Pickwick Reservoir Watersheds
(MS-06030005 and MS-0603006, in part)

Watershed Management Plan

Prepared by the Pickwick Reservoir Watershed Implementation Team
Facilitated by the Tennessee Valley Authority
The plan follows EPA's Section 319 watershed plan guidelines and MDEQ Watershed Management Plan Component Checklist.

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Executive Summary

Yellow Creek, Indian Creek and Bear Creek are tributaries to the Tennessee River in northeast Mississippi. Yellow Creek serves as source water for the Short Coleman Water Association, which provides process and drinking water for the region. Recent surveys indicate biological impairment in portions of Indian and Bear Creeks, as well as tributary streams in both the Yellow and Bear Creek watersheds. Factors contributing to these conditions have been determined for these streams. In the Bear Creek watershed, sedimentation from unstable stream banks and agricultural and silvicultural lands has been identified as the primary cause of the impaired condition. A Total Maximum Daily Load (TMDL) for sediment was completed by MDEQ in October 2005. Impaired sections include Bear Creek from near Tishomingo County Road 86 to the Alabama state line, the entire reaches of Cripple Deer and Little Cripple Deer Creeks, and the entire reach of Holly Branch. In the Yellow Creek watershed, one tributary, Caney Creek, is impaired through its entire reach. Organic enrichment and sedimentation, primarily from unstable stream banks and agricultural and silvicultural lands, are the primary causes for impairment in Caney Creek. Since Yellow Creek is source water for Short Coleman Water Association, efforts will be made to improve and protect water quality throughout this entire watershed, including the impounded portion of Pickwick Reservoir. Efforts in the Caney Creek watershed will be targeted to address the causes of impairments, delisting being the project goal. In the Indian Creek watershed, a point source, Iuka POTW, has been indicated as the cause of impairment. Recent development within the city of Iuka, as well as the channelization of headwaters of Indian Creek, may also contribute to problems in this watershed.

Projects will be conducted through partnerships with various federal, state and local agencies and private landowners to address the causes of impairment in these watersheds. Efforts to reduce non-point source pollution will occur throughout the area. Routine monitoring of water quality will occur to determine the effectiveness of the projects.

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Pickwick Reservoir

Watershed Management Plan

Introduction

Pickwick Reservoir is a man-made impoundment of the Tennessee River. The dam is located at Tennessee River mile (TRM) 207 south of Savannah, Tennessee. Although only 10 miles of the reservoir are located in Mississippi, the reservoir is actually 52 miles long and covers 43,100 acres. Three streams drain from Mississippi into Pickwick Reservoir, with segments in each watershed listed as impaired by Mississippi Department of Environmental Quality (MDEQ).

Yellow Creek enters Pickwick Reservoir at TRM 215 near the Tennessee-Mississippi state line. The lower 6 miles of Yellow Creek are impounded by Pickwick Reservoir, and the remaining portions have been channelized to form the Tennessee-Tombigbee waterway. The impounded portion serves as source water for the Short Coleman Water Association. Although water quality in the embayment meets state criteria, protecting this resource is a project priority. Most free-flowing tributaries to Yellow Creek have been channelized for flood control. Caney Creek, a tributary to Little Yellow Creek near the Doskie community, is included by MDEQ on their 303(d) list of impaired streams due to biological impairment. This impairment appears to be caused by sedimentation and organic enrichment within the stream.

An assessment of land use (aerial inventory) within the Yellow Creek watershed was completed in 2007 by TVA. Primary land uses that occur within the Yellow Creek Watershed consist of:

- Forest –95,162.2 acres (75.2%)
- Pasture/Grasslands –11,111.7 acres (8.8%)
- Urban –7,273.5 acres (5.7%)
- Scrub/Barren –6,460.6 acres (5.1%)
- Open water –4,372.8 acres (3.5%)
- Cropland –1,423.1 acres (1.1%)
- Wetland – 804.9 acres (0.6%)

The impounded portions of Yellow Creek and the channelized portion of the Tennessee-Tombigbee waterway are utilized for public recreation and commercial development. Residential access is permitted along several sections of the shoreline. Two commercial marinas operate within the embayment, and a third is being planned for construction. One formal recreational site, Goat Island, is located on the embayment, providing camping facilities and boat access for recreational purposes. Two additional boat launch sites are located in the embayment. Two commercial/industrial sites are also located in the embayment. Because of the development along the shoreline, the Yellow Creek embayment hosts moderately heavy boat traffic, both recreational and commercial. The embayment and waterway also provide a transport corridor for many recreational boaters who spend summer months in the Great Lakes region and winter months along the Gulf Coast.

Indian Creek enters Pickwick Reservoir at TRM 220. Its headwaters drain through the city of Iuka. Although Iuka is only a small urban center, Indian Creek is impacted by run-off and channel

modifications typical of an urban environment. The upper portion of Indian Creek was historically channelized to reduce flooding impacts within the city of Iuka. Currently, heavy flows during rain events increases stream bank instability and erosion. A three-mile segment of Indian Creek, from the Iuka POTW to Pickens Branch, is listed due to organic enrichment/ low dissolved oxygen. The lower portion of Indian Creek is rural farm land and forest. Land use allocations for this watershed have not been estimated.

Bear Creek enters Pickwick Reservoir at TRM 225 near the Mississippi-Alabama state line. The lower 14 miles of Bear Creek are impounded by Pickwick Reservoir. Bear Creek headwaters are located in Franklin and Winston Counties in Alabama. The stream flows west 53 miles through Alabama before entering Mississippi. It then flows north 27 miles through Tishomingo County, Mississippi, before re-entering Alabama. The impounded portion occurs primarily in Alabama; however, small segments and embayments are located in Mississippi. In Mississippi, Bear Creek is considered biologically impaired due to sedimentation from County Road 86 to the Alabama state line. Cripple Deer and Little Cripple Deer Creeks and Holly Branch are also considered impaired due to sedimentation. A secondary flood control channel was constructed adjacent to Bear Creek from stream mile 59 near Red Bay, Alabama, to mile 42 near Dennis, Mississippi. Although normal stream flow remains within the original creek channel throughout most of this length, flood waters pass over weirs and travel through the floodway. This portion of Bear Creek contains many areas of unstable stream banks, and efforts to reduce erosion will be made through this project.

Photo 1 – Bear Creek Floodway near Belmont, MS

Although an aerial inventory assessment was not conducted for the Bear Creek watershed, estimates of land use distribution were made during the sediment TMDL development. Total land area with the Bear Creek watershed is approximately 242,844 acres (379 square miles). The current land use allocations in the Bear Creek watershed are estimated to be:

- Forest –168,309 acres (69.3%)
- Pasture/Grasslands –40,011 acres (16.5%)
- Cropland –22,316 acres (9.2%)
- Scrub/Barren –5,706 acres (2.3%)
- Open water –3,603 acres (1.5%)
- Urban –1,823 acres (0.8%)
- Wetland – 1,076 acres (0.4%)

Within the Bear Creek watershed, a large floodplain occurs between the Alabama state line and Tishomingo CR 86. Most of the lands used for cropland in this watershed occur within this flood plain.

Bear Creek is used regularly by the public for canoeing and fishing. Tishomingo State Park, located on Bear Creek at the Natchez Trace, supplies canoeing services (rental, transportation, etc.) for public access. A canoe launch site is maintained in the park. The park also maintains several scenic trails along the creek for public recreation.

Photo 2 – Tishomingo State Park, located at Bear Creek near Dennis, MS

Although no known populations are currently known from Mississippi, Bear Creek is the home to at least three federally protected species of mussels. The known populations are found in the Alabama portions of the stream downstream of the state line. Historic records are known from Mississippi waters, as well as portions of the watershed upstream of Mississippi. It is hoped that improvements in water quality in the Mississippi portion of the watershed will allow these species to expand their ranges and once again live in the upper portions of this stream.

Designated Uses

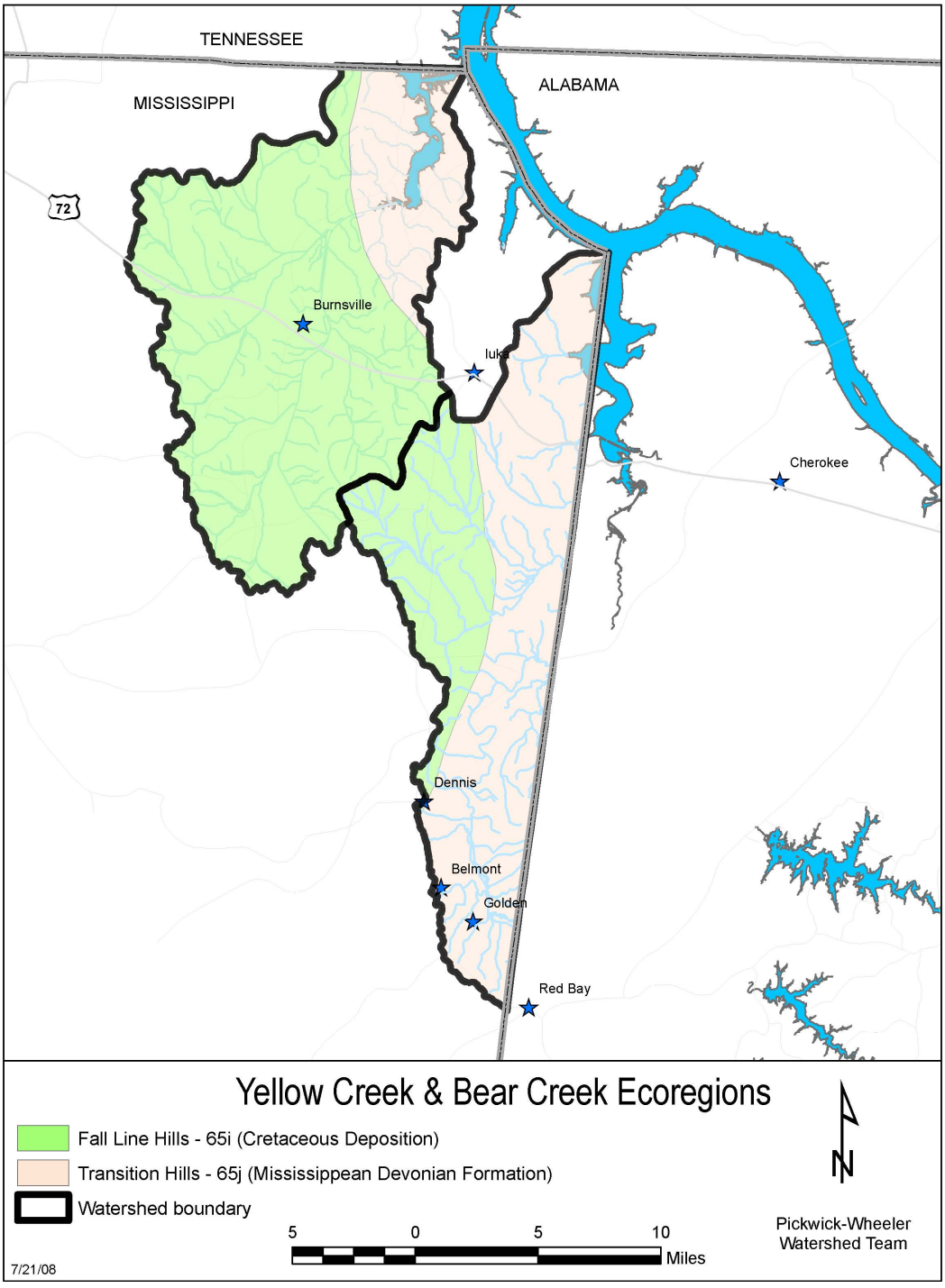
The state of Mississippi (MDEQ) has determined the designated use for the water bodies throughout the state. All free-flowing streams in the Yellow, Indian and Bear Creek watersheds have been designated for Fish and Wildlife uses. The impounded portion of the Tennessee River in Mississippi is designated for Public Water Source.

Ecoregion Description

The watershed lies within what is classified as the Transition Hills (65j) and Fall Line Hills (65i), which encompasses characteristics from the Southeastern Plains (65) ecoregion. Streams in the Transition Hills region, especially Bear and Cedar Creeks and eastern tributaries to Yellow Creek, have scoured through Mississippian and Devonian-age limestone, shale and chert formations, and often appear similar to streams of the Interior Plateau (71) ecoregion. The Fall Line Hills region contains Cretaceous-age coastal plain deposits of silt, sand, clay, and gravel which overlie the older Mississippian and Devonian-age formations. Western and southern tributaries to Yellow Creek and some western tributaries to Bear Creek (particularly Cripple and Little Cripple Deer Creeks) flow through this material and have somewhat coastal plain characteristics. Both regions are predominately forested with oak-hickory-pine, with small areas of cropland and pasture in narrow valley bottoms and along slightly sloping ridges. Upland areas are often managed as pine plantation forests, consisting of monoculture loblolly pine harvested on a 15-25 year rotation. Elevations range between 414 and 806 feet, representing some of the highest contained in the Southeastern Plains ecoregion. Woodall Mountain, located just southwest of Iuka, is the highest elevation in the state of Mississippi (806 feet). The lowest elevations (414 feet) are represented by the summer pool elevation of Pickwick Reservoir.

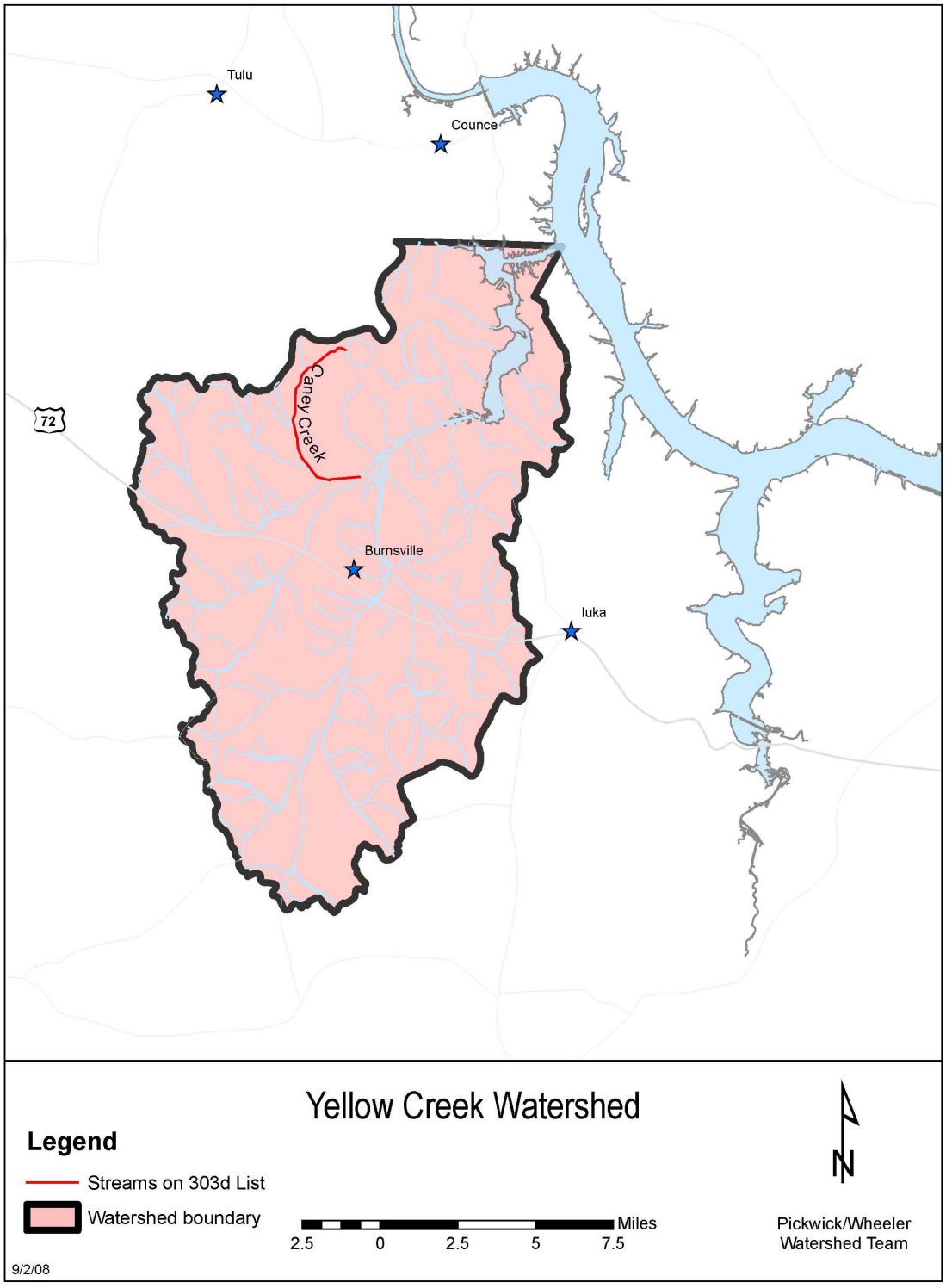
The moist temperate climate of Tishomingo County has caused strong weathering of the soils within the Pickwick and Bear Creek watersheds. Almost all the soils in this area are very strongly acid and low in available nutrients due to weathering and leaching. Soils on the uplands formed in Coastal Plain sediments, and soils on the low terraces and flood plains formed in recent material washed from the uplands. For the most part the geological formations from which the soils formed consist of irregularly bedded sand, clay, gravel, and lignite with a high degree of variability from site to site. The soils found in the uplands of Tishomingo County are possibly the oldest soils in the state of Mississippi with many of them dating to the Cretaceous period. Most of them have well defined properties indicative of their age such as deep sandy surfaces with bright red, heavier textured subsurfaces. Erosion is the major soil problem on the upland soils of Tishomingo County. Because of their high degree of weathering and inherent low fertility, it is critical that surface soils, containing the pre-dominance of available nutrients, be protected from erosion. Wherever slopes exceed 2 percent, erosion becomes a hazard if the soils are disturbed. The addition of lime to the majority of the soils within the watersheds produces a significant response in productivity for most uses.

Pickwick Reservoir Watershed-Ecoregion Map



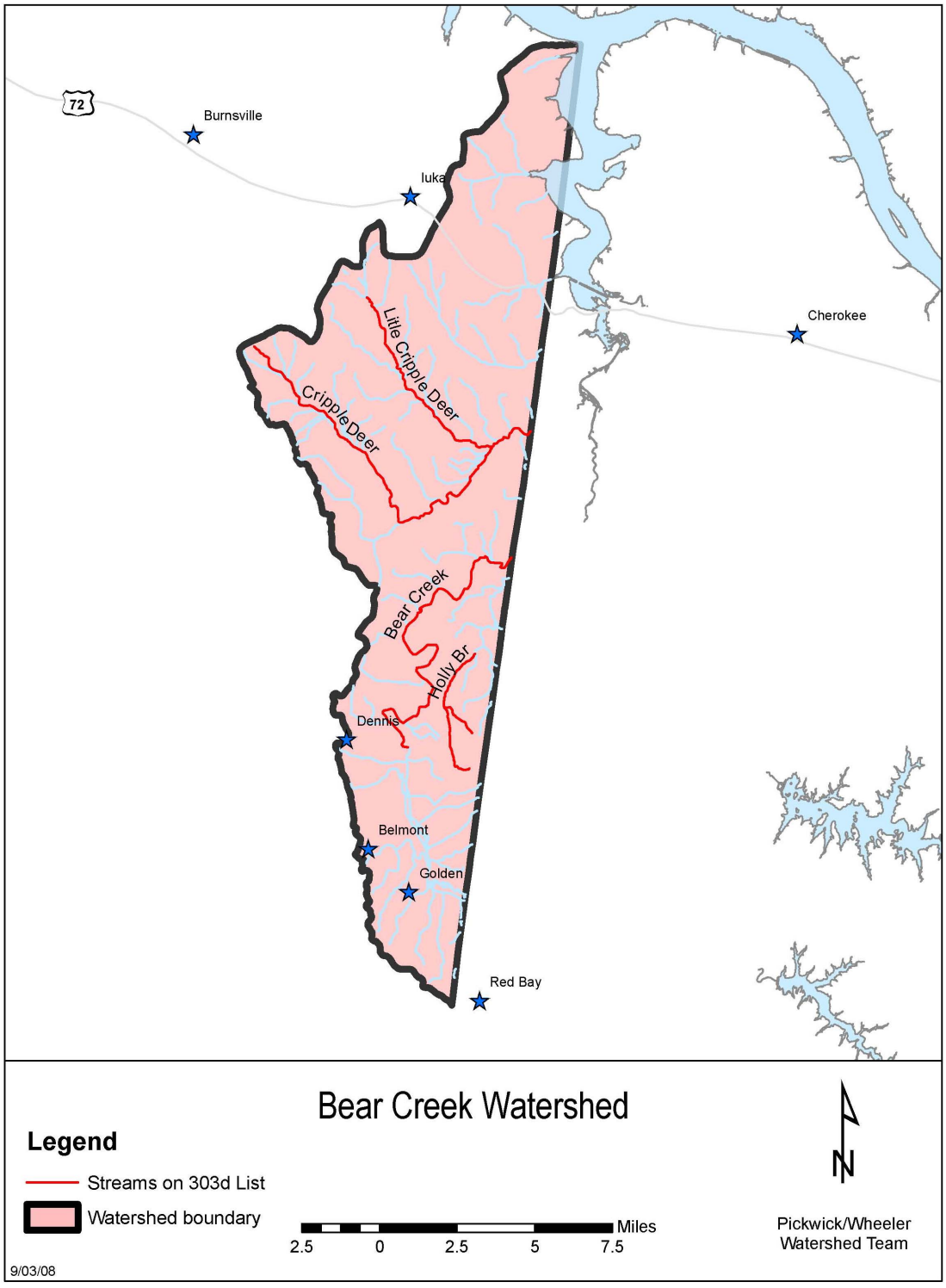
Pickwick Reservoir Watershed-Locator Map

Yellow Creek Watershed

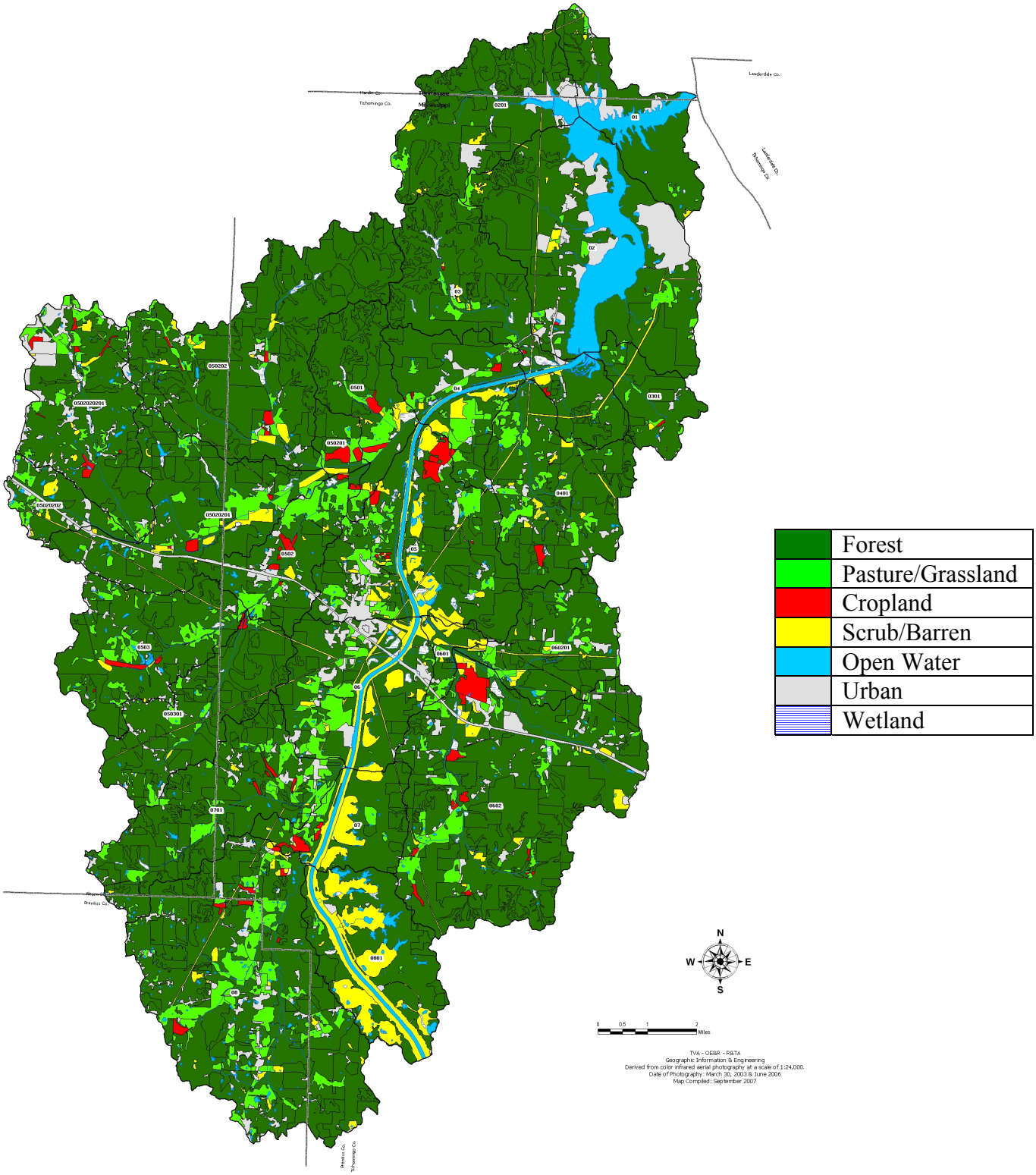


Pickwick Reservoir Watershed-Locator Map

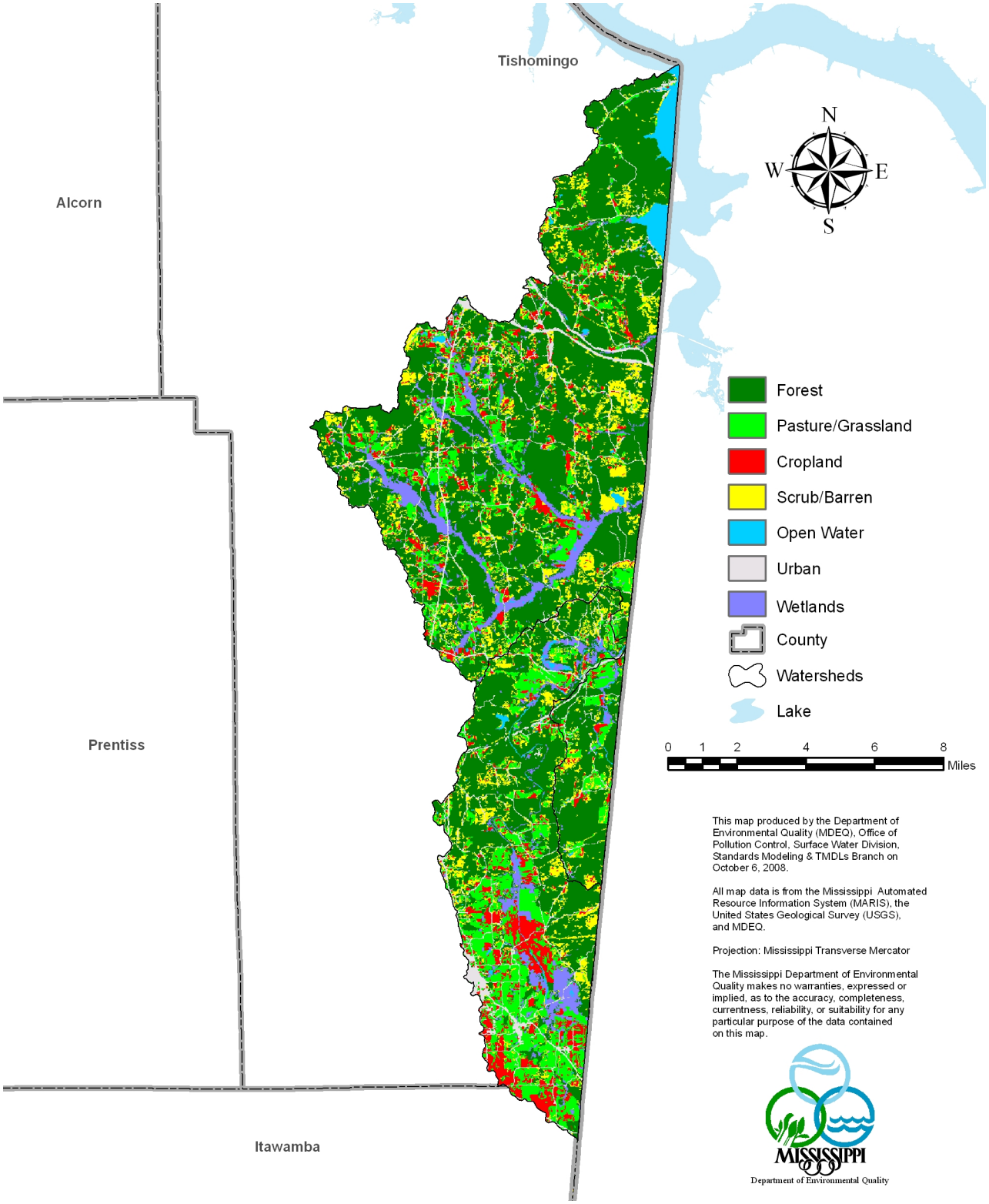
Bear Creek Watershed



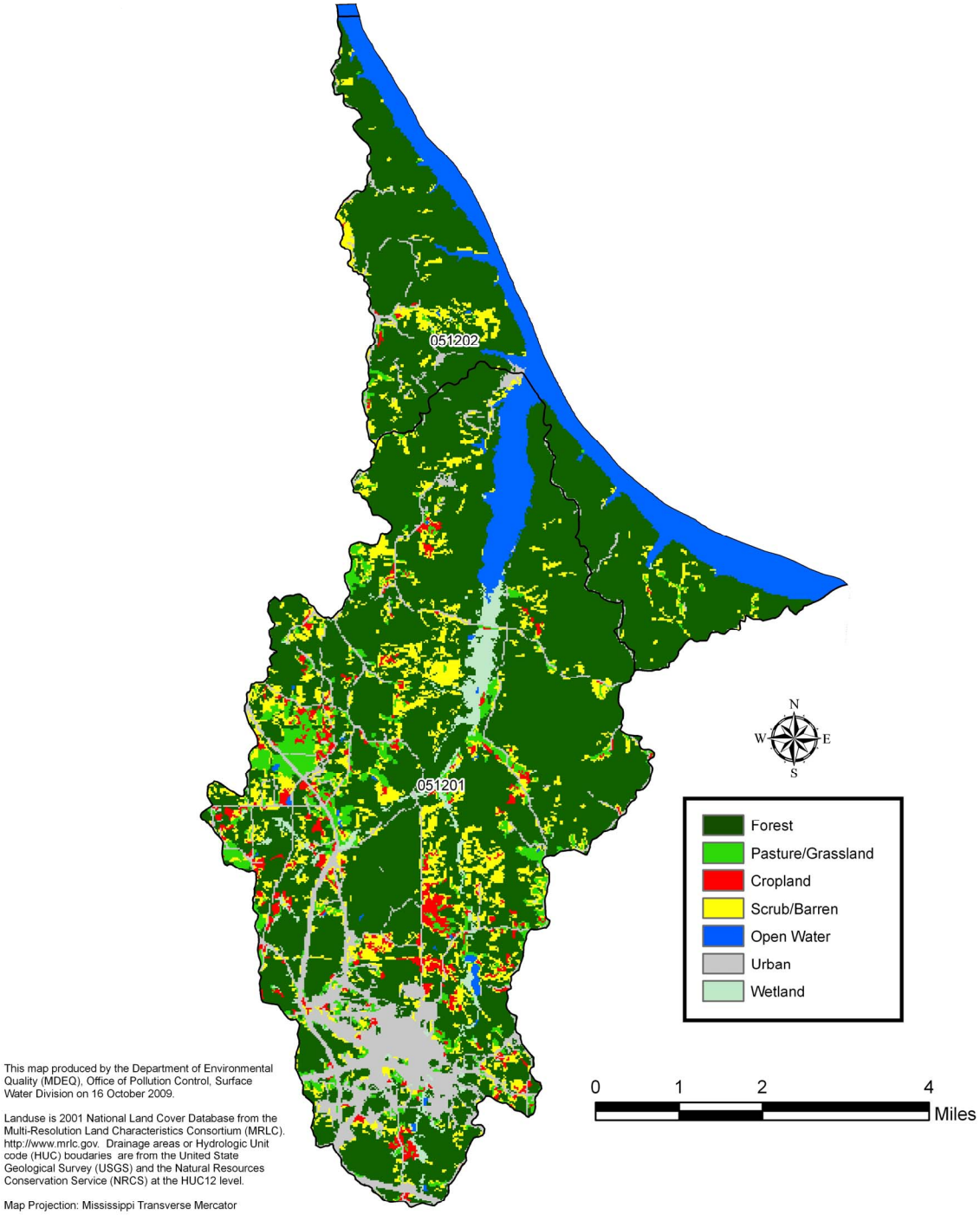
Yellow Creek Watershed-Land Use Map



Bear Creek Watershed-Land Use Map



Indian Creek Watershed-Land Use Map



This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, Surface Water Division on 16 October 2009.

Landuse is 2001 National Land Cover Database from the Multi-Resolution Land Characteristics Consortium (MRLC). http://www.mrlc.gov. Drainage areas or Hydrologic Unit code (HUC) boudaries are from the United State Geological Survey (USGS) and the Natural Resources Conservation Service (NRCS) at the HUC12 level.

Map Projection: Mississippi Transverse Mercator

The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose, of the data contained on this map.

Issues

Recent water quality assessments of Yellow, Indian and Bear Creek conducted by MDEQ and Tennessee Valley Authority (TVA) indicate biological impairment in four stream segments. Within the Yellow Creek watershed, Caney Creek is considered impaired from its source to its mouth at Little Yellow Creek (below MS Highway 365). Indian Creek, from the Iuka POTW to Pickens Creek, is impaired due to discharges from the POTW. Modifications in the treatment facility and discharge point are planned, which should result in an overall improvement in water quality. In the Bear Creek watershed, Bear Creek from Tishomingo CR 68 to the Alabama state line is considered impaired. Three tributary streams are also considered impaired. Cripple Deer Creek from its source to the Alabama state line; Little Cripple Deer Creek from its source to its mouth at Cripple Deer Creek and Holly Branch from its source to its mouth at Cedar Creek are all considered impaired due to sedimentation.

Although water quality is considered impaired through the Mississippi portion of Bear Creek, improvements in conditions throughout this reach does appear to occur. Downstream of the Mississippi portion, Bear Creek is considered to be in fair condition by the state of Alabama, and conditions in this section are suitable for three federally protected mussel species. Improvements in conditions in the Mississippi portion will hopefully allow range expansion for these species.

Biological data have been collected by both Mississippi Department of Environmental Quality and the Tennessee Valley Authority. Data collected by MDEQ were used to determine overall conditions of the streams. Streams not attaining adequate benthic criteria are considered impaired. MDEQ then studied these stream reaches to determine the cause of impairment (stressor).

During biological sampling events, MDEQ also collected chemical data at each site. For most streams in the project area, only 1-2 sample efforts were made. This provides little data to adequately characterize the chemical component of these streams. One sample location (Bear Creek at Highway 30) was sampled up to 17 times for various parameters. Based on data collected, potential pollutants did not exceed acceptable levels, and in situ readings did not exceed standard water quality criteria. A summary of the chemical analyses is presented in Appendix A.

Yellow Creek Watershed

Caney Creek is considered impaired because biological surveys show reduced diversity. The primary causes of this impairment have been determined to be sedimentation and organic enrichment/low dissolved oxygen concentrations. Surveys have been conducted by both MDEQ and TVA. Biological data for both macroinvertebrate and fish communities have been collected.

MDEQ Data

Location: Caney Creek 150 meters upstream of Tishomingo County Road 311
Macroinvertebrate (MBISQ)
Date: February 6, 2001 Results: 48.14 (Not Attaining)
Date: January 28, 2003 Results: 63.95 (Not Attaining)

Location: Caney Creek at MS Highway 365
Macroinvertebrate (MBISQ)
Date: February 26, 2008 Results: 78.68 (Attaining)

Location: Little Yellow Creek at MS Highway 365
Macroinvertebrate (MBISQ)
Date: February 26, 2008 Results: 72.19 (Attaining)

TVA Data

Location: Caney Creek at MS Highway 365
Fish Index of Biotic Integrity
Date: June 17, 2002 Results: 38 (Poor/Fair)
Date: June 13, 2007 Results: 44 (Fair)
Macroinvertebrate (EPT Taxa)
Date: June 17, 2002 Results: 5 (Poor/Fair)
Date: June 13, 2007 Results: 9 (Fair/Good)

The primary sources of enrichment in the watershed are nutrient run-off from row crop and pasture lands and some residential sources (inadequate septic systems). The primary source of sedimentation are believed to be run-off from agricultural lands, as well as run-off from disturbed lands such as timber harvest sites and earth/gravel mines. Habitat loss and instability due to historic stream channelization may also contribute to reduced biological diversity.

Indian Creek Watershed

Indian Creek is considered impaired because biological surveys show reduced diversity. The primary cause of impairment has been determined to be organic enrichment/low dissolved oxygen concentrations. Surveys have been conducted by both MDEQ and TVA. Biological data for both macroinvertebrate and fish communities have been collected.

TVA Data

Location: Indian Creek at Tishomingo County Road 256

Fish Index of Biotic Integrity

Date: June 17, 2002 Results: 38 (Poor/Fair)

Date: June 12, 2007 Results: 42 (Fair)

Macroinvertebrate (EPT Taxa)

Date: June 17, 2002 Results: 6 (Fair)

Date: June 12, 2007 Results: 5 (Poor/Fair)

The primary sources of enrichment in the watershed are nutrient from the Iuka POTW. Sediment from agricultural and silvicultural run-off and stream bank instability may also contribute to decreased biological diversity.

Bear Creek Watershed

Bear Creek is considered impaired because biological surveys show reduced diversity. The primary causes of this impairment have been determined to be sedimentation and organic enrichment/low dissolved oxygen concentrations. Surveys have been conducted by both MDEQ and TVA. Biological data for both macroinvertebrate and fish communities have been collected.

MDEQ Data

Location: Bear Creek at Tishomingo County Road 89
Macroinvertebrate (MBISQ)
Date: March 6, 2001 Results: 57.65 (Inconclusive)

Location: Bear Creek at MS Highway 30
Macroinvertebrate (MBISQ)
Date: March 6, 2001 Results: 35.18 (Not attaining)

Location: Holly Branch at Tishomingo County Road 85
Macroinvertebrate (MBISQ)
Date: January 25, 2001 Results: 57.70 (Inconclusive)
Date: February 25, 2003 Results: 52.11 (Not attaining)

Location: Cripple Deer Creek at Tishomingo County Road 157
Macroinvertebrate (MBISQ)
Date: February 7, 2001 Results: 56.60 (Inconclusive)
Date: February 14, 2003 Results: 48.00 (Not attaining)
Date: February 27, 2008 Results: 55.83 (Not attaining)

Location: Cripple Deer Creek at State Line (quarry)
Macroinvertebrate (MBISQ)
Date: February 26, 2008 Results: 73.88 (Attaining)

TVA Data

Location: Bear Creek at Highway 24 (Red Bay, AL – Upstream of MS section)
Fish Index of Biotic Integrity
Date: June 4, 2003 Results: 48 (Good)
Date: July 16, 2008 Results: 44 (Fair)
Macroinvertebrate (EPT Taxa)
Date: June 4, 2003 Results: 8 (Fair)
Date: July 16, 2008 Results: 12 (Good)

Location: Bear Creek at Tishomingo County Road 86
Fish Index of Biotic Integrity
Date: June 28, 2006 Results: 38 (Poor/Fair)
Macroinvertebrate (EPT Taxa)
Date: June 28, 2006 Results: 10 (Good)

Location: Bear Creek at MS Highway 30

Fish Index of Biotic Integrity

Date: August 26, 2003 Results: 44 (Fair)
Date: June 28, 2006 Results: 42 (Fair)
Date: June 26, 2008 Results: 48 (Good)

Macroinvertebrate (EPT Taxa)

Date: August 26, 2003 Results: 8 (Fair)
Date: June 28, 2006 Results: 8 (Fair)
Date: June 26, 2008 Results: 9 (Fair/Good)

Location: Cripple Deer Creek at Colbert County Road 1 (immediately below the state line)

Fish Index of Biotic Integrity

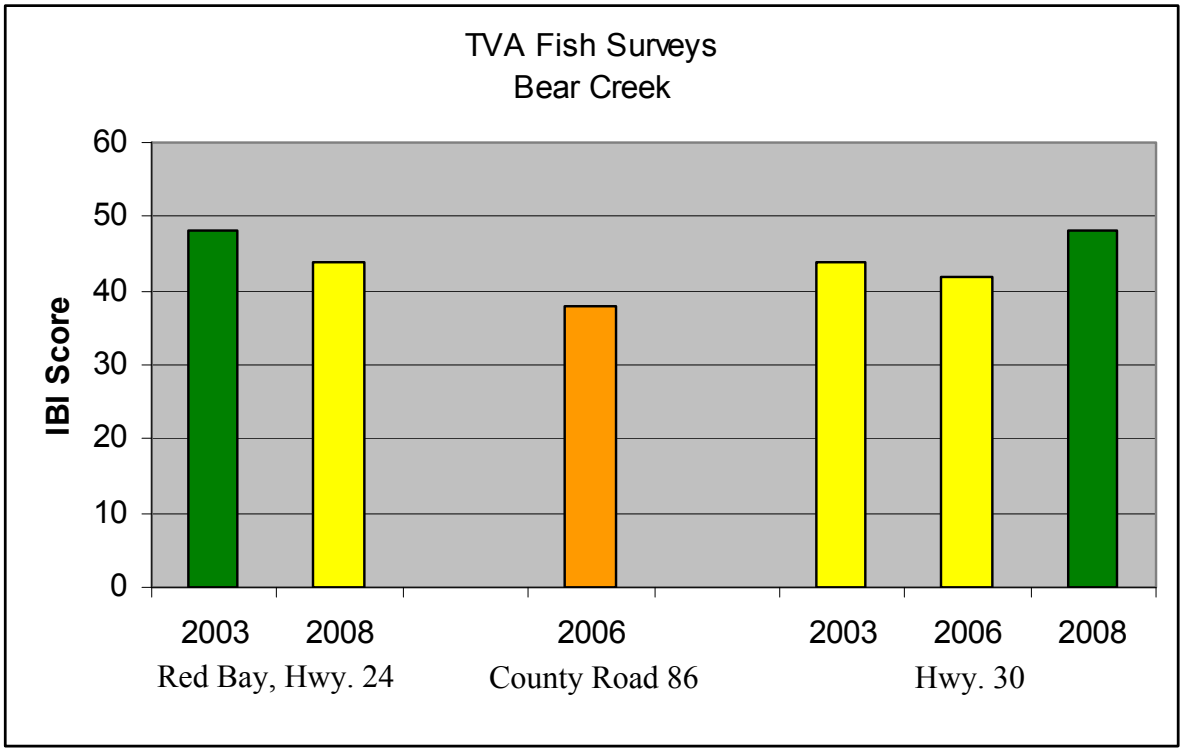
Date: June 22, 2005 Results: 40 (Fair)
Date: July 17, 2008 Results: 46 (Fair/Good)

Macroinvertebrate (EPT Taxa)

Date: June 22, 2005 Results: 14 (Good)
Date: July 17, 2008 Results: 9 (Fair/Good)

The primary sources of sedimentation are believed to be run-off from agricultural and disturbed lands such as timber harvest sites and earth/gravel mines. Additionally, a primary source of sediment is unstable stream banks throughout the watershed, especially in the region of the Bear Creek floodway near Belmont.

Graphs of TVA Data – Bear Creek



Good
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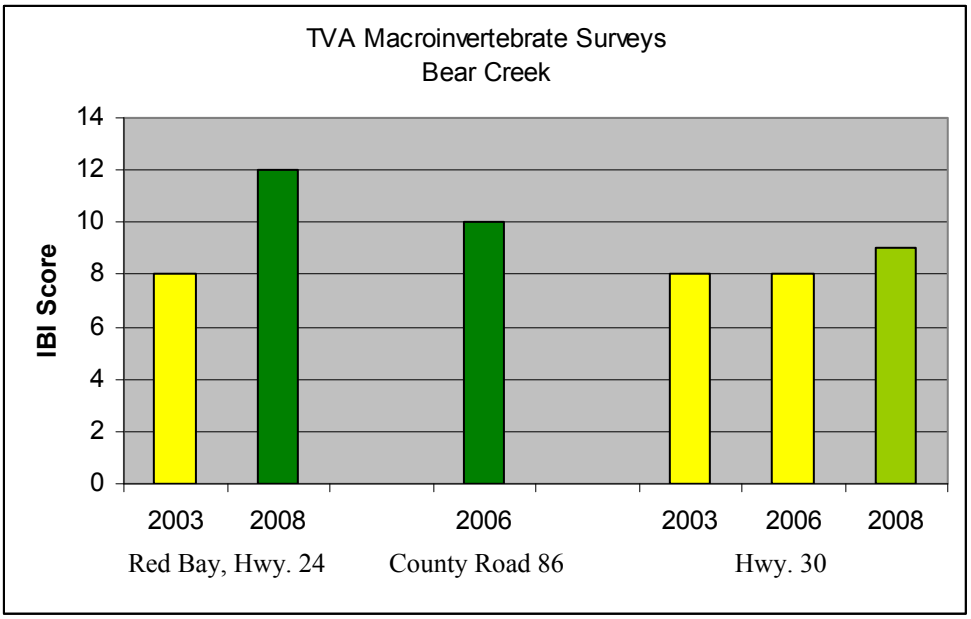

Good
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Goals

Historical activities, such as alterations in land use and stream channelization, have caused reductions in the natural communities in Holly Branch, Bear, Cripple Deer, Little Cripple Deer and Caney Creeks. As lands have been cleared by silviculture practices, for agriculture, and for rural development, exposure of surface soils to climatic conditions have resulted in increased sediment loading throughout the watersheds. Channelization of some of the streams for potential flood control has altered natural habitat conditions in the streams and left stream banks barren and subject to erosion. Altered flow regimes which occur after channelization have increased the erosive effects of flood waters and further degraded natural conditions.

The long-term goal of those creating the Pickwick Reservoir watershed plan is to develop a mechanism for removing Caney, Bear, Cripple Deer, and Little Cripple Deer Creeks and Holly Branch from MDEQ's list of impaired waters and return these streams to conditions needed to support the natural biological communities typical of this region. This goal will likely take many years to achieve; however, initial efforts are critical for long-term success. The scope of the current watershed plan will cover activities for three years. Additional efforts will likely be needed to restore these stream segments. As the project continues forward, the watershed plan will be revised, as needed, to adequately direct activities toward this long-term goal.

Short-term goals to be achieved during the first three years of this project will include:

- Establishment of a locally-led watershed team to address water quality issues.
- Completion of a Source Water Protection Plan for the Short Coleman Water Association.
- Documentation of baseline conditions for sediment, nitrogen and phosphorus loading in all listed stream segments.
- Reduction in sediment, nitrogen and phosphorus loads.*
- Improve water quality in Caney and Bear Creeks so that at least 40% of the stream lengths can be removed from the 303(d) list of impaired water bodies by 2015.
- Attainment of water quality standards in Indian Creek from the Iuka POTW outfall to Pickens Branch.
- Restoration of at least 20 acres of riparian buffer in the Bear and Yellow Creek Watersheds.
- Revegetation of at least 10 miles of logging roads in the Bear and Yellow Creek Watersheds.
- Stabilization of at least 1500 feet of severely eroding stream bank in the Bear and Yellow Creek Watersheds.

*Actual load reduction goals for sediment, nitrogen and phosphorus will be determined by the Implementation Team as baseline data becomes available for analysis.

Project activities should help restore natural conditions through as many miles of streams as possible, and various activities will reduce the erosive effects currently occurring in the watershed. Programs such as stream bank stabilization, riparian buffer restoration and stream bank revegetation will help restore stream banks to more natural conditions as well as reduce sediment loading from eroding stream banks. Animal exclusion, pasture reclamation and establishment of alternate water sources on livestock lands will help reduce both sediment and nutrient run-off from these lands. Reduction in animal access to stream banks will help reduce stream bank erosion. Immediate revegetation of logging roads and stream crossings following timber harvest will minimize the sediment loading during these activities.

Cause and Source of Impairments

Two waste water treatment discharges are located within the listed portions of the Bear Creek watershed. Neither discharger has been known to have environmental problems, nor have any Notices of Violations been issued by MDEQ Regulatory Branch. The primary cause of impairment is believed to be sedimentation. Therefore, non-point sources are considered the primary cause of impairment. Stream reaches in both watersheds are considered impaired due to sediment. Sediment sources in both watersheds are primarily from silvicultural and agricultural lands, though disturbed lands (chert/gravel pits), construction sites and road-side clearings have also been identified.

Photo 4 – Agricultural lands near Belmont, MS; Bear Creek watershed

Photo 5 – Silviculture site near Doskie, MS; Caney Creek watershed

Load Reductions of Pollutants

According to estimates used to develop the Bear Creek sediment TMDL, sediment loading in the Bear Creek watershed may range from 0.0008-0.004 tons/acre/day at the effective discharge. The effective discharge is defined as that flow which moves the most sediment or is channel forming. Currently, no empirical data exists for sediment loading in Bear Creek, so estimates of actual sediment loading were used to develop the TMDL. Estimates used indicated probable sediment loading rates from 0.002-0.08 tons/acre/year. To meet the estimated level of loading, a reduction of between 50-99% would be needed. Since no appreciable amount of sediment loading can be attributed to point source discharges in the watershed, all reductions will need to come from non-point sources. Reduction of 99% of the sediment loading in Bear Creek is neither feasible nor practical, so the goal of this project is to realize a 50% reduction in sediment loading. Since a portion of the loading in this section of Bear Creek likely originates in Alabama, efforts in the Mississippi portion of the watershed may have limitations for reaching this goal. As the project is implemented, monitoring of conditions in the stream may indicate that a lower level of reduction or expanding efforts into the Alabama portion of this watershed is needed. The scope of this project may be modified based on results of this monitoring. Baseline data for sediment loads in Bear Creek were collected by The Geological Survey of Alabama in 2003-2004; however, replication of sample methodologies would require extensive time and financial obligations. Since, total suspended solids (TSS) data will be collected throughout the project timeline, data collected initially during this project will be used for baseline, and levels of reduction will be targeted from those measurements.

Photo 3 – Previously stabilized stream bank, Golden, MS

In the Yellow Creek watershed, no data currently exists to estimate sediment or organic enrichment loading, and TMDLs have not been prepared to estimate load reduction needs. As with the Bear Creek sediment reductions, this project will attempt to reduce sediment loads by 50% in this watershed, using first-year baseline TSS data as the baseline. Nutrient concentrations (nitrogen and phosphorus), as well as biological oxygen demand (BOD) levels; will also be measured during the baseline monitoring. Estimates of reduction will be determined based on these measurements. The project goal will be to reduce enrichment to whatever levels are needed so that the dissolved oxygen (DO) concentration in monitored streams never fails to meet state ambient water quality criteria.

Project Oversight

Watershed Implementation Team – The Pickwick Reservoir Watershed Implementation Team was developed to direct and implement actions within the Yellow and Bear Creek watersheds that are determined to be necessary to meet project goals. The team will seek funding for these activities and will work together to ensure overall project success. Any interested agency, stakeholder group or individual citizen may be a member of this team. Coordination will also be needed to ensure the project follows needed guidelines to achieve success. Leadership of the Implementation Team will include a Project Facilitator, a Watershed Coordinator and a Watershed Administrator. The Implementation Team will develop working committees to oversee various aspects of this project. Working committees will include an Advisory Committee, a Technical Committee and an Education/ Outreach Committee. Other committees may also be developed as deemed necessary by the team. Various agencies and organizations with an interest in water quality in northeast Mississippi have become members of this Implementation Team. Other members may be added during the project efforts. Current Implementation Team members include:

Alcorn County Soil and Water Conservation District (ASWCD)
US Environmental Protection Agency (EPA)
US Fish and Wildlife Service (FWS)
Geological Survey of Alabama (GSA)
Mississippi Department of Environmental Quality (MDEQ)
Mississippi Department of Wildlife, Fisheries and Parks (MDWFP)
Mississippi Forestry Commission (MFC)
Mississippi Rural Water Association (MRWA)
Mississippi State University Extension Service (MSU-ES)
Mississippi Soil and Water Conservation Commission (MSWCC)
Natural Resources Conservation Service (NRCS)
Prentiss County Soil and Water Conservation District (PSWCD)
Short Coleman Water Association (SCWA)
Tishomingo County Soil and Water Conservation District (TSWCD)
Tishomingo County Department of Health (TCDH)
The Nature Conservancy (TNC)
Tennessee Valley Authority (TVA)
Local land owners and users

Decisions made by the partnership will be adopted by voice vote at periodic team meetings. Each member organization will have a single vote on each decision. A quorum (greater than fifty percent of all members) must be present at a meeting for any decisions to be accepted. No absentee or proxy voting will be accepted. Final approval of the Watershed Plan and modifications to the final Watershed Plan must be approved by seventy-five (75) percent of all members present. Other business decisions must be approved by a simple majority of members present.

Team Leadership

- Project Facilitator – The Implementation Team has selected a facilitator who will help direct project activities. The Facilitator's duties will include, but may not be limited to:
  - Work to include needed agencies, stakeholders and potential partners.
  - Delegate to the Watershed Coordinator duties necessary to carry out project activities and meetings.
  - Monitor subcontractor work to ensure completion is on track and within project scopes.
  - Serve on all Implementation Team committees and as chairperson of the Advisory Committee.

- Watershed Coordinator – The watershed coordinator has been hired to coordinate project activities and serve as the local point of contact for area residents and stakeholders. The Coordinator's duties will include, but may not be limited to:
  - Assist the facilitator by overseeing day to day activities of the project and ensure that all aspects of the project are conducted according to work plan, budget and timeline.
  - Provide monthly progress reports to the facilitator and MDEQ, and, if necessary, will assist grantee agencies with semi-annual reports to MDEQ and EPA.
  - Serve on all Implementation Team committees.
  - Attend MDEQ Basin Team meetings to provide partnership updates to the Basin Team.
  - Attend quarterly and special called meetings of the Implementation Team and update partners on project status. Assist Project Facilitator with meeting preparation and logistics
  - Maintain an electronic and hard-copy file of all Implementation Team and committee meeting minutes.
  - Work with team members to plan and implement public meetings, agency updates and other outreach/education activities.
  - Work with Tishomingo County Soil and Water Conservation District and local landowners to identify potential BMP sites and develop working relationships with landowners for BMP installation.
  - Work with Mississippi Forestry Commission and local landowners to identify potential BMP sites and develop working relationships with the landowners for BMP installation.
  - Assist landowners and participating agencies with BMP installation projects. Assistance may include, but may not be limited to, project planning, cost share calculations, permit applications, materials and supply requisition and actual installation.
  - Assist, as needed, TVA with routine and BMP monitoring activities, including, but not limited to, field collection, data storage and analysis.

- Watershed Administrator – The watershed administrator has been hired to assist the Implementation Team with administrative activities such as record keeping, budget management and clerical needs. The administrator's duties will include, but may not be limited to:
    - Attend quarterly and special called meetings of the Implementation Team and update partners on project status. Record meeting activities and submit meeting minutes to all partners in a timely fashion after the meetings.
    - Attend committee meetings and maintain minutes of the meetings.
    - Assist Watershed Coordinator with maintaining an electronic and hard-copy file of all Implementation Team and committee meeting minutes.
    - Assist Watershed Coordinator and partners with meetings, presentations and outreach activities (logistics, announcements, invitations, etc.).
    - Assist Watershed Coordinator with all necessary paperwork, including, but not limited to, applications for project funds and for Tennessee Valley Authority and Corps of Engineer, and Mississippi Department of Environmental Quality permits.
    - Assist Watershed Coordinator with monthly reports to MDEQ summarizing activities and accomplishments of the 319 funded and partnership funded projects.
    - Assist partners, as needed, with bi-annual reports to MDEQ and EPA to highlight project activities and accomplishments.
    - Assist Watershed Coordinator with maintenance of financial records for implementation projects.

- Agency Lead – Each agency member of the Implementation Team will designate one individual as a primary point of contact for all team activities. The Agency Lead's duties will include, but may not be limited to:
    - Keep their respective agency abreast of Implementation Team activities and project developments.
    - Relay all announcements, schedules and plans to others within their agency necessary for team projects.
    - Provide team with necessary information and assistance, as needed, for team activities.

  For grantee agencies, the agency lead will:
    - Work with the watershed coordinator to identify project sites and secure participation of land owners.
    - Work with watershed coordinator to ensure project completion, within timelines and budgets.
    - Coordinate grant requirements with the grantor and overseeing grant-funded activities.
    - Provide semi-annual reports to MDEQ, as required in grant contracts.

Team Committees

Education/Outreach Committee – The Education/Outreach Committee will be formed to oversee all public and agency education/outreach activities throughout the project. This committee will plan and coordinate all education events, public meetings, workshops, etc., deemed necessary for project success. This committee will make recommendations to the Implementation Team concerning the education and outreach needs of the project.

Chair: Tulon McKee, Watershed Coordinator
Janet Chapman, MDEQ
Connie Alexander, EPA
Damien Simbeck, TVA
Delta Datsis, Tishomingo Co. SWCD
Donald Garris, MRWA
Sandy Mitchell, Alcorn Co. SWCD
Gail Spears, MSWCC
Dan Owen, MSE-ES
Phil Purvis, NRCS
Christy Robinson, NRCS
George Byrd, MFC
Daniel Stuart/Nick Hatten, MDEQ

Advisory Committee – The Advisory Committee will be formed to oversee project direction and activities. This committee will determine funding needs throughout the project. If needed, this committee will make decisions on proposed activities to determine if the actions meet project scope and direction. This committee will make recommendations to the Implementation Team concerning potential project activities.

Chair: Damien Simbeck, TVA
Tulon McKee, Watershed Coordinator
Janet Chapman, MDEQ
Stuart McGregor, GSA
Phil Purvis, NRCS
Mark Gilbert, MSWCC
Jim Lacy, MFC

Technical Committee – The Technical Committee will be formed to oversee all technical aspects of the project, such as monitoring needs, load reduction estimations and water quality conditions. This committee will develop and oversee the implementation of the Monitoring Plan. This committee will work with MDEQ and EPA to evaluate water quality data throughout the project to determine project success and help determine if streams in the watershed meet state criteria for designated uses. This committee will make recommendations to the Implementation Team concerning technical needs of this project.

Chair: Robert Wimbish, NRCS
Tulon McKee, Watershed Coordinator
Damien Simbeck, TVA
Ronn Killebrew, MDEQ
Delta Datsis, Tishomingo Co. SWCD
Tommy Dean, Tishomingo Co. SWCD
L.C. Taylor, NRCS

Project Activities

Activities developed under this plan will be used to reduce sediment and nutrient loading throughout the Yellow Creek watershed and in selected regions of the Bear Creek watershed. Projects will occur in four major categories: Agriculture, Silviculture, Source Water Protection and Education/Outreach. Project partners will assist in all categories; however, certain partners will take the lead for each. The Tishomingo County Soil and Water Conservation District will oversee all agricultural activities. The Mississippi Forestry Commission will oversee silviculture activities. The Tennessee Valley Authority will oversee the source water protection and education/outreach activities.

Source Water Protection

Since the entire Yellow Creek Watershed drains toward the Short Coleman Water Association intake, efforts will be made to reduce potential pollution sources throughout the watershed. Potential pollution sources will be identified, and project partners will work to minimize the effect of these sources.

- Aerial Inventory – An inventory of land use and condition has been conducted using low-altitude infrared photography and GIS analysis. A summary of analysis will be presented to the partners and will be used to help target program activities to maximize water quality protection.
- Integrated Pollutant Source Identification – The Tennessee Valley Authority, through matching funds and in-kind services, will provide to the partners an Integrated Pollutant Source Identification (IPSI) model of the Yellow Creek watershed. This model will help the partners identify potential pollutant sources, as well as provide a mechanism to estimate pollution reduction after BMP installation.
- Source Water Assessment – Funds will be available to develop a source water assessment for the Short Coleman Water Association to identify potential pollution sources. This assessment may also be used to develop a source water protection plan for both the Short Coleman and proposed Corinth water intakes in the Yellow Creek/Tenn-Tom Waterway channel.
- Source Water Protection Plan – Data from the Source Water Assessment will be used to develop a Source Water Protection Plan. This plan will outline potential pollution sources and protection mechanisms available in the watershed. The plan will also outline mechanisms for public awareness
- Yellow Creek Embayment Outreach – Partners will work with reservoir-front residents and recreational users to reduce pollution from development, boat engines, septic systems, etc. Current efforts to work with local marinas to protect water quality in the embayment will continue. Through matching funds, some supplies will be made available to area marinas and boaters that will help reduce the risk of pollution entering the Yellow Creek embayment.

Agriculture

Agricultural activities will be conducted with cooperating land owners to address sediment and nutrient run-off from livestock and cropland operations.

- Animal Exclusion – Cost-share assistance will be available to land owners who install fencing to prevent animal access to stream banks in listed portions of Bear, Cripple Deer and Little Cripple Deer Creeks, Holly Branch and all areas in the Yellow Creek watershed. Assistance will also be available to plant excluded lands in hardwood vegetation to provide a buffer for the adjacent stream bank. If needed, funds will also be available to install alternate water systems (ponds, troughs, etc.) for pastures where no alternate source is available.
- Pasture Restoration – Cost-share assistance will be available to land owners who wish to restore overgrazed pastures or pastures which have been identified as being in poor condition. Additional assistance may be available if land owners are willing to convert pastures to native warm-season grasses.
- Rotational Grazing – Cost-share assistance will be available to land owners who install fencing to divide pastures so that rotational grazing can be used to prevent overgrazing and pasture degradation.
- Grade Stabilization – Cost share assistance will be available to land owners to construct stabilization structures to reduce erosion in gullies, ditches and other drainages.
- Sediment Basin – Cost share assistance will be available to land owners to construct settling basins, retention ponds or similar structures to reduce sediment run-off from agricultural lands.

Photo 6 – Proposed BMP site near Doskie, MS

Silviculture

Most lands in both the Bear Creek and Yellow Creek watersheds are currently forested and used for timber harvest activities. Complete removal of vegetative cover during harvest activities, as well as run-off alterations caused by the construction of logging roads and stream crossings, can contribute to heavy sediment loading. If left unrestored, these sites will continue to contribute heavy sediment loading for years following harvest activities. Programs funded under this plan will be designed to recover harvest sites immediately after harvest activities to minimize sedimentation from these sites.

- Harvest Planning – Land owners wishing to receive funding assistance through this project will work with the Mississippi Forestry Commission to develop a harvest plan for their land. This plan will outline proper procedures, including proper Best Management Practices (BMPs), to be followed by all contractors. The plan will also identify best locations for logging roads, landings and stream crossings to reduce potential impacts during harvest activities. Land owners who develop **and** follow such a plan will then be eligible for cost share assistance to implement corrective actions to reduce sediment run-off after harvest.
- Logging Road Revegetation – Cost-share assistance will be available to sow grasses along logging roads immediately after harvest is complete. Where needed, funds will also be available to grade the roads to redirect run-off and reduce the force of run-off as it travels along the roads. As funds are available, additional cost-share assistance will be given to land owners willing to use native warm-season grasses for revegetation efforts.
- Landing Restoration – Cost-share assistance will be available to sow grasses throughout areas used to stage equipment and activities during logging operations.
- Stream Crossing Restoration – Cost-share assistance will be available to grade and reforest any areas where stream crossings were required during harvest activities. If needed, funds will also be available to stabilize stream banks in these areas to reduce erosion and restore natural conditions.

Photo 7 – Eroding logging road near Doskie, MS

Education/Outreach

Since public involvement will be critical to the success of this project, reaching local land owners with all aspects of project activities will be critical. Maintaining up-to-date communication with local residents, officials and project partners will be vital for project success. A communication and marketing plan will be developed to highlight outreach activities.

- Public Meetings – Meetings will be conducted during the initial phases of this project to increase awareness of local citizens concerning current issues in the watersheds and to introduce project plans to potential partners. Periodically during the project, additional meetings may be conducted to help keep interested citizens up-to-date on project activities.
- Stakeholder Presentations – Periodically, partners will meet with local stakeholder groups (Cattlemen's Association, Forestry Association, Economic Development agencies, etc.) to introduce this project to members and keep them up-to-date with project activities.
- Government Briefings – As needed, presentations will be made to local, state and federal agencies to provide project summaries and present results. If requested, written reports will be submitted to government officials to provide detailed summaries of project activities.
- Activity Workshops – As needed, workshops will be held to distribute information and ideas to watershed residents concerning various aspects of this project. Workshops will include, but may not be limited to:
    - Septic system maintenance workshops
    - Clean boating events
    - Riparian buffer seminars
    - Forestry planning workshops
    - Watershed Harmony presentations
    - Secchi Day
    - Envirothon
    - Water quality educational video
- Project Tours – As BMP projects are implemented, tours will be given to interested land owners, potential partners and various agencies to increase awareness of project activities and to highlight project successes. These tours will provide direct recognition of participating land owners and will hopefully initiate additional interest in watershed activities.
- Watershed Education Events – Partners will work with area schools and organizations to provide hands-on educational events to increase awareness of water quality issues and highlight the need for projects to protect and improve water quality in the area.

Monitoring

Throughout the project, monitoring of water quality conditions will be vital to track project success and identify additional needs. Both chemical and biological monitoring will be utilized to track results. Prior to initiation of this project, little chemical data has been collected in these watersheds. Initial data collected during the first year will serve as baseline data for conditions in the streams. When possible, data will be collected in the immediate vicinity of BMP installation sites to measure success of the project activities. Pre- and post-BMP monitoring at these sites will help determine pollutant load reductions directly associated with these project activities. Biological monitoring will be used to measure long-term benefits of this project. A monitoring plan will be developed to outline monitoring needs and schedules.

Biological Monitoring

Biological monitoring during this project will consist of benthic macroinvertebrates, fish and bacteriological collections. Biological data will be used to determine overall stream health. Bear Creek is known to be inhabited by three federally listed and one candidate species of mussels. None are known to occur in the Mississippi portion of the stream; however, populations are known to occur immediately downstream of the Mississippi-Alabama state line. Biological community data will be very important to tract conditions in the watershed to help manage/protect these populations. Mississippi Department of Environmental Quality (MDEQ) uses benthic macroinvertebrate data to determine over-all stream health (listing criteria). TVA routinely monitors both macroinvertebrates and fish, so information concerning fish communities will also be obtained during this project. Macroinvertebrate data will be utilizing MDEQ standard protocols or equivalent. Joint sampling efforts with MDEQ and TVA will be conducted at the beginning of the project to determine if TVA protocols will adequately meet MDEQ listing criteria. If data is adequately comparable, TVA will use its Level II sampling protocol throughout the project. If results of joint sampling indicate that TVA protocols do not provide comparable results to MDEQ protocol, MDEQ protocol will be used throughout the project.

Biological Sample Schedule

Macroinvertebrate data will be collected twice during each five year interval. Initial data will be collected at the beginning of the project (2008). Additional data will be collected after three years (2011) and again after two more years (2013). If additional funding is available to extend the project beyond the original three years, monitoring will continue on the three/two year interval throughout the project life.

Fish data will be collected every five years. Initial data will be collected at the beginning of the project (2008) and additional data will be collected in five years (2013).

Under TVA's current valley monitoring plan, all hydrologic units in the Tennessee Valley are monitored every five years for biological health. Both macroinvertebrate and fish data are collected. Typically only one site is sampled in each hydrologic unit; however, TVA currently monitors two sites in the Yellow Creek watershed. In the Bear Creek watershed, TVA has only one routine monitoring location, but also collects data at two sites immediately downstream of the project area in Alabama (see Sample Locations).

Biological Sample Locations

In the Yellow Creek watershed, biological data will be collected at two locations. These two sites are located in the lower reaches of each stream's watershed and are both part of TVA's routine monitoring efforts.

- Caney Creek at Mississippi Highway 365
- Little Yellow Creek at Mississippi Highway 365

In the Bear Creek watershed, biological data will be collected at five locations. One of these locations is part of TVA's routine monitoring efforts.

- Bear Creek at Mississippi Highway 30 (TVA routine location)
- Bear Creek at County Road 86
- Cripple Deer Creek at County Road 157
- Cripple Deer Creek at the Alabama/Mississippi state line (Vulcan Quarry)
- Holly Branch at County Road 85

Chemical Monitoring

Chemical monitoring during this project will consist of multiple parameters sampled on a monthly basis throughout the project period. Minimal historical data is available for these watersheds. Baseline data will be obtained during the first year of the project period. Comparison with the following two years will be made to determine if improvements can be documented or if additional data must be collected after the first phase of the project. Portions of both Bear and Caney Creek watersheds are considered biologically impaired possible due to sediment contamination. Measurements of total suspended solids (TSS) and turbidity will be used to tract reductions in sediment loading in these streams. Biological impairment of Caney Creek may also be caused by organic enrichment and subsequent low dissolved oxygen levels. Measurements of dissolved oxygen (DO) and biological oxygen demand (BOD) will be used to tract conditions. Since nutrient loading in a stream greatly affects conditions leading to low DO impairment (i.e. algal blooms), nitrogen (TKN, NO_2-NO_3 and NH_3-N) and Phosphorus (TP) levels will also be monitored. Since most devices used to measure DO also contain temperature, pH and conductivity capabilities, these parameters will also be measured. Alkalinity and hardness will be measured when possible to provide general information about the conditions in these watersheds

Standard operating procedures (SOP) and quality assurance/quality control (QA/QC) manuals of any organization (field crews or laboratory) must meet minimum MDEQ and TVA requirements. In-situ parameters will be made using calibrated devices or other similar method. Laboratory parameters will be processed by an approved laboratory. Sample collection, handling and analysis will be conducted using approved SOP and follow QA/QC guidelines.

Chemical Sample Schedule

All parameters will be sampled monthly at all sites. Since dissolved oxygen and pH levels are greatly influenced by aquatic plant photosynthesis activities, measurements of these parameters in the Yellow Creek watershed must be made before 10:00 a.m. during summer months (May-September). If low DO or high pH conditions are determined at other locations during the first year (2009), samples will be made before 10:00 a.m. during future years. If significant fluctuations in DO and/or pH are suspected or measured, additional samples may be taken between 1:00 p.m. and 4:00 p.m. on the same days of morning measurements.

Chemical Sample Locations

In the Yellow Creek watershed, chemical data will be collected at six locations.

- Choate Creek at County Road 260 (Alcorn County)
- Coke Creek at County Road944
- Caney Creek at Mississippi Highway 365
- Caney Creek at County Road 300
- Little Yellow Creek at Mississippi Highway 365
- Little Yellow Creek at mouth

In the Bear Creek watershed, chemcial data will be collected at nine locations.

- Bear Creek at Mississippi Highway 30
- Bear Creek at Natchez Trace Parkway (or at Tishomingo State Park canoe access)
- Bear Creek at County Road 86
- Bear Creek at County Road 68
- Cripple Deer Creek at Mississippi Highway 25
- Cripple Deer Creek at County Road 157
- Cripple Deer Creek at the Alabama/Mississippi state line (Vulcan Quarry)
- Little Cripple Deer Creek at County Road 957
- Holly Branch at County Road 85

Chemical Monitoring – BMP site locations

Additional chemical monitoring, using same methods and parameters as monthly monitoring efforts, will be conducted at selected BMP locations, as feasible. Locations will be selected based on access and likely direct impact of BMP installation. Samples will be collected during or immediately after storm events with at least two inches of rainfall in a twenty-four hour period. At least three samples will be collected before the BMP's are installed. After installation, samples will be collected during similar storm events (same magnitude and season) to determine BMP effectiveness. Since some BMP's require multiple years to become effective (vegetative buffers, biological stabilization, etc.), monitoring may be needed for several years after installation before effectiveness can be determined.

Project Budget

Primary funding of project activities will be made through a Clean Water Act, Section 319 grant from EPA through MDEQ and matching funds from various partners. Estimated project costs for initial BMP installation are approximately $1.5 million, including in-kind services and cost-shares. Matching funds will be provided by various Implementation Team members, stakeholder groups and participating land owners. See Table 1 for a summary of anticipated expenses.

Table 1 – Budget Summary for Project Implementation

	Total Expenditure	Grant (Federal) Funds	Matching Funds
Personnel	**$524,150.00**	**$134,400.00**	**$389,750.00**
Administration	$47,400.00	$35,400.00	$12,000.00
Project Coordination	$123,000.00	$84,000.00	$39,000.00
Monitoring	$60,000.00	$0.00	$60,000.00
Source Water Assessment	$51,000.00	$15,000.00	$36,000.00
BMP Activities	$242,750.00	$0.00	$242,750.00
Travel	**$11,500.00**	**$0.00**	**$11,500.00**
Septic System Seminars	$1,500.00	$0.00	$1,500.00
Source Water Assessment	$1,000.00	$0.00	$1,000.00
Administration	$3,000.00	$0.00	$3,000.00
Project Coordination	$6,000.00	$0.00	$6,000.00
Equipment	**$0.00**	**$0.00**	**$0.00**
Supplies	**$841,950.00**	**$690,675.00**	**$151,275.00**
Education Supplies	$10,200.00	$6,675.00	$3,525.00
BMP Activities	$831,750.00	$684,000.00	$147,750.00
Contractual	**$0.00**	**$0.00**	**$0.00**
Construction	**$0.00**	**$0.00**	**$0.00**
Education/Outreach	**$78,000.00**	**$0.00**	**$78,000.00**
Public Education/Outreach	$60,000.00	$0.00	$60,000.00
Field Day Tours	$8,100.00	$0.00	$8,100.00
Forestry BMP Education	$3,600.00	$0.00	$3,600.00
Boater Education	$4,500.00	$0.00	$4,500.00
Septic System	$1,800.00	$0.00	$1,800.00
Other	**$12,250.00**	**$12,250.00**	**$0.00**
Land Owner Incentives	$12,250.00	$12,250.00	$0.00
Indirect Charges	**$0.00**	**$0.00**	**$0.00**
Total	**$1,467,850.00**	**$837,325.00**	**$630,525.00**

Implementation of the Plan

The Pickwick Reservoir Watershed Implementation Team was developed in 2005 to address water quality problems in the Yellow and Bear Creek watersheds. In 2007-2008, the Implementation Team requested, and has received grant money to help address these issues. During the spring of 2008, a watershed coordinator was hired to oversee project activities and coordinate efforts of local and agency partners.

Public forums will begin during the summer and fall of 2008 to increase awareness of water quality issues with local land owners. These forums will be structured to provide background watershed information to local residents, government officials and agencies, and industrial and private land owners. These forums will hopefully generate enough interest in the Pickwick Reservoir watershed to fully implement this watershed plan. Cooperating partners will conduct numerous activities to address water quality issues in the watershed. Project activities will be conducted during a three-year period to implement all major actions (i.e., BMP installation) in the plan. Continued monitoring and project coordination will be conducted for at least 10 years to determine overall success of the efforts. Oversight of each aspect of project activities will be assigned to one or more of the participating partners; however, other partners will participate and assist with each activity. These activities are outlined in the following timeline.

Activity	Initiation	Completion	Partner Oversight
Seek grant funds to assist land owners with BMP installation	May 2006	May 2008	MSWCC, MFC, TVA
Provide a Watershed Coordinator for project oversight	March 2008	End of project	SWCD
Solicit land owner participation in cost share programs	June 2008	August 2011	SWCD, MFC
Develop demonstration sites to increase public awareness/ involvement	June 2008	June 2009	TVA, SWCD, MFC
Host site tour to highlight BMPs and watershed activities	June 2009	End of project	TVA, SWCD, MFC
Develop Source Water Assessment for Short Coleman Water Association	June 2008	June 2009	TVA
Develop Source Water Protection Plan for Short Coleman Water Association	July 2009	March 2010	MDEQ, EPA, TVA
Conduct educational events for public awareness and participation	September 2008	End of project	TVA, EPA
Provide regular project updates to partners, local residents, government officials and interested parties	June 2008	End of project	All partners

Project Timeline (continued)

Activity	Initiation	Completion	Partner Oversight
Establish BMPs on lands throughout the watershed to reduce pollution loading	June 2008	End of project	SWCD, MFC
Conduct septic system education events and assist home-owners with failing septic systems	June 2008	End of project	TVA, EPA
Conduct water quality protection events with reservoir user groups to increase awareness for source water protection	October 2008	End of project	TVA
Conduct regular public meetings to provide updates/information	June 2008	End of project	All partners
Monitor chemical status	September 2008	December 2011	TVA, MDEQ
Monitor biological status	January 2008	December 2013	TVA, MDEQ

References

Mississippi Department of Environmental Quality, "Mississippi 2006 Section 303(d) List of Impaired Water Bodies, Draft", April 2007

Mississippi Department of Environmental Quality, "Mississippi 2008 Section 303(d) List of Impaired Water Bodies", Draft, April 2008

Mississippi Department of Environmental Quality, "TMDL, Bear Creek Watershed for Biological Impairment Due to Sediment", October 2005

Mississippi Department of Environmental Quality, Surface Water Division website, http://www.deq.state.ms.us/MDEQ.nsf/page/SurfaceWater_home

Appendix A