August 2020

Lime Kiln Dam Project
Neosho, Missouri

DRAFT RESTORATION PLAN

Prepared by:

U.S. Fish and Wildlife Service

Missouri Department of Natural Resources

1.0 INTRODUCTION

The Missouri Trustee Council (Trustees) is comprised of the State of Missouri, represented by the Missouri Department of Natural Resources (MDNR), and the U.S. Department of the Interior, represented by the U.S. Fish and Wildlife Service (USFWS). In May 2012, the Trustees finalized the Springfield Plateau Regional Restoration Plan and Environmental Assessment (SPRRP), a comprehensive plan that describes the process by which the Trustees will use recovered funds to restore natural resources injured by the release of hazardous substances within the Springfield Plateau.

In accordance with the goals and objectives of the SPRRP, this Draft Restoration Plan (Draft RP) identifies and evaluates restoration alternatives considered for achieving the restoration objectives, and identifies the preferred alternative that the Trustees are considering in order to compensate the public for injuries to natural resources and their services in Shoal Creek, Newton County, an area within the Springfield Plateau.

1.1 Background

Commercial mining began about 1848 in Newton County, Missouri and moved westward into Kansas and southward into Oklahoma. At first, lead was of primary interest; however, the ore was rich in zinc deposits and zinc production became increasingly important over time. The Tri-State Mining District (Tri-State) spans portions of the states of Kansas, Missouri and Oklahoma. The Missouri portion includes Barry, Christian, Greene, Lawrence, Jasper, and Newton Counties. Tri-State is the fourth largest historic producer of lead and the number one historic producer of zinc within the United States.

As a result of these mining and related activities, large amounts of hazardous substances, including cadmium, lead, and zinc, were released into Missouri's environment, and these metals continue to be released in certain areas of Tri-State. Cadmium, lead, zinc, and other metals associated with mining are toxic to a wide variety of plants and animals. After nearly 150 years of mining and smelting, chat piles, tailings sites, waste rock piles, and subsidence ponds remain as features of the landscape. Although injury assessment is ongoing, the Trustees have decided to initiate restoration now for two main reasons: (1) the Trustees believe that the injury assessment completed to date has sufficiently demonstrated the types of injury and service losses to enable the identification of appropriate types of restoration actions, and (2) the Trustees have recovered partial damages for the Site from some of the Potentially Responsible Parties (PRPs) (Eagle-Picher Holdings, Peabody Energy Corp., and Blue Tee, Brown Strauss) through various settlements, including bankruptcy. Remedial activities are still ongoing at the Site, but the Trustees nevertheless believe it is possible to proceed with restoration, if planned and implemented in careful coordination with the ongoing remedial cleanup. The remedial cleanup is expected to improve the water quality of Shoal Creek by removing surficial mine waste that can be carried into the stream.

This project takes place within Shoal Creek, tributary to the Spring River, within Newton County, Missouri. Past mineral processing operations resulted in the release of hazardous substances and high concentrations of heavy metals in sediment and soils in Newton County, triggering clean up actions by the U.S. EPA under CERCLA. The Trustees are

required to use these funds to restore, replace, or acquire the equivalent of injured natural resources and associated lost services as a result of exposure to hazardous substances. The intent of restoration is to compensate the public for harm to natural resources and lost uses. The sooner the restoration can begin, the sooner those benefits will be realized.

1.2 Purpose and Need for Restoration

As described in §2 of the SPRRP, the Trustees developed the SPRRP to identify a preferred alternative to restore injured natural resources and to establish criteria for selecting projects to implement such restoration alternatives. This draft RP complements and incorporates much of the information and analysis contained within the SPRRP. The SPRRP can be accessed at: FWS Tri State Missouri website. The Trustee-selected alternative in the SPRRP included a combination of restoration activities and projects to accomplish restoration goals at or near the site of injury.

The purpose and need of this draft RP, in accordance with the analysis contained in the SPRRP, is to propose and analyze a primary restoration project to restore injured natural resources as part of the on-going restoration process. This draft RP/ presents a range of alternatives to meet the Trustees' goal of restoring and/or enhancing natural resources affected by historical mining activities and to compensate the public for injures to natural resources and ecological services lost in the interim.

1.3 Authorities and Legal Requirements

This draft RP was prepared by the Trustees pursuant to their respective authority and responsibilities as natural resource trustees under CERCLA (42 U.S.C. § 9601, *et seq*.) and its implementing regulations.

In addition, federal trustees must comply with NEPA, 42 U.S.C. § 4321 *et seq*., and its regulations, 40 C.F.R. § 1500 *et seq*., when planning restoration projects. NEPA requires federal agencies to consider the potential environmental impacts of planned actions. NEPA provides a mandate and framework for federal agencies to determine if their proposed actions have significant environmental effects and related social and economic effects, consider these effects when choosing between alternative approaches, and inform and involve the public in the environmental analysis and decision-making process.

1.4 Public Participation

Public participation and input are important parts of the restoration planning process. To comply with the statutory and regulatory processes, the Trustees will solicit comments on this draft RP for 30 days, ending on September 28th 2020. We will notify the public by posting in a local newspaper, as well as publishing the open comment period on our websites. Comments can be provided to: Scott_Hamilton@fws.gov or Eric.Gramlich@dnr.mo.gov, or mailed to:

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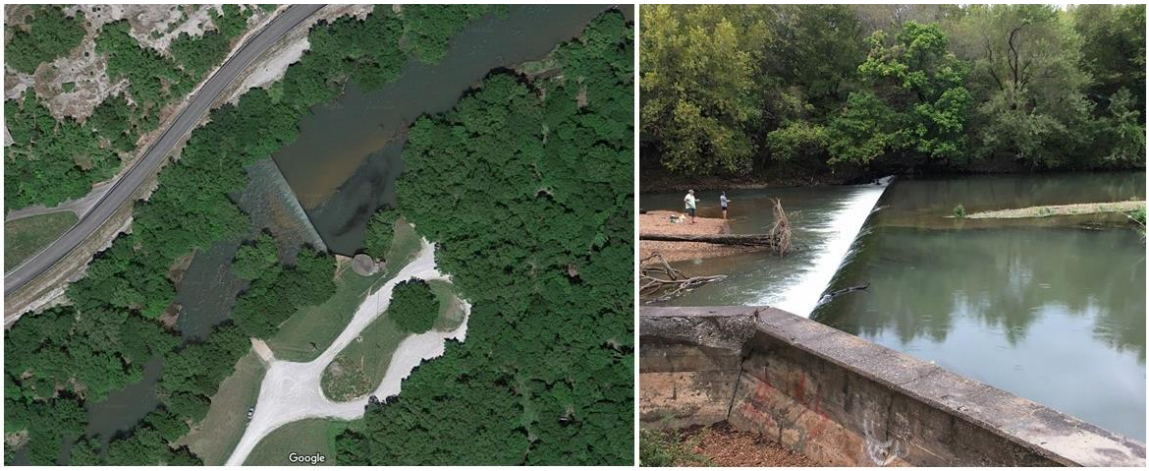
2.0 ALTERNATIVES CONSIDERED

2.1 Project Background

This chapter presents the alternatives for the Lime Kiln Fish Passage Project, a collaboration between the NRDA Trustees and the National Fish Passage Program (NFPP) of the USFWS. The preferred alternative will restore the biological connection between the upstream aquatic community of Shoal Creek and the downstream aquatic community, separated when the dam structure was built by the Army in the 1900s. This biological connection will be achieved by placing rocks against the downstream side of the dam, creating a relatively gentle slope for the water to flow over.

The dam was originally built to pool water for the city of Neosho and Camp Crowder's drinking water. An intake pipe is currently situated upstream of the dam structure, within the pond formed by the dam, and water is pumped from it into the nearby treatment plant. It is still currently used as the source of drinking water for the city. The dam causes navigation problems for boaters floating along this segment of Shoal Creek, and at least two drownings have occurred in recent times as a result of the hydraulic conditions caused by this structure. The Lime Kiln Dam is owned by Neosho, the MO Department of Conservation leases the adjacent land on the river's left bank as a river access.



On the left is the overhead view of the Lime Kiln dam, the right picture is taken from the public use area on the left descending bank of Shoal Creek. Rock would be placed downstream of the dam.

Shoal creek is home to a variety of mussel species, including the Federally Endangered Neosho mucket (Lampsilis rafinesqueana). Recent surveys have found a declining number of healthy mussel beds within this stream, and studies have shown that declines in mussel density and species richness correspond with elevated levels of lead, zinc, and

cadmium. The largest of the remaining mussel beds are located within 5 miles upstream and downstream of the Lime Kiln dam. In their juvenile stages, mussels use certain species of fish to disperse to new areas of a stream by attaching to their gills and dropping off later. Fish are unable to pass over the dam, so the upstream fish and mussel species (and other aquatic organisms) have become genetically isolated from downstream populations. The proposed restoration project will allow the aquatic biological community, which has been injured by releases of hazardous substances associated with past mining practices, to become more resilient by increasing the genetic diversity that will come as a result of reuniting the separated populations.

2.2 Project Objectives

The NFPP has the following objectives:

- Provide fish passage for select and native species and for non-motorized boating recreation without interfering with water diversion for the water supply
- Low maintenance of diversion structure and associated fish passage and boating features
- No to little rise in the 100-year floodplain (depends on what floodplain permits require)
- Facilitation of natural stream processes as possible (i.e. sediment transport)
- Resilience during future flood events
- Improve debris maintenance and maintain debris-free condition at municipal intake

The NRDA Trustees have the additional following objectives:

- Improve the natural biological community within Shoal Creek, and the Spring River watershed
- Aid in the recovery of the Neosho Mucket, a state and federally endangered species, by increasing the range of host fish within Shoal Creek

2.2 Restoration Criteria

To ensure the appropriateness and acceptability of restoration options addressing ecological losses, the Trustees evaluated each option against restoration evaluation criteria. Below are the criteria used to evaluate the potential restoration projects described in this Draft RP as part of the NRDAR process. The criteria reflect the "factors to consider when selecting the alternative to pursue" (NRDAR factors) as described in 43 C.F.R. § 11.82(d)(1-10). The Trustees have considered the following factors as part of their evaluation of the Preferred Alternative in this Draft RP:

Technical Feasibility (43 CFR 11.82(d)(1):
The preferred restoration alternative must be technically sound. The Trustees considered the level of risk or uncertainty involved in implementing a project. A proven record of

accomplishment demonstrating the success of projects utilizing similar or identical restoration techniques can be used to satisfy this evaluation criterion.

Compliance with Laws, Regulations, and Policies (43 CFR 11.82(d)(9-10):
Development of this draft RP requires consideration of a variety of legal authorities and their potential applicability to the Preferred Alternative(s). As part of restoration planning process, the Trustees have initiated steps to ensure compliance with applicable laws, regulations, and policies. Implementation of the Preferred Alternative(s) would remain subject to meeting all permitting and other environmental compliance requirements to ensure the project is implemented in accordance with all applicable laws and regulations.

Consistency with the Trustees Restoration Goals:
The Preferred Alternative(s) should meet the Trustee's intent to restore the injured resources or the services those resources provide. Included in this criterion is the potential for success (meeting restoration goals) and the level of expected return of resources and resource services.

Public Health and Safety (43 CFR 11.82(d)(8):
The Preferred Alternative(s) ideally should not pose a threat to the health and safety of the public.

Avoidance of Further Injury (43 CFR 11.82(d)(5):
The Preferred Alternative(s) should avoid or minimize adverse impacts to the environment and the associated natural resources. The Trustees considered the future short- and long-term injuries, as well as mitigation of past injuries, when evaluating projects.

Time to Provide Benefits:
The Trustees considered the time expected for the project to begin providing benefits to the target ecosystem and/or public. A more rapid time to delivery of benefits is favorable.

Duration of Benefits:
The Trustees considered the expected duration of benefits from the restoration alternatives. Projects expected to provide longer-term benefits were regarded more favorably.

2.3 Restoration Alternatives

The Trustees considered the following restoration alternatives in developing this plan:

2.3.1 Alternative 1 – No Action

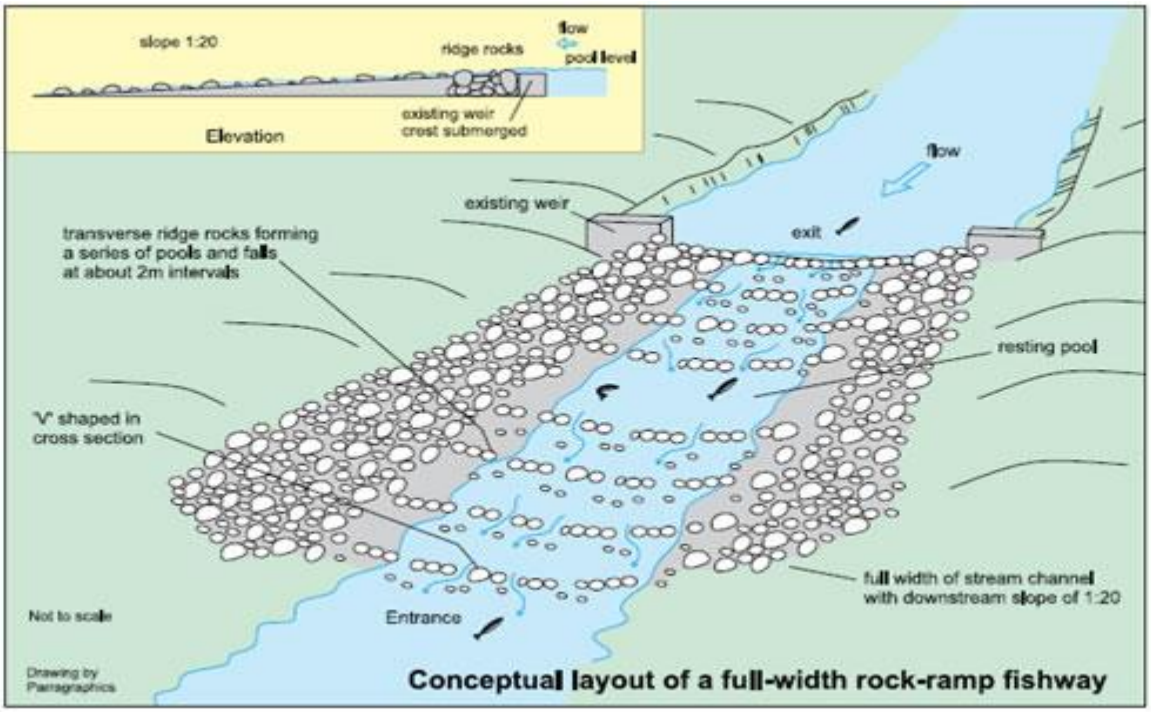
Alternative 1, the “No Action” alternative considers the environmental consequences of conducting no restoration of Lime Kiln Dam and is included in this RP as a basis for comparison of the other alternatives to the status quo. If the “No Action” alternative is selected, there would be no restoration of natural hydrologic processes nor natural biological connection between upstream and downstream aquatic populations injured as the result of mine wastes, and therefore would not meet the project objectives, nor the

criteria of “Avoidance of Further Injury”. The “No Action” alternative is not expected to provide additional compensation to the public for interim ecological and human use losses for the impairment of surface water due to mining actions. The Trustees concluded that the No Action Alternative would not meet the purpose and need for restoration under this draft RP, or the responsibilities of the Trustees under CERCLA and its associated regulations.

2.3.2 Alternative 2 (Preferred Alternative) – Construction of Rock Ramp

This alternative is to construct a rocky ramp composed of a homogenous mix of gravel and large (24-30”) cobble-sized rock that begins at the downstream side of the dam and meets up with the existing grade of the streambed after 220’. The rocky ramp itself has a rough surface composed of cobble/boulders that are also spaced to facilitate fish passage along multiple lines of flow. Several species of fish (Chubs (Hybopsis spp), Eastern shiners (Notropis sp), Black bass (Micropterus salmoides), and Arkansas Darter (Etheostoma cragini) were used in a model that determined the dimensions of the proposed project. Swimming speed of the fish species, distance that can be traveled by the fish in a “burst”, and endurance of the fish, for instance, were used to calculate the acceptable water velocity on this project. This velocity dictated the steepness of the slope of rocks to be placed against the downstream face of the dam.

The construction will begin with the placement of rock at the downstream end of the project area first and advancing upstream toward the dam in order to minimize sedimentation. Construction vehicles and materials will enter the stream using the existing boat ramp access, no trees will need to be cut or streambank disturbed. No work will occur above Lime Kiln dam.



This figure (from the Corps of Engineers) is included to show the concept of a full-channel rock ramp. The specific dimensions do not pertain to this project.

This alternative would meet all the above restoration criteria, as well as the objectives of the project. The Trustees concluded that Alternative 2 is the preferred alternative and would best meet the purpose and need for restoration of the aquatic system while minimizing environmental harm.

The proposed budget for this project is not to exceed $700,000. $344,000 will come from NFPP funds, and the estimated remainder will come from NRDA settlement funds.

2.3.3. Alternative 3 Removal of Lime Kiln Dam

This alternative is to remove Lime Kiln dam entirely from the channel of Shoal Creek. Heavy equipment would enter the stream via the boat ramp, cranes would load pieces of the broken-up concrete from the dam into dump trucks for hauling materials off-site. This option would allow for fish and other aquatic organisms (and watercraft) to pass freely from downstream to upstream after the obliteration of the dam. However, the removal of the dam would also release the sediment that has collected in the still waters behind it, with a high likelihood of burying downstream mussel beds containing endangered species. The change in gradient in this section of stream would cause greater erosive forces upstream, possibly destabilizing other mussel beds and streambanks. These impacts would contradict our criteria of Avoidance of Further Injury. Furthermore, water would no longer be able to be stored for use as drinking water for Neosho, and thus this option is not likely to be supported by the city. The Trustees concluded that this alternative would not meet all the criteria for restoration, nor the needs of the City of Neosho, and therefore the removal of Lime Kiln dam was not the preferred alternative.

3.0 ENVIRONMENTAL COMPLIANCE

General information regarding the location of the proposed restoration projects, and affected resources, including the physical resources, biological setting, and socioeconomic resources, is provided in the SPRRP at Section 4, Affected Resources, (Springfield Plateau Regional Restoration Plan) and is incorporated by reference herein. The specific site to be restored is within the city limits of Neosho, and is an access managed by the Missouri Department of Conservation. The stream itself is impacted by both hazardous substances associated with past mining as well as nutrients from agriculture practices, and has been listed as impaired on EPA's impaired waters list for both pollutants. Both banks have a narrow riparian corridor near the project area with exposed tree roots. Mussel beds containing endangered Neosho Muckets occur within 5 miles up and downstream of Lime Kiln dam. The nearest bed is located just downstream from Lime Kiln dam, but will not be impacted directly, and precautions will be taken to ensure there will be no indirect impacts from sedimentation.

Actions undertaken by a federal trustee to restore natural resources or services under CERCLA are subject to the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 *et seq.*) and other federal laws. NEPA requires an assessment of any federal action that may impact the human environment. At this time, the Trustees are evaluating this

plan pursuant to a categorical exclusion which will be documented in the Final Restoration Plan, in which the Trustees will select restoration projects to implement. To the extent additional analysis is warranted and as appropriate, the public will have the opportunity to comment. A completed NEPA Compliance Checklist(s) will be included with the Final Restoration Plan.

Any additional environmental compliance required, including compliance with Endangered Species Act (ESA) consultation and National Historic Preservation Act (NHPA), as appropriate, will occur prior to implementation. Necessary permits, such as the 404 Corps of Engineers permit and floodplain no-rise certificate, are the responsibility of the City of Neosho.

4.0 AGENCIES, ORGANIZATIONS, AND PARTIES CONSULTED FOR INFORMATION

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