

## **Yalobusha River System, Mississippi**

The Yalobusha River System upstream from Grenada Lake, is located in the Loess Hills Region of central Mississippi. Highly erodible surface soils, sand-bedded channels in downstream reaches, and resistant, clay-bedded channels in upstream reaches characterize the predominantly agricultural basin. More than 200 miles of channels upstream from Grenada are threatened by a variety of processes ranging from excessive erosion and sedimentation, bank failures, and destruction of habitat. More than 70 headcuts are migrating upstream with time, some as high as 10 feet, eroding channel beds and initiating bank collapse and the loss of agricultural land.

Following settlement of the region in the mid to late 1800's, land clearing and poor conservation practices led to massive erosion and gulying of fields and uplands and the filling of stream channels. When streams and flood plains filled with sediment, they flooded frequently. Like most agricultural basins in the Midwestern United States, drainage districts formed around the turn of the 20<sup>th</sup> century dredged and straightened much of the channel network to reduce flooding problems. As a result, upstream deepening (erosion) of channels led to bank collapse and additional downstream filling and flooding problems from the accumulation of sediment and woody debris. The upper Yalobusha River was dredged in the 1960's with similar results as the straightened, enlarged channel emptied directly into a smaller, unimproved sinuous channel within the boundary of Grenada Reservoir.

The potential for catastrophic flooding along downstream reaches of the Yalobusha River has dramatically increased since the early 1960's as a consequence of channel-adjustment processes related to channelization in the late 1960's. Upstream migrating knickpoints caused deepening of upstream reaches and tributary channels causing channel widening by collapse of streambanks. Trees growing on these channel banks were delivered to the flow when the banks failed and were transported downstream to form a large debris jam and lake-like conditions downstream from Calhoun City. Flooding now occurs on an annual basis.

Channel incision has resulted in destruction of remains of the natural stream corridor. Addition of sediment to the system, loss of riparian vegetation and continual channel instability have destroyed natural aquatic resources and deteriorated both aquatic habitat and water quality. While flood protection, erosion control, and channel stabilization are primary needs in this basin, stream rehabilitation and water quality improvement needs are also import to local stakeholders.

The key to alleviating the flooding problems for the residents of Calhoun City is removal or bypassing the debris jam in the downstream reaches. However removal of the debris dam without upstream grade control would result in re-incision of the channel's sand bed. This would initiate a new wave of bank caving, sediment loading and channel debris. To inhibit further channel erosion and still provide flood relief, the U.S. Army Corps of Engineers is constructing grade-control structures along main stem and tributary channels prior to engineering works on the debris jam itself. The location and number of in-channel structures are based on the results of research on stability conditions and erodibility of the clay beds conducted the ARS-National Sedimentation Laboratory (NSL) in cooperation with the Vicksburg District. Pipe-drop structures, used to reduce and inhibit gulying adjacent to incised channels are also being constructed. Stream rehabilitation measures and stream management practices that improve water quality are also planned. The Yalobusha Drainage District, the City of Calhoun City and Calhoun County Government urge that this work continue until the project is completed.