

THE BEE LAKE WATERSHED IMPLEMENTATION PROJECT

A Joint Project of the Bee Lake Watershed Implementation Team

The Mission
The mission of the Bee Lake Watershed Implementation Project 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 Watershed Implementation Team (WIT) identified seven priority concerns within the Bee Lake Watershed. Those concerns are: 1) Sedimentation from adjacent agricultural runoff and a failing weir, 2) Lake levels and backwater flooding from the Yazoo River, 3) Noxious aquatic vegetation dispersal 4) Organic enrichment, 5) Future development around the lake, 6) Fisheries management and 7) Lake access. In order to accomplish the goals of the project, each concern must be carefully addressed to reduce associated impacts to the watershed.

History of Bee Lake
Historical hydrologic evidence indicates that Bee Lake may have been created by the Ohio River, but popular belief holds that Bee Lake is an oxbow of the Yazoo River. The watershed is approximately 11,870 acres in size, and is located in the Mississippi Alluvial Plains ecoregion. Its soils are very productive and easily eroded. Native vegetation in the watershed is bottomland hardwood forest consisting of oak, gum, cottonwood, and cypress. 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).

Primary inflow to Bee Lake is through nearby Tchula Lake and outflow is through canals to the Yazoo River and an additional canal to lower Tchula Lake, near its confluence with the Yazoo River. Bee Lake also receives inflow from field drains and improved ditches from within the watershed. Bee Lake is a major source of irrigation water for local farmers. In 1993, land use in the watershed was primarily agricultural with 51% of the watershed used for crop production. Another 14% was used as pasture. Cotton is the major crop in the watershed and other cultivated crops include soybeans, rice, sorghum, winter wheat, small grains, corn, and sunflowers.

The watershed is situated atop the Mississippi Alluvial Aquifer and drinking water is primarily obtained through privately owned wells. 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 all in the Bee Lake watershed and an estimated 60 people live within the watershed boundary as of 2000.

There are no threatened or endangered aquatic species present in the watershed. The Paddlefish (*Polyodon spathula*) is present in Bee Lake and may become threatened by commercial fishing and the high demand for caviar. Game fish such as white crappie (*Pomoxis annularis*), black crappie (*P. nigromaculatus*), bluegill (*Lepomis macrochirus*), redear (*L. microlophus*), and black bass (*Micropterus* species) are abundant in the watershed.

Best Management Practices (BMP)
A Best Management Practice is a method, process, or activity, that is most effective at delivering a particular outcome. To properly address the WIT priority concerns within the Bee Lake watershed, a suite of BMP's will be installed.

- 1) Sedimentation**
Structures for Water Control (+/- 50 units)
Overflow 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)

2) Weir Construction
A new weir will allow Bee Lake to store at least 7,000 acrefeet 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.

3) Noxious Aquatic Vegetation
Alligator Weed (*Alternanthera philoxeroides*) and Coon-tail (*Ceratophyllum demersum*) have been collected in Bee Lake. The WIT has decided the best management practice to control Alligator Weed in Bee Lake is to use the Alligator Weed Flea Beetle (*Agasicles hygrophila*) and herbicide to control Coon-tail. Through the implementation of the BMP, Bee Lake should see an increase in accessible water acres, improved safety, a more diverse fish habitat, and higher aesthetic value.

4) Organic Enrichment
Impairments listed in the 1996 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 the Bee Lake Watershed Implementation Plan.

5) Future Development
With Bee Lake's aesthetic value, 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.

6) Fisheries Management
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. 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. 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.

7) Lake Access
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). 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.

Legend

- Bee Lake Watershed
- Structures Before Project
- Structures After Project
- New Boat Ramp Site
- Drainage Ditch
- Earthen Levee
- Grass Buffer
- Older Grass Buffer
- Hydro Mat
- Grass Buffers
- Riparian Buffers
- Herbicide Treatment
- Rip Rap
- Wetland



Aerial Photography Provided By: The U.S. Department of Agriculture, National Agriculture Imagery Program (NAIP) and Mississippi Automated Resource Information System (MARIS)
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