



STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

www.dnr.mo.gov

DEC 15 2014

Mr. John Weber
Environmental Contaminants Specialist
U.S. Fish and Wildlife Service
101 Park DeVille Dr., Suite A
Columbia, MO 65203

RE: Proposal in Response to Request for Proposals for Natural Resource Damage Restoration Projects for Riparian, Wetland, and Floodplain Habitat with Big and Black River Watersheds in the Southeast Missouri Lead Mining District

Dear Mr. Weber:

The Department of Natural Resources' Division of Environmental Quality, Soil and Water Conservation Program, is pleased to submit the enclosed proposal in response to the Request for Proposals (RFP) for Natural Resource Damage Restoration Projects that is due December 15, 2014.

The project proposal is entitled "Riparian, Wetland, and Floodplain Habitat Restoration within the Big and Black River Watersheds of Southeast Missouri" and is a compensatory habitat restoration project. This project is requesting \$1,000,000 in natural resource damage assessment and restoration (NRDAR) funds over a four-year project period from January 1, 2015 to December 31, 2018.

The proposal is a targeted riparian and floodplain habitat project that will implement as many streambank stabilization and riparian buffer practices as possible in the identified Tier 1 and 2 watersheds of the Big and Black river watersheds in order to compensate for natural resources injured by the release of hazardous substances associated with the historical mining activities of the ASARCO, LLC in the Southeast Missouri Lead Mining District. These conservation practices will address sheet, rill, and gully erosion; grazing management; sensitive areas; and woodland erosion in priority riparian areas in the Big and Black river watersheds. In addition, as resources allow, the Natural Resources Conservation Service (NRCS), Missouri Department of Conservation (MDC) and The Nature Conservancy (TNC) will assist landowners with riparian practices such as streambank stabilization, stream bioengineering, pollinator habitat improvement, forest and woodland improvement, glade savannah open woodlands, and reinforced stream crossings. The existing state and local conservation practice delivery system in Missouri will be used to implement this project.

This system includes SWCP, the soil and water conservation district offices in each county, the Soil and Water Districts Commission, and two key partners: NRCS and MDC. NRCS and MDC will assist with certification of conservation practices, as needed, and MDC will help enhance the wildlife habitat of practices implemented through the Missouri Soil and Water Conservation Cost-Share Program. Another vital partner will be TNC. This private organization will assist with selection of plant species for floodplain restoration sites and provide expertise with streambank stabilization projects in areas where active streambank erosion is occurring. The NRCS, MDC, and TNC will also assist interested landowners with easements and land acquisitions through their existing programs.

Thank you for considering our proposal for funding. If you have any questions, please contact Mr. Steve Walker at 751-8453 or Ms. Colleen Meredith at 751-7143 in the Soil and Water Conservation Program.

Sincerely,

DIVISION OF ADMINISTRATIVE SUPPORT



Lori Gordon
Director

LG:swd

Enclosure

Application for Federal Assistance SF-424

Version 02

*1. Type of Submission <input checked="" type="checkbox"/> Preapplication <input type="checkbox"/> Application <input type="checkbox"/> Changed/Corrected Application	*2. Type of Application <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	*If Revision, select appropriate letter(s): * Other (Specify)
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*3. Date Received:	4. Application Identifier:
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5a. Federal Entity Identifier:	*5b. Federal Award Identifier:
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State Use Only:

6. Date Received by State:	7. State Application Identifier:
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8. APPLICANT INFORMATION:

*** a. Legal Name: Missouri Department of Natural Resources**

* b. Employer/Taxpayer Identification Number (EIN/TIN): 44-6000987	*c. Organizational DUNS: 878144757
--	--

d. Address:

***Street1:** P.O. Box 176
Street 2:
***City:** Jefferson City
County: Cole
***State:** MO
Province:
Country: United States ***Zip/ Postal Code:** 65102-0176

e. Organizational Unit:

Department Name: Natural Resources	Division Name: Environmental Quality
--	--

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Ms. **First Name:** Janet
Middle Name:
***Last Name:** Laughlin
Suffix:

Title: Fiscal & Administrative Manager

Organizational Affiliation:
MO Department of Natural Resources-Div of Administrative Support

*Telephone Number: (573) 751-1246	Fax Number: (573) 751-7749
*Email: janet.laughlin@dnr.mo.gov	

Application for Federal Assistance SF-424

Version 02

9. Type of Applicant 1: Select Applicant Type: **A. State Government**

Type of Applicant 2: Select Applicant Type:

- Select One -

Type of Applicant 3: Select Applicant Type:

- Select One -

*Other (specify):

*10. Name of Federal Agency:

U. S. Fish and Wildlife Service

11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

*12. Funding Opportunity Number:

*Title: **Natural Resource Damage Assessment and Restoration**

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Big River Watershed (Washington & Iron counties); Upper Black River Watershed (Reynolds & Wayne counties)

*15. Descriptive Title of Applicant's Project:

Riparian, Wetland, and Floodplain Habitat Restoration within the Big and Black River Watersheds of Southeast Missouri

Attach supporting documents as specified in agency instructions.

Application for Federal Assistance SF-424

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16. Congressional Districts Of: 8, 9

*a. Applicant

*b. Program/Project:

Attach an additional list of Program/Project Congressional Districts if needed.

17. Proposed Project:

*a. Start Date: 1/1/2015

*b. End Date: 12/31/2018

18. Estimated Funding (\$):

*a. Federal	\$1,000,000.00	*d. Local	
*b. Applicant		*e. Other	
*c. State		*f. Program Income	
*d. Local		*g. TOTAL	\$1,000,000.00

*19. Is Application Subject to Review By State Under Executive Order 12372 Process?

- a. This application was made available to the State under the Executive Order 12372 Process for review on
- b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- c. Program is not covered by E.O. 12372

*20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation.)

- Yes
- No

21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)

**I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Ms.

*First Name: Lori

Middle Name:

*Last Name: Gordon

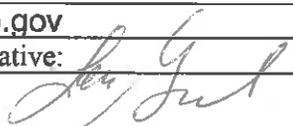
Suffix:

*Title: Director, Missouri Dept. of Natural Resources

*Telephone Number: (573) 751-7961

Fax Number: (573) 751-7749

*Email: karen.kremer@dnr.mo.gov

*Signature of Authorized Representative: 

Date Signed: 12/10/14

Application for Federal Assistance SF-424

Version 02

***Applicant Federal Debt Delinquency Explanation**

The following field should contain an explanation if the Applicant organization is delinquent on any Federal Debt. Maximum number of characters that can be entered is 4,000. Try and avoid extra spaces and carriage returns to maximize the availability of space.

BUDGET INFORMATION - Non-Construction Programs

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		Total (g)
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	
1. NRD		\$	\$	\$ 1,000,000	\$	\$ 1,000,000
2.						0
3.						0
4.						0
5. Totals		\$ 0	\$ 0	\$ 1,000,000	\$ 0	\$ 1,000,000

SECTION B - BUDGET CATEGORIES

Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel	\$	16,607	\$	\$	\$ 16,607
b. Fringe Benefits		7,955			7,955
c. Travel					0
d. Equipment					0
e. Supplies					0
f. Contractual		969,175			969,175
g. Construction					0
h. Other					0
i. Total Direct Charges (sum of 6a-6h)		993,737	0	0	993,737
j. Indirect Charges		6,263			6,263
k. TOTALS (sum of 6i and 6j)	\$	1,000,000	\$ 0	\$ 0	\$ 1,000,000

7. Program Income	\$		\$	\$	\$ 0
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Authorized for Local Reproduction

SECTION C - NON-FEDERAL RESOURCES					
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS	
8. Natural Resource Damage Assessment & Restoration	\$ 1,000,000	\$	\$	\$	1,000,000
9.					0
10.					0
11.					0
12. TOTAL (sum of lines 8-11)	\$ 1,000,000	\$ 0	\$ 0	\$ 0	1,000,000

SECTION D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
	13. Federal	\$ 333,336	\$ 83,334	\$ 83,334	\$ 83,334
14. Non-Federal	0				
15. TOTAL (sum of lines 13 and 14)	\$ 333,336	\$ 83,334	\$ 83,334	\$ 83,334	\$ 83,334

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT					
(a) Grant Program	FUTURE FUNDING PERIODS (Years)				
	(b) First	(c) Second	(d) Third	(e) Fourth	
16. Natural Resources Damage Assessment & Restoration	\$ 166,668	\$ 333,334	\$ 333,332	\$	166,666
17.					
18.					
19.					
20. TOTAL (sum of lines 16-19)	\$ 166,668	\$ 333,334	\$ 333,332	\$	166,666

SECTION F - OTHER BUDGET INFORMATION	
21. Direct Charges: \$993,737	22. Indirect Charges: \$6,263 @ 25.5%
23. Remarks:	



KEY CONTACTS FORM

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Lori Gordon

Title: Director, Div of Administrative Support

Complete Address: PO Box 176 Jefferson City MO 65102

1101 Riverside Drive Jefferson City MO 65101

Phone Number: 573-751-7961 Email: lori.gordon@dnr.mo.gov

Payee: *Individual authorized to accept payments.*

Name: Melanie McNally

Title: Accounting Specialist

Mail Address: PO Box 176 Jefferson City MO 65102

Phone Number: 573-751-1597

Administrative Contact: *Individual from Sponsored Program Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc.)*

Name: Janet Laughlin

Title: Fiscal and Administrative Manger

Mailing Address: PO Box 176 Jefferson City MO 65102

Phone Number: 573-751-1246

FAX Number: 573-751-7749

E-Mail Address: janet.laughlin@dnr.mo.gov

Principal Investigator: *Individual responsible for the technical completion of the proposed work.*

Name: Steve Walker

Title: Project Coordinator

Mailing Address: PO Box 176 Jefferson City MO 65102

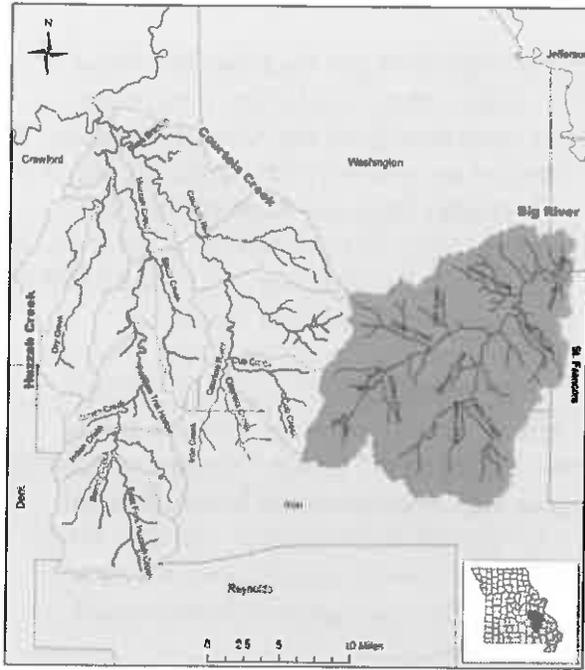
Phone Number: 573-751-8453

FAX Number: 573-526-3508

E-Mail Address: steve.walker@dnr.mo.gov

Web URL: www.dnr.mo.gov

**Riparian, Wetland, and Floodplain Habitat Restoration within the
Big and Black River Watersheds of Southeast Missouri
Proposal Requesting \$1 Million in Natural Resource Damage and Restoration Funds**

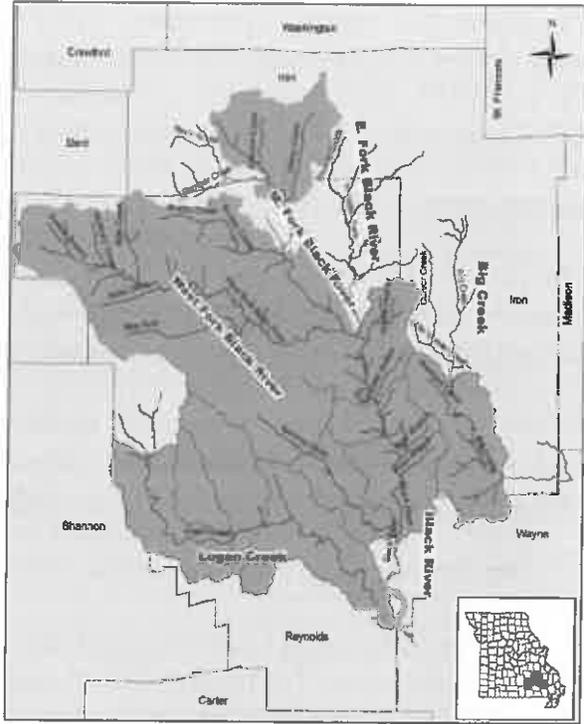


Legend

- Tier1_Priority
- Tier2_Priority



Map created by Kelly Rogers September 2011
This map was prepared as a report for the Missouri Department of Natural Resources. It is not intended to be used for any other purpose. The Missouri Department of Natural Resources is not responsible for any errors or omissions in this map or for any consequences arising from the use of the information contained herein.



Legend

- Tier1_Priority



Map created by Kelly Rogers September 2011
This map was prepared as a report for the Missouri Department of Natural Resources. It is not intended to be used for any other purpose. The Missouri Department of Natural Resources is not responsible for any errors or omissions in this map or for any consequences arising from the use of the information contained herein.

**Project Period: January 1, 2015 to December 31, 2018
Project Area: Big and Black River Watersheds
Missouri Congressional Districts 8 and 9**

**Sponsored by
Soil and Water Conservation Program
Missouri Department of Natural Resources
1101 Riverside Drive, P.O. Box 176
Jefferson City, MO 65102-0176
Project Coordinator: Steve Walker
Phone: (573) 751-8453
Fax: (573) 526-3508
steve.walker@dnr.mo.gov**

Restoration Project Proposal
Riparian, Wetland, and Floodplain Habitat Restoration within the Big and Black River
Watersheds of Southeast Missouri

Background

The Missouri Trustee Council (Trustees) recovered monetary damages from the American Smelting and Refining Company (ASARCO, LLC) to settle certain legal claims regarding injuries to natural resources and their services. Monies recovered from the Natural Resource Damage Assessment and Restoration (NRDAR) settlement are available for public proposals by the Trustees in accordance with the Southeast Missouri Ozarks Regional Restoration Plan (SEMORRP). The Trustees are comprised of the Missouri Department of Natural Resources and U.S. Department of the Interior represented by the U.S. Fish & Wildlife Service. The SEMORRP provides the process framework which governs the approach for restoration project identification, evaluation, selection and implementation.

The SEMORRP was a joint effort among state and federal natural resource agencies and is coordinated with the public. The SEMORRP is jointly administered by the Trustees to assist in carrying out their natural resource trust mandates under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Oil Pollution Act, and the Clean Water Act. Natural resource damages received through negotiated or adjudicated settlements must be used to restore, rehabilitate, replace and/or acquire the equivalent of those natural resources injured and services lost. This document is available at:

<http://dnr.mo.gov/env/hwp/sfund/nrda.htm> and

<http://www.fws.gov/midwest/es/ec/nrda/SEMONRDA/index.html>.

The Southeast Missouri Lead Mining District (SEMOLMD) is one of the largest lead producing regions in the world. The mining district encompasses several counties located from 40 to 90 miles south to southwest of St. Louis. As a result of the contamination of natural resources in SEMOLMD from mining wastes, the Trustees initiated ongoing NRDAR activities at numerous sites within SEMOLMD. Natural resource damage assessments have shown heavy metal contamination injuring thousands of acres of land, dozens of miles of streams, and the terrestrial and aquatic life that depend on these habitats. ASARCO, LLC, and/or its predecessors, owned and operated mining leases, mills and smelters in the Old and New Lead Belts. Therefore, the Trustees filed and settled a claim against ASARCO, LLC for injury to natural resources and their services.

Project Summary

The project "Riparian, Wetland, and Floodplain Habitat Restoration within the Big and Black River Watersheds of Southeast Missouri" is a compensatory habitat restoration project sponsored by the Soil and Water Conservation Program (SWCP) of the Missouri Department of Natural Resources (MDNR). This project is requesting \$1,000,000 in Natural Resource Damage Assessment and Restoration (NRDAR) funds and will be conducted following the NRDAR process developed by the Trustees for the Southeast Missouri Lead Mining District pursuant to the CERCLA (42 U.S.C. §§ 9601-9675) and implementing regulations (43 C.F.R. Part 11). The project area will include the Big River in Washington and Iron counties and the upper Black River in Reynolds and Wayne counties, including the Logan Creek and Stinking Creek

watersheds in Reynolds County, which empty into the Black River and Clearwater Lake. This project will comply with the preferred alternative selected in the SEMORRP, which is a combination of primary and compensatory restoration. The highest priority for implementing conservation practices in riparian areas will be the identified Tier 1 restoration areas listed in Figures 1 and 2. The targeted riparian and floodplain habitat areas for this project will be located near, but not within, contaminated areas of the Big and Black River watersheds.

The SWCP will work closely with several conservation partners in implementing this project, including the county soil and water conservation districts (SWCDs), Natural Resources Conservation Service (NRCS), Missouri Department of Conservation (MDC), and The Nature Conservancy (TNC). The SWCDs share office space with the NRCS in most counties and have worked cooperatively with the NRCS for many years in providing outreach and information to landowners and assisting them in developing conservation plans, completing cost-share contracts, and implementing and certifying conservation practices. SWCD Technicians II staff are authorized to certify the practices listed with an asterisk in Table 1. Some SWCD staff have also been authorized to certify grazing systems. The practices in Table 1 will be eligible for funding for this proposed project and promoted by SWCD staff and cooperating partner staff during one-on-one visits with landowners within the project area. Thus, most practices implemented during this project will not have to rely on other agencies for certification. All conservation practices will be implemented using NRCS or MDC standards and specifications unless other proven methods are approved by the Trustees, and will be certified by the appropriate agency or contract partner.

Project Description

The purpose of this project is to help compensate the public for injury to riparian, wetland, and floodplain habitat from heavy metal contamination. This project will work with private landowners to implement riparian conservation practices in the identified priority watersheds for the purposes of improving, protecting, and restoring degraded riparian, wetland, and floodplain habitat and streambanks, and to promote upland practices which protect riparian areas from sedimentation and nonpoint source runoff. Riparian and floodplain forest habitat is generally defined as forest, wetland or wet prairie communities adjacent to streams or within floodplains. A secondary goal will be to improve the quality of nearby surface and ground waters in the vicinity of the habitat restoration sites.

Table 1 provides a list of conservation practices that will be available for cost-share within this proposal.

Table 2 provides a list of the eligible watersheds and stream riparian areas in the Big and Black River watersheds and their restoration priorities. Tier 1 watersheds are the highest priority for restoration.

The SWCP has extensive experience with enrollment in state and federal cost share programs since the program administers one half of the state parks, soils and water sales tax. In fiscal year 2014 the allocation for cost-share to landowners is \$31 million. Some advantages the SWCP may have over other federal, state, and private organizations in implementing NRDAR funds include:

1. The SWCP has an experienced and efficient delivery system established for implementing this project. This delivery system includes the Department's staff and the local SWCD staff and partners. In addition to the state cost-share program, most SWCDs in Missouri have past experience in implementing special state and federal conservation projects (i.e. NRCS Mississippi River Basin Healthy Watersheds Initiative (MRBI) and Cooperative Conservation Partners Initiative (CCPI) programs, federally-funded Section 319 nonpoint source implementation projects and state-funded Special Area Land Treatment (SALT) projects.
2. The existing web-based Missouri Soil and Water Information Management System (MoSWIMS) will be used for cost-share contract development, payments to landowners, conservation practice evaluation criteria, and time recording for SWCD staff.
3. The SWCP routinely uses cooperative agreements and contracts with other agencies and organizations for a variety of services.
4. The requested NRDAR funds can be leveraged with SWCP funding depending on the practices and extents chosen by landowners. SWCP cost-share is limited to 75% of eligible project costs. NRDAR funds can be used to raise cost-share up to 90% or fund additional components or extents of a practice, if necessary, to make the practices economically feasible for landowners to install. The SWCP recommends that landowners incur a portion of the cost of the conservation practices, either in-kind or cash basis, to be invested in the project.

The Missouri Department of Conservation has a total of three private land conservationists (PLCs) and two fisheries management biologists in the Big and Black River watersheds that will provide technical assistance to landowners for riparian buffer practices, including technical assistance and available cost-share for wildlife plant species mixes which may be in addition to the cost-share provided through the SWCP to provide better habitat. The estimated technical and financial assistance provided by the MDC for this project will be at least \$160,000 based on the projected implementation of approximately 100 conservation practices at an average cost of approximately \$1,600 per practice. The MDC has found that landowners are generally more willing to implement stream related practices if a light equipment stream crossing is part of their project. The components of these stream crossings are rock, grading and shaping and critical area seeding, so for little additional cost, construction of stream crossings often results in landowners agreeing to install additional riparian habitat practices. The MDC may be able to provide equipment and operators for in-stream construction projects dependent on their workload. If so, stream crossings will be installed with their assistance, otherwise, the SWCP will contract with TNC or other partners that have in-stream experience. Stream crossings are a component part of the SWCP WQ10 Stream Protection Practice, but it is not a stand alone practice.

The TNC is submitting an independent proposal to the Trustees in response to this RFP with a focus on streambank stabilization, assessment and in-stream projects. The SWCP is supportive of their proposal and intends to coordinate with TNC for mutual benefits to both projects. The Missouri Department of Agriculture (MDA through an existing partnership with the SWCP will provide short-term loans to landowners through their Bridge Loan Program for the up-front costs

of implementing conservation practices. These loans do not have to be paid back until landowners receive their cost-share payments; therefore, these loans enable more landowners to participate in cost-share programs.

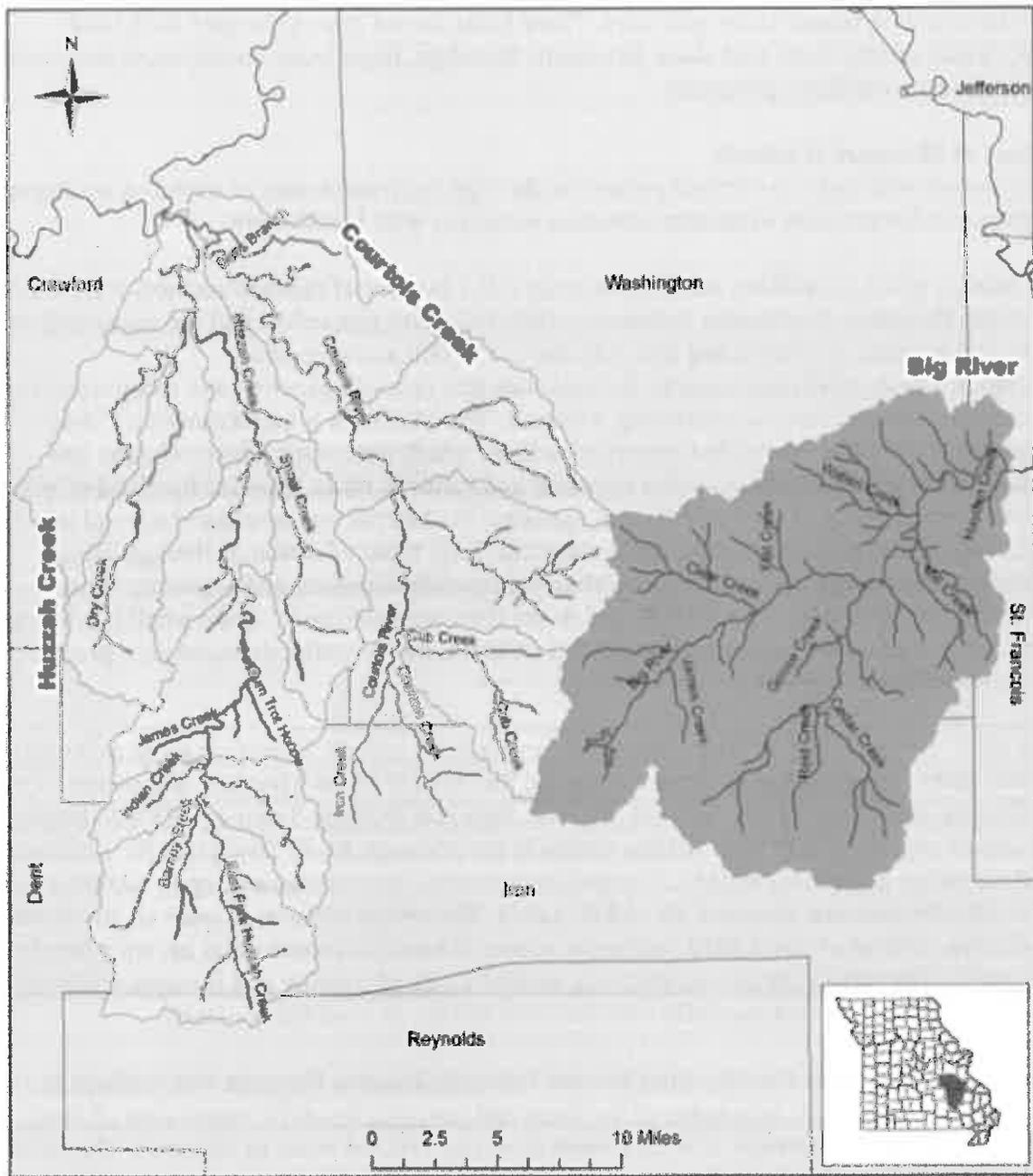
Status of Missouri Wetlands

This project will assist in wetland protection through implementation of livestock exclusion practices and promotion of partner easement programs with landowners.

Originally, about 4.8 million acres in Missouri (10.7 percent of the land surface) were wetlands. Missouri Resource Assessment Partnership (MoRAP) program calculated the remaining wetland acres in Missouri; it is estimated that only about 113,000 acres remain (morap.missouri.edu/Projects.aspx). Several state and federal agencies have recognized the need to preserve and enhance our remaining wetlands. The MDNR's Water Resources Center administers the State Wetlands Conservation Plan, which encourages the protection and restoration of wetlands and provides technical assistance to other agencies involved in wetland issues. With the help of state and federal agencies, the MDNR has completed several projects, including studies assessing urban wetlands, identifying types of wetlands through image analysis, determining the hydrology of Missouri riparian wetlands, and assessing specific wetland mitigation sites. The MDNR and its partners are working to locate small headwater wetlands in agricultural areas and establish a dollar value for wetlands under past, present and future conditions.

The MDC currently has 15 large, intensively managed wetlands, comprising approximately 81,000 acres. These wetlands are mainly in the floodplains of the Missouri, Mississippi, Grand, St. Francis, and Osage rivers. In 1994, the U.S. Fish and Wildlife Service (USFWS) began the process of acquiring land from willing sellers in the Missouri River floodplain for a national wildlife refuge called Big Muddy. The project authorizes the purchase of up to 60,000 acres in 25 to 30 units between Kansas City and St. Louis. The refuge consists of over 16,700 acres of land in ten units as of April 2012. Although access is limited at some units, all are publicly accessible. The refuge focuses on restoring several kinds of riverine and floodplain habitat, allowing lands to interact naturally with the river and act as seasonal wetlands.

The Natural Resources Conservation Service Wetlands Reserve Program was initiated in 1992. This program purchases easements of wetlands and provides funds for restoration of those wetlands. There are presently 858 easements covering 119,168 acres in Missouri. The MDC, USFWS and NRCS have protected more than 260,000 acres of wetlands through easements or purchases, restored more than 43,000 acres, and enhanced more than 41,000 acres in Missouri.



Legend

- Tier1_Priority
- Tier2_Priority



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Map created by Wade Stanger September 2011
 This map can be found at MDSuperfund.NR1361MCIRestorationBRT.BigRiver.mdnr.com
 Although all data sets used to create this map have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials. The user of distribution shall not constitute any such warranty, and no responsibility is assumed by the department in the use of these data or related materials.

Figure 1. Priority restoration areas for the Big River watershed.

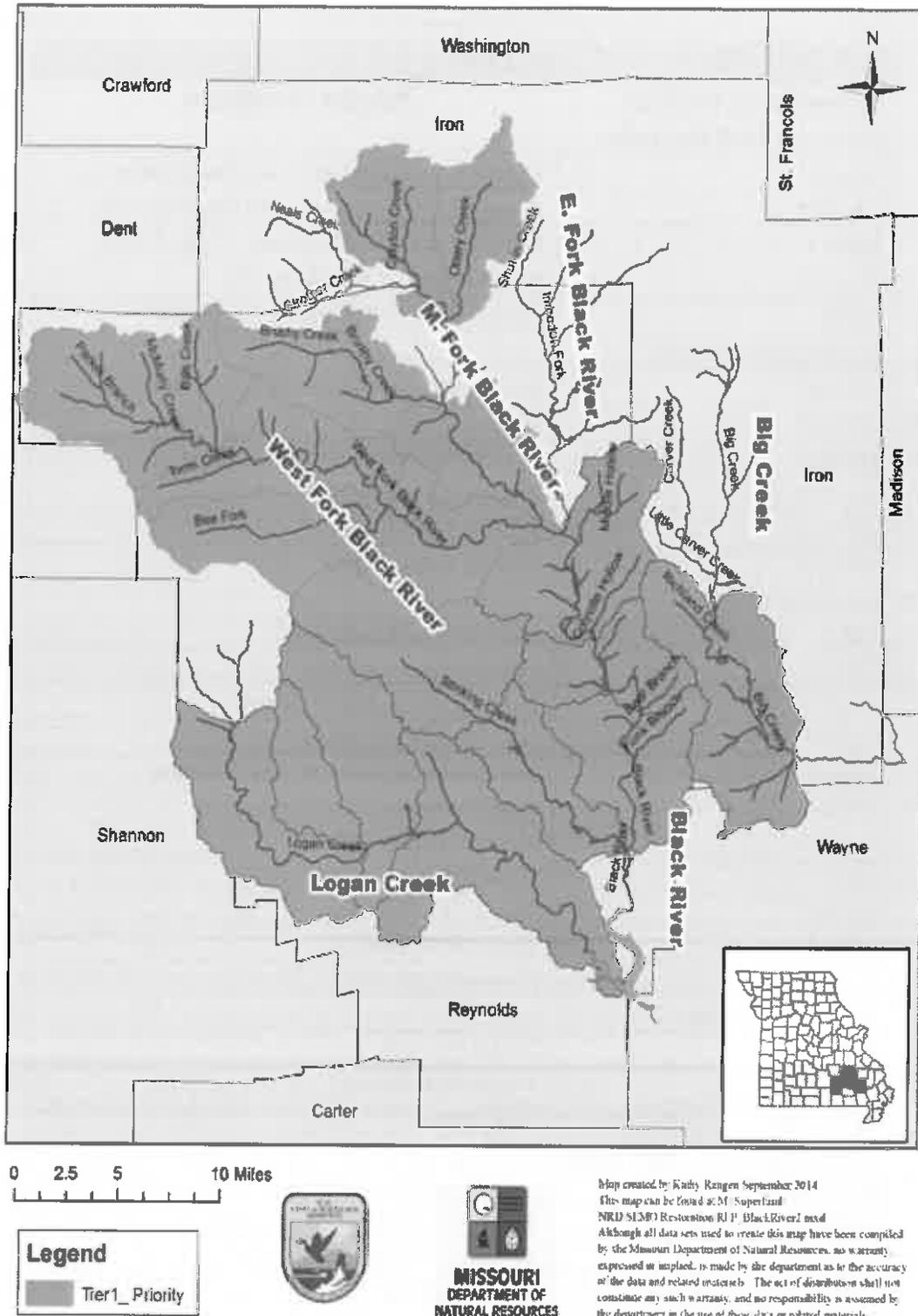


Figure 2. Priority restoration areas for the Black River watershed.

Table 1. Eligible conservation practices.

SWCP Practices	
Conservation Practices	Practice Description
Sheet and Rill/Gully Erosion	
DSL-01*	Permanent Vegetative Cover Establishment
DSL-02*	Permanent Vegetative Cover Improvement
DSP-11	Permanent Vegetative Cover - Critical Area
DWC-01	Water Impoundment Structure
N380	Windbreak/Shelterbelt Establishment
Grazing Management	
DSP-02*	Permanent Vegetation Cover Enhancement
DSP 3.1	Grazing System Water Development
DSP 3.2	Grazing System Water Distribution
DSP 3.3	Grazing System Fence
DSP 3.4	Grazing System Lime
DSP 3.5	Grazing System Seed
Sensitive Areas	
C650	Streambank Stabilization
DSP-31	Sinkhole Improvement
BDSP-31	Buffer Sinkhole Improvement
N351*	Well Decommissioning
N380*	Windbreak/Shelterbelt Establishment
N386*	Field Border
N391*	Riparian Forest Buffer
N393*	Filter Strip
N574*	Spring Development
N725*	Sinkhole Treatment
WQ10*	Stream Protection
Woodland Erosion	
DFR-04*	Forest Plantation
N472*	Livestock Exclusion
MDC Practices	
Pollinator Habitat Improvement	
MDC 300 A	Forest and Woodland Improvement
MDC 300 B-5	Glade Savannah Open Woodland
MDC 500 B	Reinforced Stream Crossing
TNC Practices	
	Stream Bioengineering

* District Technician IIs are authorized to certify these practices; some have specialized certification for grazing systems as well.

Table 2. Tier 1 and Tier 2 streams within the Big and Black River watersheds targeted for restoration of riparian, wetland, and floodplain habitat. Streams are listed in order from downstream to upstream and the priority ranking of each stream for restoration is listed in parentheses.

Watersheds and Streams	Restoration Priority
Big River Watershed (Figure 1)	
Big River (1)	Tier 1
Hayden Creek (2)	Tier 1
Wallen Creek (3)	Tier 1
Mill Creek (4)	Tier 1
Reid Creek (5)	Tier 1
Goose Creek (6)	Tier 1
Cedar Creek (7)	Tier 1
Flat Creek (8)	Tier 1
Clear Creek (9)	Tier 1
James Creek (10)	Tier 1
Courtois Creek Watershed (Figure 1)	
Courtois Creek	Tier 2
Courtois River	Tier 2
Cub Creek	Tier 2
Doss Creek	Tier 2
Iron Creek	Tier 2
Huzzah Creek Watershed (Figure 1)	
Barney Creek	Tier 2
Dry Creek	Tier 2
East Fork Huzzah Creek	Tier 2
Huzzah Creek	Tier 2
Indian Creek	Tier 2
James Creek	Tier 2
Possom Trot Hollow	Tier 2
Shoal Creek	Tier 2
Black River Watershed (Figure 2)	
Black River Below Stinking Creek (Not Eligible)	
Black River above Stinking Creek (1)	Tier 1
Logan Creek Watershed (Figure 2)	
Logan Creek	Tier 1
Bear Branch	Tier 1
Coyote Hollow	Tier 1
Funk Branch	Tier 1
Middle Hollow	Tier 1
Stinking Creek	Tier 1

Watersheds and Streams	Restoration Priority
Middle Fork Black River Watershed (Figure 2)	
Clayton Creek	Tier 1
Middle Fork Black River	Tier 1
Ottery Creek	Tier 1
West Fork Black River Watershed (Figure 2)	
Bee Fork	Tier 1
Bills Creek	Tier 1
Brushy Creek	Tier 1
McMurty Creek	Tier 1
Parker Branch	Tier 1
Toms Creek	Tier 1
West Fork Black River	Tier 1
Logan Creek Watershed (Figure 2)	
Logan Creek	Tier 1
Big Creek Watershed (Figure 2)	
Big Creek	Tier 1
Richland Creek	Tier 1

Budget

The budget for the project is shown in Table 3. Technical and administrative assistance to landowners will be provided by the SWCDs within the identified priority watersheds. NRDAR project funds are requested for a District Technician II position to act as a project manager for coordination with landowners, the SWCP, and project partners.

Table 3. Project budget.

	STATE FISCAL YEAR 1 (01/01/2015 - 06/30/2015)	STATE FISCAL YEAR 1 (07/01/2015 - 06/30/2016)	STATE FISCAL YEAR 2 (07/01/2016 - 06/30/2017)	STATE FISCAL YEAR 3 (07/01/2017 - 06/30/2018)	STATE FISCAL YEAR 4 (07/01/2018 - 12/31/2018)	TOTALS
Salary	\$ 2,076	\$ 4,152	\$ 4,152	\$ 4,152	\$ 2,076	\$ 16,607
Fringe (47.9%)	\$ 994	\$ 1,989	\$ 1,989	\$ 1,989	\$ 994	\$ 7,955
Contractual: Cost-Share	\$ 69,760	\$ 139,518	\$ 139,518	\$ 139,518	\$ 69,760	\$ 558,074
Contractual: District Personnel	\$ 26,388	\$ 52,775	\$ 52,775	\$ 52,775	\$ 26,388	\$ 211,102
Contractual: Streambank Restoration	\$ 25,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 25,000	\$ 200,000
Subtotal Direct Costs	\$ 3,070	\$ 6,140	\$ 6,140	\$ 6,140	\$ 3,070	\$ 24,561
Indirect Costs (25.5%)	\$ 783	\$ 1,566	\$ 1,566	\$ 1,566	\$ 783	\$ 6,263
						\$ 1,000,000
TOTAL GRANT COST	\$ 125,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 125,000	\$ 1,000,000

The estimated costs associated with Soil and Water Conservation Program administration of cost-share and incentive payments to landowners for implementing conservation practices during this project will be 0.10 FTE per year for an Environmental Specialist III position or an estimated \$4,152 per year. The costs over the four-year project period will be \$16,607. The NRDAR funds will also be used to hire a new District Technician II (1.0 FTE) in one of the soil and water conservation district offices within the project area to coordinate the riparian restoration activities throughout all of these districts during the four-year project period. Salary and benefits based on \$18 per hour, over the four-year project period will be \$211,102.

Streambank stabilization practices will be provided in part through a contract with TNC.

Project Goal

The primary goal of this project is to provide long-term replacement of the natural resource areas damaged by hazardous substance releases. This will be accomplished by maximizing development of wildlife habitat and diversity and improving and protecting water quality, the quality of aquatic and riparian habitats, and the species and communities dependent on those natural resources. Riparian corridors will be developed that provide habitat for migratory birds, amphibians, and other species. The re-vegetated floodplain areas will improve water quality by preventing erosion of sediment into streams through bank stabilization and runoff filtration. One of the keys in accomplishing this goal will be establishing as many contiguous riparian forest buffers, filter strips, and WQ10 stream protection practices as possible within the floodplains and adjacent to the Tier 1 perennial streams shown in Table 2 and Figures 1 and 2.

Since the early 1800s, the cumulative effects of riparian land use in Missouri have resulted in fragmented riparian forests, loss of protective forest cover along stream channels, and impairment of critical natural resource functions. Loss of streamside forest typically resulted in accelerated bank erosion, channel widening, shallower stream depths, increases in stream temperature, loss of aquatic and riparian habitat, and other effects (Roell, 1994). In addition, many streams have been channelized. A variety of streambank stabilization designs have been developed by various agencies and organizations to restore damaged riparian areas and this project will attempt to demonstrate and/or combine as many different methods and designs as possible in order to learn more about which ones perform best over time.

Riparian buffers, which include the practices of filter strips, riparian forest buffers, and WQ10 stream protection, will be critically important to this project's riparian restoration efforts. Riparian buffers protect surface and ground water quality from impacts related to land use and provide food and habitat for a wide variety of wildlife species. Buffer plants slow sediment-laden runoff and depending on their width and vegetational complexity, from 50-100% of sediments, as well as the nutrients and other pollutants attached to them, may be deposited or absorbed. When surface water runoff is filtered by a riparian buffer, approximately 80 to 85% of the phosphorus is captured, and nitrogen and other pollutants can be transformed by chemical and biological soil activity into less harmful substances. In addition, riparian plants act as sinks, absorbing and storing excess water, nutrients, and pollutants that would otherwise flow into streams (Connecticut River Joint Commission, 2005). Buffers are most effective when they are contiguous. Long, contiguous buffer strips are much more important than fragmented strips with greater widths as even small gaps in vegetation along the bank can channel the runoff into the stream and negate the effect of surrounding buffers.

Three-Zone Buffer Systems

One of the best designs for buffers is a three-zone buffer system, which was originally developed as part of an initiative to protect the Chesapeake Bay (Hawes and Smith, 2005). The combination of vegetation types (trees, grass and shrubs) helps maximize the efficiency and diversity of benefits that the buffer provides.

Zone 1

Minimum Width: 15 ft.

Composition: Native trees and shrubs.

Function: Bank stabilization, habitat, shade, flood prevention.

Management: None allowed except bank stabilization and removal of problem vegetation, as needed.

Zone 2

Minimum Width: 60 ft.

Composition: Native trees and shrubs.

Function: Removal of nutrient, sediments and pollutants from surface and subsurface flows, habitat.

Management: Some removal of trees to maintain vigorous growth.

Zone 3

Minimum Width: 30 ft.

Composition: Grasses and herbaceous plants.

Function: Slow surface runoff, trap sediments and pesticides.

Management: Mowing.

Special Conditions for Conservation Practice Implementation

The conservation practices in Table 1 will be eligible for implementation in the identified priority restoration areas (Figures 1 and 2).

The requested NRDAR funds will be leveraged through the SWCP depending on the practice and extents chosen by landowners. Cost-share assistance may vary from 75% to 90% cost-share for the eligible project conservation practices listed in Table 1. In addition, significantly higher out-of-production payments may be offered using a tiered approach that increases incentives for riparian buffers that meet optimum or maximum listed conditions. Also, the maximum assistance amounts, allowable widths, and other limitations associated with some conservation practice standards and specifications may be waived or modified in order to maximize the restoration of floodplain, wetland, riparian and stream habitats. These monies will be used to implement conservation practices that will expand and enhance wildlife habitat, stabilize streambanks, reduce sheet and rill/gully erosion, help protect riparian and floodplain areas from runoff of nonpoint source pollutants (i.e. sediments, organic materials, nutrients, pesticides, bacteria), and help compensate for natural resources injured by the release of hazardous substances associated with historical mining activities of the ASARCO, LLC. Priority restoration areas will be located near, but not within, contaminated areas of the Big and Black River watersheds.

Conservation practices implemented by county soil and water conservation districts (SWCDs) must be maintained for the life of the practice, which for most practices is 10 years. The expectation for this project will also be a 10-year maintenance life. The SWCD technicians will be responsible for ensuring practices are designed, implemented, and maintained in accordance with policies, and appropriate standards and specifications.

Proposed Objectives:

This proposal has adopted the restoration goals developed by the Trustees within the Big and Black River watersheds following the suggested tiered approach to ensure funds are expended in

close vicinity to the areas where hazardous waste-related injuries occurred. Figures 1 and 2 provide maps of the highest priority restoration areas identified by the Trustees. The highest priority sites are those closest to:

- Large areas of existing valuable natural resources (as determined by the Trustees and partner organizations), such as existing state, federal, or private conservation areas or preserves.
- Conservation Opportunity Areas (as determined by the Missouri Department of Conservation).
- Areas of importance for Threatened and Endangered Species.
- Uncontaminated portions of the Big and Black River watersheds.
- Historic wetlands.

According to Broadmeadow and Nisbet (2004), Wenger (1999), Fischer and Fischenich (2000), the U.S. Army Corps of Engineers (1991), the most effective buffer widths depend on which resources are being protected. Scientific studies have shown that effective buffer widths range from 10 feet for bank stabilization and stream shading, to over 300 feet for wildlife habitat. The necessary buffer width and riparian habitat requirements for a specific location also depend on the soil type, slope, land use, and types of species being protected (e.g. birds, mammals, reptiles, amphibians, fish). While trout and other cold water aquatic species can benefit from the shading, habitat, food, and water quality protection that a 150-foot buffer provides, mammals such as the red fox and the bobcat require riparian corridors of approximately 330 feet. Furthermore, birds such as the cerulean warbler, require a large forested buffer that is much wider than 300 feet.

Buffers are most effective when they are contiguous. Fisher and Fischenich (2000) recommended that long, contiguous buffer strips should often be a higher priority than fragmented buffer strips of greater width. This is because small gaps in vegetation along the bank can channelize runoff into the stream and effectively negate the effects of surrounding buffers. Also, failure to extend protection to the smaller headwater streams within a watershed may ignore important sources of sedimentation and pollution as these streams often have a greater influence on water quality than wider buffers on portions of larger streams that are already carrying polluted water. Furthermore, removing riparian vegetation from the banks of small, heavily shaded streams has a greater impact on stream temperature and aquatic habitat than removing vegetation from larger streams, where only a fraction of the water is shaded (U.S. Army Corps of Engineers, 1991). Clinnick et al (1985) advocated a minimum buffer width of 20 meters (66 feet) for the protection of ephemeral streams.

Landowners in the project area own little bottom land which is often their most productive land for agriculture. "Ideal" buffers are difficult to promote because of loss of production from the buffer acres. District technicians will promote that "some buffer is better than no buffer," and then provide economic incentives proportional to buffer widths to compensate for loss of production. This approach has been shown to be very successful with current SWCP practices. Therefore, this project will make every attempt to attain the following objectives:

1. Restore natural resources and services injured by the release of hazardous substances within the Southeast Missouri Lead Mining District.
2. Improve and protect the quality of aquatic and riparian habitats, the wildlife species and communities dependent on those natural resources, and water quality.

3. Enhance alluvial habitats, riparian corridors, and improve water quality by preventing erosion of silt and soil into streams through bank stabilization and runoff filtration.
4. Promote revegetation of floodplains and increase habitat for migratory birds, amphibians, and other wildlife species.
5. Improve, protect, and expand riparian, wetland, and floodplain habitat within the identified Tier 1 and Tier 2 watersheds.
6. Estimate increases in wildlife usage (e.g. migratory bird usage of restored areas) and populations.
7. Promote and implement riparian conservation practices.
8. Restore degraded riparian areas and streambanks.
9. Provide education and outreach to landowners about available federal, state, and private programs that acquire high quality riparian corridors or provide easements or other institutional controls on restored or acquired riparian areas.
10. Conduct one-on-one contacts with producers and complete or initiate on-farm planning with 100 or more producers. Discuss potential resource needs and available cost-share assistance for improving and protecting riparian, wetland, and floodplain habitat.
11. Promote up to 25 upland practices that exclude livestock from stream corridors and sensitive areas through the following state cost-share practices: DSP 3. Grazing Systems, and N472 Use Exclusion.
12. Implement up to five water impoundment structures at suitable locations within riparian corridors to enhance and expand aquatic habitats for a variety of wildlife species.
13. Implement up to 30 riparian buffer practices within riparian corridors of the identified Tier 1 watersheds (technical assistance for wildlife habitat will be provided by MDC private land conservationists).
14. Complete annual reports by January 31 each year and the final report by December 31, 2018.

Through these objectives, this project will strive to restore and protect riparian forests, wetlands and floodplains; improve the condition of riparian habitats; and prevent further degradation to stream corridors. Restoration of riparian areas may include planting trees, fencing cattle out of the stream corridor, or stabilizing erodible streambanks. This project will also seek to locate and preserve healthy riparian forest and wetland areas that have been minimally disturbed, but are threatened with development.

Innovative Incentives

In order to help ensure that most riparian buffers implemented during this project meet or surpass an optimum width for a multitude natural resource services including wildlife habitat, several innovative incentives will be offered to landowners based on the riparian buffer widths that they agree to install. A one-time out of production incentive of \$500 per acre will be offered for a 20-25 foot buffer, with a tiered step-up incentive based on additional buffer widths. The incentive amounts will be determined by a committee of local, federal and state partners.

A popular practice with agricultural landowners that has been established in a prior Section 319 Nonpoint Source Project has been to plug lead exploration holes. These are very prevalent in this area and landowners want to remove these from their farms because of equipment damage from inadvertently hitting them. On-farm discussions with landowners regarding this practice has

allowed the SWCD staff to promote other conservation practices for their land. It is requested that this practice be considered by the Trustees as an addition to this project with potentially increasing the project area to include St. Francois County, since they have been so successful with their 319 project and can assist the other SWCDs.

Project Evaluation

The success and effectiveness of this project will be measured based on how well the goals and objectives are met. Due to the paucity of surface water quality monitoring stations in the project area, field-level water quality modeling with the Nutrient Tracking Tool program will be one of the methods used in estimating the effectiveness of the implemented conservation practices in reducing runoff of sediment, nitrogen, and phosphorus.

The MDC will use their existing protocols to measure the success of this project in establishing wildlife habitat and documenting the usage of these habitats by migratory birds and other wildlife species.

One method of evaluating the benefit of streambank stabilization practices is measurement of the soil that is excavated and removed that would likely have eroded if left untreated.

The MoSWIMS system captures evaluation information such as tons of soil saved, acres served, extents installed, watershed and other criteria for each conservation practice implemented. The SWCP will provide information on a HUC-12 scale for state cost-share conservation practices implemented within the project boundaries, in addition to those implemented with NRDAR funds for a more complete picture of restoration efforts.

Stream Water Quality Monitoring

Stream water quality monitoring will be conducted using existing long-term stream gaging and water quality monitoring stations operated by the MDNR and U.S. Geological Survey (USGS). In addition, MDNR may be able to implement new water quality monitoring within the identified Tier 1 and 2 watersheds during the project with federal Section 319 funds.

Existing historical stream water quality monitoring data in Missouri will be used to document pre-project mean parameter concentrations (mg/L) and watershed loading rates (tons/mi²/yr) for available stream data in Missouri streams from 1990-2014 (Table 4). Figure 3 shows the locations of the historic long-term stream water quality monitoring stations in Missouri. Mean total nitrogen and total phosphorus concentrations and watershed loading rates measured during the project at existing long-term stream water quality monitoring stations will be compared with the long-term mean total nitrogen and total phosphorus concentrations and watershed loading rates calculated from 1990-2011. Similar historical assessments will be completed for all available sediment, heavy metal and pesticide parameters and these data will be compared with the post-project water quality monitoring data to evaluate changes in water quality data after conservation practices have been implemented.

Table 4. Big River and Black River

Historical mean water quality parameter concentrations (mg/L or ug/L), mean loads (lbs/day) and watershed loading rates (tons/mi²/yr) for flow, total nitrogen (TN), total phosphorus (TP), total suspended solids (TSS), total lead (Pb), total cadmium (Cd), dissolved copper (Cu), and total zinc (Zn) for the period of record (1990-2014).

Big River near Richwoods – 07018100, 735 square mile drainage area									
Parameter	Unit	Count	Average	StDev	Min	Max	Median	Mean Lbs/Day	T/Mi ² /Yr
Flow cfs	ft ³ /s	157	746	1,640	45	16,100	319		
TN	mg/L	36.00	0.51	0.27	0.09	1.10	0.44	2,056	0.511
TP	mg/L	148.00	0.04	0.06	0.01	0.59	0.03	149	0.037
TSS	mg/L	121.00	20.27	54.56	0.00	556.00	7.50	81,544	20.247
TPb	µg/L	51.00	51.56	57.25	4.62	230.00	30.60	207.40	0.051
TCd	µg/L	51.00	0.44	0.40	0.07	2.00	0.33	1.78	0.000
DCu	µg/L	54.00	2.17	1.56	0.50	6.00	1.40	8.71	0.002
TZn	µg/L	51.00	27.81	24.29	6.00	110.00	18.00	111.87	0.028
T=total, D=dissolved, N=nitrogen, P=phosphorus, Pb=lead, Cd=cadmium, Cu=copper, Zn=zinc									

Black River below Annapolis – 07061600, 493 square mile drainage area									
Parameter	Unit	Count	Average	StDev	Min	Max	Median	Mean Lbs/Day	T/Mi ² /Yr
Flow cfs	ft ³ /s	841.00	651.46	1,460.43	36.00	28,800.00	329.00		
TN	mg/L	132.00	0.23	0.14	0.06	1.20	0.21	810	0.300
TP	mg/L	134.00	0.02	0.02	0.01	0.17	0.02	69	0.025
TSS	mg/L	701.00	65.67	180.54	0.00	2,520.00	6.00	230,812	85.443
TPb	µg/L	50.00	0.92	2.66	0.02	13.70	0.14	3.24	0.001
TCd	µg/L	50.00	0.03	0.04	0.01	0.26	0.02	0.12	0.000
DCu	µg/L	68.00	1.57	2.03	0.20	10.10	0.50	5.53	0.002
TZn	µg/L	52.00	3.36	4.94	0.60	20.00	1.05	11.80	0.004
T=total, D=dissolved, N=nitrogen, P=phosphorus, Pb=lead, Cd=cadmium, Cu=copper, Zn=zinc.									

Missouri Stream Teams

A total of nine stream teams are active in the Big and Black River watersheds and available pre-project macroinvertebrate and water quality data will be compared with post-project data in order to determine if improvements in water quality and aquatic populations may have occurred.

The Resource Assessment and Monitoring Program (RAM Program)

The RAM Program is conducted by the Missouri Department of Conservation to assess and monitor long-term trends in the health of Missouri’s warm water streams. There are five major

factors that affect stream health and each of these must be balanced in order for a stream to be healthy:

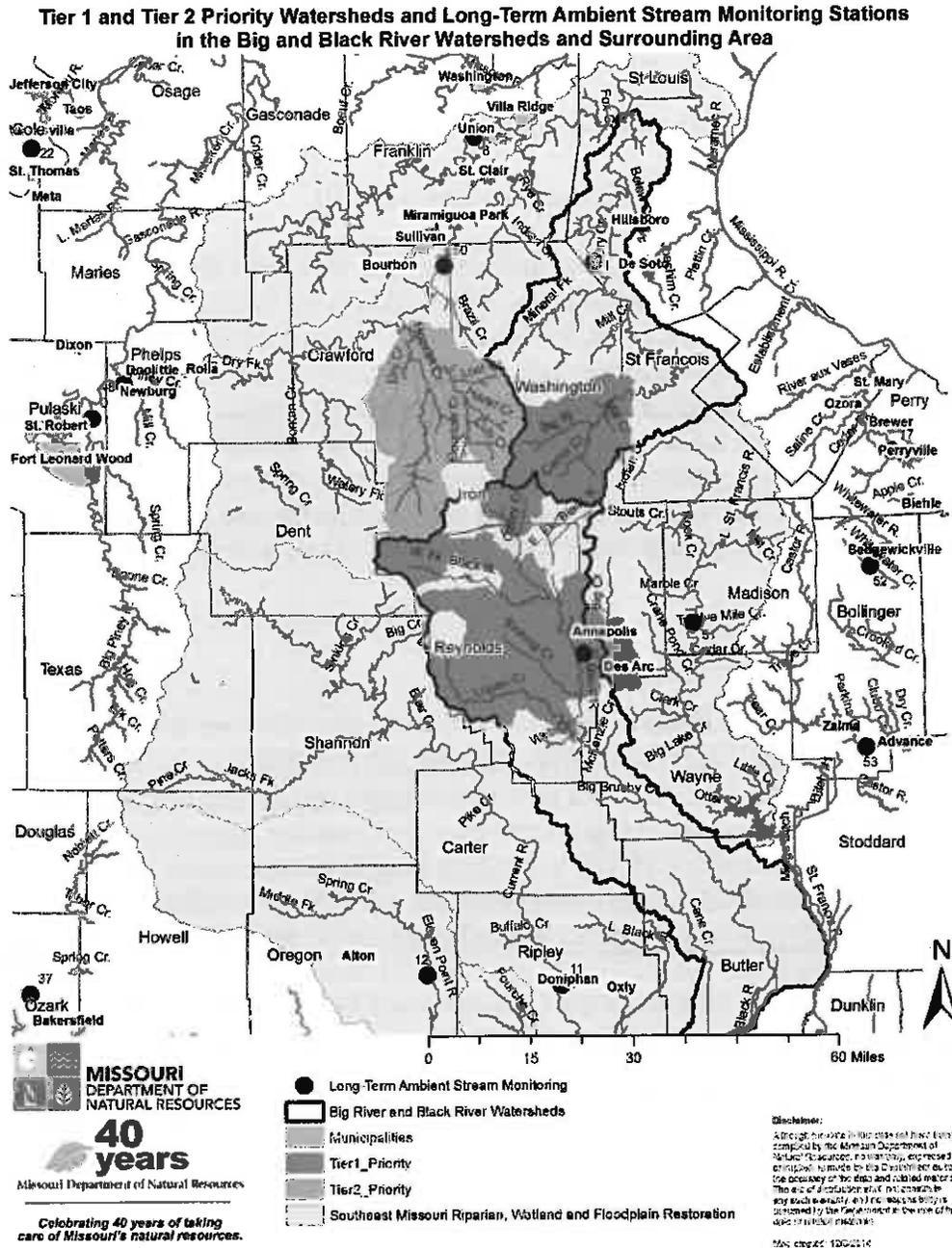
- Water quality,
- Stream flow,
- Physical habitat (channel shape, rock/soil makeup and vegetation in and around a stream),
- Stream system connectivity (how the watershed interacts with the surface and groundwater), and
- Biotic interactions (the way different species interact).

The RAM Program samples water quality and habitat and compares the information to healthy sites to determine benchmarks for restoration efforts. However, the program's focus is on the living organisms in streams because their well-being is the ultimate goal of the stream conservation efforts. If improvements in animal and plant life occur, this is evidence the restoration efforts have been effective. The RAM sites can be adjusted and the MDC has committed to include some RAM sites within the project area so that long-term improvements in fish and macroinvertebrate populations can be monitored as a measure of success of the streambank stabilization and riparian restoration efforts implemented during this project. The MDC's resource professionals will assist with the sampling and analysis of macroinvertebrates during this project.

Edge-of-Field Modeling

The Nutrient Tracking Tool (NTT) is a new, innovative program that will be used to help measure the success of this project in reducing nutrients (total nitrogen and total phosphorus) and sediment (total suspended solids) loads from riparian and floodplain areas where conservation practices are implemented. The NTT is a web-based (<http://nn.tarleton.edu/NTT/>), field-level conservation practice assessment computer program that uses the Agricultural Policy Environmental eXtender model (APEX) to perform long-term continuous simulations of "baseline" versus "alternative" conservation practices and generate realistic estimates of the average annual pounds or tons of nutrient and sediment runoff that are reduced by conservation practices in both surface and subsurface flows. The NTT was developed for use in Missouri through a contract between Tarleton State University and MDNR from 2011-2013. The model performs simulations for most state and federal conservation practices. The District Technician II hired through this project will be trained to run the NTT tool on the practices implemented for the project and if feasible for other conservation practices implemented in these watersheds.

Figure 3. Location of Tier 1 and 2 watersheds in relation to the long-term ambient stream monitoring stations in Missouri.



The Missouri Department of Natural Resources has developed a database that provides access to the raw data and analysis of all quantitative invertebrate sampling it has performed. This database is now available to the public online at www.dnr.mo.gov/env/esp/biologicalassessments.htm. Within the next few years, the Missouri Department of Conservation plans to have on-line access to its RAM database, as well as its fisheries and aquatic habitat database that contains community-level data. These databases are updated on an ongoing basis.

The department retrieves raw data from the USGS National Water Information System and numerous state, federal and municipal sources. This data is imported into the Missouri state computer system for storage and statistical analysis. The department maintains data in its Water Quality Assessment database, which comes from the department's own monitoring efforts and a wide array of other public and private sources.

The second program involves volunteers who monitor water quality of streams throughout Missouri. The Volunteer Water Quality Monitoring Program is a cooperative project of the Department of Natural Resources, the Department of Conservation, and the Conservation Federation of Missouri and is a subset of the Missouri Stream Team Program. Since its inception in 1993, 8,487 citizens have attended 487 water quality monitoring workshops held by program staff across the state of Missouri. This has resulted in the submission of more than 19,872 separate data sheets at 5,453 Missouri stream sites. The volunteer hours spent in this endeavor total more than 430,004 hours, worth an approximate \$8,084,075.20 in added value to the state.

The total number of Stream Teams has now reached 4,580. Each level of training is a prerequisite for the next higher level, as is appropriate data submission. Levels 2, 3, 4 and CSI represent increasingly higher quality assurance and quality control stringency. Data submitted by volunteers of Level 2 or above may be used by the department to establish baselines of water quality for particular streams, or to point out potential problems that are in need of further investigation. Level 2 and higher volunteer monitors are required to return for a validation workshop at least every three years in order to ensure that their equipment and methods are up to date and that the data they are gathering has a high level of quality assurance. Currently, there are nine active Stream Teams conducting stream monitoring in the counties within the Big and Black River watersheds. Any past and current water quality data collected by these Stream Teams in the vicinity of areas where riparian habitat restoration is completed will be assessed and included in project reports.

Missouri's Water Quality Monitoring Programs

The objectives of Missouri's water quality monitoring program are to: (1) characterize background or reference water quality conditions; (2) better understand flow events, and daily and seasonal water quality variations and their underlying processes; (3) characterize aquatic biological communities and habitats and to distinguish between the impacts of water chemistry and habitat quality; (4) assess time trends in water quality; (5) characterize local and regional impacts of point and nonpoint source discharges on water quality; (6) check for compliance with water quality standards or wastewater permit limits; (7) develop TMDLs to prescribe acceptable limits of pollutants to be discharged; and (8) support development of strategies to return impaired waters to compliance with water quality standards. All of these objectives have a statewide scope.

Proposed Applicant Ranking Criteria

The following applicant ranking criteria will be reviewed and revised with input from the Trustees to weight the scoring and can be used as a tool to prioritize local landowner contracts so conservation practices implemented during this project will provide the best possible riparian, wetland, and floodplain habitat and water quality benefits. These criteria will be assigned points based on their importance in achieving the project objectives and apply to the contract acres of each applicant. It is recommended that applicants who achieve an established threshold score should have their contracts approved immediately (based on funding availability). This will help expedite the approval of contracts and accelerate the implementation of conservation practices.

This proposal has adopted the restoration goals developed by the Trustees within the Big and Black River watersheds to ensure funds are expended in close vicinity to the areas where hazardous waste-related injuries occurred which is captured with the ranking criteria. Figures 1 and 2 provide maps of the highest priority restoration areas identified by the Trustees. In addition, the highest priority sites are those closest to:

- Large areas of existing valuable natural resources (as determined by the Trustees and partner organizations), such as existing state, federal, or private conservation areas or preserves.
- Conservation Opportunity Areas/Priority Geography (as determined by the Missouri Department of Conservation).
- Areas of importance for Threatened and Endangered Species.
- Uncontaminated portions of the Big and Black River watersheds.
- Historic wetlands.

Table 6. Example Applicant Eligibility and Ranking Criteria

A. Determine Applicant Eligibility				
1	Is the applicant's land located within a designated Tier 1 or Tier 2 watershed in the Big or Black River watershed? If the answer is Yes, proceed to A.2. If No, STOP, the applicant is not eligible for NRDAR cost-share.	Yes	No	X pts
2	Is the applicant's land located within an uncontaminated riparian area? If Yes, proceed to B.1. to rank the application. If No, STOP, the applicant is not eligible for NRDAR cost-share.	Yes	No	X pts
B. Determine Applicant Rank				
1	Is the applicant's land located in a designated Tier 1 watershed in the Big or Black River watershed?	Yes	No	X pts
2	Is the applicant's land located in a designated Tier 2 watershed in the Big or Black River watershed?	Yes	No	X pts
3	Is the applicant's land located in the riparian area of one of the perennial streams listed in Table 2?	Yes	No	X pts
4	Is the applicant's land located within a watershed with large areas of existing valuable natural resources, such as existing state, federal, or private conservation areas or preserves as designated by the MDC or TNC?	Yes	No	X pts
5	Is the applicant's land located within a Conservation Opportunity Area/Priority Geography as designated by MDC or TNC?	Yes	No	X pts
6	Is the applicant's land located within an area of importance for threatened or endangered species as designated by MDC or TNC?	Yes	No	X pts
7	Is the applicant's land located within a historic wetland area as designated by the MDC or TNC?	Yes	No	X pts
8	Will a newly installed or expanded buffer be implemented on only one side of a stream with a defined bed and bank, where no buffer is present on the opposite bank?	Yes	No	X pts
9	Will the installed or expanded buffer be implemented on both sides of a stream with a defined bed and bank, or on one side of a stream where a buffer already exists on the opposite bank?	Yes	No	X pts
10	Will all areas of the installed or expanded buffer be a minimum 25 foot width from the high bank of the stream?	Yes	No	X pts
11	Will all areas of the installed or expanded buffer be a minimum foot width from the high bank of the stream?	Yes	No	X pts
12	Will all areas of the installed or expanded buffer be a minimum foot width from the high bank of the stream?	Yes	No	X pts
13	Will all areas of the installed or expanded buffer be a minimum 100 - 200 foot width from the high bank of the stream?	Yes	No	X pts
14	Will all areas of the installed or expanded buffer be a minimum 200-300 foot width from the high bank of the stream?	Yes	No	X pts
15	Will all areas of the installed or expanded buffer be a greater than a minimum 300 foot width from the high bank of the stream?	Yes	No	X pts
16	Will all areas of the installed or expanded buffer be contiguous with and join together buffers upstream and downstream of the proposed site?	Yes	No	X pts
17	Will all areas of the installed or expanded buffer meet or exceed the three-zone buffer specifications recommended by Hawes and Smith (2005)?	Yes	No	X pts
18	Will an entire cropped field be converted to a riparian buffer?	Yes	No	X pts
19	Will livestock be excluded from stream access?	Yes	No	X pts
20	Will a prescribed grazing system be implemented?	Yes	No	X pts

