BACKGROUND
The Pontchartrain Levee District is conducting a flood control study of the ~108,000-acre Bayou Manchac/Watershed. The Watershed drains the southern sections of the City of Baton Rouge, Louisiana, including the ~98,000-acre Spanish Lake Swamp sub-watershed.

Spanish Lake Swamp is a natural backwater depression that was formed over thousands of years by the alluvial processes of the Mississippi River. The swamp system persists today as an island of predominantly natural floodplain forests and open water habitats within a region that has been heavily developed for industrial, agricultural, and urban purposes. Bayou Manchac and the Spanish Lake Swamp are subject to backwater flooding from the Amite River. The flood control project is primarily focused on addressing flooding caused by the Amite River.

HABITAT PROBLEMS
Spanish Lake Swamp is typical of the overflow forest ecosystems that characterize much of the Mississippi River’s floodplain in southern Louisiana. Following the historic 1927 flood, construction of the Marlinee Mississippi River Levee permanently isolated the swamp from periodic overbank flooding by the Mississippi River. Beginning in the 1940s and early 1950s, a series of human activities further modified the swamp. These included the construction of internal drainage projects; oil and gas exploration efforts; timber harvest activities; and artificial management of water levels that created a permanent pool below elevation 5 feet.

These activities have collectively modified the swamp’s internal drainage patterns, resulting in the almost permanent inundation of approximately 1,400 acres occurring below elevation 5. In addition, an additional 2,800 acres between elevation 5 and 6 feet have also been affected by the altered drainage and surface runoff rates attributed to the permanent pool. The cumulative effects of altered flooding on these lands have adversely affected the habitat for many wetland-dependent species.

A series of dikes, gates, and locks have been constructed to provide for the regulated flow of water into and through the swamp. Many of these dikes, gates, and locks were constructed in the 1940s and 1950s to provide for flood control along the Amite River. These structures are still in use today.

An examination of stage data for the Mississippi River and Amite River provides a comparison of the water level conditions within which the Upper Bayou Manchac originally developed when it was connected to the Mississippi River against the stages now provided by the Amite River. The duration, timing, and extent of inundation by floodwaters, whether provided by the Mississippi River or the Amite River, have the principal influence on the type and extent of wetland communities that can be established and maintained within Spanish Lake Swamp and Bluff Swamp.

The stage data shows that the Mississippi River at this location is generally characterized by smooth transitions from low to high water periods over the course of a year. The extended period of high flows that begin in late fall and extend into early summer, followed by low flows that stretch throughout most of fall, create conditions within the lower elevation floodplain areas that are ideal for the establishment, dominance, and regeneration of extensive cypress swamp forests. These conditions also support a hardwood forest on the higher elevation floodplain areas consisting of the most water-tolerant bottomland hardwood species.

HYDROLOGIC DATA

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<tr>
<th>Date (day-month)</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
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<tbody>
<tr>
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<td>19-Jul 7-Sep</td>
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<td>16-Dec</td>
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The Bayou Manchac gage near Kleinpeter is influenced by local drainage in the Upper Bayou Manchac Watershed and backwater flooding from the Lower Bayou Manchac Watershed. An examination of stage data at Bayou Manchac shows that the stage data is lowest during the summer months and highest during the fall and spring months.

The hydrologic regime for the Upper Bayou Manchac area is a result of the interaction between the natural attenuation of floodwaters through wetland communities (particularly cypress forests) and the regulated flow of water through the system. The hydrologic regime within the Upper Bayou Manchac area is more consistent with the natural regime than the regime provided by the Amite River.

The proposed Bayou Manchac flood control project consists of a variety of features. Those project features that deal with the Spanish Lake Swamp are the following:

- An improved water control structure to better regulate the exchange of water between the Spanish Lake Swamp and Bayou Manchac.
- A revised water management plan that more closely approximates the natural hydrologic regime under which the swamp naturally developed.
- Evaluation of the potential success that the proposed Gate Operation Plan can have in naturally restoring a cypress-dominated forest in Spanish Lake Swamp is shown below. This photograph was taken in June 2009 after opening of the Alligator Bayou gate.