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Kansas Water Pollution Control Revolving Fund
Innovative Green Infrastructure Reserve Project
Stream and Riparian Restoration on the Cottonwood River (Reach C2)

Nonpoint Source Project Management Plan

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Participating Entities:

The major sponsor for the project would be the Kansas Water Office (KWO). They would be aided by the Kansas Forest Service (KFS); Kansas Department of Agriculture, Division of Conservation (KDA-DOC); Flint Hills Resource, Conservation and Development (RC&D); and local landowners. Other cooperating entities include Natural Resources Conservation Service (NRCS); U.S. Army Corps of Engineers; U.S. Geological Survey (USGS); U.S. Department of the Interior Fish and Wildlife Service; Kansas Dept. of Wildlife and Parks (KDWP); Watershed Restoration and Protection (WRAPS) Stakeholder Leadership Teams (SLT); Lyon County, KS; and the City of Emporia, KS.

Project Location:

John Redmond Reservoir was constructed from 1959-1964 for purposes of flood control, water supply, water quality, and recreation (U.S. Corp of Engineers, 2006). The reservoir is located on the Neosho River, and drains 3,000 square miles of mostly grass and cultivated land. The Kansas Department of Health and Environment (KDHE) has identified impairments to ecosystem quality because of excessive sediment and nutrient loading into the reservoir (KDHE, 2003). To identify strategies to ensure the long-range availability of habitat, water storage capacity, and ecosystem function within the John Redmond Reservoir and surrounding watershed, the Kansas Water Office and U.S. Army Corp of Engineers developed a watershed feasibility study. Within this study, a need was identified to estimate suspended -sediment loading into and out of the reservoir, as well as to characterize stream-channel stability.

Sediment transport and stability of streambanks were characterized by USGS and The Watershed Institute (TWI). From February 2007-2008, USGS estimated sediment transport to John Redmond Reservoir during an approximately average year of streamflow was 1.12 million tons of sediment (Lee and others, 2008). TWI classified the riparian area and assessed the stability of stream channels upstream from John Redmond Reservoir (TWI, 2006). This study estimated annual erosion rates from surveys at representative channel locations, as well as characterizing “hotspots” of channel erosion based on aerial photography. Using average streambank erosion rates estimated by TWI (0.215 tons/foot of streambank in the Cottonwood River; 0.372 tons/foot in the Neosho River), an estimated that 162,800 tons of sediment are transported from the 210 miles of the mainstem Cottonwood and Neosho Rivers annually. The Kansas Water Office is planning to implement streambank stabilization efforts in this reach to reduce sediment transport to John Redmond reservoir. After consultation with landowners, NRCS, KDA-DOC, and Flint Hill RC&D, a 12,393-foot reach of the Cottonwood River has been selected for streambank stabilization and riparian restoration (Figure 1).

The project sites are located in the Neosho Basin along the Lower Cottonwood River in Lyon County, Kansas. The Cottonwood River combines with the Neosho River prior to entering John Redmond Reservoir, which is the impacted surface water body. The hydrologic unit code (HUC) for this portion of the stream is 11070203040. The KWO will focus primarily on 16 sites within reach C2 (Figure 1). This portion of the Cottonwood River is located directly upstream from the confluence of the Neosho and Cottonwood Rivers. Streambank projects are currently being finalized on the Neosho River directly downstream from the confluence of the two rivers, and construction is planned to soon commence on the Cottonwood River projects directly above the confluence of the two rivers. Intergovernmental Environmental Reviews were prepared for the Neosho River projects in late 2009 and early 2010 and for Reach C1 Cottonwood River projects in late 2011.

Reach C2 (Figure 2) consists of sixteen sites in seven different sections, townships, and ranges (30-19S-12E); (26-19S-11E); (25-19S-11E); (24-19S-11E); (23-19S-11E); (22-19S-11E); (15-19S-11E). Reach C2 represents the one of the highest priority reaches for sediment reduction above John Redmond.

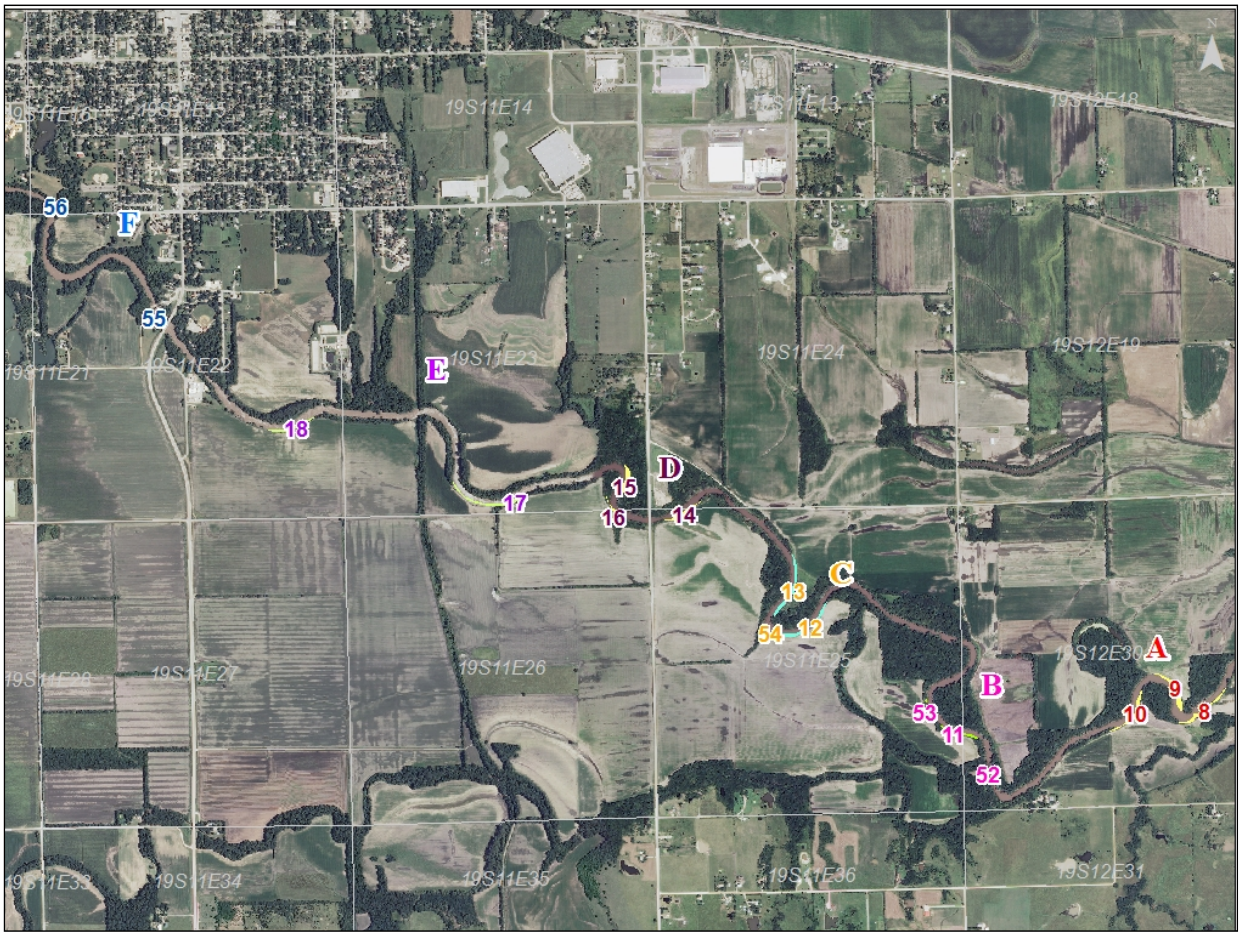

Figure 1. Reach C2 Rehabilitation Sites on the Cottonwood River. Subsets of projects identified by color and letters A through F.

Site ID	Estimated Bank Length (Feet)	Estimated Sediment Reduction (Tons/Year)	Estimated Construction Cost
9	949	807	$91,749.32
8	1,119	2,434	$108,184.92
10	1,022	2,051	$98,806.96
53	436	667	$42,152.48
52	161	124	$15,565.48
11	817	1,693	$78,987.56
54	685	729	$66,225.80
12	1,232	2,652	$119,109.76
13	1,228	3,022	$118,723.04
14	859	1,340	$83,048.12
16	521	486	$50,370.28
15	614	2,862	$59,361.52
17	1,545	3,802	$149,370.60
18	968	1,836	$93,586.24
55	152	307	$14,695.36
56	85	67	$8,217.80
Total	**12,393**	**24,879**	**1,198,155**

Population Served:

The population of the Neosho River basin is estimated to be more than 174,000 individuals. More than 75,000 individuals in the basin will benefit either directly or indirectly by sustained water supply from John Redmond Reservoir. Improved water supply capacity at John Redmond Reservoir will result in continued water supply to Wolf Creek Nuclear Power Plant, which produces enough electricity to power more than 800,000 homes.

Assessment of Need:

Federal reservoirs in Kansas serve as the source of municipal and industrial water for more than two-thirds of the state's population. They are a recreational destination and provide a reserve for stream flow for water quality, aquatic life and related activities. The reservoirs are an integral part of the infrastructure of water supply in Kansas. Like all infrastructure, reservoirs age. They fill with sediment, reducing their capacity to meet our needs. While erosion is a natural process, it is accelerated by our actions, such as urbanization, agriculture and alteration of riparian and wetland areas. A viable Kansas economy depends on well-managed natural resources.

In addition to protecting public water supply, efforts such as streambank stabilization can help reduce sedimentation, which can lead to healthier riparian areas. Healthy riparian areas are an important component in filtering out pollutants and sediment from the streams and lakes. Healthy riparian areas can also control bank erosion, provide habitat and slow surface water runoff that leads to flooding. The improvement to water quality would also benefit recreational users (boating, camping, fishing, hunting, swimming, etc.) at John Redmond Reservoir and on the Cottonwood River, and the aquatic conditions for fish and other species would also be improved. The project as a whole could prolong the life of the reservoir so that other benefits, such as flood control and future potential water supply, would be available for years to come.

Growing evidence shows that a significant source of sediment in streams is generated from stream channels and edge of field gullies. Streambank erosion can contribute nutrients, such as phosphorus, which can cause water quality impairments. Stream stabilization projects can be costly compared to more traditional land surface Best Management Practices (BMPs) involving multiple landowners and a combination of stream stabilization techniques. Funding is needed to continue the process of protecting our streams.

Programs are available through state and federal agencies to restore riparian areas and streams. However, more targeted planning is needed to restore the areas with the greatest potential to improve the health of the watershed and extend the life of our reservoirs.

Protection of the three federal reservoirs in this basin is another aspect of source water protection. The state has made significant investments in acquiring storage space in Council Grove, Marion, and John Redmond reservoirs for municipal and industrial use. Reducing sedimentation into the lakes is a water quality as well as water quantity issue. Efforts such as streambank stabilization can help reduce sedimentation.

Water Quality Goals and Objectives:

There are 60 approved Total Maximum Daily Loads (TMDLs) within the Neosho basin that describe the strategies and goals to reduce pollution to achieve water quality standards. The 2008 303(d) list submitted to the Environmental Protection Agency (EPA) identifies watersheds associated with 26 stream chemistry sampling stations and two biological monitoring stations as water quality impaired. Among the streams, dissolved oxygen (D.O.) depletion, zinc, total phosphorus and copper cause the greatest number of impairments. Among the lakes, eutrophic conditions indicative of excessive algae production are the predominant cause of impairment. Many of the stream segments, configured in a watershed setting, have a TMDL applied to them as a whole.

Goal: Protect and restore future water supply capacity in John Redmond Reservoir.

Objectives:

1. Stabilize up to 12,393 feet of streambank of the Cottonwood River above John Redmond.
2. Demonstrate project effectiveness in reducing stream segments sediment contribution.
3. Provide public education of the effects of streambank stabilization on sedimentation.

Non-point Source Pollution Control Practices:

The *Stream and Riparian Restoration for the Cottonwood River Streambank Rehabilitation Project (Reach C2)* will:

- Rehabilitate and stabilize a portion of the Cottonwood River known to contribute significant sediment loads and pollutants to the watershed and John Redmond Reservoir
- Restore riparian buffers adjacent to the stream rehabilitation sites
- Indicate the change in pollutants as a result of the project
- Evaluate the impact of streambank restoration projects on habitat and species occurrence for the Neosho madtom and mussel species

Each project survey and design will conform to NRCS Conservation Practice Standard 580, Streambank and Shoreline Protection; Conservation Practice Standard 322, Channel Bank Vegetation; and Conservation Practice Standard 484, Mulching which are in Section IV of the electronic Field Office Technical Guide (eFOTG). The designs will include documentation necessary to meet the applicable standards and statements of work which are also in the eFOTG. The construction specifications, operation and maintenance (O&M) plans, and general notes included on the drawings shall be tailored to the individual project. A copy of the design, drawings, and supporting documentation will be provided to the NRCS district conservationist (DC) prior to the beginning of construction. An electronic copy of the drawings and support documentation will be provided to the NRCS technical liaison. The documentation will include a signed statement by the professional engineer (PE) stating "to the best of my professional knowledge, judgment, and belief, these plans meet applicable NRCS standards."

Estimated Costs:

Total Amount: $1,747,536
Loan Amount Requested: $1,310,652

Project costs for reach C2, which includes 16 hot spot sites with a total length 12,393 feet, are described in the table below. The total project cost of the *Cottonwood River Streambank Rehabilitation Project (Reach C2)* is estimated at $1,747,536**.** KWO requests a loan of approximately 75% of the project costs in the amount of $1,310,652 with 100% of the principal forgiven.

	CWSRF	Sponsor Contribution	Agency
Streambank Stabilization Construction	$1,198,155	$224,000	KDA-DOC
Engineering, Design and Construction Oversight			
Riparian Vegetation Implementation and Management	$18,600	$17,400	KDA-DOC
Environmental Coordination (includes T&E species surveys and archeological investigation)	$73,897	$8,960	Local Match
		$127,924	In-Kind KWO
		$3,600	Cash KWO
Project Management including loan administration, information and education outreach with Basin Advisory Committees)		$55,000	In-Kind KWO
On-the-ground project administration, landowner meetings	$20,000		

Permits Required:

The project participant will be required to secure all necessary permits, including those from the U.S. Army Corps of Engineers (USACE); the Kansas Department of Agriculture, Division of Water Resources; and the Kansas Department of Health and Environment (KDHE) [specifically, a stormwater discharge permit (when appropriate)]. A KDHE Stormwater Pollution Protection Plan will be developed for each project. This plan would minimize the possibility of adverse actions resulting from a complaint during the construction period.

Schedule:

March 2012
- Project Kick-Off Meeting
- Secure landowner commitment
- Identify Survey, Design, and Construction Oversight contractor

April 2012
- Request cost estimates for Survey, Design and Construction Oversight
- Notify landowners of anticipated project schedule
- Coordinate with USFWS and KDWPT on T&E Surveys
- Notify county, city and WRAPS SLT of anticipated project schedule
- Inform Environmental Coordination agencies of project intent and schedule
- Hold Public Meeting in conjunction with Neosho BAC meeting

May 2012
- Initiate contract for Survey, Design and Construction Oversight

June – September 2012
- Conduct Survey and Design

August 2012
- Conduct Neosho madtom and flathead catfish on Neosho and Cottonwood Phase I projects. Conduct mussel surveys on Cottonwood Phase I and II projects.

October 2012
- Present draft designs to landowners
- Submit permit applications (KDHE, KDA-DWR, KDWPT, County floodplain, and USACE)
- Draft RFP for Construction

November 2012
- Release RFP for Construction
- Hold Pre-Bid Meeting
- Hold Public Hearing

December 2012
- Identify successful construction contractors and Initiate contract

January 2013
- Provided all environmental permits have been secured, issue Notice to Proceed for Construction contractors.

February - June 2013
- Construction of streambank projects

July 2013
- Check out and final report of completed construction projects

References:

Lee, C.J., Rasmussen, P.P., and Ziegler, A.C., 2008, Characterization of suspended-sediment loading to and from John Redmond Reservoir, 2007-2008: U.S. Geological Survey Scientific Investigations Report 2008-5123

Kansas Department of Health and Environment, 2003, Neosho River Basin Total Maximum Daily Load: Information Available on the Web, accessed November 2, 2006, at http://www.kdheks.gov/tmdl/ne/RedmondSILT.pdf

Kansas Water Office. Kansas Water Plan, Neosho Basin Section, Watershed Restoration and Protection Basin Priority Issue. 2009.

Kansas Water Office. Kansas Water Plan. Statewide Management Categories and Policies. Enhanced Stream Corridor and Wetland Management to Address Reservoir Sedimentation. 2009.

Watershed Institute, Inc., 2006, Enhanced riparian area/stream channel assessment for John Redmond feasibility study, Prepared for the Kansas Water Office, pp. 1-25. http://www.kwo.org/Reports%20%26%20Publications/RiparianReport/Rpt_EnhancedRiparianAreaStreamChannelAssessment_Intro.pdf