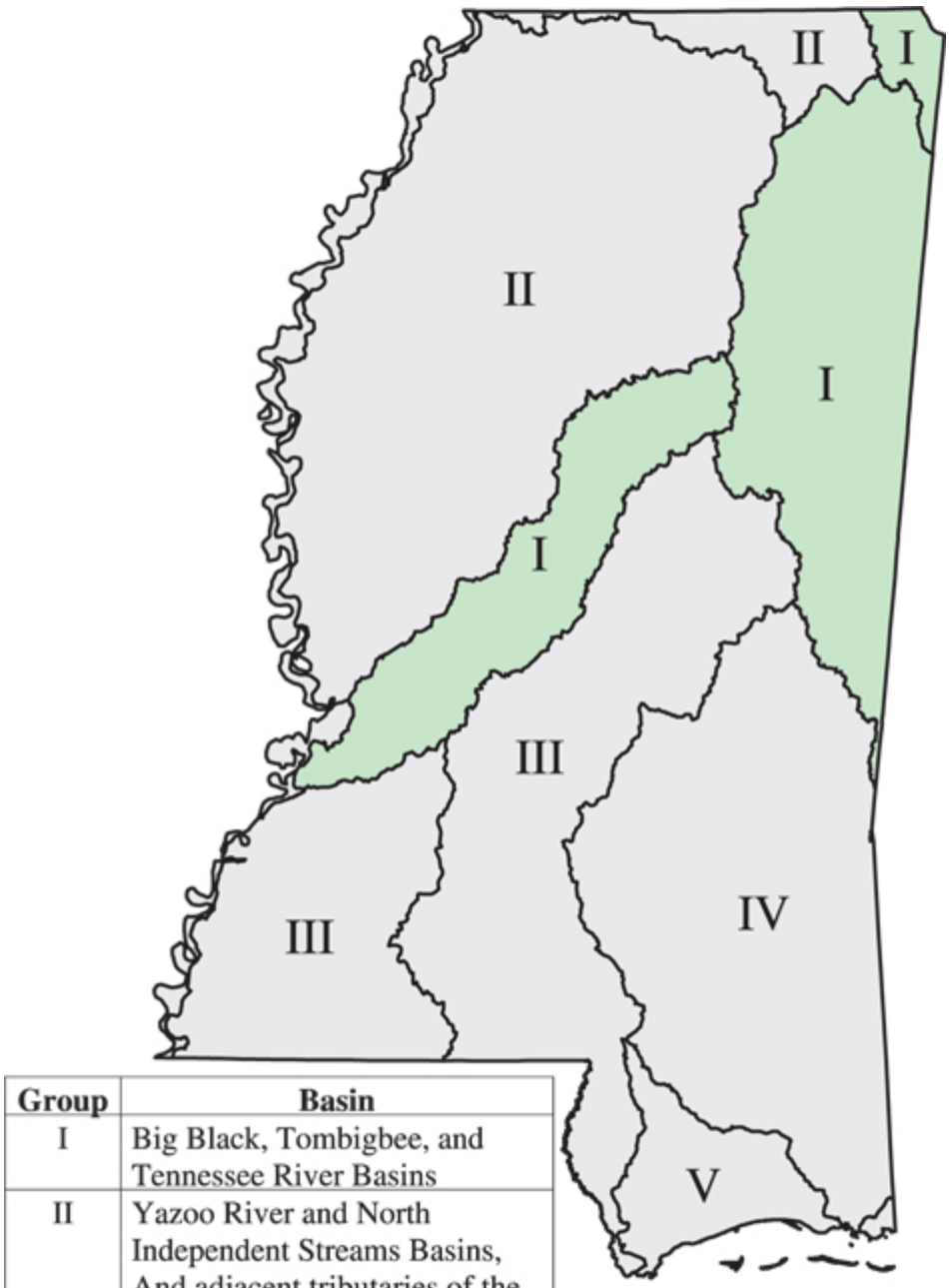


Figure C.1. Mississippi Basin Management Cycle.



Group	Basin
I	Big Black, Tombigbee, and Tennessee River Basins
II	Yazoo River and North Independent Streams Basins, And adjacent tributaries of the Mississippi River
III	Pearl River and South Independent Streams Basins, And adjacent tributaries of the Mississippi River
IV	Pascagoula River Basin
V	Coastal Streams Basin

Figure C.2. Mississippi Basin Management Basin Groups.

APPENDIX D

Checklist of Watershed Implementation Plan Elements

FY03/04 319 Watershed-Based Plans Guide

Name of Watershed-Based Plan: Hickahala Watershed Implementation Plan

Required Watershed Elements	Location
1. a. Non-point Source Agricultural runoff. The primary concerns are nutrient loading, pathogens and sedimentation. The critical areas have been identified and are being treated followed by the less critical areas. 319 funds and USDa programs are being used to address these sites. b. Water infiltration into sewer system and storm water. Due to the amount of growth and other unknown issues, the storm water is infiltrating the sewer systems causing storm water to also be treated as wastewater. At this time, there are no funds to address this problem. c. Closed landfills and illegal dumping. Due to the issue of closed landfills, trash and litter are being dumped wherever people can find a place. There are no funds to address this issue at this time. d. Flooding of low lying areas (wells). This causes contamination of the wells that provide water to homes. There are no funds for addressing this at this time. e. Kudzu Control. Kudzu is an invasive species. It takes over the land and is a major problem. USDA programs have monies to address this issue. f. Beaver control. This is an issue that has been addressed in the past. Beavers stop up flowing water causing flooding of timber roads, and roadside ditches. At this time, there are no funds available to address this issue. g. Loss of quail habitat. The quail population has decreased dramatically due to loss of habitat. USDA programs have money to address this issue in the reestablishment of habitat.	Table 3.2
2. a. 50 to 76% reduction in fecal coliform loading, b. no reduction in discharge at this time, but making sure state standards for pH levels are being met before approving any more point source discharges	Chapter III, Section D, Subsection 3

Required Watershed Elements	Location
• Critical Area Planting (100 acres) • Grade Stabilization Structures (70 structures) • Diversions (20,000 feet) • Ponds (22 ponds) • Tree Planting (1,500 acres) • Stream Crossings (20 crossings) • Water and Sediment Control Basins (50 basins) • Fencing (100,000 feet) • Pasture and Hayland Planting (400 acres)	Chapter IV Section B Subsection 4
Ag BMPS 319 funds- $804,500.00 USDA funds- $250,000.00	Table 4.1, and Chapter IV Section1 Subsection 3
The overall objective of the education strategy for Hickahala Creek id to improve the water quality and protect high quality waters through the implementation of BMPs in selected areas to reach the desired outcome of reduced runoff, sedimentation, and cattle access to the streams. The second goal is to inform and educate the public about Best Management practices that benefit water quality.	Chapter V
All Best Management Practices using 319 funds shall be implemented by August 28, 2007.The Restoration of Quail Habitat funding will end December 31, 2007.	Chapter IV
Before and after soil losses will be collected on each installed BMP, and before and after photo documentation is being taken on a sample of the installed practices. Also, MDEQ will estimate the reduction of sediments and other pollutants from each BMP installed as part of this project through the use of a modeling system developed by EPA.	Chapter VI

APPENDIX E

Funded 319 Project Proposal

PROJECT TITLE:
Hickahala Creek/Senatobia Creek Nonpoint Source Pollution Project

PROJECT ABSTRACT:
This project will be located in the southeastern portion of Tate County and the northeastern portion of Panola County in Mississippi.
The objectives of this project will be:

To improve water quality and protect high quality waters through the implementation of selected BMPs in targeted areas.

To apply Best Management Practices (BMPs) to agricultural lands in the project area so as to reach the desired outcome of reduced runoff, sedimentation and cattle access to streams.

To inform and educate the public about Best Management Practices that benefit water quality.

The project cost is $864,501. Of this amount, $518,700 in 319 funds are requested with the balance of $345,801 to be supplied as match.

LEAD ORGANIZATION:

Mississippi Soil and Water Conservation Commission
Patrick Vowell, Project Manager
P.O. Box 23005
Jackson, MS 39225-3005

Phone: (601) 354-7645
Fax: (601) 354-6628
e-mail: pvowell@mswcc.state.ms.us

COOPERATING AGENCIES:

Tate County Soil and Water Conservation District, Panola County Soil and Water Conservation District, USDA Natural Resources Conservation Service, Mississippi Department of Environmental Quality, and US Environmental Protection Agency.

GRANT ADMINISTRATOR:

Mark E. Gilbert, Environmental Administrator
MS Soil & Water Conservation Commission
P.O. Box 23005
Jackson, MS 39225-3005

Phone: (601) 354-7645
(601) 497-1649 (cell)
Fax: (601) 354-6628
e-mail: mgilbert@mswcc.state.ms.us

PROJECT LOCATION:

Hickahala Creek Watershed (08030204-100)
Senatobia Creek Watershed (08030204-090)
(see attachment 1 for a map depicting the targeted areas of the project)

PROJECT OBJECTIVE:

The Primary objective of this project will be to implement selected Best Management Practices (BMPs) in the Hickahala and Senatobia Creek sub-watersheds that will result in reduced pollutant loadings from agricultural nonpoint sources. The main water quality problems to be addressed by this project are organic enrichment and animal waste nutrient loadings from agricultural lands in the watersheds.

PROJECT DESCRIPTION:

Segments of Hickahala Creek, James Wolf Creek and Senatobia Creek have been placed on the Mississippi 1998 Section 303(d) list of waterbodies as monitored waterbody segments due to organic enrichment/low dissolved oxygen, nutrients and fecal coliform bacteria. The applicable state standard specifies that the DO concentrations shall be maintained at a daily average of not less than 5.0 mg/l. The applicable state standard also specifies that for the summer months, the maximum allowable level of fecal coliform shall not exceed a geometric mean of 200 colonies per 100 ml, nor shall more than ten percent of the samples examined during any month exceed a colony count of 400 per 100 ml. For the winter months, the maximum allowable level of fecal coliform shall not exceed a geometric mean of 2000 colonies per 100 ml, nor shall more than ten percent of the samples examined during any month exceed a colony count of 4000 per 100 ml. Mississippi currently does not have standards for allowable nutrient concentrations.

Low dissolved oxygen (DO) impairments are due to the oxidation of organic material. Organic enrichment is measured in terms of TBODu (Total Ultimate Biochemical Oxygen Demand). TBODu represents the oxygen consumed by microorganisms while stabilizing or degrading carbonaceous and nitrogenous compounds. Nonpoint loading of

TBODu results from the transport of pollutants into receiving waters by overland surface runoff and groundwater infiltration. Land use activities within the watersheds such as agriculture and silviculture contribute to nonpoint source loading. Fecal coliform bacteria are used as indicator organisms. They are readily identifiable and indicate the possible presence of other pathogenic organisms in the waterbody.

The headwaters of Hickahala Creek begin in Tate County. It flows in a westerly direction to its confluence with Arkabutla Lake at Coldwater, MS. Senatobia Creek flows in a northwesterly direction from Panola County into Tate County to the confluence with Old Senatobia Canal.

The Hickahala and Senatobia Creek watersheds encompass approximately 234.2 square miles (149,910 acres). Land uses in the watersheds include urban, forest, cropland, pasture, water, wetlands and aquaculture. The predominant land use in the watershed is agriculture with pasture and cropland comprising 59% and 21% of the watersheds respectively. The major crops within the watershed are corn, cotton and soybeans

Soil types in the Hickahala/Senatobia Creek watersheds include Grenada-Loring, Riston-Providence and Memphis Associations. These are silty to silty/sandy soils that are well drained to moderately well drained found in upland areas on gently sloping to steep sloping terrain in thick loess. These soil types are easily eroded without proper protection.

The Mississippi Department of Environmental Quality (MDEQ) has identified segments of Hickahala and Senatobia Creeks in its 305(b) report as partially supporting the use of Aquatic Life Support. They are on the Mississippi Section 303(d) list as impaired due to organic enrichment/low DO, nutrients and fecal coliform. This project will involve working with land operators in the watersheds to address organic material and animal waste entering Hickahala Creek and Senatobia Creek from agricultural non-point sources. As required by Section 303(d) of the Federal Clean Water Act, a Total Maximum Daily Load (TMDL) has been developed to address the impairments of Hickahala and Senatobia Creeks. (A copy of the TMDLs are attached).

This project will be implemented in three phases. Phase I will consist of analyzing existing assessment data, identifying target areas within the watershed where stressors are causing the greatest damage and if the application of needed Best Management Practices will yield a beneficial reduction in pollutant loadings. Education and outreach activities will also be conducted during this phase to inform landowners in the watershed about the objectives of the project. The Mississippi Soil and water Conservation Commission will cooperate with the MS Department of Environmental Quality, the NRCS and the Tate and Panola County Soil and Water Conservation Districts in identifying the appropriate Best Management Practices for targeted areas in the watershed and educating landowners as to the need for their participation.

Phase 2 will consist of (based upon the findings of phase 1) the application of Best Management Practices (BMPs) on targeted areas in the watershed that will result in desired pollutant load reductions. The MSWCC will accomplish this through it's water quality cost share program. In this project, records will be kept at both the state level and local level so as to determine the progress being made in carrying the project out and the benefits that are being received as related to the improvement of water quality within the project. During the planning process with participants, the amount of soil loss from the area to be treated with a particular BMP will be determined and recorded. The amount of soil saved as a result of applying the BMP will also be determined and recorded. Since pesticides, fertilizer/plant nutrients animal waste and organic matter are transported to the waters as by overland flow, this information will indicate the project effectiveness in reducing pollutant loadings. Participants in the project will be required to maintain BMPs for a period of up to ten years after installation.

Additional education and outreach efforts will be conducted during this phase to inform and educate the public about Best Management Practices that benefit water quality. This will be accomplished by the following:
Establishing at least two demonstration farms to inform the public about best management systems.
Conduct at least two field day/tours during the life of the project.
Prepare and distribute at least 1,000 fact sheets highlighting the benefits derived from the project.
Publish at least four articles about the project in newsletters and local newspapers.
Erect at least 20 project roadside signs which designate where water quality practices are in progress or have been completed.

To address the above stated water quality problems Best Management Practices (BMPs) will be installed on agricultural lands in the project area. Potential BMPs to be installed include but are not limited to:
100 acres of critical area planting
70 grade stabilization structures
20,000 feet of diversions
22 ponds
2020 acres of tree planting
20 stream crossings
50 water & sediment control basins
100,000 feet of fencing
400 acres pasture & hayland planting
2,000 acres prescribed grazing

Phase 3 will consist of post BMP evaluation to determine the pollutant load reductions achieved by the application of Best Management Practices. The MSWCC will coordinate with the MDEQ in collecting information on installed BMPs.

MILESTONES:

1. Sign grant contract with MS Department of Environmental Quality. (Month 0)

2. Issue policies and procedures for implementing the project to the SWCD office. (Month 1)

3. Meet with the board of SWCD commissioners to get their understanding of their responsibilities and participation. (Month 2)

4. In conjunction with the local SWCD, establish a locally led watershed advisory group to assist with implementation activities. (Month 2-3)

5. Provide training to district staff. (Month 2-3)

6. Assist in establishing an evaluation system in conjunction with the MS Department of Environmental Quality to indicate the benefits of the project. (Month 2-3)

7. Conduct a landowner meeting to inform potential participants about the project. (Month 3)

8. Secure commitments from several landowners and operators who are willing to participate in the project. (Month 3-4)

9. Assist participants in developing a conservation plan and applying best management practices. (Month 4-12)

10. Establish at least one demonstration farm (Month 4-12)

11. Document pre-existing site conditions. (Month 2-12) (Before and after photo documentation will be conducted.)

12. Accelerate conservation planning and application assistance. Special effort will be made to complete conservation plans during this time frame. (Month 13-24)

13. Conduct at least one informational field day/tour to inform the public about the project. (Month 13-24)

14. Establish at least one demonstration farm. (Month 13-24)

15. As requested, assist MDEQ with evaluations. (Month 0-36)

16. Assemble data on the amount of soil saved. (Month 0-36)

17. Erect project roadside signs which designate where water quality practices are in progress or have been completed. (Month 4-36)

18. Provide continued conservation planning and application assistance to participants. (Month 25-36)

19. Review the status of applying best management practices to reach the objectives of the project. (Month 25)

20. Based upon the needs and finding of milestone 18, assistance in planning and/or application will be redirected and/or accelerated. (Month 25-36)

21. Publish at least four articles about the project. (Month 0-36)

22. Publicity of the project will be increased; at least one field day/tour will be conducted and at least 1,000 fact sheets will be developed and distributed. (Month 25-36)

23. Bi-annual reports will be made to MDEQ. (Month 0-36)

24. Make Final report to MDEQ. (Month 36)

MEASURES OF PROJECT SUCCESS
(also see Phase 1 and 3 information under Project Objective)
The following measures and indicators of progress will be utilized to track the success of this project:

NPS Pollutant Load Reduction – the amount of soil saved as a result of the installation of best management practices (BMPs) in this project will be a direct indicator of organic material and animal waste reductions to Hickahala and Senatobia Creeks. Since pesticides, fertilizer/plant nutrients, organic material and animal waste are transported to the waters by surface runoff, BMPs installed to reduce sediment will also result in a reduction of concentrated surface runoff thereby enhancing the effectiveness and success of the project.

Implementation of NPS Controls – this project will involve the installation of Best Management Systems. Best Management Systems are defined as a combination of BMPs, both structural and vegetative, which are the most practical, effective and economical means of preventing or reducing pollution from nonpoint sources to a level compatible with water quality goals. **The estimated types and numbers of BMPs to be installed as part of Best Management Systems are listed in the project description of this proposal.** The application of best management systems in the project will be the responsibility of the landowners and operators participating in the project as cooperators of the local soil and water conservation district.

Public Education, Awareness, and Action - this project will include the establishment of at least 2 demonstration farms that will be used to inform the public about best management systems. These will be utilized during the 2 field day/tours that will be conducted in the project. Also, at least 1,000 informational fact sheets highlighting the benefits derived from the project will be developed and distributed as well as the publishing of at least 4 articles about the project in newsletters and local newspapers. At least 20 project roadside sign will be erected where water quality practices are installed in the project. Other educational actions will be conducted to measure the success of the project. These include such things as increased public awareness; before and after photo documentation; increased cooperation among agencies, associations, public bodies and educational institutions; and the economic benefits of applying best management practices. The Mississippi Soil and Water Conservation Commission will request information through the local soil and water conservation district that will assist in measuring the success of the project in the demonstration area.

PROJECT PERIOD

The length of this project will be three years.