



**MARIES RIVER REGION
MODOT STREAM MITIGATION BANK
DRAFT PROSPECTUS**

Environmental Unit
Design Division

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I. OBJECTIVES

The goal of this project is to restore stream function and habitat within the Maries River where a low water crossing has impacted aquatic organism passage and sediment transport to mitigate for stream impacts resulting from MoDOT highway construction projects that are located within or near the proposed geographic service area boundary.

MoDOT plans to replace one low water crossing, Sestak's Slab, on the Maries River in Osage County, Missouri. Improvements will involve removal of the entire crossing as well as the older, upstream crossing and installation of a span structure similar to other structure improvements done by MoDOT on the Little Niangua River.

The Maries River supports known populations of Niangua darter, a federally listed endangered species. The Niangua darter was assigned federal protection in 1985 under the Endangered Species Act and the recovery plan was approved in July 1989. Recovery goals include reducing existing and potential threats to existing populations, documenting that population size is stable or increasing for an area, and establishing new populations in additional drainages.

Low water crossings are barriers to fish movement because of high velocities and scour holes. Removal of these structures should enable darter populations to reconnect, thus increasing opportunity for genetic diversity and boosting population growth. Removal and replacement of these structures also improves channel stability and sediment transport, as well as minimizing the continued long-term expense of repairs by county road crews.



Figure 1: MoDOT Maries River Region Mitigation Bank, Osage County, Missouri, location map.

II. ESTABLISHMENT AND OPERATION

MoDOT plans to establish and operate a stream mitigation bank by replacing a low water crossing on the Maries River. The anticipated number of credits is based on the degree of environmental gain as it relates to aquatic habitat restoration and enhancement.

The State of Missouri Stream Mitigation Method was partially used to calculate the number of credits available for replacement of the low water crossing on the Maries River. MoDOT conducted a survey of the river bottom both upstream and downstream of the structure, in order to estimate the stream length influenced by the low water crossing. The protocol that was followed for initial credit establishment upstream of a particular crossing is as follows: An elevation was shot at the top deck of the low water crossing. A second elevation was shot on the upstream side of the crossing in the streambed. In-stream survey shots were then taken progressing upstream to determine the elevation equivalent to the elevation of the crossing deck. This determines the height of the aggradation. The distance between these survey points was calculated as the length of upstream influence. The downstream credit was calculated by determining the distance to the downstream edge of the scour hole below the structure, and subsequently multiplying this distance by two. This total distance is the length of downstream influence and used in the box labeled *Stream Length in Reach* in the Stream Mitigation Bank Credit Assessment Worksheet (worksheet). Net Benefit in the worksheet was determined based on two factors, sediment transport and benefits to a federally threatened and endangered species, the Niangua darter. Within the *Excellent* category, one example of restoration actions includes “removing dams and large weirs, pipes, culverts, and other manmade in-stream structures with >50 linear feet of direct fill/impact, then restoring the stream channel to referenced, stable morphologic patterns (i.e. Replace culverts with span bridges)”. Although the stream channel is not fully restored, approximately 50% of the channel will be open to sediment transport, fish and aquatic organism passage using this methodology. The structure will pass a greater amount of water during high water events, thereby having a degree of influence on flood events. They will be bottomless and allow scour holes to be filled following a couple of flood events, allowing organism passage during low flows.

Secondarily, credits obtained using this methodology were doubled for this project, as a result of increasing the channel opening to 100%, as compared to a 50% channel opening that was targeted for previous projects.

The credits generated by the Bank shall be used as compensatory mitigation for unavoidable and adverse environmental impacts to aquatic resources of the United States and where legal requirements apply to other natural resources, as these impacts result from public transportation projects constructed by MoDOT.

III. SERVICE AREA

The Bank is established to provide mitigation to compensate for impacts to the waters of the United States, exclusively streams, within the regulatory jurisdiction of the USACE, Kansas City District, as shown in Figure 2.

The service area for this Instrument is number seven, as outlined in the MoDOT Umbrella Instrument (UI). The primary service area of the Bank consists of that portion of the Osage River Basin designated as Ozark/Osage Ecological Drainage Unit (EDU) (Maries River, Tavern Creek, Saline Creek, Lake Ozark, Niangua River, Grand Auglaize Creek, Gravois Creek, Pomme de Terre River, Osage River, Sac River, Cedar Creek, Turnback Creek) in MDC's Aquatic Gap Analysis Pilot Project. Aquatic Ecological System type called Tavern Creek. Bank credits will generally be authorized for use within the Osage River EDU, but may be authorized in the same larger Aquatic Subregion on a case-by-case basis as outlined in the UI.

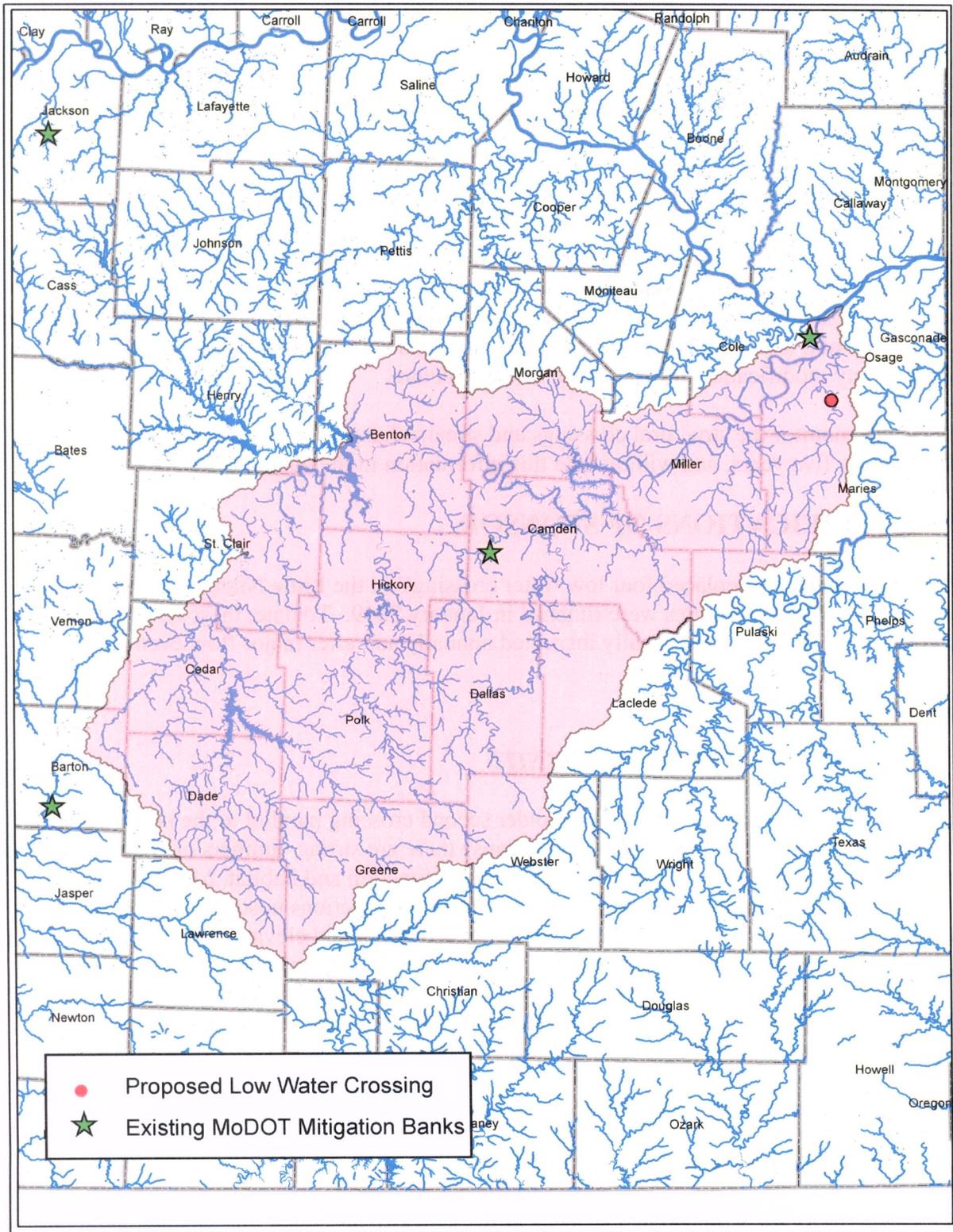


Figure 2. Maries River Region Service Area Boundary.

IV. NEED FOR AND TECHNICAL FEASIBILITY OF BANK

The intended use of the Bank is for compensatory mitigation of aquatic impacts for federally or state-funded transportation projects. MoDOT has projects within the long-range plan that will impact stream resources in this particular watershed. Projects on that list include Route 50 east and Route 63 south.

V. OWNERSHIP AND LONG-TERM MANAGEMENT

MoDOT will enter into an agreement with the owner of the crossing, Osage County, which enables MoDOT to take the crossing into the State system for the period of construction, then giving the structure back to the County after construction. The County will agree to maintain the structure in its new state and must take into account aquatic organism passage and sediment transport in any modifications/maintenance of the structure.

MoDOT will monitor the structural crossings and stream channel for any notable changes on a yearly basis for five years, and will include this information in the annual Bank Report.

VI. QUALIFICATIONS OF SPONSOR

MoDOT has previously replaced four low water crossings on the Little Niangua River with pre-cast structures. These structures were finished in January 2009. To date, these structures are in good condition and have been visually inspected annually and after major flow events.

VII. BANK

A. ECOLOGICAL SUITABILITY OF SITE

Sestak Slab is a low water crossing with an older second crossing parallel to the newer crossing. This particular structure is a good candidate because there are strong numbers of Niangua darters downstream of the crossing. In order to restore stream function and habitat, MoDOT will be surveying the streambed upstream of the crossing and valley sections upstream and downstream of the crossing. These surveys will show changes in the streambed elevation and cross section. A uniform cross section does not have a lot of habitat diversity, whereas a varied cross section with a low flow channel has more diverse habitat. The Missouri Department of Conservation regularly monitors darter populations in the Maries River. This data can also be used to demonstrate habitat restoration.

Success will be measured by replacement of the crossing with a span type crossing.

B. WATER RIGHTS/SUSTAINABILITY

The low water crossing is owned by Osage County. MoDOT will enter into an agreement with Osage County to take the crossing into state ownership to replace the crossing, and then give the crossing back to the county.



Photograph 1: Taken 2/9/09. Looking west at upstream side of Sestak's Slab.



Photograph 2: Taken 7/16/09. Looking west at downstream side of Sestak's Slab.