BEE LAKE WATERSHED IMPLEMENTATION PLAN

FINAL DRAFT
June 30, 2006

BEE LAKE WATERSHED IMPLEMENTATION PLAN

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I. MISSION STATEMENT

The mission of the Bee Lake Watershed Implementation Plan (WIP) is to develop a more sustainable future for the resources, residences, and businesses located within the watershed by addressing all identified natural and wildlife resource concerns. The implementation of this plan also partially fulfills the mission of all members of the Bee Lake Watershed Implementation Team (WIT) including: Delta F.A.R.M., Delta Wildlife, Ducks Unlimited, Environmental Protection Agency, Mississippi Department of Environmental Quality, Mississippi Soil and Water Conservation Commission, Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Department of Health, Mississippi State University Department of Wildlife and Fisheries, Natural Resources Conservation Service, U.S. Geologic Survey, U.S. Fish and Wildlife Service, Yazoo-Mississippi Delta Joint Water Management District, all other partnering agencies and the private landowners, farmers, and business owners in the watershed.

II. BEE LAKE WATERSHED DESCRIPTION

There is some historical hydrological evidence that Bee Lake could have been created by the Ohio River. However, popular belief holds that Bee Lake is an oxbow created by the Yazoo River located in Holmes County, in western Mississippi. The watershed is approximately 11,870 acres in size (Figure 2.1) (Tetra Tech 2003). We estimate that approximately 60 people lived in this watershed in 2000 (based on Census 2000 census block data for Holmes County). Portions of the town of Thornton and the historic plantation communities of Lakeland, Maryland, Gum Grove, Bealon, Bonanza, Little Bonanza, Stonewall, Quofaloma, Jenkins and Pluto are in the Bee Lake watershed (DeLorme 1998). Bee Lake is a popular sport fishing lake and contributes to the local economy through its fishery. The Mississippi Department of Wildlife, Fisheries, and Parks maintains a pay-to-launch boat ramp on the lake near Highway 49E (Tetra Tech 2003).

The watershed is located in the Mississippi Alluvial Plains ecoregion, and is underlain by Mississippi River Alluvium (MDEQ 2000). Native vegetation in the watershed is bottomland hardwood forest consisting of oak, gum, cottonwood, and cypress (MARIS on-line mapping accessed 7/15/04). The topography of the watershed is relatively flat, with only a 25-foot elevation difference between the highest point (northeast watershed) and the lowest point (north central watershed). There are two major soil types in the watershed. The majority of the soil in the watershed is of the Dundee-Forestdale-Dubbs association. A small area in the southeast portion of the watershed contains soil of the Sharkey-Forestdale-Dundee association (Tetra Tech 2003). These soils are very productive and easily eroded (SCS).

Primary inflow to Bee Lake is through Tchula Lake (a nearby oxbow lake) during high water periods (typically in the spring), and outflow is through canals to the Yazoo River and an additional canal to lower Tchula Lake, near where it joins the Yazoo River (Tetra Tech 2003). Bee Lake also receives inflow from field drains and improved ditches from within the watershed. Bee Lake is used as a source of irrigation water, thus contributing to the local agricultural economy. There are other smaller lakes and ponds in the watershed, including commercial catfish ponds to the south of the lake (DeLorme 1998, Tetra Tech 2003). The watershed is underlain by the Mississippi River Alluvial Aquifer, which is used for additional agricultural irrigation. Drinking water is largely obtained through private wells from an aquifer found below the Mississippi River Alluvial Aquifer (Tetra Tech 2003). Community drinking water sources are currently being developed as the West Holmes County Water Association began laying waterlines around the lake in 2005.

In 1993 land use in the watershed was primarily agricultural (65%), with 51% of the watershed in crop production, and 14% in non-cultivated agricultural uses such as pasture. Cotton is the major crop in the watershed, it accounts for approximately 51% of the cropland. Other crops cultivated in the watershed include (in order of abundance) soybeans, rice, snap beans, sorghum, winter wheat, small grains, corn, and sunflowers (Tetra Tech 2003).

Figure 1. Bee Lake Watershed, Holmes County, Mississippi.

III. WATERSHED IMPLEMENTATION TEAM (WIT)

A. Member Organizations and Agencies *(Acronyms)*

Delta Farmers Advocating Resource Management (Delta F.A.R.M.)

Delta Wildlife

Mississippi Department of Environmental Quality (MDEQ)

Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP)

- Mississippi Museum of Natural Science (MDWFP-MMNS)
- Wildlife Division (MDWFP-WD)
- Fisheries Division (MDWFP-FD)

Mississippi State University (MSU)

- Extension Service (MSU-ES)
- College of Forest Resources (MSU-CFR)
- Department of Wildlife and Fisheries (MSU-CFR-DWF)

United States Geological Survey (USGS)

Ducks Unlimited (DU)

United States Fish and Wildlife Service (USFWS)

United States Department of Agriculture (USDA)

- Natural Resources Conservation Service (USDA-NRCS)
- Farm Service Agency (USDA-FSA)

Mississippi Soil and Water Conservation Commission (MSWCC)

Mississippi Farm Bureau Federation (Farm Bureau)

Delta Council

Mississippi Department of Health (MDH)

Yazoo-Mississippi Delta Joint Water Management District (YMD)

United States Environmental Protection Agency (EPA)

Bee Lake Watershed Private Landowners

Bee Lake Watershed Private Business Owners

B. WIT Executive Committee

Trey Cooke, Delta F.A.R.M. & Delta Wildlife (Chairman)
Richard Ingram, Mississippi Department of Environmental Quality
Steve Goff, Mississippi Department of Environmental Quality
Ronn Killebrew, Mississippi Department of Environmental Quality
Louie Thompson, Private Landowner
Garry Lucas, Mississippi Department of Wildlife, Fisheries, and Parks
Daryl Jones, Mississippi State University, College of Forest Resources

C. WIT Technical Committee

Trey Cooke, Delta F.A.R.M. & Delta Wildlife (Chairman)
Richard Rebich, U.S. Geological Survey
Stacey Shankle, Ducks Unlimited
Gayden Pollan, Delta F.A.R.M. & Delta Wildlife
Steve Goff, Mississippi Department of Environmental Quality
Ronn Killebrew, Mississippi Department of Environmental Quality
Chris Woodson, U.S. Fish and Wildlife Service
Bobby McCain, Natural Resources Conservation Service
Rogerick Thompson, Natural Resources Conservation Service
Patrick Vowell, Mississippi Soil and Water Conservation Commission
Garry Lucas, Mississippi Department of Wildlife, Fisheries, and Parks
Gene Herring, Mississippi Department of Health
Todd Tietjen, Mississippi State University Department of Wildlife & Fisheries
Dean Pennington, Yazoo-Mississippi Delta Joint Water Management District

D. WIT Land, Home, and Business Owner Committee

Louie Thompson, Pluto Plantation (Co-Chairman)
Trey Cooke, Delta F.A.R.M. & Delta Wildlife (Co-Chairman)
B. Bryan Jones, Bonanza, Lakeland, and Jones Planting Co.
Thomas G. Peaster, Maryland
James R. Peaster, Gum Grove & Jenkins
Chat Phillips, Bailey Place
Mart Smith, Bealon Plantation
William Thompson, Pluto
John Newcomb, Stonewall
Shirley Liberto, Liberto Estate
Barbara Driver, Liberto Estate
Jean Bell, Bell's Grocery
Hugh Hathorn, Little Bonanza

Danny Wiggington, Lakeland
Mike Foose, Pluto
Arthur Abercrombie, Quofaloma Plantation

E. WIT Educational Committee

Trey Cooke, Delta Wildlife (Co-Chairman)
Daryl Jones, MSU-CFR-DWF (Co-Chairman)
Eugene Herring, Waste Water Division, MS Department of Health
Georgia Spencer, Education Program Director, MS Museum of Natural Science
Garry Lucas, Fisheries Biologist, MS Dept. of Wildlife, Fisheries, and Parks
Laura Beiser, NPS Education Program Administrator, MDEQ
Ann Porter, MDEQ
Betsy Padgett, Holmes County Director, MSU Extension Service
Katherine Jacobs, MSU-CFR-DWF
Todd Tietgen, MSU-CFR-DWF
Stephen Little, MS Soil & Water Conservation Commission
Jeannine May, Public Affairs Specialist, USDA-NRCS
Vernon Hartley, MS Farm Bureau Federation

IV. INTERESTS

A. LAND, HOME, & BUSINESS OWNER COMMITTEE

The lake is the very foundation for any and all economic prosperity in the watershed. The soils around the lake were originally deposited by historical flood events. This rich soil sustains profitable farming operations and wildlife habitat for an abundance of terrestrial species. The aesthetic beauty of the lake and its recreational values make the watershed highly desirable for either primary or secondary homes.

Bee Lake from the county bridge off U.S. Hwy. 49E

Bell Grocery is the only non-Ag related business in the watershed.

The aesthetic value and the recreational opportunities also increase land values around the lake, further benefiting the landowners and county tax base. The lake itself provides irrigation water to adjacent cropland and aquaculture, saving precious ground water supplies from further depletion. The only non-ag related business in the watershed is sustained by the lake's popularity as a recreational fishery.

It is the consensus of the WIT to address each and every issue that threatens the long-term environmental and economic sustainability of this lake and watershed.

Sheet erosion from this cotton field has scoured a pathway into the lake.

B. TECHNICAL COMMITTEE INTERESTS

Eight priority concerns have been identified in the Bee Lake Watershed. Sedimentation from adjacent agricultural runoff and the failing weir pose immediate threats to the lake.

Bee Lake cannot continue to be a productive fishery and an irrigation water storage reservoir if the lake level cannot be maintained and sedimentation is not significantly reduced. A noxious aquatic weed, like Alligator Weed, pose a threat to autumn dissolved oxygen (DO) levels and reduces the availability of open water for fishing and recreation on the lake.

Alligator Weed, seen to the right, threatens dissolved oxygen levels and recreational access on Bee Lake.

Organic enrichment is also a concern of the WIT and MDEQ. However, very little data exists to document the severity, sources, and impact of organic enrichment in Bee Lake. Therefore, the WIT shall recommend further monitoring of organic enrichment in Bee Lake and will restrain from proposing a plan to address the concern until more is known.

The WIT identified three additional concerns that impact watershed use rather than water quality. These concerns include future development around the lake, fisheries management, and boat access. All concerns are listed in *Table 4.1* in order of priority.

Each concern must be carefully addressed in order to:

1. Control future growth around the lake.
2. Manage increasing fishing pressure.
3. Reduce associated impacts in the watershed.

Table 4.1. Priority Concerns

Status	Description
Concern: Causes: Location: Extent:	**Sediment/Turbidity** Nonpoint and point source agricultural runoff and backwater flooding from the Yazoo River and Tchula Lake. Bee Lake Affects entire lake.
Concern: Causes: Location: Extent:	**Lake Level/Weir** Poor construction of original weir, insufficient maintenance of weir, backwater flooding from the Yazoo River and Tchula Lake. GPS 90.39895 33.08561 Affects entire lake.
Concern: Causes: Location: Extent:	**Noxious Aquatic Vegetation** Natural dispersal and boat hull transfer Bee Lake Throughout the lake, primarily on the upper ¼ of the lake.
Concern: Causes: Location: Extent:	**Organic Enrichment** Not known, speculation indicates agricultural runoff, failing septic systems, and decaying noxious aquatic vegetation. Bee Lake May affect entire lake.
Concern: Causes: Location: Extent:	**Future Development** Aesthetics and recreational opportunities have increased lake usage and interest in primary and/or secondary home construction. Bee Lake Lake front properties.
Concern: Causes: Location: Extent:	**Fisheries Management:** Disproportion in species composition of fish population and stocks are below potential carrying capacity. High sediment load impinges on spawning and/or growth of fish. Potential for over-harvest of bass and crappie Bee Lake Entire lake.
Concern: Causes: Location: Extent:	**Lake Access/Boat Ramps** The public boat access sites (two fee based concrete ramps and three dirt ramps) cannot service everyone during peak fishing periods. Concrete ramps: Bell's Grocery and another location in Thornton. Three dirt ramps located at points around lake. Bell's Grocery and another location in Thornton. Access affects entire lake usage.

V. BEE LAKE RESOURCES

A. WATER QUANTITY

1. Surface Water

The lake has been slowly filling in due to sedimentation from adjacent cropland, thereby reducing lake depth and water storage capacity for surface water irrigation interests. A weir was constructed by concerned farmers in the 1970's to maintain water levels for irrigation and fishing. Despite the fact that the weir has been maintained by local farmers, its crude construction is frequently damaged and threatened by storm events and backwaters from the Yazoo River and Tchula Lake. The weir represents the single most important asset in the watershed. Without the weir, recreational fishing and surface water irrigation will no longer by feasible in the watershed. There are no other significant surface water irrigation sources within the watershed.

2. Ground Water

Irrigation water use in this watershed is partially supplied by groundwater from the alluvial aquifer. The high carbonate levels in the ground water makes it marginally suitable for drinking, but suitable for agricultural uses. Nutrient levels in the ground water are low, and nitrate levels are below the EPA drinking water standard (Tetra Tech 2003). Heavy agricultural ground water usage has resulted in the lowering of the ground water table throughout the Yazoo River basin (MDEQ 2000).

3. Conservation

The Yazoo-Mississippi Delta Joint Water Management District (YMD) and MDEQ permit and monitor both surface and ground water irrigation use in the watershed. Private landowners have installed water control structures and sub-soil fields in the fall to conserve water resources. However, no significant efforts have been made within the watershed to conserve water use as the topography does not lend itself to large scale land forming, tail-water recover construction, or surface water irrigation reservoir construction.

B. FISHERIES RESOURCES

There are no threatened or endangered aquatic species present in the watershed. However, the Paddlefish is present in Bee Lake (Tetra Tech 2003) and may become threatened by commercial fishing and the high demand for caviar. Game fish such as white crappie, black crappie, bluegill, redear, and black bass are also struggling due to high turbidity levels in the lake that impact the spawn and reduce overall carrying capacity.

White crappie are the most popular game fish as shown by these children from their grandparent's fishing pier at Bee Lake.

Furthermore, overfishing threatens game fish populations as recreational fishing and bass tournaments continue to increase on the lake. MDEQ has sampled fish populations in Bee Lake for pesticide contamination, while MDWFP has historical data on pesticide contamination (MDEQ 2003a). All water bodies in the Delta, including Bee Lake, were placed under fish consumption advisory in 2001 for DDT and Toxaphene in catfish over 22 inches and all sizes of carp, buffalo, and gar (MDEQ 2001). However, fish advisories for Bee Lake were lifted after TMDLs for Legacy Pesticides were developed in the Yazoo River Basin (MDEQ 2005). Alligator Weed and other noxious aquatic vegetation also threaten Bee Lake. The MDWFP has been monitoring the situation and controlling Alligator Weed with Alligator Weed Flea Beetles obtained from the US Army Corps of Engineers.

Wetland Reserve Program (WRP) reforestation on the south end of the Bee Lake Watershed.

Native Warm Season Grass Buffer planted adjacent to Bee Lake protect against soil erosion and enhance bobwhite quail nesting habitat.

C. WILDLIFE RESOURCES

Terrestrial wildlife, migratory birds, and other wildlife thrive in the watershed. Forestlands are managed for timber production, white-tailed deer, and turkey. Wetlands are managed for waterfowl and shorebirds. Southern reaches of the watershed have been enrolled in the Wetland Reserve Program and adjoin the Hillside National Wildlife Refuge.

Private landowners have also planted native warm season grasses and legumes around field borders for quail and other small game.

Food plots are maintained within the watershed for migratory ducks, mourning dove, white-tailed deer, and eastern wild turkey.

Although there have been no recorded sightings, the watershed does fall within the range of the Louisiana Black Bear. Other federally (added by PB) threatened or endangered species that may occur in the watershed, but are presently not documented, are the Least Tern and Pondberry. Species of special interest that do occur in the watershed include Bald Eagle, American Alligator, Black-bellied Whistling Duck, Osprey, Grasshopper Sparrow, Roseate Spoonbill, Wood Stork, and White Ibis.

Public duck hunting is allowed on Bee Lake. However, there is no other public hunting or fee based hunting opportunities in the watershed. Ducks, mourning dove, quail, white-tailed deer, eastern wild turkey, and rabbits are commonly hunted on private lands in the watershed by landowners, family, and invited guests.

Table 6.1. Water quality criteria for Bee Lake 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

VI. WATER QUALITY STANDARDS

The designated use class for Bee Lake stated in the Mississippi water quality regulations is Fish and Wildlife Support. The designated beneficial uses for Bee Lake are Aquatic Life Support and Secondary Contact Recreation (http://www.deq.state.ms.us/MDEQ.nsf/page/WMB_yazoodesignate?OpenDocument). *Table 2,* Lists the numeric water quality criteria applicable to Bee Lake watershed surface waters (MDEQ 2002).

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).

A. Current Condition

There is not a routine water quality monitoring station in Bee Lake watershed. Bee Lake was sampled at one station during both the 1994 and 1995 Clean Lakes sampling programs. The water quality data from these sampling programs can be found in the Bee Lake TMDL (Tetra Tech 2003) and in the Yazoo River Basin water quality data compendium (MDEQ 2003a). Bee Lake was included on the 1996 303(d) List as impaired due to nutrients, organic enrichment/low DO, pesticides, and sediment/siltation. TMDLs addressing these impairments have been completed, and Bee Lake is in the process of being removed from the 303(d) List (MDEQ 2004a).

B. Total Maximum Daily Load (TMDL)

Bee Lake was included on the 1996 Mississippi 303(d) list as impaired due to nutrients, organic enrichment/low dissolved oxygen, pesticides, and sediment/siltation; Two total maximum daily load studies (TMDLs) related to these listed segments have been completed, one addressing nutrients, organic enrichment/low dissolved oxygen, and sediment/siltation, and one addressing pesticides.

A TMDL addressing nutrients, organic enrichment/low dissolved oxygen, and sediment/siltation has been completed and approved by U.S. EPA (Tetra Tech 2003). The TMDL report states that no known point sources related to these pollutants/impairments are present in the watershed. Nonpoint sources related to these pollutants/impairments that were accounted for in the development of the TMDL included runoff from cultivated and non-cultivated agricultural lands, catfish pond discharges, and background sources (forest land). Wet weather conditions were identified as the critical condition for these impairments. Failing septic systems were assumed to contribute a negligible load and so were excluded from the analysis. Furthermore, a noxious aquatic weed (Alligator Weed) has consumed more than 20% of the surface water acres of Bee Lake itself and may be contributing to low DO lev-

els during the fall and winter when cold weather causes the plant material to die off and begin decomposing. Since Mississippi does not currently have nutrient water quality criteria, a nutrient TMDL was not developed, however, nutrient contributions to oxygen demand were included in this TMDL. No reductions were recommended for oxygen demanding loads to Bee Lake. Sediment load reductions of 33%-60% were recommended in the TMDL; these reductions were achieved by reducing sediment loads from agricultural lands. TMDLs for oxygen demand and sediment are shown in *Table 3* (Tetra Tech 2003).

Table 6.2. Bee Lake TMDL

Type	TBODu (lb/day)	Sediment (ton/acre/year)
Waste Load Allocation	0	0.2 – 0.33
Load Allocation	234	0.2 – 0.33
Margin of Safety	(implicit)	(implicit)
TMDL	234	0.2 – 0.33

The Bee Lake pesticide impairment was addressed in a pesticide TMDL for the Yazoo River basin (MDEQ 2003b). The target for this TMDL is removal of fish consumption advisories for DDT and Toxaphene, and reduction of water column concentrations to the DDT human health and aquatic organism standard, and the Toxaphene fresh water chronic standard. The methods proposed for achieving these targets included implementation of BMPs to reduce sediment loading to water bodies (pesticides are present in basin soils) and natural attenuation (historical pesticide monitoring data from the Yazoo River basin indicate a decreasing trend in pesticide concentrations in soils, fish tissue, and water) (MDEQ 2003b). However, fish advisories for Bee Lake were lifted after TMDLs for Legacy Pesticides were developed in the Yazoo River Basin (MDEQ 2005).

VII. WATERSHED IMPLEMENTATION PLAN

The initial goal of this WIP is to address the concerns identified by the WIT. This will be achieved by the implementation of projects (listed later in this section) to address short-term concerns and an educational strategy to address long-term concerns. By addressing these concerns, Bee Lake will achieve its Mississippi water quality criteria and beneficial use designation for Aquatic Life Support while meeting local stakeholder objectives.

The underlying principle of this WIP (and the Basin Management Program itself) is adaptive management. While the initial goal of this WIP is to address concerns identified by the WIT, post-project monitoring may suggest that not all concerns were fully addressed. Likewise, additional concerns may

arise that were not originally identified by the WIT. Therefore, this WIP is a living document and should be reviewed and modified periodically to ensure adequate improvements are made and sustained throughout the life of the watershed.

The initial actions taken through the implementation of this WIP should provide measurable results by the end of 2007. In 2008, the WIP should be updated with the results of the initial actions and modified to address any inadequacies and newly identified concerns.

Following are detailed descriptions of management actions planned for the initial implementation of this WIP. Note that the values shown for load reductions, number of management practices to be installed, and costs are planning estimates and subject to change.

A. AGRICULTURAL BEST MANAGEMENT PRACTICES - DESIRED BENEFITS

The objective of this action is to **reduce sediment loads** from agricultural land to approximately 1900 to 3300 tons/year (Tetra Tech 2003). Estimated load reductions associated with this objective are listed below:

- Approximately 1800 to 3200 tons/year reduction of sediment load, 35% to 67% reduction of load from agricultural lands, 33% to 60% reduction of total sediment load;
- Approximately 18 tons/year reduction of total nitrogen load, 70% reduction; and
- Approximately 2.3 tons/year reduction of total phosphorus load, 33% reduction; and
- Approximately 33% reduction of DDT and Toxaphene loads (Tetra Tech 2003).

Through this load reduction, several benefits will arise for farmers, businesses, recreational fishermen, and the general public. The TMDL for sediment will be met. Water storage capacity and lake depth will be maintained. Consolidated sediment on the bottom of the lake will be minimized, providing better spawning areas for game fish. Turbidity will be reduced improving DO levels, fisheries productivity, and aesthetic values.

1. Participants

(a). Delta F.A.R.M.

Delta F.A.R.M. will enroll willing farmers in the watershed into the organization's self-assessment program to improve overall environmental stewardship. The organization will assist farmers by providing information on voluntary BMP implementation that is above and beyond BMPs identified in this WIP. A majority of these BMPs directly address nonpoint source agricultural runoff.

(b). Delta Wildlife

Delta Wildlife will administer EPA/MDEQ 319 funds for the implementation of projects critical to the success of the WIP that cannot be cost-shared through USDA Conservation Programs or other partners. These projects may include bank stabilization, drainage improvements, water control structures, grass filter strips, riparian buffers, stiff grass hedges, land forming, and other BMPs. Delta Wildlife will work with the landowners in the watershed to identify critical areas and develop BMP implementation plans. Furthermore, Delta Wildlife will coordinate the implementation and certification of all BMPs in the watershed with private landowners and other partners, no matter the funding source.

(c). USDA-NRCS and FSA

The USDA offers a suite of cost-shared conservation practices that can be used by private landowners and farmers to address almost all water quality, quantity, and wildlife resource concerns. The NRCS provides technical assistance on all USDA conservation programs and administers a large majority of programs. The FSA administers the Conservation Reserve Program. Delta Wildlife and the NRCS will work with landowners in the watershed to identify critical areas and determine USDA program eligibility. If eligibility requirements are met and funding is secure, the landowner will enroll in the program. The Environmental Quality Incentives Program (EQIP) will be used for land forming, conservation tillage practice incentive, water control structures, bank stabilization and other BMPs to the extent of program availability in Holmes County. Conservation Reserve Program (CRP) will be used for riparian buffer establishment and grass filter strips.

(d). Mississippi Partners for Fish and Wildlife

The Mississippi Partners for Fish and Wildlife is a conglomerate of natural and wildlife resource organizations and agencies headed by the U.S. Fish and Wildlife Service that provides cost-sharing on various BMPs in Mississippi. Most notably, the Partnership can provide water control structures and tree seedlings for reforestation or riparian buffers.

(e). U.S. Geological Survey

The U.S. Geological Survey (USGS) will provide data from the Mississippi Systems Evaluations Area (MSEA Project). This data documents the measured benefits of various BMPs. By using this data, the WIT can choose the best BMP to address a specific concern. Furthermore, the data can be used to measure the benefits of each BMP installed. The USGS will also be installing a permanent water moni-

USGS Monitoring Station installed on Bee Lake in the fall of 2005.

toring station on Bee Lake to measure turbidity, lake level, pH, conductivity, temperature, and other baseline water quality measurements. The data will be "real time" and downloaded to the USGS server hourly. The data will be posted on the USGS website. This will enable the WIT and MDEQ to monitor improvements in turbidity and other water quality measurements during pre and post project implementation.

(f). MS Dept. of Environmental Quality

MDEQ shall provide 50% of the cost of the USGS water quality monitoring station through a cooperative agreement with the USGS.

(g). Private Landowners

Although almost every BMP that will be implemented through this plan will be cost-shared, none will be 100% cost-shared. Therefore, the private landowners and farmers in the watershed will be required to provide equipment, labor, fuel, and some money to off set the cost of implementation.

2. Best Management Practices (BMP) Activities

To properly address sedimentation, turbidity, and all ag related non-point source pollution in Bee Lake, a suite of BMPs must be installed throughout the watershed. These BMPs may include, but are not limited to:

- Structures for Water Control (+/- 50 units)
- Overfall Pipes (+/-20 units)
- Riparian Buffers (+/-20 acres)
- Grass Filter Strips (included in riparian buffer estimate)
- Grass Waterways (+/-15 acres)
- Stiff Grass Hedges (+/-20 sites)
- Field Borders (+/-5 acres)
- Land Forming (+/-500 acres)
- Bank Stabilization (as needed, +/-15 sites, may include grass waterway estimate)
- Cover/Double Cropping (+/-500 acres)
- Drainage Improvement (+/-2 miles)

Delta Wildlife will work with the landowners and the WIT to survey the watershed and identify areas of concern. Then, Delta Wildlife will work with the landowner to identify solutions to the concern and develop an implementation plan specific to his/her property. Funding for the implementation of each personal implementation plan will vary. USDA funding will be targeted first, followed by Mississippi Partners for Fish and Wildlife and other sources. If no funding is available through these sources,

Section 319 funds will be used if the need is critical. If USDA funding is used, NRCS staff and engineers will survey, design, and certify BMP installations. If other sources are used, qualified professionals and/or engineers will be used to survey, design, and certify BMP installations. Ultimate responsibility for ensuring installation of these measures rests with MDEQ under MS Code Ann. 49-17-29(a)(2).

Regardless of the funding source, the long-term maintenance of BMPs installed through this WIP will be the responsibility of the private landowners. USDA funded projects will require maintenance agreements, as will Mississippi Partners for Fish and Wildlife projects. 15-year minimum maintenance agreements will also be required on projects funded through Section 319. Section 319 maintenance agreements will be held and monitored by Delta Wildlife through December 31, 2007, and then the Mississippi Department of Environmental Quality.

3. Schedule

The first process in implementation is the identification of sites for treatment. This survey process was completed in March of 2006. Implementation plans for each landowner will then be developed. BMPs will be designed and engineered to USDA-NRCS specifications. Funding for implementation will then be identified, and once secured, each approved practice will be installed. Installation of BMPs will begin in 2006 and continue through 2007. The USGS monitoring station was installed in September, 2005. Delta Wildlife will submit reports on the progress of implementation bi-annually to MDEQ through December 31, 2007.

4. Budget

Projected costs for implementing practices required by this plan are listed in the table below. Funding for these items include USDA, Mississippi Partners for Fish and Wildlife, Section 319, and private landowners.

Table 7.1. Projected Costs for Agricultural BMPs

Practice	Unit Cost (w/installation)	Number of Units	Total Cost
Water Control Structures	$2,500.00	50	$125,000.00
Overfall Pipes	$5,000.00	20	$500,000.00
Riparian Buffers	$1,175/acre	20/acres	$23,500.00
Grass Waterways	$450.00/acre	15/acres	$6,750.00
Stiff Grass Hedges	$250.00/site	20/sites	$5,000.00
Field Borders	$1,165.00/acre	5/acres	$5,825.00
Land Forming	$400.00/acre	500/acres	$200,000.00
Bank Stabilization	$10,000.00/site	15/sites	$150,000.00
Cover/Double Cropping	$20.00/acre x 15 years	500/acres	$150,000.00
Drainage Improvement	$10,000.00/mile	2/miles	$20,000.00
USGS Construction/Instrumentation	$30,000.00	1	$30,000.00
USGS Monitoring	$20,000.00/yr.	5 yrs	$100,000.00
			TOTAL $1,316,075.00

B. WEIR RECONSTRUCTION – DESIRED BENEFITS

The objective of this action is to reconstruct the existing weir in order to maintain an adequate lake level in Bee Lake when the Yazoo River and Tchula Lake drop below the lake's outlet elevation. A reliable weir is critical to sustain an adequate lake depth for year-round recreational fishing and water storage capacity for surface water irrigation. Furthermore, an improved weir will reduce head cutting and associated sediment loading in the lake. The fisheries, water quality, water supply, aesthetics, and economy of the watershed depend on a reliable and functioning weir. A reliable weir is the single most important component of this WIP.

A new weir will ensure Bee Lake's ability to store at least 7,000 acre/feet of water for recreational fishing and surface water irrigation. Currently, the lake provides water for 15-20 permitted surface water users and would provide ample water to permit additional users in the future. Furthermore, the weir would maintain an average depth of 7.1 feet throughout the lake, maximizing fisheries potential.

1. Participants

(a). Yazoo-Mississippi Delta Joint Water Mgt District

The Yazoo-Mississippi Delta Joint Water Management District (YMD) is charged with the duty of managing water supply in a majority of the Yazoo Basin, including the Bee Lake Watershed. YMD permits and monitors both ground and surface water use in the watershed for MDEQ. YMD promotes and implements water conservation measures through a number of methods, one of which is the Delta Study (Mississippi Delta Comprehensive Multipurpose Water Resource Plan). Initially, the study was designed to investigate the feasibility of various water conservation practices. The initial phase of the

study has been completed. Today, funding for the Delta Study is being used to implement large-scale water conservation practices that benefit multiple users and the public. The Delta Study is funded by the USDA-NRCS.

YMD committed to stabilize the Bee Lake weir with Delta Study funding in late 2005 and rebuild the weir in 2006. Funding has already been secured. Preliminary surveys, elevation options, and design options have also been completed.

(b). Private Landowners

All preliminary weir designs and elevations will inundate +/- 15 acres of production cropland. Inundation will affect at least two different property owners, both of which have agreed to these terms. Furthermore, the weir will be built on private property (owned by a third landowner). At least three landowners will be sacrificing either land and/or potential revenue to ensure the construction of the new weir.

(c). U.S. Geological Survey

The monitoring station installed on Bee Lake will also measure lake level. Data may be reviewed on the USGS website. This will help to measure the effectiveness of the weir.

(d) Natural Resource Conservation Service

Engineers with the USDA-NRCS will assist in the design of the weir.

2. Weir Construction Activities

YMD has already begun preliminary survey and design work. Furthermore, the existing weir has been "patched" until construction can begin. Design, site selection, and elevation options will be presented to potentially affected landowners and users. Once a design, site, and elevation are agreed upon, construction will begin in 2006. YMD shall conduct all activities associated with weir survey, design, and construction. YMD will monitor the weir and either maintain the weir or establish a maintenance agreement with local landowners.

3. Schedule

YMD began preliminary survey and design work in 2005. During the winter of 2005 and spring of 2006, YMD and local stakeholders will decide on a design, site, and elevation for the weir. As soon as conditions are suitable, construction will begin and should be complete before December 31, 2006. Delta Wildlife and/or YMD will submit weir construction status reports to MDEQ when (1) the site, design, and elevation have been approved, (2) when construction begins, and (3) when construction is complete. The USGS monitoring station will be installed by December 31, 2005.

4. Budget

Projected costs for implementing practices required by this plan are listed in the table below. Funding for these items include USDA-Delta Study Funds, YMD, NRCS and Private Landowners.

Table 7.2. Projected Costs for Weir Construction

Practice	Unit Cost (w/installation)	Number of Units	Total Cost
YMD weir repair	$15,000.00	1	$15,000.00
NRCS Survey & Design	$100/hr.	20 hrs.	$2,000.00
YMD Construction	$200,000.00	1	$200,000.00
USGS Monitoring Station	$20,000.0/yr	5 yrs	$100,000.00
			Total $317,000.00

C. NOXIOUS AQUATIC VEGETATION – DESIRED BENEFITS

Noxious aquatic vegetation has created numerous problems in Bee Lake. Alligator Weed restricts access and movement on the lake. Furthermore, there is a isolated coon-tail problem on the upper end of the lake that threatens the entire lake if it is spread. Both pose a safety threat to swimmers and skiers. Plant materials cover the surface of the water, blocking sunlight for phytoplankton production. This ultimately reduces overall fish carrying capacity as lake productivity is then based on a less efficient means of energy conversion. A rapid die-off of aquatic vegetation can stress dissolved oxygen supplies. By best management of the aquatic vegetation Bee Lake should see an increase in accessible water acres, improved safety, a more diverse fish habitat, and higher aesthetic value. Vegetation coverage on most areas of the lake is currently at optimum levels for lake use while providing a diverse habitat for fish. A few areas have invasive vegetation that needs to be controlled.

1. Participants

(a). Mississippi Department of Wildlife, Fisheries, and Parks

MDWFP has been and will continue to monitor aquatic vegetation in Bee Lake. To date, MDWFP fisheries biologist have significantly reduced Alligator Weed in the lake through the stocking of Alligator Weed Flea Beetles. MDWFP will continue to monitor and control noxious aquatic weeds in Bee Lake.

(b). Delta Wildlife

Delta Wildlife will work with MDWFP to monitor and control noxious aquatic vegetation in Bee Lake. Delta Wildlife and MDWFP will pursue additional funding sources to more aggressively address noxious aquatic weeds in the lake. If none can be secured, some Section 319 funds may be used for eradication of coon-tail in the upper lake.

(c). Recreational Fishermen and other Boaters

Many noxious aquatic plant materials are transferred by different parts of a boat when they move within a lake and from one lake to another. Recreational fishermen, skiers, and other boaters must play a role in the control of noxious aquatic weeds in Bee Lake. Through educational outreach activities (further outlined in section 4.0), boaters will be encouraged to clean their boat hulls, live wells, and lower units before and after they launch their boats in Bee Lake.

(d). U.S. Army Corps of Engineers

The USACOE has historically provided MDWFP with Alligator Weed Flea Beetles used in the control of Alligator Weed. The USACOE will continue to provide these insects to MDWFP for use in Bee Lake and other areas with severe Alligator Weed problems.

2. Noxious Aquatic Weed Activities

MDWFP will continue their on-going efforts to monitor aquatic weed and control Alligator Weed in Bee Lake. Delta Wildlife and MDWFP staff will work together to identify other noxious aquatic weeds in Bee Lake and develop a control or eradication plan. Funding for such plans will be pursued through extramural grants. If no grants are secured, Section 319 funding may be used if the need is determined critical. Educational outreach components needed for noxious aquatic weed control will also be developed by MDWFP in conjunction with Delta Wildlife.

3. Schedule

MDWFP has been and shall continue to monitor aquatic weed problems in Bee Lake. Furthermore, they will continue to control Alligator Weed with Alligator Weed Flea Beetles until which time Alligator Weed is at perceived optimal levels. In 2006, MDWFP and Delta Wildlife will identify other noxious aquatic weeds in Bee Lake and develop a control and/or eradication plan. MDWFP and Delta Wildlife will also submit grant proposals for the plan in 2006. If funding is secured through extramural grants, implementation will begin in 2007. If funding is not secured, MDWFP, Delta Wildlife, and MDEQ will determine the feasibility of using Section 319 funds to implement parts or all of the proposed control and/or eradication plan in 2007. Educational outreach components needed for noxious aquatic weed control will be developed and implemented in 2006. Delta Wildlife will submit bi-annual reports to MDEQ on the status of noxious aquatic weed control in Bee Lake.

4. Budget

Projected costs for implementing practices required by this plan are listed in the table below. Funding for these items include MDWFP, USACOE, Delta Wildlife, and a potential extramural grant source.

Table 7.3. Projected Costs for Noxious Aquatic Weed Control

Practice	Unit Cost (w/installation)	Number of Units	Total Cost
MDWFP Monitoring	$300 day/yr.	3 days/yr./3years	$ 2,700.00
Delta Wildlife Assistance	$100.00/hr.	80 hrs.	$8,000.00
Alligator Weed Flea Beetles	$0.00/500 insects	10/yr.	$0.00
Stocking Flea Beetles	$300/day/yr.	1 day/yr./3years	$900
Other Control/Eradication (Other Possible Sources)	$20,000.00	1	$20,000.00
Total	**$20,700.00**		**$31,600.00**

D. ORGANIC ENRICHMENT – DESIRED BENEFITS

Impairments listed in the1996 Mississippi 303(d) list for Bee Lake included nutrients and organic enrichment. It is possible that phosphorus, nitrogen, and failing septic systems are contributing to organic enrichment in Bee Lake. Despite this concern, the WIT does not believe that there is enough data to support listed impairments for nutrients and organic enrichment in Bee Lake. Therefore, the WIT shall advise MDEQ that further monitoring and assessment should be conducted to determine if in fact there is a problem. If a problem is clearly identified, the WIT will then develop a plan of action to address the issues in an amended and updated version of this WIP.

1. Participants

(a). MS Dept. of Environmental Quality

MDEQ may provide monitoring and assessment to determine the extent and severity of organic enrichment, nutrient loading, and other associated water quality measurements.

(b). MS Dept. of Health

MDH may provide monitoring and assessment to determine the extent and severity of organic enrichment, nutrient loading, and other associated water quality measurements. Furthermore, if failing septic systems are identified as a concern, they will assist in developing an action plan to address the issue.

(c). U.S. Geological Survey

USGS may provide monitoring and assessment to determine the extent and severity of organic enrichment, nutrient loading, and other associated water quality measurements

(d). MS Dept. of Wildlife, Fisheries, and Parks

MDWFP may provide monitoring and assessment to determine the extent and severity of organic enrichment, nutrient loading, and other associated water quality measurements

(e). YMD Joint Water Management District

YMD may provide monitoring and assessment to determine the extent and severity of organic enrichment, nutrient loading, and other associated water quality measurements

2. Organic Enrichment Activities

The WIT shall submit a request to MDEQ asking for assistance in monitoring and assessing organic enrichment and nutrient loading in Bee Lake. MDEQ will then develop a monitoring program and possible ask for assistance from other agencies (listed above). If monitoring activities indicate a need to address organic enrichment and nutrient loading, the WIT will re-convene to develop a plan of action. This plan will be added to the WIP.

3. Schedule

The WIT shall make this request upon submission of the initial WIP to MDEQ in the spring of 2006. Monitoring schedules shall be determined by MDEQ or other agencies involved in the monitoring and assessment phase. The WIT will develop a plan of action based on needs determined by the assessment.

4. Budget

Projected costs for monitoring and assessment requested by the WIT are listed in the table below. Funding for these items may possibly include MDEQ, USGS, MDH, MDWFP, and YMD.

Table 7.4. Projected Costs for Monitoring Organic Enrichment

Practice	Unit Cost (w/installation)	Number of Units	Total Cost
Monitoring	$30,000.00/yr	2 yrs.	$60,000.00
Assessment	$5,000.00	1 time	$5,000.00
			Total $65,000.00

E. FUTURE DEVELOPMENT – DESIRED BENEFITS

With Bee Lake's aesthetic values, popularity among fishermen, and its proximity to Yazoo City and Jackson, future development of lake-front properties could pose a threat to the lake's water quality, natural beauty, and property values. By establishing covenants or building codes around Bee Lake, water quality, natural beauty, and property values can be preserved or improved.

1. Participants

Private Land and Business Owners

It will be the initiative of the private land and business owners to develop an association, develop covenants, or to work with Holmes County officials to develop building codes for Bee Lake. The WIT will assist if requested.

2. Future Development Activities

The private land and business owners of Bee Lake will determine the activities associated with this WIP action item. The WIT will assist if requested and keep abreast of all activities and actions.

3. Schedule

The WIT shall submit a letter to the land and business owners on Bee Lake respectfully requesting their consideration in developing covenants or building codes for future development. This letter will be mailed after the final submission of this WIP to MDEQ in the spring of 2006. Delta Wildlife will update MDEQ on any actions taken by the land and business owners through standard bi-annual reports.

4. Budget

Projected costs for implementing this WIP action items will be negligible and assumed by the land and business owners on Bee Lake.

F. FISHERIES MANAGEMENT – DESIRED BENEFITS

Fishing pressure, water quality, and many other factors limit the fisheries potential and overall fish productivity at Bee Lake. The stocks of sunfish and bass in Bee Lake are believed to be well below levels that were present in the 1950's and 1960's (MDWFP, Bee Lake Fishery Management Plan, 2005). Many of the factors limiting fish production will be addressed through other action items that reduce sedimentation, reduce turbidity, sustain lake levels, reduce noxious aquatic weeds, and improve water quality in general. However, intensive fisheries management is needed on Bee Lake to address intense fishing pressure and fish harvest. Through management, creel limits, slot restrictions, habitat modification, water quality improvements and other means, the fishery at Bee Lake can be improved to sustain current and future fishery demands, with a possible restoration of the sunfish and bass fisheries.

1. Participants

(a). MS Dept. of Wildlife, Fisheries, and Parks

MDWFP acts to manage the public fisheries of Mississippi, including Bee Lake. MDWFP Fisheries Biologists will continue to monitor, assess, and manage the fishery at Bee Lake.

(b). Delta Wildlife

Delta Wildlife will provide assistance to MDWFP to manage the fishery at Bee Lake as needed. Furthermore, Delta Wildlife's Adopt-a-Lake Program may be used to add additional deep water fishing structures for fishermen at Bee Lake.

(c). Recreational Fishermen

Recreational fishermen must recognize all regulations and management activities implemented on Bee Lake. Full cooperation with MDWFP will be needed to properly manage the fishery. Additionally, the Adopt-a-Lake Program administered by Delta Wildlife will require the assistance of fishermen and residence of the lake to be implemented.

2. Fisheries Management Activities

MDWFP monitors fish species diversity, populations, age structure, sizes, and harvest at Bee Lake. These activities will continue. Furthermore, MDWFP actions are guided by a Fisheries Management Plan for Bee Lake that was implemented in 2005. Through monitoring activities, creel limits, slot limits, and other regulations may be placed on the harvest of fish in the lake. MDWFP is also developing a new map for the lake with depth profile and user features. Delta Wildlife also encourages fishermen to participate in the Adopt-a-Lake Program whereas structures will be placed in deep water areas of the lake for summer and early fall fishing.

3. Schedule

MDWFP implemented the Bee Lake Fisheries Management Plan in the spring of 2006. The new lake map will be available in 2007. If interest exists, the Adopt-a-Lake Program will be implemented in 2006. Delta Wildlife will submit a report of actions to MDEQ bi-annually.

4. Budget

Projected costs for fisheries management are listed in the table below. Funding for these items include MDWFP, Delta Wildlife, and recreational fishermen.

Table 7.5. Projected Costs for Fisheries Management

Practice	Unit Cost (w/installation)	Number of Units	Total Cost
Monitoring: - field Fish Population - Reports	$590 day $266 day	4 2	$2,892
Monitoring: 2007 - field Harvest Survey -Reports	$288 day $266 day	28 10	$10,730
Mgt. Plan Development	$266 day	7	$1,860
Regulatory Enforcement (2 officer patrol)	$538 day	20	$10,760
Map Development - field Drafting	$288 day $266 day	5 3	$2,238
Adopt-A-Lake	$250.00/structure	30 structures	$7,500.00
		Total	$35,980.00

G. LAKE ACCESS – DESIRED BENEFITS

During peak fishing periods at Bee Lake (February, March, and April), there are not enough boat ramps to service the needs of the public. There are only two public boat ramps (both fee based) on the 1,400-acre lake. For those that do launch their boats during the peak fishing season, many must park their vehicles and trailers on the shoulder of US Highway 49E, creating safety issues for motorists. At least one additional public boat ramp with adequate parking is needed to service the public during peak fishing periods. A public fishing pier would also be beneficial.

1. Participants

(a). MS Dept. of Wildlife, Fisheries, and Parks

MDWFP, through the Sports Fish Restoration Program, provides funding for the construction of boat ramps and fishing piers on public waters. MDWFP maintains a full, year-round, crew building boat ramps around the state. If a site is identified, MDWFP will provide assistance in the construction of a boat ramp and/or pier at Bee Lake.

(b). Delta Wildlife

Delta Wildlife will work with MDWFP to identify potential sites for a future boat ramp and/or pier. Delta Wildlife will also work with the landowner to arrange an easement for MDWFP or compensation for the land if needed.

(c). Private Landowners

The boat ramp will be constructed on private property. The landowner(s) will either donate the land through an easement or request minimal compensation.

2. Lake Access Activities

Delta Wildlife and MDWFP will work to identify a site for the boat ramp and/or pier. If a site is identified, Delta Wildlife and MDWFP will work with the landowner to secure an easement for construction. MDWFP will then survey, design, and construct the boat ramp.

3. Schedule

Site identification will begin in the spring of 2006. Construction will be completed within 6 months of site identification. Delta Wildlife and/or MDWFP shall submit a status report of progress bi-annually to MDEQ.

4. Budget

Projected costs for boat ramp construction are listed in the table below. Funding for these items include MDWFP, Delta Wildlife, and Private Landowners.

Table 7.6. Projected Costs for Boat Ramp Construction

Practice	Unit Cost (w/installation)	Number of Units	Total Cost
Site ID	$500.00	1	$500.00
Easement	$5,000.00/ac.	2 acres	$10,000.00
Construction	$30,000.00	1	$30,000.00
			Total **$40,500.00**

VIII. WIP IMPLEMENTATION BUDGET

The total cost of the implementation components listed in this section of the Bee Lake Watershed Implementation Plan is listed below in Table 3.3. This does not include WIP Educational Outreach or WIP Monitoring budgets listed in each respective section. The Grant Total WIP Budget is listed at the end of this document.

Table 8.1. Project Costs for Implementation Phase of WIP

Action Item	Cost
Agricultural BMPs	$1,276,075.00
Weir Reconstruction	$307,000.00
Noxious Aquatic Vegetation	$31,600.00
Organic Enrichment	$65,000.00
Future Development	$0.00
Fisheries Management	$35,980.00
Lake Access/Boat Ramp	$40,500.00
Total	**$1,756,155.00**

IX. EDUCATION STRATEGY – DESIRED BENEFITS

The overall objective of community education in the Bee Lake 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 effects.
- Increase public awareness of the long-term environmental and economic advantages of protecting and improving water quality and habitat in Bee Lake watershed.
- Increase public awareness of methods that prevent the spread of noxious aquatic weeds.
- Increase public awareness of the importance of fisheries management to sustain the fishery at Bee Lake.

A. SIGNAGE

Signage in the proper location and with the proper message should provide long-term educational opportunities within the watershed. Signs should be erected for both the project in general and for specific aspects of the project.

1. Activities and Participants

(a). Highway Signs - Two (2) general project signs should be erected on both north bound and south bound lanes of U.S. Hwy. 49 E. at the watershed boundary line. A general message will be conveyed along with the logos of all partners involved in the project.

Primary Partner – MS. Dept. of Environmental Quality

(b) Aquatic Weed Signs – Signs should be erected at all boat ramps educating fishermen about noxious aquatic weeds in the lake and the information to help fishermen prevent further spreading of the weeds in Bee Lake and transfer to other lakes.

Primary Partner – Delta Wildlife

(c) Lake Front BMP Signs – Signs should be placed at structures installed on the lake bank facing the lake, to inform the fishermen that the adjacent landowners are doing their part to improve the fishery and reduce sedimentation.

Primary Partner – Delta Wildlife

(d) BMP Signs – Signs should be erected at select BMPs installed as a part of this project for use during field days and tours.

Primary Partner – Delta Wildlife

(e) Weir Sign – A sign should be erected at the weir informing the public as to the importance of the weir.

Primary Partner – YMD Joint Water Management District

(f) Lake Map and BMP Sign at Boat Ramp – A large sign should be erected at the primary boat ramp (Bell's Grocery) and any other newly established boat ramps as a part of this project identifying the BMPs and other practices implemented to improve the fishery and water quality in the lake.

Primary Partner – Delta Wildlife

2. Indicators

MS Dept. of Transportation annual traffic statistics for U.S. Hwy. 49 E. can be used to document the number of vehicles that pass within a visual of the highway signs. At the primary boat ramp (a fee based boat ramp) the boat ramp owner will report the number of boats launched to provide an indication of how many people were exposed to all signs erected at the boat ramp and lake front signs. BMP signs will be seen by those who attend field days and tours. Attendance will be documented after the tours are held. Traffic at the weir sign cannot be documented, but is heavily used by bank fishermen.

Schedule

All signs will be designed, printed and erected in 2006.

Budget

Funding for signage to come from MDEQ, EPA, Delta Wildlife, Delta F.A.R.M., USDA-NRCS, and/or YMD.

Table 9.1. Projected Costs for Signage

Sign(s)	Design, Printing, and Material Cost	Installation	Total Cost
Highway Signs (2)	$2,000.00	$200.00	$2,200.00
Aquatic Weed Signs (1)	$350.00	$100.00	$450.00
Lake Front BMP Signs (8)	$1,600.00	$800.00	$2,400.00
BMP Signs (12)	$1,200.00	$1,200.00	$2,400.00
Weir Sign (1)	$200.00	$100.00	$300.00
Lake Map and BMP Boat Ramp Sign (1)	$1,000.00	$100.00	$1,100.00
			Total **$8,850.00**

B. BMP MANUALS FOR AGRICULTURAL PRODUCERS IN THE WATERSHED

1. Activities and Participants

There are several resources that provide extensive information on the installation of BMPs on ag lands to reduce non-point source pollution, regulatory laws, USDA Conservation Programs, and other cost-sharing opportunities. Among these resources includes The Delta F.A.R.M. Program Manual and a BMP Guide by the Mississippi Soil and Water Conservation Commission. Both publications will be distributed to all landowners and producers in the watershed.

Primary Partners – Delta F.A.R.M. and MS Soil and Water

2. Indicators

There are 14 landowners and/or producers in the watershed. All will receive these aforementioned documents. Furthermore, Delta F.A.R.M. will document the BMP's in use and new BMP's implemented within the watershed on an annual basis through an Evaluation process. This information (in an anonymous format) will be annually reported to MDEQ in the Delta F.A.R.M. Annual Environmental Stewardship Report.

3. Schedule

All deliverables will be distributed in 2006. Annual evaluations will begin after the 2006 cropping year has been completed. Evaluations will be annually performed thereafter.

4. Budget

Funding for printed materials and distribution shall come from Delta F.A.R.M. and the MS Soil and Water Conservation Commission. Annual evaluations and data analysis will be performed by Delta F.A.R.M. Results of the annual evaluation will be published by Delta F.A.R.M.

Table 9.2. Projected Costs for BMP Booklets and Documentation

Item	Cost	Unit	Total Cost
MSWCC Booklet	$2.06/ea.	14	$28.84
Delta F.A.R.M. Manual	$2.06/ea.	14	$28.84
Annual Evaluations	$35.00/ea.	14/yr.	$490.00/yr.
Annual BMP Report	$1,850.00	1/yr.	$1,850.00/yr
		Total	**$2,397.68**

C. HANDOUTS FOR NOXIOUS AQUATIC WEEDS

1. Activities and Participants

Information specific to the types of noxious aquatic weeds that threaten Bee Lake will be developed and printed on a brochure. Identification, prevention of spreading, and other information will be included. This information will be passed out at all fee-based boat ramps and offered through a dispenser at other boat ramps. Furthermore, the information will also be printed on the back of lake maps developed by MDWFP. This will be discussed in more detail later.

Primary Partners – MDWFP and Delta Wildlife

2. Indicators

By knowing the number of boat launches, the number of brochures handed out at fee-based boat ramps can also be determined. At other locations, the number of brochures placed in the dispenser will be known so a proper count can be acquired.

3. Schedule

Brochures will be developed, printed and distributed in 2006. The brochures will also be continuously distributed thereafter.

4. Budget

Funding for development, printing, and distribution is to come from MDEQ, EPA, Delta Wildlife, and MDWFP.

Table 9.3. Projected Costs for Aquatics Brochure

Item	Cost	Unit	Total Cost
Development & Design	$1,000.00	1 time	$1,000.00
Printing	$0.35	5000	$1,750.00
Distribution & Dispensers	$200.00	4	$800.00
		Total	**$3,550.00**

D. LAKE MAPS

1. Activities and Participants

MDWFP is in the process of doing a comprehensive topography survey of Bee Lake. Once all the data are collected, a map will be developed for lake users. The map will be offered in a printed format and electronically from the MDWFP website. A summary of the Bee Lake WIP and the Bee Lake Noxious Aquatic Weed Control Brochure will be printed on the back of all printed maps.

Primary Partners – MDWFP and Delta Wildlife

2. Indicators

The number of maps printed will be known. It will be difficult to obtain information that would indicate how many are distributed as the maps will be offered in many different locations and through many different partners.

3. Schedule

The maps and associated information will be printed in late 2006.

4. Budget

MDWFP will develop all maps. Delta Wildlife and MDWFP will share the cost of printing and distribution.

Table 9.4. Projected Costs for Lake Maps

Item	Cost	Unit	Total Cost
Survey and Development	$2,238.00	1 time	$2,238.00
Design	$1,000.00	1 time	$1,000.00
Printing	$5,000.00	1 time	$5,000.00
Distribution	$1,000.00	1 time	$1,000.00
			Total **$9,238.00**

E. CREEL SURVEY DATA

1. Activities and Participants

Multiple surveys are performed at random throughout the year, but at least one is always done during the peak usage period in April. As the survey provides MDWFP with useful information for fisheries management, it also provides MDWFP with an opportunity to education fishermen on issues relevant to the lake. MDWFP has agreed to use these surveys to pass out information about the WIP and expand their survey to collect data that may provide better metrics to evaluate the success of the fisheries management components of the WIP and other WIP components.

Primary Partner – MDWFP

2. Indicators

MDWFP will work with the WIT to further expand the Creel Survey form used at Bee Lake. Reports from all surveys will be available on the MDWFP website.

3. Schedule

MDWFP intends to perform at least 3 creel surveys on Bee Lake each year for the next 3-years.

4. Budget

MDWFP will accrue all costs.

Table 9.5. Projected Costs for Creel Survey Data

Item	Cost	Unit	Total Cost
Data Collection and Report	$10,730.00	1/year x 3	$32,190.00
		Total	**$32,190.00**

F. PUBLIC FISHING PIER

1. Activities and Partners

As a part of the Implementation Component of the WIP, MDWFP and Delta Wildlife will attempt to identify and build a public fishing pier on Bee Lake. However, if this item is successfully implemented, it will provide additional public outreach, educational, and economic opportunities for the community. Contingent on the establishment of the pier, MDWFP and the MSU-ES have agreed to hold a fishing rodeo on Bee Lake for children and use the pier to promote outdoor classroom activities in local schools.

Primary Partners – MDWFP and MSU-ES

2. Indicators

Any fishing rodeos or outdoor classroom activities would be documented. Other public use would not be documented.

3. Schedule

MDWFP and MSU-ES will begin scheduling use of such a pier as soon as a pier is constructed.

4. Budget

MDWFP will accrue all fishing rodeo costs and MSU-ES shall coordinate local school usage free of charge.

Table 9.6. Projected Costs for Public Fishing Pier Usage

Item	Cost	Unit	Total Cost
Children's Fishing Rodeo	$2,000.00	1/yr. X 2	$4,000.00
		Total	**$4,000.00**

G. DIRECT MAIL

1. Activities and Participants

Several direct mail pieces can be used to further educate the community on the WIP and the needed steps to sustain improvements accrued.

(a). Fishermen – A direct mail piece should be developed specifically for Bee Lake Fishermen. Information about the WIP in general, noxious aquatic weeds, fisheries managed, and other items can be thoroughly explained. Targeted individuals would be identified through fishing license sales, creel survey data, and fee-based boat launch application forms.

Primary Partners – MDWFP and Delta Wildlife

(b). Home and Lake House Owners – Information about approved septic systems should be provided to all home owners around the lake. This should be developed by MDH. Furthermore, a summary of the WIP should be included.

Primary Partners – MDH and Delta Wildlife

2. Indicators

A list of all recipients of direct mail pieces will be provided to MDEQ.

3. Schedule

Direct Mail pieces will be developed and distributed in 2006.

4. Budget

MDH and Delta Wildlife will share the cost of Direct Mail Pieces.

Table 9.7. Projected Costs for Direct Mail

Item	Cost	Unit	Total Cost
Development	$500.00/each	2	$1,000.00
Printing	$0.60/each	1,200	$720.00
Mailing/Delivery	$0.39	1,200	$468.00
		Total	**$2,188.00**

H. MISSISSIPPI OUTDOORS PRODUCTIONS

1. Activities and Participants

MDWFP publishes Mississippi Outdoors Magazine, produces Mississippi Outdoors TV show, and hosts a weekly radio show. These media outlets reach many hunters, fishermen, and outdoorsmen in the State of Mississippi. These opportunities shall be utilized to educate the public on the Bee Lake WIP and specific aspects of the project.

(a). **Magazine** – At least one article will be written about the Bee Lake WIP and published in the Mississippi Outdoor Magazine.

Primary Partner – MDWFP

(b). **TV Show** – At least one feature will be filmed on Bee Lake highlighting the project and fishery and run on the Mississippi Outdoor TV Show.

Primary Partner – MDWFP

(c). **Radio** – At least one interview per year will be made on Mississippi Outdoor Radio pertaining to the project.

Primary Partner – MDWFP and MSU-CFR

2. Indicators

Circulation of the Mississippi Outdoors Magazine will be documented and reported to MDEQ. Listenership and viewership will be documented to the extent possible of the radio and TV shows.

3. Schedule

Educational outreach components associated with Mississippi Outdoor Productions will begin in 2006.

4. Budget

MDWFP and MSU-CRF (sponsor of radio show) will fund these items.

Table 9.8. Projected Costs for Mississippi Outdoor Productions

Item	Cost	Unit	Total Cost
Magazine Article	$1,000.00	1	$1,000.00
TV Show Spot	$2,400.00	1	$2,400.00
Radio Spots	$500.00	3	$1,500.00
			Total **$4,900.00**

I. WEBSITE LINKAGES

1. Activities and Partners

As many agencies and organizations are involved in this WIP, information about this project will be listed on many different websites. Some websites will take a holistic approach to describing the WIP and all associated information while others will only have information on specific items. MDEQ and Delta Wildlife will

attempt to make sure all sites are linked together so all information can be accessed easily.

Primary Partners – MDEQ and Delta Wildlife

Secondary Partners – USGS, YMD, MDH, MDWFP, Delta

2. Indicators

Websites will monitor traffic. Traffic will be reported to MDEQ.

3. Schedule

As websites information is uploaded, they will be linked beginning in 2006 and throughout the project.

4. Budget

MDEQ and Delta Wildlife will develop holistic websites for this project. Other agencies will upload specific items and PDFs. These services will be hard to track as a budget item; however, those that can are listed below.

Table 9.9. Projected Costs for Website Development and Linkage

Item	Cost	Unit	Total Cost
MDEQ	$3,500.00	1	$3,500.00
Delta Wildlife	$1,000.00	1	$1,000.00
USGS	$2,500.000	1	$2,500.000
Others	$5,000.00	Multiple	$5,000.00
		Total	**$12,000.00**

J. PRESS RELEASES AND PRINTED MATERIALS

1. Activities and Participants

Numerous press releases and printed materials will be made throughout the WIP implementation. Each stage of the project and each public event will be advertised by targeted press releases and other printed materials. Press releases will be developed by many of the WIT partners. Printed materials will be developed by Delta Wildlife, Delta F.A.R.M. and MDEQ.

Primary Partners – All WIT members

2. Indicators

All press releases will be documented by the circulation of the publication it runs in. Printed materials will be distributed to a target audience depending on the purpose.

3. Schedule

Press releases and printed materials will be developed and distributed throughout the 3-year project.

4. Budget

It is difficult to estimate cost of these items. The following is a close approximation.

Table 9.10. Projected Costs for Press Releases

Item	Cost Per Set	Number	Total Cost
Press Releases	$250.00/each	9	$2,250.00
Printed Materials	$500.00/each	3	$1,500.00
Feature Articles	$500.00/each	5	$2,500.00
			Total **$6,250.00**

K. CONSERVATION FAIRS, TOURS, AND FIELD DAYS

1. Activities and Partners

Several public activities will be scheduled as a part of the WIP. These activities include a small community event, conservation fair, a field day, and several smaller private tours.

(a). Small Community Event – This event will be a "kick-off" event that will be only for the community of Thornton and local residents in the spring of 2006. The event will include a lunch and discussion of the WIP.
Primary Partners – MSU-ES, MDWFP, Delta Wildlife, MDEQ

(b). Conservation Fair – This will be a larger event with a fishing rodeo, BBQ cookout, field tour for farmers, Q & A session, press conference, and other events. This event is scheduled for 2007.
Primary Partners – MDEQ, MSU-ES, Delta Wildlife, MDWFP

(c). **Field Day** – At least one additional field day will be held other than the one during the Conservation Fair. This event will be for producers, natural resource professionals, and regulatory agencies. The tour will highlight the BMPs that were installed to improve the lake. This tour is scheduled for the 2007.
Primary Partners – Delta Wildlife, Delta F.A.R.M., NRCS, MDEQ

(d) Private Tours – Any group of 6 or more may request a private field tour of the project area during the project. Delta Wildlife will host these tours.
Primary Partners – Delta Wildlife and Delta F.A.R.M.

(j.) Indicators

Attendance to all WIP associated activities will be documented and reported to MDEQ.

(k.) Schedule

All aforementioned activities will take place in 2006 and 2007. Private tours may continue after 2007.

l. Budget

Major funding for these events will be paid for by Delta Wildlife.

Table 9.11. Projected Costs for Fairs, Tours and Field Days

Item	Cost	Unit	Total Cost
Small Event	$1,500.00	1	$1,500.00
Conservation Fair	$3,500.00	1	$3,500.00
Field Tours	$1,000.00	1	$1,000.00
Private Tours	$500.00	5	$2,500.00
			Total **$8,500.00**

L. TOTAL EDUCATION STRATEGY BUDGET

Table 9.12. Project Costs for Education

Item	Cost	Unit	Total Cost
Signage			$8,850.00
BMP Booklets			$2,397.00
Aquatics Brochure			$3,550.00
Lake Maps			$9,238.00
Creel Surveys			$32,190.00
Fishing Rodeo			$4,000.00
Direct Mail			$2,188.00
MS Outdoors Productions			$4,900.00
Website and Linkage			$12,000.00
Press Releases and Print			$6,250.00
Tours, Fairs, Etc…			$8,500.00
			Total **$94,063.00**

X. EVALUATION

A. Monitoring

There will be at least two (2) separate water quality monitoring plans for the Bee Lake WIP. The purpose of the first plan is to document baseline water quality parameters before, during, and after the implementation of the WIP. Information will be used to document the baseline water quality benefits accrued by the Bee Lake WIP. Parameters will include lake depth (water level at gage elevation), precipitation, temperature, conductivity, and turbidity. These parameters will be taken continuously (real-time) for at least a 3-year period and recorded by the U.S. Geological Survey. Data may be obtained by logging on to the USGS website at: http://waterdata.usgs.gov/ms/nwis/uv?dd_cd=01%2C02%2C03%2C04%2C06%2C07&format=gif&period=7&site_no=072873355. Data collection began on September 7, 2005 from a permanent station installed on the Bee Lake bridge just off U.S. Highway 49E near Thornton, MS. The monitoring plan will cost approximately $30,000.00 per year and will be split between the USGS and MS Dept. of Environmental Quality.

The second water quality monitoring plan will be designed to evaluate and assess organic enrichment and nutrient loading in Bee Lake. At this point in time, there is not sufficient data to support an action plan to address organic enrichment and nutrients. It is not even known if organic enrichment and nutrient loading is a problem at the lake despite its 303(d) listing. The Mississippi Department of Environmental Quality will develop and implement an organic enrichment and nutrient monitoring program to evaluate and assess the situation. If organic enrichment and/or nutrients are identified as a serious concern at Bee Lake, the WIT and MDEQ will re-convene to develop an action plan to address the situation.

Other, non-water quality associated components of the WIP will also be monitored. MDWFP will monitor the success of noxious weed control, fisheries management, and the installation of additional boat ramp(s). Future development will be monitored by the land and business owners in the watershed.

B. Assessment of Progress

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 by the WIT and MDEQ. Delta Wildlife will track and document the implementation of all WIP components. Water quality data from the USGS monitoring station, as well as information on activities occurring in the watershed and stakeholder concerns collected during the period from 2005 through 2008 will be utilized. Assessment will be science-based to the extent possible. Reductions in sediment loading will be assessed by reviewing turbidity and conductivity data from the USGS water quality monitoring station before and after implementation of the WIP. At least a 33% reduction is expected. The stability of the lake level after weir construction will be assessed by using the USGS gage depth data. MDWFP will map noxious aquatic weeds before and after the project to assess the effectiveness of weed control measures.

MDWFP will also assess the fisheries management plan base upon fish sampling procedures, creel surveys, and other procedures. MDEQ will assess the need for further action to address organic enrichment and nutrients based on monitoring data. Boat ramp assessments will be simply based on the fact that one or more boat ramps have been constructed on the lake. Future development will be assessed to the extent possible, but will more than likely require a longer time line.

C. Evaluation of the WIP

This watershed implementation plan will be evaluated and revised in 2009, the next Management Planning year of the Basin Group II Basin Management Cycle. The evaluation of this plan will be organized by the Bee Lake Watershed Implementation Team, beginning in January 2009. 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 WIT. One month will be allowed for evaluation and submittal of comments. Therefore, comments will be due two months after the evaluation procedure is initiated. Evaluation may take place every 5 years if necessary.

Evaluation of the plan will occur in two ways. The first way will be a science-based assessment (to the extent possible) of whether the plan goals are being achieved. The second way will determine if the plan reflects the targeted goals subsequent to plan completion. The actions taken by the initial WIP should change the condition of the watershed, requiring modifications to the watershed's description.

D. Plan Revision Procedure

After evaluation, WIT and 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 Bee Lake, the watershed implementation plan will be revised to address a different restoration issue or issues, or to protect the water quality of the lake. If the evaluation criteria are not being met, the approach for restoring Bee Lake watershed quality will be revised based on knowledge that has been gained since 2004. The draft of the revised watershed implementation plan will be completed in April; one month after the evaluation has been completed.

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 imple-

mentation 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 final watershed implementation plan. The final watershed implementation plan will be submitted to the Implementation Team for review and approval. After the final watershed implementation plan has been approved, the Implementation Team will notify their stakeholders of the completion and availability of the final plan for use as a guide to watershed restoration and protection activities. Revisions to the plan may take place every 5 years if needed.

E. EVALUATION BUDGET

Item	Cost	Unit	Total Cost
Monitoring – USGS	$20,000.00/yr.	5 years	$100,000.00
Monitoring – MDEQ	+/-$65,000.00	1 time	$65,000.00
Assessment of Progress	$10,000.00	Every 3-5 years	$10,000.00
Evaluation of WIP	$10,000.00	Every 3-5 years	$10,000.00
Revision of WIP	$10,000.00	Every 3-5 years	$10,000.00
			Total **$195,000.00**

F. TOTAL WIP BUDGET

Item	Cost	Unit	Total Cost
Implementation			$1,756,155.00
Education Strategy			$94,063.00
Evaluation			$185,000.00
			GRAND TOTAL **2,035,218.00**

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APPENDIX

APPENDIX A: Stressors

Stressor:	**Sediment/Turbidity**
Justification:	Non-point source agricultural runoff and bank sloughing due to backwater flooding from the Yazoo River and Tchula Lake.
Location:	Bee Lake
Extent:	Entire lake
Stressor:	**Lake Level/Weir**
Justification:	Poor construction of original weir and insufficient maintenance has cause partial failure of weir function.
Location:	GPS 90.39895 33.08561
Extent:	Affects entire fishery, public access, and water storage volume.
Stressor:	**Noxious Aquatic Vegetation**
Justification:	Natural dispersal and boat hull transfer of Alligator weed and Coon-tail has threatened public access, provides organic enrichment, and reduces DO levels.
Location:	Bee Lake
Extent:	Throughout the lake, primarily on the upper ¼ of the lake.
Stressor:	**Organic Enrichment**
Justification:	Not known, speculation indicates agricultural runoff, failing septic systems, and decaying noxious aquatic vegetation.
Location:	Bee Lake
Extent:	May affect entire lake.

APPENDIX B: History

After finding that Bee Lake could completely dry up during periods of extended and extreme drought, local farmers who depended on the lake for irrigation water constructed the first weir on the lake. That was more than 30 years ago. Since that time, local farmers and residents have taken an active role in preserving the lake, whether it be for irrigation, aesthetics, or the fishery.

In more recent years, the fishery had become so popular that the lake began to be monitored much more closely by fisheries biologists from the Mississippi Department of Wildlife, Fisheries, and Park. It was soon learned that loose sediment on the bottom of the lake was limiting fisheries production. This was attributed to non-point source runoff from adjacent cropland. Furthermore, invasive exotic aquatic weeds were also found in the lake. In the meantime, the EPA lowered its allowable DDT levels in fish, causing MDEQ to post new DDT fish advisories around the lake. This coupled with a new 303(d) list of impaired streams and rumors about a potential new regulatory process called "TMDL's" created a new found concern by local farmers and residents.

Delta Wildlife, Inc. was made aware of this renewed concern for the lake in 2000 as fishermen began calling about the Alligator Weed and declining fishery. The Yazoo-Mississippi Delta Joint Water Management District (YMD) was also contacted during the same period by farmers who were concerned about the old weir that had begun to leak. The next year, Delta Wildlife, Inc. secured a 319 Grant from MDEQ to put buffers in place around the lake to reduce erosion. Furthermore, YMD budgeted to repair or rebuild the Bee Lake Weir in 2006.

Delta Wildlife installed over 7 miles of buffers around the lake in 2002 while YMD addressed the failing weir by patching it until funding was secured for a complete reconstruction. During this process, both YMD and Delta Wildlife, Inc. gained the trust and friendships of the landowners, farmers, and residencts in the watershed.

When Bee Lake was placed on the priority list for a Watershed Restoration Plan in 2004, Delta Wildlife, Inc. stepped forward to fully develop and implement a plan. Through a process of inclusive planning from both technical and local stakeholders, the plan is presented in this document, and the first phase will be implemented in the next two years. Delta Wildlife, Inc. continues to play a major role in the water quality components of this project while YMD has focused on the water quantity components. However, it is the willing participation by local farmers and residents that will make the development and implementation of this plan successful.

APPENDIX C: Checklist of Watershed Implementation Plan Elements

Required Watershed Elements	Located Reference
1a. Non-Point Source Agricultural Runoff. The primary concern is sediment and must be control throughout the watershed. Critical areas have been identified and will be addressed first followed by secondary and less critical areas, totaling approximately 14,000 acres of cropland. 319 funds, USDA programs, and other sources will be used to address these sites with structural and vegetative measures. 1b. Lake Level/Weir. The weir shall be replaced to protect water level in the lake for irrigation use, recreation, and fisheries. This will be done using USDA funding. 1c. Noxious Aquatic Vegetation. Alligator Weed and Coon-tail threatens both recreational access and water quality through organic enrichment and DO demand during the fall and winter. Alligator Weed will be treated by a biological means and funded by the USACE and MDWFP. Coon-tail will be treated with herbicides. 1d. Organic Enrichment. Bee Lake is listed for Organic Enrichment although all the causes are not known. MDEQ will continue to monitor Organic Enrichment and attempt to identify all causes before any action is taken. 1e. Future Development. Landowners around the lake are concerned with future development. However, not water quality components were identified and therefore this concern will not be addressed through implementation. 1f. Fisheries Management. Heavy fishing pressure can threaten the lake. MDWFP will continue to monitor the fishery and place more strict creel and/or slot limits on the lake as needed. 1g. Lake Access. Fishermen want additional access to the lake. However, private landowners around the lake are unwilling to provide land for additional boat ramps. Solutions to boat ramp crowding will be discussed with the owners of the current boat ramps.	Table 4.1
1a. 33% to 60% reduction of total sediment load; 1b. 70% reduction of total nitrogen load 1c. 33% reduction of total phosphorus load 1d. 33% reduction of DDT and Toxaphene loads	Chapter VII, Section A (Tetra Tech 2003)
• Structures for Water Control (+/- 50 units) • Overfall Pipes (+/-20 units) • Riparian Buffers (+/-20 acres) • Grass Filter Strips (included in riparian buffer estimate) • Grass Waterways (+/-15 acres) • Stiff Grass Hedges (+/-20 sites) • Field Borders (+/-5 acres) • Land Forming (+/-500 acres) • Bank Stabilization (as needed, +/-15 sites, may include grass waterway estimate) • Cover/Double Cropping (+/-500 acres) • Drainage Improvement (+/-2 miles)	Chapter VII, Section A, Subsection 2

APPENDIX C continued

Required Watershed Elements	Located Reference
Ag BMP $1,276,075.00 Weir $307,000.00 Noxious Aquatics $31,600.00 Organic Enrichment $65,000.00 Future Development $0.00 Fisheries $35,980.00 Lake Access $40,500.00 TOTAL $1,756,155.00	Table 8.1
The overall objective of community education in the Bee Lake 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.	Chapter IX
All BMPs, both structural and vegetative, will be implemented by December 31, 2007.	Chapter VII
The USGS has a real time water quality monitoring station on Bee Lake that will assess the real-time affects (before, during, and after) of 7 basic water quality parameters. MDEQ will take annual water quality samples at the lake to measure more specific parameters. Furthermore, MDEQ will estimate the reduction of sediments and other pollutants from each structural and vegetative structure installed as a part of this project through the used of a modeling system developed by EPA.	Chapter X

APPENDIX D: Section 319 Funded Projects and Maps

Arthur Abercrombie
Co-Owner, Quofaloma Plantation
P.O. Box 2471
Baton Rouge, LA 70821
(225) 381-0259

Cooperator providing $160,631.00 match towards project through installation and maintenance.

Item	Unit Cost*	# of Units
12" x 30' Plastic Pipe	$142	1
15" x 30' Plastic Pipe	$190	5
18" x 30' Plastic Pipe	$267	10
24" x 30' Plastic Pipe	$416	5
30" x 40' Steel Culvert	$1,600	1
Installation of Above	$1,000	1
24" x 30' x 2' 45 degree drop w/ splatter plate	$1,400	1
Installation of Above	$1,000	1
ditch excavation	$1.50	9360 ft.
Hydro Mats	$130/roll	52 rolls

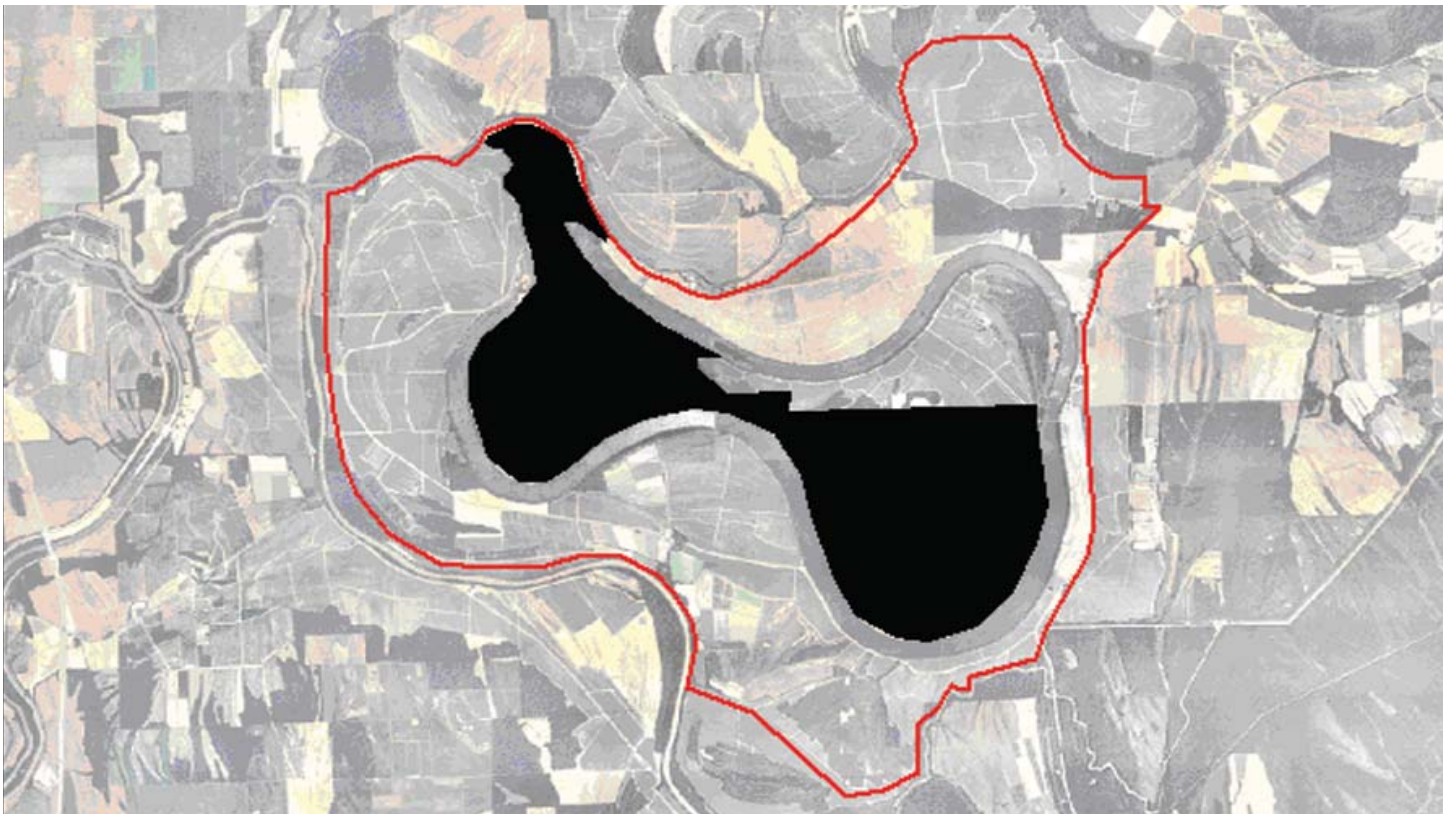
Jamie, Rich, and/or Sonny Peaster
Gumgrove Plantation
Jenkins Plantation
Renter, Part of Holmes Co. 16th Section
964 Belle Air Circle
Yazoo City, MS 39194
662.746.2883

Cooperator providing $22,000.00 match towards project through installation and maintenance.

Item	Unit Cost*	# of Units
15" x 30' Plastic Pipe	$190	2
24" x 40' x 3' drop w/ splatter plate	$1,800.00	1
Installation of Above	$1,000.00	1
18" x 35' x 2' 45 degree drop w/ splatter plate	$1,200.00	1
Installation of Above	$1,000.00	1
24" x 30' w/ slotted side outlet	$1,000.00	4
Installation of Above	$1,000.00	4

Bryan Jones
Owner, Big Bonanza
Owner, Little Bonanza
Renter, Lakeland Plantation
Renter, part of Holmes Co. 16th Section
P.O. Box 1062
Yazoo City, MS 39194
662.746.0360

Cooperator providing $239,500.00 match towards project through a donation of pipe, installation and maintenance.



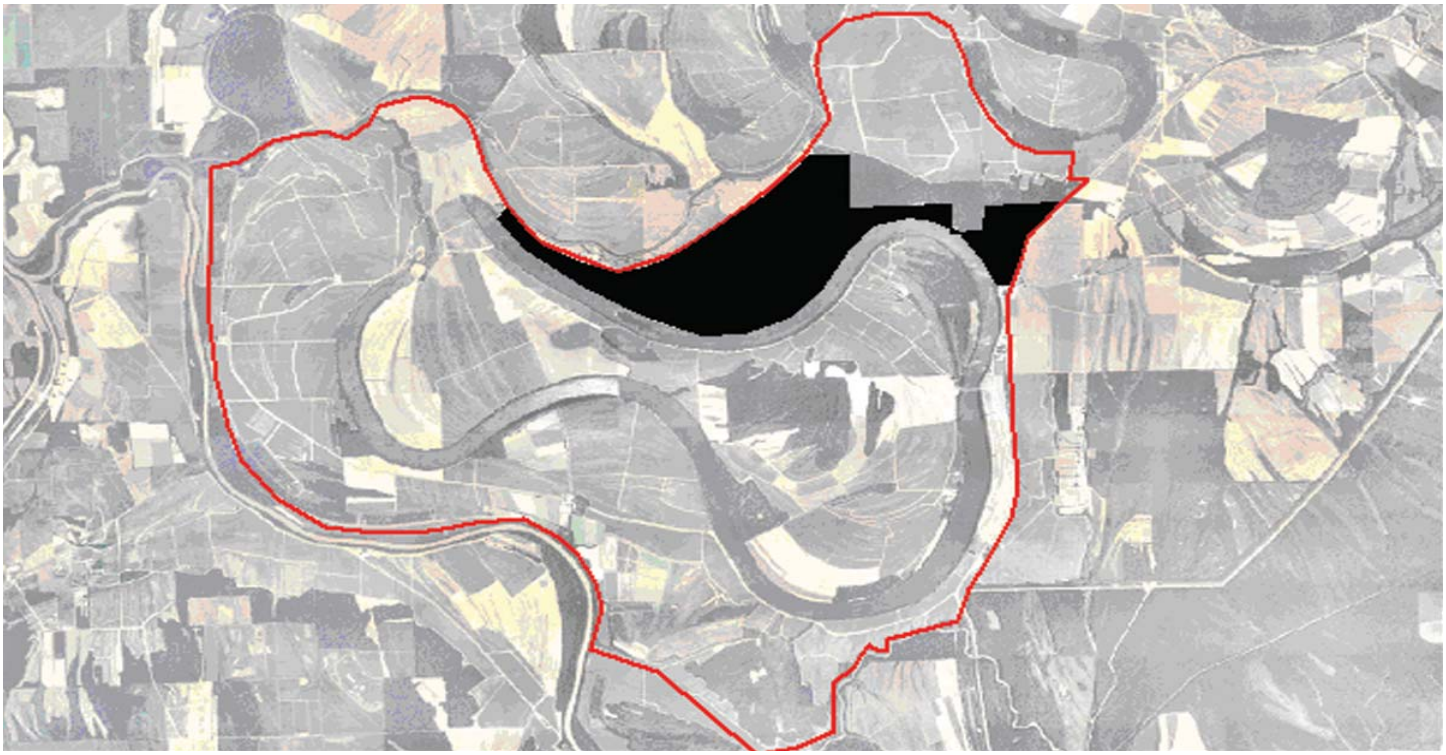
Item	Unit Cost*	# of Units
12" x 30' Plastic Pipe	$142	4
15" x 30' Plastic Pipe	$190	5
18" x 20' Plastic Pipe	$178	25
24" x 30' Plastic Pipe	$416	17
24" x 20' Plastic Pipe	$277	2
24" x 30' x 3' riser	$1,250	1
Installation of above	$1,000	1
18" x 30' x 3' drop on front	$1,000	1
Installation of above	$1,000	1
24" x 20' x 3' riser w/ 6" perm. stoplogs	$1,000	1
4' riser only (48" x 48")	$500	1

Item	Unit Cost*	# of Units
Installation of above	$500	1
24" x 30 x 3' riser on front and 5' 45 degree drop on rear	$1,800	2
Installation of above	$1,000	2
Installation of 60" x 60' steel culvert and all associated dirt work, rip rap placement, etc…	$10,000	1
18" x 30' x 5' 45 degree drop	$1,250	1
Installation of above	$1,000	1
30" x 32' steel culvert	$1,280	1
Installation of above	$1,000	1
24" x 30' x 3' drop on front	$1,500	1
Installation of above	$1,000	1
24" x 30' x 2' drop w/ splatter plate	$1,500	1
Installation of above	$1,000	1
24" x 30' x 3' drop w/ splatter plate	$1,550	2
Installation of above	$1,000	2
90# Rip Rap	$1,000/truck	10

William Thompson
Co-Owner, Pluto Plantation
Renter, Maryland Plantation
3410 Bee Lake Road
Tchula, MS 39169
(662) 571-3653
Cooperator providing $32,500.00 match towards project through installation and maintenance.

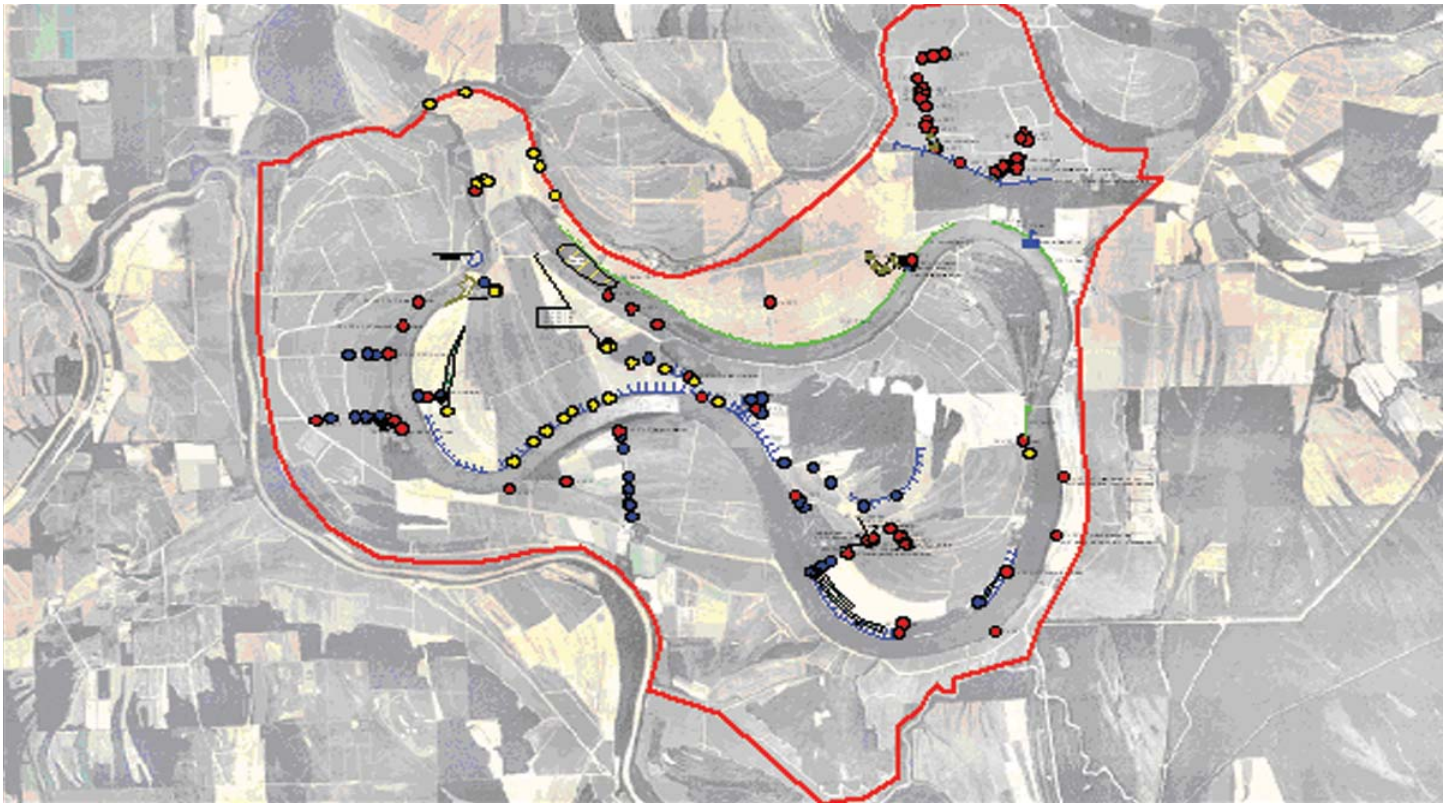
Item	Unit Cost*	# of Units
15" x 30' Plastic Pipe	$190	2
24" x 30' x 3' drop w/ splatter plate	$1,500	1
30" x 40' steel culvert	$1,600	1
24" x 50' x 3' stand pipe	$1,800	1
Installation of Above	$6,000	1
48" x 50' x 3' stand pipe	$5,500	1
Installation of Above	$6,000	1

John Newcomb
Owner, Stonewall Plantation
10500 Bee Lake Road
Tchula, MS 39169
(870) 822-0303
Cooperator providing $29,686.25 match towards project through installation and maintenance.



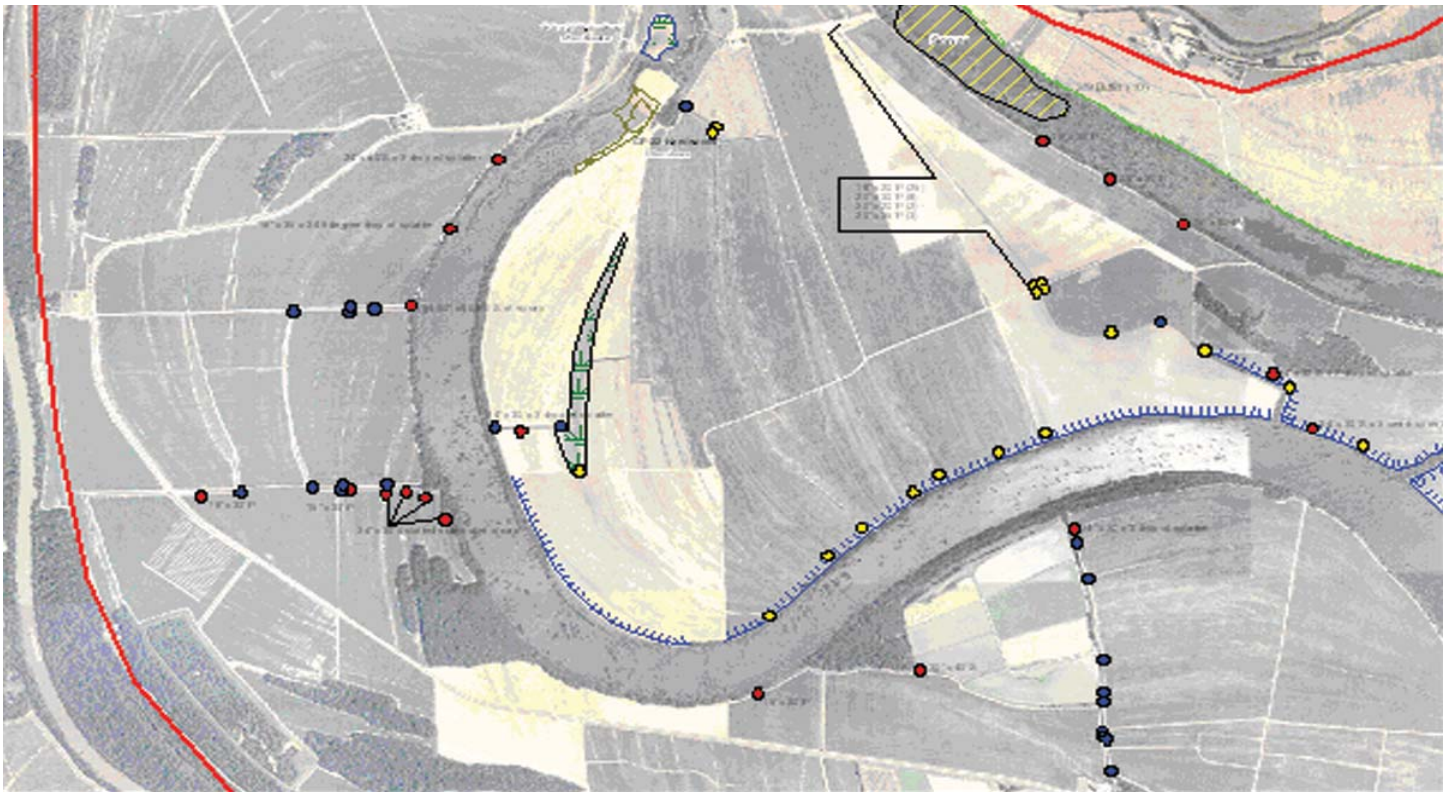
Item	Unit Cost*	# of Units
15" x 30' Plastic Pipe	$190	5
Installation of above	$500	6
24" x 50' Plastic Pipe	$693	1
8' x 60' steel pipe with 3' traugh	$8,400	1
Installation of above plus dirt work, levee construction, wetland treatment area, clearing, etc..	$25,000	1
Sonar Herbicide Application to Lake Frontage	$10,000	2
Ditch Excavation	$1.50	3000 ft.
Hydro Mats	$130/roll	90 rolls
Planting Grass Buffer	$125/ac.	2.4 ac.

BEE LAKE WATERSHED IMPLEMENTATION MAP



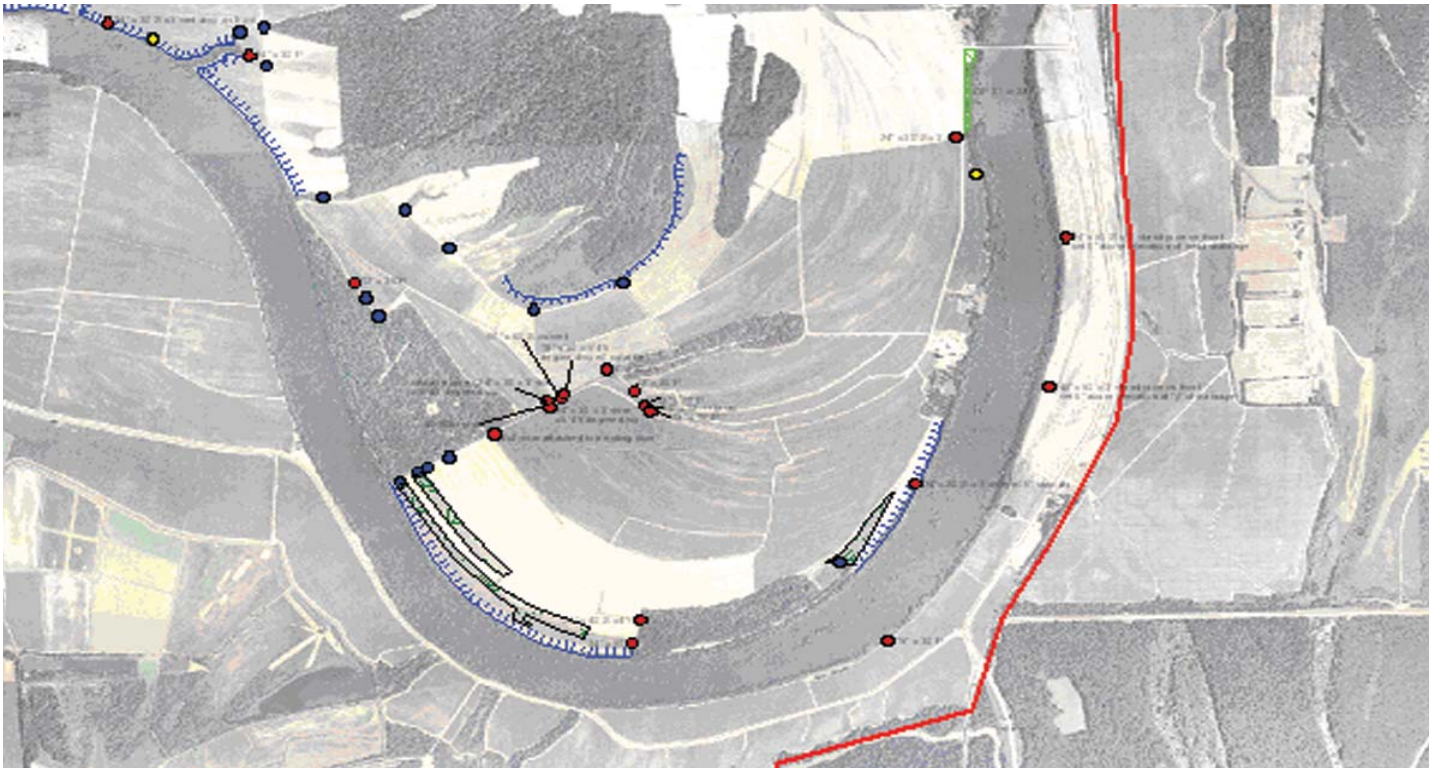
BEE LAKE WATERSHED IMPLEMENTATION MAP - WESTERN REACHES

Lakeland, Gumgrove, Jenkins Plantations
Part of Stonewall and Pluto Plantations



BEE LAKE WATERSHED IMPLEMENTATION MAP - SOUTHEAST REACHES

Pluto, Bonanza, Maryland Plantations



BEE LAKE WATERSHED IMPLEMENTATION MAP - NORTHEAST REACHES

Quofaloma and Stonewall Plantations