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**AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009**  
**KANSAS CLEAN WATER STATE REVOLVING FUND**  
**STREAM AND RIPARIAN RESTORATION IN THE UPPER NEOSHO RIVER BASIN**  
**NONPOINT SOURCE PROJECT MANAGEMENT PLAN**

**Project Sponsor:**

Kansas Water Office  
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**Participating Entities:**

Kansas Forest Service (KFS); State Conservation Commission; Flint Hill Resource, Conservation and Development Council (RC&D); local landowners. Other cooperating entities include Watershed Restoration and Protection (WRAPS) Stakeholder Leadership Teams; Natural Resources Conservation Service (NRCS), Farm Services Agency (FSA), U.S. Army Corps of Engineers, U.S. Geological Survey.

**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. Streambank erosion from 3.5 miles of "hotspots" (#12-25) located along an 8.3 mile stretch of the Neosho River is estimated to contribute 51,800 tons per year (TWI, 2006). 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, SCC, and Flint Hill RC&D, an 8.3-mile reach of the Neosho River has been selected for streambank stabilization and riparian restoration (Figure 1).



Figure 1. Project Location.

**Population Served:**

The stream stabilization and restoration component of this project proposal will create at least one planning and design position and will maintain two additional planning and project management staff.

This project will require the purchase of numerous hand tools and related items, as well as, significant quantities of rock and vegetation, which would provide revenue to a number of local, regional, and national vendors. Implementation of the project will require travel to the impacted region with overnight stays in motels, and meals in local restaurants. Much of the work to be accomplished will likely occur in small and rural communities and require multiple days and nights in one town. The presence of this project in a small community could truly make a real difference in the survival of some small locally owned motels or restaurants in some of those communities.

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 80,000 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.

## DRAFT

Reservoir sedimentation is a result of soil erosion from the land surface and from stream channels and banks. In most Kansas watersheds, this natural process has been accelerated due to changes in land cover and the modification of stream channels to accommodate agricultural, urban, and other land uses.

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.

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.

Targeted streambank stabilization and riparian restoration is identified as a need in the 2009 Kansas Water Plan.

### **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 8.3 miles of streambank of the Neosho 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:**

*This section will include a description of the non-point source pollution control practices to be installed including a general site plan showing the location of the practices, applicable performance standards and operation and maintenance requirements.*

The *Stream and Riparian Restoration in the Upper Neosho River Basin* will:

- Rehabilitate and stabilize up to ten portions of the Neosho River known to contribute significant sediment loads to the watershed and John Redmond Reservoir. Restore a riparian buffer adjacent to the stream

**DRAFT**

restoration sites through the Conservation Buffer Initiative, Continuous Conservation Reserve Program (CRP), or other programs as available.

- Maintain funds to provide maintenance and monitoring of stream stabilization projects (sponsor contribution)
- Install turbidity monitor downstream of restoration reach to assess sediment loads before and after restoration (sponsor contribution)

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:**

*This section will include a statement of estimated costs for the project, including O&M, and the sources of funding to be utilized*

	<b>CWSRF Request</b>	<b>Sponsor Contribution</b>
Stream stabilization and rehabilitation	\$863,000	\$200,000
Monitoring and Maintenance		\$100,000
Stream Turbidity Monitor		TBD
<b>Total</b>	\$863,000	\$300,000

The 2008 Legislature appropriated funds from the State General Fund to the newly created Reservoir Beneficial Use Account for the purchase of water supply storage under contract at federal reservoirs in Kansas that has not yet been paid for, but is anticipated to be needed in the future. In 2009, the Reservoir Beneficial Use Account was made available for activities shown to secure, protect, or restore storage at federal reservoirs in Kansas. Approximately \$335,000 from the Reservoir Beneficial Use Account will be dedicated towards implementation of this project (includes interest payment).

Each participating entity will provide in-kind contributions in the form of project management, public outreach and education, and ground-truthing of reconnaissance survey areas.

Additional revenue sources will be leveraged through the use of CWSRF and the Reservoir Beneficial Use Fund. These sources include, but are not limited to, U.S. Army Corps of Engineers Section 204 funds, Conservation Buffer Initiative, and Continuous CRP. Considering the additional contributions of in-kind services and opportunities for leveraging, more than 23% of the total project costs will be contributed outside of the CWSRF loan.

**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.

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**Schedule:**

Task	Start	Finish	2009												2010						% Comp.	
			J	J	A	S	O	N	D	J	F	M	A	M	J	J						
KDHE sends award letters & loan contracts sent to loan recipients	6/15/09	6/15/09	◆																		●	100%
Informational meeting with project partners and participating landowners	6/22/09	6/22/09	◆																		○	0%
Public Meeting to discuss draft facilities plan	7/15/09	7/15/09		◆																	○	0%
Development of project design for streambank stabilization and riparian	7/1/09	8/1/09	◆	◆																	○	0%
Installation of turbidity monitors	7/10/09	7/10/09	◆																		○	0%
Suspended sediment sample collection	7/10/09	7/10/09	◆																		○	0%
Public Hearing to present final facilities plan	8/15/09	8/15/09			◆																○	0%
Request for Proposal (RFP) posted for construction of streambank stabilization	8/15/09	9/15/09			◆	◆															○	0%
Construction contractor selected and Contract Negotiated	9/15/09	10/15/09				◆	◆														○	0%
Contract Awarded and Initial Payment Made	11/15/09	11/15/09						◆													○	0%
Implementation of streambank stabilization features	3/1/10	5/1/10										◆	◆								○	0%
Final payment to construction contractor	6/15/10	6/15/10																		◆	○	0%
Conduct field tour with BAC members, WRAPS SLT and interested stakeholders	7/15/10	7/15/10																		◆	○	0%

**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](http://www.kwo.org/Reports%20%26%20Publications/RiparianReport/Rpt_EnhancedRiparianAreaStreamChannelAssessment_Intro.pdf)