

**Platner Bayou-Tippo Bayou Watershed Plan****9 Key Element Plan****HUC 080302050701****MWS 9337****GY21 Project Area****September 27, 2021****Element a: Identification of Causes and Sources of Impairment**

The Platner Bayou-Tippo Bayou Watershed is located in the central portion of Tallahatchie County in North Mississippi covering approximately 31,220 acres. According to the 2019 National Land Cover Database (NLCD), the landuse within this watershed is comprised of approximately 67% cropland, 13% wetlands, 10% forestland, and 10% other (water, scrub/barren, pastureland and urban) (Figure 1). This watershed is unique in the fact that part of it lies within the Bluff Hills ecoregion and the other part is in the Mississippi Alluvial Plains otherwise referred to as the Mississippi Delta. Only 14% of the watershed falls within the Bluff Hills Region of the Yazoo Basin while the majority of the watershed, 86%, is located within the Mississippi Delta. The location of the watershed places the Platner Bayou-Tippo Bayou watershed into three different ecoregions. The Bluff Hills ecoregion contains the eastern 4,379 acres of the watershed. The Northern Holocene Meander Belts makes up about 912 acres along the western edge of the watershed and the central part of the watershed (25,925 acres) is in the Northern Pleistocene Valley Trails ecoregion. The change in ecoregions from the Buff Hills to the other two ecoregions can also be seen in Figure 1. The changes in ecoregions corresponds with drastic changes in landuse as the hilly upland area falls off into the flatter land commonly found in the Mississippi and is used primarily for agricultural purposes.

The water-use classification for all water bodies in this watershed, as established by *Regulations for Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*, is for *Fish and Wildlife*. Waters with this classification are intended for fishing and propagation of fish, aquatic life, and wildlife. Waters that that are classified as *Fish and Wildlife* should also be suitable for secondary contact recreation, which is defined as incidental contact with water including wading and occasional swimming.

Waterbodies within the Platner Bayou-Tippo Bayou Watershed have a long history with Mississippi's Section 303(d) List of Impaired Water Bodies. Beginning in 1996, Patterson Bayou (MS345E) and Tippo Bayou (MS346E) were included on the impaired waters list. In 2008, Hubbard Creek (933711) was added to the states impaired waters list. Since that time, TMDLs have been developed for Patterson Bayou and Tippo Bayou. Hubbard Creek remains on the active §303(d) list.

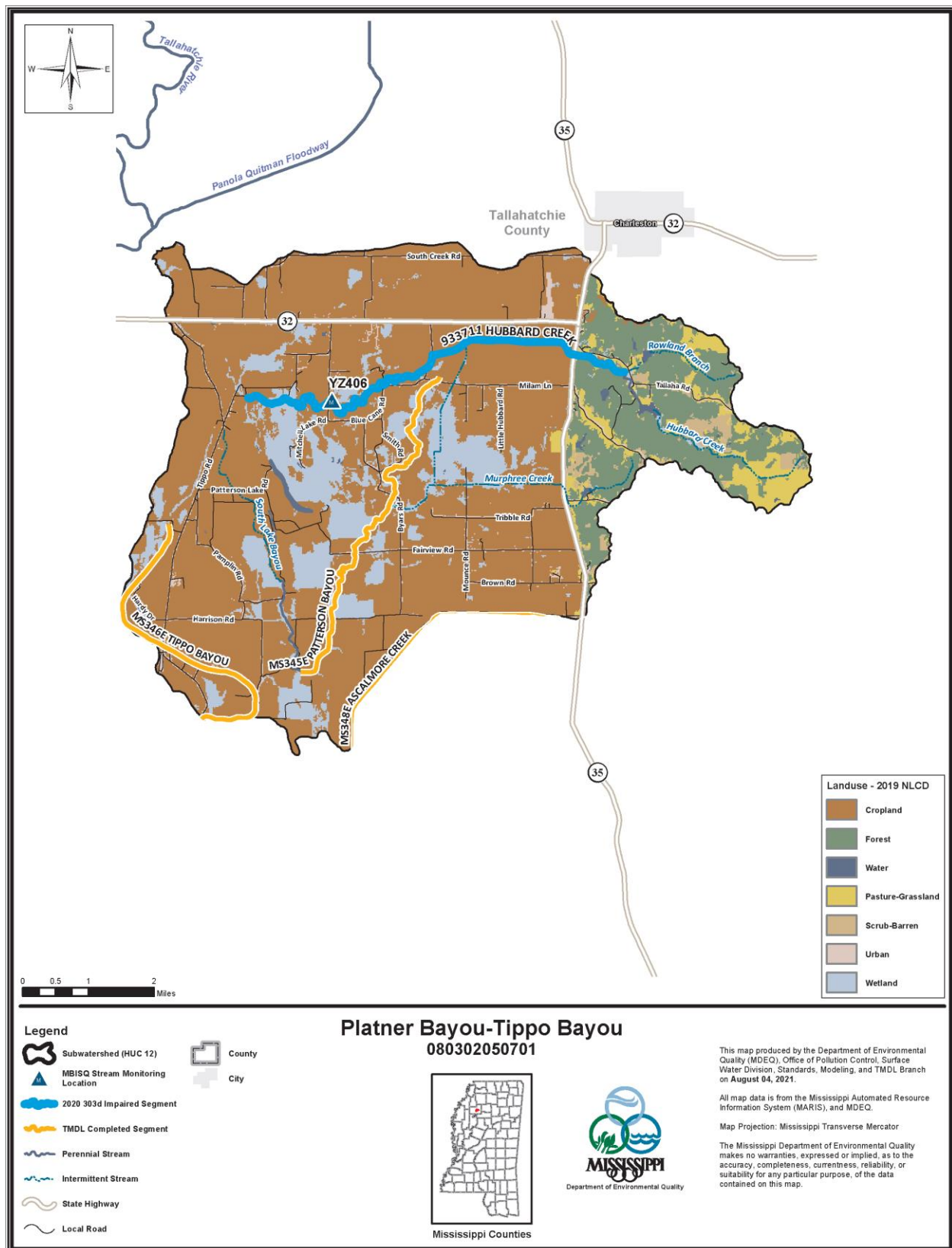


Figure 1: Platner Bayou-Tippo Bayou Watershed Landuse Map

There are several Total Maximum Daily Load (TMDL) reports for water bodies within the Platner Bayou-Tippo Bayou Watershed (HUC 080302050701). Both Patterson Bayou and Tippo Bayou are included in the regional sediment [\*Total Maximum Daily Load Yazoo River Basin Delta Region for the Delta Region\*](#). The State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters regulation does not include a numerical water quality standard for aquatic life protection due to sediment. The narrative standard for the protection of aquatic life is sufficient for justification of TMDL development but does not provide a quantifiable TMDL target. The target for this TMDL is based on reference sediment yields developed by the Channel and Watershed Processes Research Unit (CWPRU) at the National Sedimentation Laboratory (NSL). This TMDL calls for an 80-85% reduction in sediment.

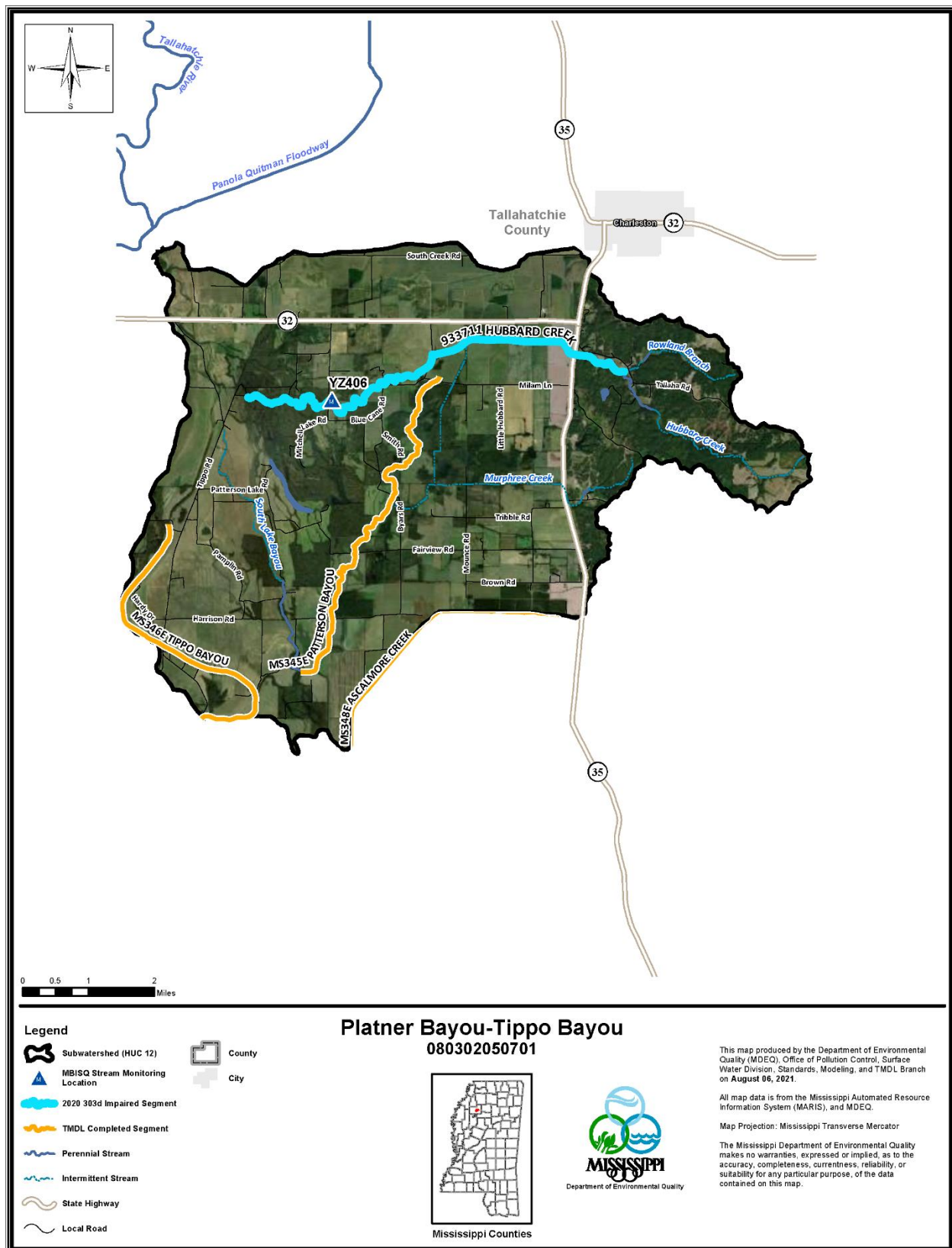
Nonpoint loading of sediment in a water body results from the transport of the material into receiving waters by several processes including mass wasting, head cutting, gullying, and sheet and rill erosion. Sources of sediment come from improper agricultural and silvicultural practices as well as from a plethora of other improper land-use activities, e.g. construction, mining, channel alterations.

Patterson Bayou has an additional TMDL for nutrients and dissolved oxygen: [\*Total Maximum Daily Load for Total Nitrogen, Total Phosphorus, and Organic Enrichment/Low Dissolved Oxygen for Patterson Bayou\*](#). Mississippi does not have water quality standards for allowable nutrient concentrations. MDEQ currently has a Nutrient Task Force (NTF) working on the development of criteria for nutrients. The TMDL identified an annual concentration of 0.58 mg/l as an applicable target for TN and 0.09 mg/l for TP for water bodies located in the east side of the Delta. This TMDL calls for Total Phosphorus (TP) to be reduced by 97.16% and Total Nitrogen (TN) to be reduced by 90.79%.

Tippo Bayou also has a TMDL nutrients and dissolved oxygen: [\*Total Maximum Daily Load for Total Nitrogen, Total Phosphorus, and Organic Enrichment/Low Dissolved Oxygen for Tippo Bayou\*](#). The TMDL identified an annual concentration of 0.58 mg/l as an applicable target for TN and 0.09 mg/l for TP. This TMDL calls for Total Phosphorus (TP) to be reduced by 97.3% and Total Nitrogen (TN) to be reduced by 91.2%.

There are no facilities in the Platner Bayou-Tippo Bayou Watershed with NPDES permits that include limits for Total Suspended Solids (TSS) which is used as an indicator of sediment contributions from permitted activities. Certain contaminants may be associated with sediment such as pesticides and nutrients. These contaminants were not addressed directly within these TMDLs. However, these contaminants would also be controlled by the same best management practices (BMPs) that control the sediment from nonpoint sources of pollution. Non-point loading of nutrients and organic material in a water body results from the transport of the pollutants into receiving waters by overland surface runoff, groundwater infiltration, and atmospheric deposition. Unlike nitrogen, phosphorus is primarily transported in surface runoff when it has been sorbed by eroding sediment.

Figure 2 shows all of the impaired segments and segments with TMDLs in the Platner Bayou-Tippo Bayou Watershed.



**Figure 2: Platner Bayou-Tippo Bayou Watershed Impaired Segments and Monitoring Sites**  
**Element b: Expected Load Reduction**

The *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* (MDEQ, 2021) regulation does not include a numerical water quality standard for aquatic life protection due to sediment; however, a narrative standard for the protection of aquatic life was interpreted to determine an applicable target for the sediment TMDL in the Platner Bayou-Tippo Bayou Watershed. The narrative standard states waters shall be free from materials attributable to municipal, industrial, agricultural, or other dischargers producing color, odor, taste, total suspended solids, 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 uses. The sediment TMDL which includes both Patterson Bayou (MS345E) and Tippo Bayou (MS346E) concluded that sediment yields would need to be reduced by 80-85% in the watershed. All sediment yield reductions were developed from suspended sediment concentration data measured at stable streams in the same ecoregion(s). The targets were developed to reflect stable stream conditions using reference sediment yields. These reference conditions were established by the USDA's Channel and Watershed Processes Research Unit (CWPRU) at the National Sedimentation Laboratory (NSL).

Nonpoint loading of sediment in a water body results from the transport of material into receiving waters by the processes of mass wasting, head cutting, gullying, and sheet and rill erosion. Sources of sediment include agriculture, silviculture, rangeland, construction sites, roads, urban areas, mass wasting areas, gullies, surface mining, in-channel and instream sources, and historical landuse activities and channel alterations.

At the time of nutrient TMDL development for both Patterson Bayou and Tippo Bayou, MDEQ does not have numeric nutrient criteria. To develop the TN and TP targets a percentile approach was used following EPA recommendations. The Total Nitrogen and Total Phosphorus TMDL for Patterson Bayou (MS345E) recommended Total Phosphorus (TP) needs to be reduced by 97.16 % with a target annual concentration of 0.09 mg/L and a reduction of Total Nitrogen (TN) to be 90.79% with an annual target concentration of 0.58 mg/L. The Total Nitrogen, Total Phosphorus, and Organic Enrichment/Low DO TMDL for Tippo Bayou (MS346E) calls for a 97.3% reduction of Total Phosphorus with a target concentration of 0.09 mg/L and a reduction of Total Nitrogen by 91.2% and a target concentration of 0.58 mg/L.

Non-point loading of nutrients and organic material in a water body results from the transport of the pollutants into receiving waters by overland surface runoff, groundwater infiltration, and atmospheric deposition. Unlike nitrogen, phosphorus is primarily transported in surface runoff when it has been sorbed by eroding sediment.

The NRCS has a list of approved BMPs to address nutrients and sedimentation. This list will be used to identify candidate BMPs in Platner Bayou-Tippo Bayou watershed.

**Element c: Proposed Management Measures**

Coordinating partners with MDEQ include the Mississippi Soil and Water Conservation Commission (MSWCC), the Natural Resource Conservation Service (NRCS), and the local Soil and Water Conservation Districts (SWCDs) throughout the state. These SWCDs are typically housed within USDA Service Centers co-located with NRCS offices. These USDA Service Centers handle federal assistance programs offered through the Farm Bill. As part of these services, SWCD staff communicate regularly with the local landowners and operators within the watershed as they work to support sign-ups for Farm Bill initiatives. Staff from MSWCC and the SWCD depend upon assistance from their NRCS partners in determining landowner interest in the watershed because they are on the farms and in the fields with the landowners, understand the needs at the local level, and have knowledge of the amount of unfunded applications for federal program assistance which meet Section 319 eligibility requirements. Based on their analysis, installation of the following BMPs would mitigate sediment and nutrient issues in the Platner Bayou-Tippo Bayou watershed helping the stream recover: fencing, watering facilities, ponds, streambank and shoreline protection, dikes, critical area planting, grade stabilization structures, forage and biomass planting, structures for water control, cover crops or any other practices to help reduce sedimentation and nutrient loading. Factors considered for determining specific locations for the placement of BMPs included the following attributes based upon best professional judgement of trained NRCS, SWCD, and MDEQ staff:

1. Likely water quality benefits;
2. Willing landowners;
3. Implementation of the recommendations of the TMDLs (i.e., “It is recommended that water bodies within [the watershed] be considered a priority for streambank and riparian buffer zone restoration and any sediment reduction BMPs, especially for road crossings, agricultural activities, and construction activities);
4. Ease of showing effectiveness of the BMP(s) through monitoring; and
5. Shorter length of time for anticipated results (i.e., within the grant period).

**Element d: Technical and Financial Assistance**

As part of any Section 319 funded project, MDEQ requires a 40% match in project areas. This match may be in the form of actual dollars or may be provided as “in-kind” to project activities. Partners in this project that may contribute match include MSWCC, Tallahatchie County Soil and Water Conservation District, NRCS, USGS (monitoring), and/or local landowners and operators. For project implementation, administration, management, and watershed plan revision, as well as hosting and facilitating team meetings, MDEQ plans to work under a memorandum of agreement (MOA) with the MSWCC to implement this project. Project partners provided the funding amounts used to estimate costs for BMP installation. Provided below is summary of estimated costs for potential BMPs and overall project implementation:

**Cost Estimate: Full Project Implementation**

<b>BMPs**</b>	<b>Size/Amount</b>	<b>Estimated Cost</b>
Grade Stabilization Structure	85 each @ \$8,000	\$680,000
Heavy Use Area Protection	10,000 sq.ft. @ \$3.93	\$39,300
Tank/Trough	10 each @ \$6,000	\$60,000
Cover Crops	5,000 ac @ \$73	\$365,000
Fencing	1,040 ft. @ \$4.50	\$4,680
Dikes	136,000 ft. @ \$1.90	\$258,400
Pond	5 @ \$6,250	\$31,250
Fencing	20,000 ft. @ \$4.50	\$90,000
Structure for Water Control	15 each @ \$5,000	\$75,000
Forage and Biomass Planting	300 ac. @ \$211	\$63,300
Streambank and Shoreline Protection	2,500 ft. @ \$166.87	\$417,175
<b>Technical Assistance*</b>	N/A	\$45,000
<b>Education and Outreach*</b>	N/A	\$28,000
<b>Monitoring*</b>	N/A	\$25,760
<b>Project Management, Implementation, Coordination, Plan Revision*</b>		\$135,000
<b>Total Estimated Cost</b>		<b>\$2,317,865</b>

\* Denotes fields that are estimated upon three incremental funding cycles of the project

\*\* Conservation Best Management Practices provide a 40% match at a minimum.

Due to the magnitude of this project, the project will need to be funded incrementally using multiple funding sources. In order to fully address all suggested conservation needs in the watershed, this plan recommends funding be provided in 3 increments. To maximize education and outreach activities and monitoring efforts, MDEQ plans to leverage with existing programs already allocated for funding where possible.

Below is the estimated budget for the second incremental funding (Phase 1) of this project:

**Cost Estimate: Phase 1 Implementation**

<b>BMPs*</b>	<b>Size/Amount</b>	<b>Estimated Cost</b>
Grade Stabilization Structure	15 each @ \$8,000	\$120,000
Heavy Use Area Protection	5,000 sq.ft. @ \$3.93	\$19,650
Tank/Trough	6 each @ \$6,000	\$36,000
Cover Crops	700 ac @ \$73	\$51,100
Fencing	1,040 ft. @ \$4.50	\$4,680
Streambank and Shoreline Protection	1,000 ft. @ \$166.87	\$166,870
<b>Technical Assistance</b>	N/A	\$15,000
<b>Education and Outreach</b>	N/A	\$14,000
<b>Monitoring</b>	N/A	\$12,880
<b>Project Management, Implementation, Coordination, Plan Revision</b>		\$45,000
<b>Total Estimated Phase 1 Cost</b>		<b>\$485,180</b>

\*Conservation Best Management Practices provide a 40% match at a minimum. \*

**Element e: Information and Education**

The MDEQ, in cooperation with numerous federal, state, and local stakeholders has developed diversified information/education programs, best management practices manuals, literature, books, videos, and public service announcements that address pollutants from the seven (7) major landuse categories of Nonpoint Source Pollution: agriculture, construction, forestry, on-site waste water disposal, surface mining, urban storm water runoff, and hydrologic modification. Audiences from pre-school to adults throughout the state are reached with a variety of mature, well-designed programs each year. These programs, events, manuals and literature can be used in the Platner Bayou-Tippo Bayou watershed project by tailoring them to address nonpoint sources of sedimentation and nutrients. A positive approach is used to reach the full diversity of people in the community with projects that foster a “sense of place”, a “sense of pride in community”, and a sense of the native plants, animals, and general ecology of their region, as well as the history of the community and a sense of economics. Stakeholders and coordinators join together to participate in problem-solving, brainstorming, plan development, training workshops, festival event planning, soil and water conservation field days, tree boards, poster, art and writing projects and other activities that promote collaboration and ownership of the watershed, as well as solutions to its problems. The ultimate goal is to bring about behavior changes and the use of “best management practices” that will improve water quality and the overall quality of life in the watershed. Evaluation forms, pre-test/ post-test, surveys, and reporting of the number of people who attend workshops, trainings and events are among the



methods used to measure the success of education/information programs. A partial list of MDEQ's programs that could be used in the Platner Bayou-Tippo Bayou watershed are listed below:

- **Water Model Presentations** - Envirosapes and groundwater aquifer models distributed statewide with training and related interactive lesson plans.
- **Teacher Workshops** – train educators in proximity to the watershed about NPS pollution and provide materials and information that can be used in their classrooms.
- **Adopt A Stream** - workshops and training venues for citizens, teachers, and students in the Platner Bayou-Tippo Bayou Watershed.
- **Watershed Harmony Mobile Classroom** - for ages kindergarten – adults with state and federal public education objectives tailored for 4<sup>th</sup> and 5<sup>th</sup> grade students.
- **“Train the Trainer”** - workshops and materials for Soil and Water districts, Extension Service, etc.
- **“Waste Pesticide Disposal Event”** - The primary goal of this program is to help Mississippi farmers and property owners minimize the environmental risks associated with the disposal of waste-pesticide products by disposing of products in a safe and efficient manner.

As part of the education outreach efforts, the stakeholder group forming the Platner Bayou-Tippo Bayou Watershed Implementation Team (WIT) will participate in a minimum of 3 face-to-face meetings. The purpose of these meetings is to provide updates on implementation activities, education events and review and modify the watershed plan. In concert with these WIT meetings, and to incentivize stakeholder participation, project funding will be used to purchase food and other refreshments for the WIT along with providing support for renting facilities in which to host those events. In accordance with 41 CFR § 301-74.11, light refreshments, meals, and/or beverages are an allowable expense under CWA Section 319, provided a description of the agenda, purpose, location, costs, etc., are outlined in an approved 319 grant workplan. The purpose of the meetings will be for updating the watershed plan, and hosting field days to showcase the implemented BMPs for the public. At this time the exact number of participants and locations are not known therefore costs have been estimated for the purposes of this plan and will be updated.

#### **Element f: Implementation Schedule**

Section 319 NPS funding will be used to support implementation of this watershed-based plan for this HUC 12 sub-watershed. MDEQ, along with support from the Watershed Implementation Team and Project Manager (where applicable), will:

1. Work to develop, execute, and implement a Subgrant Agreement that specifies the roles, tasks, requirements, and milestones for project implementation. (Month 1)
2. Facilitate, in coordination with MDEQ and other partners, meetings, media and social media promotion of the project, and coordinate activities to fully implement this plan. (Months 1-36)

3. Work with the Tallahatchie County SWCD, MSWCC, NRCS, and MDEQ to inform landowners and operators within the watershed about the project and work to secure commitments from priority area landowners and operators who are willing to participate in the project. (Months 1-6)
4. Work with the local SWCD, MSWCC, NRCS, and MDEQ to determine through GIS applications and intensive site surveys the priority areas within the sub-watershed that are contributing significant pollutant loads. All BMPs shall be installed in accordance with the guidelines developed in the latest edition of the NRCS Technical Field Manual, or other approved guidelines. (Months 1-36)
5. Facilitate, in cooperation with MDEQ and other monitoring partners, the completion and implementation of an effective and efficient plan to monitor baseline water quality conditions in the watershed and track changes in water quality over time resulting from the BMPs implemented through this project. (Plan Completion: Months 1-2); Implementation: Months 3-36)
6. Submit blank copies of standard maintenance agreements to MDEQ. (Months 13-36)
7. Conduct inspections of BMPs during construction (Months 3-36)
8. Coordinate with and support the local SWCD, MSWCC and NRCS in the collection of relevant GPS coordinates of all installed BMPs and incorporate this information into a GIS format. All geospatial data shall be collected in a manner consistent with the Federal Geographic Data committee-endorsed standards. (Months 3-36)
9. Collect adequate photo documentation before, during, and after installation of the approved BMPs. (Months 3-36)
10. Report measured, or estimated, nonpoint source pollutant load reduction, acreage affected, pre-and post- site conditions, and GIS data. (1-36)

**Element g: Milestones and Outcomes**

<b>Milestone</b>	<b>Outcome</b>	<b>Probable Completion Date</b>
Continue Coordinating with the MDEQ, NRCS, MSWCC, USGS, and the Tallahatchie Co. Soil and Water District to determine additional priority areas that are contributing significant pollutant loads to Platner Bayou-Tippo Bayou Watershed	Target priority areas for BMPs	Months 1-36
Initiate watershed monitoring	Baseline condition monitoring	Completed using historical data
Meet with landowners and cooperators to continue securing commitments to install BMPs in priority areas	Landowner Commitment	Months 1-36
Establish routine meeting schedule for WIT to support WBP revision	WIT meetings	Months 1-36
Implement BMPs	BMP installation	Months 1-36
Coordinate with Landowners to inspect BMPs that were installed using Section 319 funds	BMP Inspection	Months 1-36
Begin monitoring to collect data on post-BMP water quality	Post-BMP Monitoring	Months 42-48
Implement the developed education and outreach plan	Education/Outreach events scheduled	Months 1-36
Finalize revised WBP	Final Revised WBP	Months 30-36

**Element h: Load Reduction Evaluation**

The *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* does not include a water quality standard applicable to aquatic life protection due to sediment or nutrients. However, a narrative standard for the protection of aquatic life was interpreted to determine an applicable target for the Yazoo River Basin Delta Region TMDL. The narrative standard states that waters shall be free from materials attributable to municipal, industrial, agricultural, or other dischargers producing color, odor, taste, total suspended solids, 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 uses. In lieu of numeric criteria for sediment and nutrients, the monitoring will be conducted to collect data on parameters that are considered surrogates for sediment (Total Suspended Solids, Total Suspended Sediment, turbidity) and nutrients along with conventional in-situ parameters generally measured to determine aquatic health (e.g. Dissolved Oxygen, pH, Temperature, Conductivity, Dissolved Solids) will also be obtained. The following thresholds will be used to measure compliance applicable with water quality criteria and/or target thresholds:

Parameter	Threshold
Dissolved Oxygen	Daily Average of 5.0 mg/L; Instantaneous threshold of 4.0 mg/L
Dissolved Oxygen % Sat	$\geq 70\%$ - $\leq 125\%$
pH	6.0-9.0
Temperature	Not to exceed 90°F
Specific Conductance	Less Than 1000 micromhos/cm
Dissolved Solids	Monthly average less than 750 mg/L; instantaneous threshold less than 1500 mg/L
Chemical Oxygen Demand	35 mg/L
Total Suspended Solids	65 mg/L
Turbidity	75 NTU
Total Nitrogen	0.58 mg/L annual concentration (numeric threshold established by TMDLs for Patterson Bayou and Tippo Bayou)
Total Phosphorus	0.09 mg/L annual concentration (numeric threshold established by TMDLs for Patterson Bayou and Tippo Bayou)

In addition to chemical data, biological community data and in stream habitat surveys will be collected over the course of the project to determine attainment of the Aquatic Life Designated Use. These data are extremely helpful in identifying trends in water quality and should provide information to help determine if the implementation activities are resulting in water quality improvements.

It should be noted that recovery time of a stream is variable and may extend beyond the timeframe identified in the workplan. At the end of the project, data will be analyzed to determine if the data indicate improvements to water quality in the Sherman Creek-Panola Quitman Floodway watershed. In the event data indicate little or no positive change, a Stressor Analysis will be conducted to determine if any new or additional stressors are preventing improvements to water quality. If any new stressors are identified, the Watershed Implementation Team will identify future actions/activities to address those stressors.

### **Element i: Monitoring**

Prior to BMP installation, pre-implementation water quality chemical and biological monitoring will be collected to serve as baseline data for the project along with any historical data available on Tippo Bayou, Patterson Bayou, and Hubbard Creek. Water quality monitoring will include water chemistry data (nutrients, suspended solids, oxygen demand, chlorides, etc.), in-situ field measurements for such parameters as dissolved oxygen, pH, temperature, specific conductance, and turbidity, datalogger (sonde) deployment for continuous in-situ field measurement data as well as biological community monitoring for benthic macroinvertebrates and algal/periphyton chlorophyll-a in support of Delta nutrient criteria development. A list of this historical water

quality monitoring in the Platner Bayou-Tippo Bayou watershed is provided in the table below and their sample locations are shown in Figures 1 and 2.

<b>Station ID</b>	<b>Water Body</b>	<b>Sample Year(s)</b>	<b>Collecting Agency</b>	<b>Project</b>	<b>Water Chem</b>	<b>In-Situ</b>	<b>Sonde</b>	<b>Benthics and/or Algal</b>
YZ406	Hubbard Creek	2004, 2014	USGS, MDEQ	Delta Nutrient, Delta Bluff Hills Nutrient	X	X		X

Post-BMP monitoring locations will be selected using best professional judgement and will be targeted to reflect water quality downstream of BMP activity. Once BMP installation is complete, and there has been sufficient time for the stream to stabilize, post BMP monitoring will be initiated. Post BMP monitoring will be conducted in a way that allows for comparison with the pre-implementation data. Because recovery periods of streams can be dependent on type and amount of BMPs installed, more than 1 year of post BMP data may be needed to observe a change in water quality. In some cases, it may take 5 or more years to see full benefits of BMPs. All data collection efforts will be conducted using trained personnel following established Standard Operating Procedures and adhering to agency Quality Assurance protocols.