

MISSOURI CONSERVATION HERITAGE FOUNDATION
STREAM STEWARDSHIP TRUST FUND – GRANT PROGRAM
REQUEST FOR MITIGATION PLAN APPROVAL

The Stream Stewardship Trust Fund is available to restore, enhance, and/or protect stream systems and associated riparian habitats. Proposed projects will be prioritized and funded by the Foundation based on regional stream needs, maximum return on expended monies, level of threat to the stream system, and overall anticipated benefits to stream resources. Proposed projects should be located within the ecological drainage unit (EDU) where participating stream impacts occurred. Approval will be limited to projects that restore, enhance, or preserve Missouri's diverse stream systems.

This request form will be used by MCHF Board members assigned to the Stream Stewardship Trust Fund – Grant Program Action Team. Proposals submitted for funding consideration need to clearly explain elements of stream-based projects listed below which warrant consideration during the approval process. Spaces provided in the elements below are not to be considered limiting, and the attachment of additional pages of explanation is encouraged in order to provide full details.

The Goal of the MCHF's Stream Stewardship Trust Fund is to provide an innovative tool for the restoration, enhancement, and protection of Missouri's streams and aquatic resources.

- 1) Project Title Round Hill Road Low Water Crossing Replacement Project, Moniteau Creek
Landowner Name Cooper County Commission

- 2) County Cooper MDC region Central

- 3) Project objectives – We are proposing this mitigation project because we believe it will fulfill the following objectives. One objective of the project is to replace the existing low water crossing at Round Hill Road with a newly designed, clear-span crossing to facilitate fish and other aquatic organism passage and allow for improved water conveyance and sediment transport increasing stream stability. A second objective is for Missouri Department of Conservation (MDC) personnel to monitor and evaluate changes in Topeka shiner populations and their subsequent distribution. These objectives all address specific areas of concern in the Ten Year Topeka shiner Strategic Plan, and the USFWS study *Identification of Fish Passage Barriers impacting Topeka shiners in extant watersheds and potential introduction watersheds within Missouri.*

These objectives will also address specific areas of concern discussed in the Compensation Planning Framework for the Moreau/ Loutre Rivers EDU.

This project will address the issues of small-scale stream channelization due to bridge construction and replacement causing bank erosion, riparian destruction, and sedimentation issues downstream. The project will also address the problem of small-scale instream gravel mining operations and small-scale attempts to remedy stream channel problems by pushing instream gravel around causing an increase in stream bank erosion and sedimentation. With the construction of this project sediment will be allowed to move downstream during high flow events and will not be trapped in the stream channel and the reduced buildup of gravel will remove the requirement to manage gravel by county staff to maintain the existing structure.

The lower reach of Moniteau Creek tributary Draffen Branch will be used as a reference reach to gauge the effectiveness of this project. The lower reach of Draffen Branch had a bridge replacement project installed in 2009 and will provide a good comparison for the effectiveness of this project.

The project submitted for consideration, is in the upper Moniteau Creek watershed, which is considered a priority by MDC for the following reasons: The upper Moniteau Creek watershed is one of two remaining watersheds in the state where Topeka shiners are still found, it has also been designated a priority watershed and an Aquatic Conservation Opportunity Area (ACOA). Replacing the existing low water crossing with a clear-span structure will facilitate fish passage, and also improve sediment transport thereby restoring a critical component of the natural stream process and enhancing stream habitat stability within this reach. An inventory and assessment of low water crossings, including a priority ranking, has been completed for the entire upper Moniteau Creek watershed. The assessment identified thirteen barriers to aquatic organism passage. One of these barriers was replaced over Draffen Branch on Sandbank Drive. Of the twelve remaining barriers the low water crossing over Round Hill Road ranks number three in priority.

5) Site protection instrument (circle):

Acquisition Perpetual easement Special management agreement

6) Describe the details of the site protection instrument (ownership, legal arrangements, how the instrument assures the long term protection of the proposed mitigation site):

This project will be completed under a 30-year term cooperative agreement between Cooper County and the Missouri Department of Conservation.

7) Baseline information

- a. Describe the ecological characteristics of the proposed project site:

The project site is located on Moniteau Creek 0.5 miles upstream of the confluence of Moniteau Creek and Culley Creek. This site marks the downstream end of the upper one

third of the known Topeka shiner range in the Moniteau Creek watershed. Removal of this barrier would greatly aid movement of Topeka shiner populations and other stream fishes from downstream areas into the approximately 19 miles of stream habitat above the current crossing.

- b. Historic and existing plant communities, hydrology and soils of the proposed project site: The upper Moniteau Creek watershed was historically a mix of prairie, savanna, and forested areas with the western portion mostly dominated by tall grass prairie and savanna. This area has now been converted to predominantly pasture land with a mix of cropland and forested areas. Moniteau Creek and its tributaries are highly impacted by groundwater influence which acts to maintain some pool habitat in the upper watershed even during dry periods. The soils of the area are composed of predominantly Wrengart silt loam (73581), followed by Goss very gravely silt loam (70024), and Dockery silt loam (66004) in the floodplain areas. These soils overlay predominantly Ordovician, dolomite bedrock formations followed by Mississippian Kinderhookian and Osagean limestone formations.
- c. Project application must include maps identifying the proposed project boundary with lat/long boundaries in decimal degrees and a GIS shape file with metadata of the delineated boundary.

See attached figures for project locations and details.

- d. Describe existing hydro-system connectivity between the stream project site and any wetlands or other waters including tributaries connecting to receiving waters:

This site is located at the crossing on Round Hill Road over Moniteau Creek. It is approximately six miles from the furthest upstream point in the headwaters of Moniteau Creek. Upstream of the crossing, Moniteau Creek is formed from a series of unnamed headwater streams, mostly first and second order in nature. Approximately 0.5 miles downstream from the site, third order Culley Creek joins Moniteau Creek from the north, and approximately 1.5 miles downstream from the site, third order Smiley Creek joins Moniteau Creek from the south. All areas upstream of the site are impacted to varying degrees by groundwater inputs.

- 8) Determination of credits as determined by the Missouri Mitigation Method (attach credit calculation worksheet or other detailed information to demonstrate the specific approach for credit calculation for this project):

- a. Number of stream channel credits ██████████ 6058
- b. Number of riparian credits _____
- c. Stream type (circle): Ephemeral Intermittent Perennial

- 9) Mitigation work plan

- a. Specifications of the project (geographic boundaries, construction methods, timing, sequence): The current low water crossing is a typical vented ford with four concrete box culverts. Aquatic organism passage barriers exist (particularly to benthic fishes) at low flows due to the culverts being perched above the stream bed, as well as a biological barrier due to the concrete floor and walls. At moderate to high flows, the structure creates velocity, exhaustion, and jump barriers. The boundaries of the project will be confined to the foot-print of the existing low water crossing. The project will entail demolition of the existing low water crossing by chipping/breaking up the structure, then loading and hauling the refuse off site. Once removed, the new low water bridge (clear-span design) will be constructed on the same foot-print and tie into the existing roach approaches. Design plans have yet to be developed, but will be similar to recently completed single clear-span crossings used in numerous other low water crossing replacement projects to address AOP concerns. It is anticipated that all in-stream work related to this project will be completed soon after the seasonal spawning time frame (March 15 through June 15) 2015. The structure will span 75% of the existing channel width and have no bottom to the opening and will be designed to pass a 10 year flood event. This is a requirement for the BRO (MoDOT) cost share credit the county is aiming for which will provide 80% cost credit toward another structure in the future.
- b. Methods for establishing desired plant community (species composition and type, control of undesirable species, size of plants used, control of wildlife damage): This project does not include the establishment of any plant communities. Any areas disturbed during construction will be planted to pre-existing cover.
- c. Grading plan and elevations of constructed features (describe or attach engineering design plans): Although design plans have not been completed for this project, the elevation of the new bridge will be high enough to pass a ten-year flood event. The new structure will be a clear-span type structure without a floor and will utilize the natural stream bed to facilitate AOP and sediment transport. Actual design will take place after funding approval.
- d. Describe or attach drawings showing existing stream channel cross sections, proposed alterations to the stream channel and/or banks, a description of in-stream structures including materials used for improvements, dimensions and elevations, and riparian plantings: No alterations to the existing stream channel and/or banks are planned for this project. A clear-span type of structure will be constructed in place of the existing low water crossing with culvert pipes. Some rip-rap will be placed around the bridge abutments to protect from scour. The new low water bridge will have a clear-span approximately 80 feet long with an elevation sized to pass a ten year flood event.

10) Maintenance plan:

- a. Description and schedule of maintenance following initial construction:

The County will monitor and provide maintenance to the structure in a fashion that is typical of maintenance work on other crossings it is responsible for. This will include removing gravel and flood debris from the deck of the crossing as needed; removing snags and obstructions from the stream channel in the immediate vicinity of the crossing if flow under the crossing is obstructed; and examine the crossing immediately following high flow events for scour or undercutting that may impact the structural integrity of the crossing, and provide maintenance as needed to the crossing and roadway approaches.

- b. Mowing frequency and timing:

Not Applicable.

- c. Herbicide applications (chemical used, method, timing, frequency):

Not Applicable

- d. Irrigation plan (include source of water): Not Applicable.

- e. Passive water control and instream structure description and required maintenance (type and frequency): See subsection (a) for maintenance information.

11) Performance standards

- a. Description of the performance standards used (include metrics for determining project success):

Riparian: Not Applicable.

Stream Channel: The three main standards that will be met by this project are: 1) the existing crossing that has been identified as a barrier to AOP and sediment transport will be removed; 2) the newly designed clear-span bridge will not have a floor and use the natural stream bed; and 3) the length of the clear-span bridge will be greater than 75% of the bank-full channel width.

Reference stream(s) used (if any): These performance standards have been documented as being successful in facilitating AOP and sediment transport at the Draffen Branch project, consistent with recovery efforts throughout the Topeka shiner range and in other stream systems in the State.

- b. Describe how the performance standards relate to the objectives of the mitigation site (include description of the desired resource type, expected functions or services being measured, or any other applicable metrics): Replacing the existing low water crossing with a clear-span structure will not only facilitate fish passage, but will also improve sediment transport thereby restoring a critical component of the natural stream process and enhancing stream habitat stability within this reach of habitat. The portions of Draffen Branch near Sandbank Drive will be used as a reference reach to help establish achievement of defined objectives.

- 12) Describe the method and frequency of project monitoring to determine when performance standards are being met (project site must be monitored for an appropriate period not less than 5 years after initial construction/planting), who will be conducting the monitoring, and the frequency monitoring reports will be submitted: MDC will provide monitoring to evaluate the response of Topeka shiner populations and habitat associated with this low water crossing improvement project. An annual Topeka shiner sampling site currently occurs immediately above the Round Hill Road crossing. A sample site is defined as a stream reach 200 m in length that includes at least three pools. Each pool represents a separate, independent, and closed sub-

sample of the site as pools are typically isolated by intermittent flow or shallow riffles that restrict fish movement. Each pool in the site is sampled once with a 4.6x1.8-m (15x6-ft) or 1.8x1.8-m (6x6ft) drag seine with 3.2 mm (1/8 inch) mesh to collect fish. We use from one to four seine hauls to sample each pool completely and combine the catch into a total sample for the pool. Using a rapid scanning approach, we identify all fish species collected and determine a relative score for each based on perceived abundance and apparent percent composition of the total catch: 0=absent, 1=low approximate percent of catch (<5%) and/or low apparent abundance (<5 fish), 2 = medium (<25% or 5-50 fish), or 3 = high (>25% or >50 fish). We separate Topeka shiners from the other fish, make a precise count, and measure each for total length to the nearest 1 mm by using a digital image taken of fish in aggregate with a ruler for scale. Several physical characteristics of each site are recorded. Water temperature and conductivity, maximum depth, pool length and width, substrate type and silt coverage (%) of the bottom substrate are collected from each pool at each site.

13) Long-term management plan:

- a. Describe how the project site will be managed after performance standards have been met: The County will provide standard maintenance as described above in the Maintenance Plan.
- b. Annual cost estimate for management: \$ Responsibility of Cooper County
- c. Funding mechanisms will be used to finance long term management (including responsible party: Cooper County Road and Bridge Funds)
- d. Long term management responsibilities transferred to (include description of their long term management plan and a written stewardship commitment that includes a financing plan): Long term management responsibilities are transferred to the Cooper County Commission.

14) Adaptive management plan (due to inability to construct project in accordance with approved plans, monitoring revealing that the project is not meeting performance standards, remedial measures resulting in project modifications, design changes, revisions to maintenance requirements, revised monitoring, etc); continual monitoring will occur and any necessary coordination will take place with the COE:

- a. Description of strategy to address unforeseen changes in the project: If there is an inability to construct the project in accordance with approved plans, no further action will be taken and the existing structure will be left in place. Design changes will only occur after consultation and approval by MDC, USFWS, USACE, and the Cooper County Commission.
- b. Party (ies) responsible for implementing adaptive management: If failure in the project is due to an act of God, the agencies will assist with adaptive management implementation. If project failure is due to County negligence, the County will be responsible for implementing adaptive management plans and remedial measures with oversight from agencies.

15) Financial Assurances: The MCHF has previously demonstrated its ability to fund good stream projects and is committed to the installation, monitoring, and long term management of its compensatory mitigation projects. Since an important basis for project selection is a project's fit

into MDC's statewide stream management plan, a commitment of the biological, engineering, and legal resources of MDC also accompanies each project. In addition to MDC's support, the MCHF has incorporated financial assurances into its cost-per-credit and will retain financial assurances not to exceed 10% of each project's estimated completion cost to establish a continuous contingency fund balance of \$250,000.00.

16) Total cost of the project is estimated at \$402,500.00. SSTF Resources are requested in the amount of \$ 100,000.00.

17) Partner funds in the amount of \$ 302,500.00 are being contributed by: Cooper County Commission (\$200,000.00), United States Fish and Wildlife Service Fish Passage Program (\$100,000.00 pending approval), Missouri Department of Conservation in kind (\$2,500.00).

18) Total stream length of the project NA Total Riparian corridor acreage NA

19) Total cost per credit (including all costs) estimated at \$ 15.18.

20) If the project is leveraged with contributions from others, SSTF Resources are requested to fund which practices/products/costs activities? A portion of demolition of the existing structure, bridge construction and labor, material, and engineering costs.

21) Schedule for project completion and/or installation: If grants are awarded, it is expected that the project will begin fall 2015.

Note: Proposal must include appropriate on-site photographs, county maps locating the proposed project, related topographic, soils, or other maps, drawings and materials necessary to describe planned activities. In order to reproduce color photographs and maps, a complete electronic file is requested with project proposals.

MDC Region: Central Date: 11/24/14

Name of project leader, and Division: Scott Williams, Fisheries

Lead Division Regional Supervisor or Field Operations Chief Approval:

Sign: Pat D. Cahill Date: 11/24/14

Lead Division Administrator Approval: Pat D. Cahill Date: 11/24/14

MDC Director Approval: Robert J. ... Date: Nov 25, 2014

SKM TAD

Please return to the Executive Director of the Missouri Conservation Heritage Foundation.

MCHF Approval: C.B. ... Date: 12-3-14

Figure 2: Topographic Map Locating the Project Site

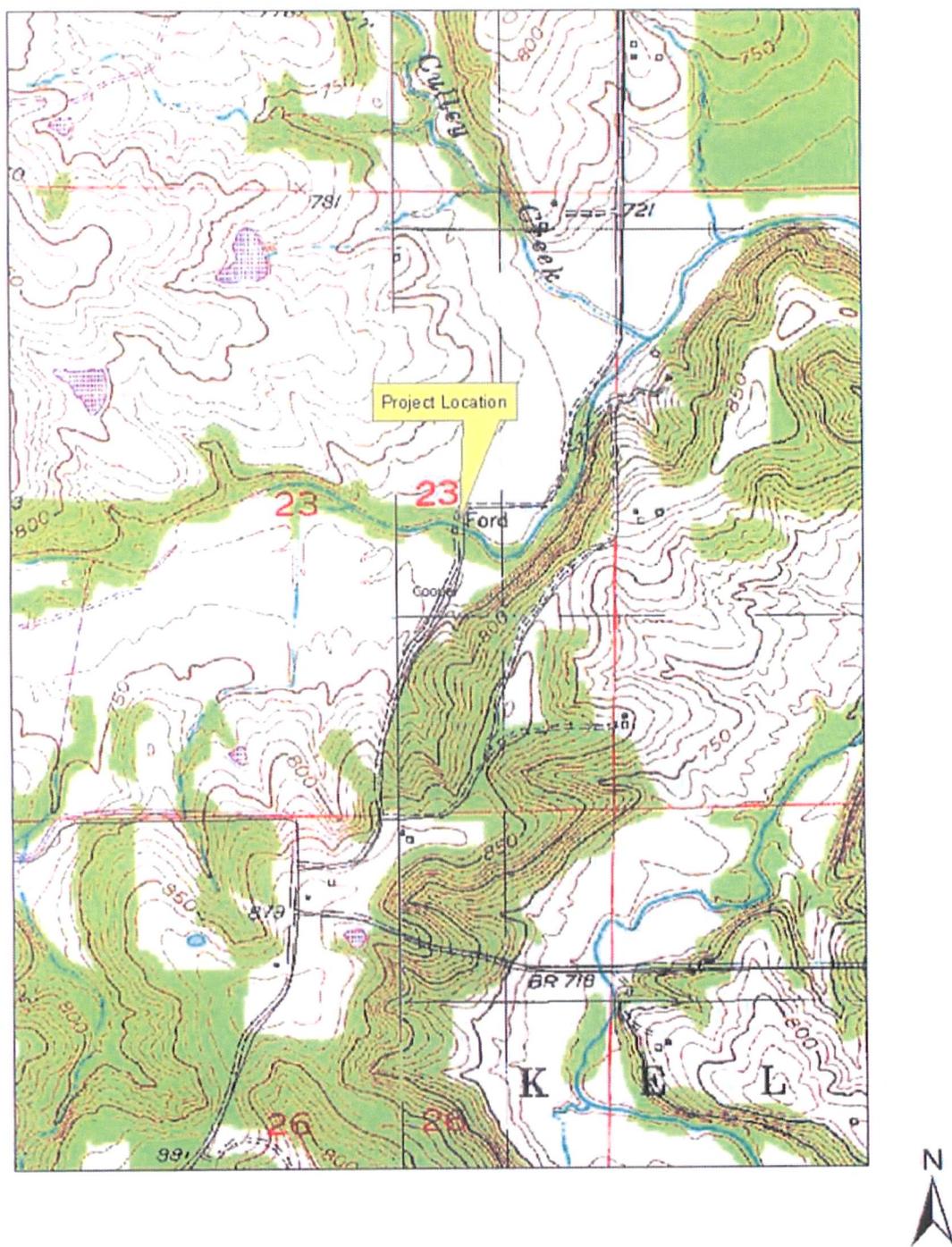


Figure 3: Photograph of downstream crossing face from right descending bank.



Figure 4: Photograph of downstream crossing face from center of the stream channel.



IN-STREAM WORKSHEET

Stream Type	Ephemeral 0.15	Intermittent 0.2	Perennial Stream 0.4		
Priority Waters	Tertiary 0.05		Secondary 0.2	Primary 0.4	
Net Benefit	Stream Relocation to Accommodate Authorized Project 0.5		Moderate 1.2	Good 2.4	Excellent 3.5
Site Protection	Corps approved site protection without third party grantee 0.1		Corps approved site protection recorded with third party grantee, or transfer of title to a conservancy 0.4		
Credit Schedule	Schedule 1 0.3		Schedule 2 0.1	Schedule 3 0	

Factors	Net Benefit 1	Net Benefit 2	Net Benefit 3	Net Benefit 4	Net Benefit 5	Net Benefit 6
Stream Type	0.4					
Priority Waters	0.4					
Net Benefit	3.5					
Site Protection	0					
Credit Schedule	0.3					
Sum Factors (M)=	4.6					
Stream Length Benefited (do not count each bank separately or count same channel reach twice) (LF)=	1317					
Credits (C) = M X LF	6058					
Total Instream Credits Generated C X LK Factor* =						

Total Instream Credits Generated from all Columns = 6058

* Location and Kind (LK) Factor only applies to permittee-responsible mitigation projects
(see page 18 of document) .

