

MONDAY CREEK: A CASE STUDY IN SUCCESSFUL PARTNERING¹

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Abstract. The U.S. Army Corps of Engineers, in partnership with the Ohio Department of Natural Resources (ODNR), Division of Mines and Reclamation, is conducting a Feasibility Study to evaluate the applicability of various restoration solutions to the overall degradation of the ecosystem of the Monday Creek Watershed. In addition to the Corps and the ODNR, seven other federal, state and local agencies are actively involved in the project. The watershed encompasses 116 square miles (74,240 acres) of Athens, Perry and Hocking Counties, Ohio. Extensive portions of the Monday Creek watershed have been subjected to underground and surface mining since the mid-1800s and a number of stream reaches in the watershed are sterile and unable to support diverse, aquatic life due to acid mine drainage. The objectives of this paper are to explain the various roles and responsibilities of each of the agencies involved and to show how a cooperative partnership among the agencies has been instrumental in the success of this complex and challenging project.

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Introduction

Recognizing the concerns of Federal and state agencies, local officials, and individuals about the environmental condition of the watershed, the U.S. House of Representatives Committee on Transportation and Infrastructure adopted a resolution in March 1996, requesting the Chief of Engineers to: *“determine whether modifications are warranted to solve a variety of water and related resource problems in the Hocking River Basin with priority given to Sunday and Monday Creek sub-basins. Special emphasis shall be given to the need for environmental restoration of lands and waters that have been impacted by resource extraction and other land uses.”*

Funds were provided in Federal Fiscal Year 1997 to the U.S. Army Corps of Engineers, Huntington District, to conduct the reconnaissance portion of the investigation. A Reconnaissance Report was completed and concluded that engineering solutions for resolving the acid mine drainage problems could be formulated which would result in ecosystem restoration benefits in excess of project costs. The report was approved by Corps Headquarters on November 19, 1997 as a basis for proceeding to the feasibility phase. A Feasibility Cost Sharing Agreement was executed on April 27, 2000 between the Corps and the ODNR and the feasibility study began in October after funding for the study was obligated by both agencies.

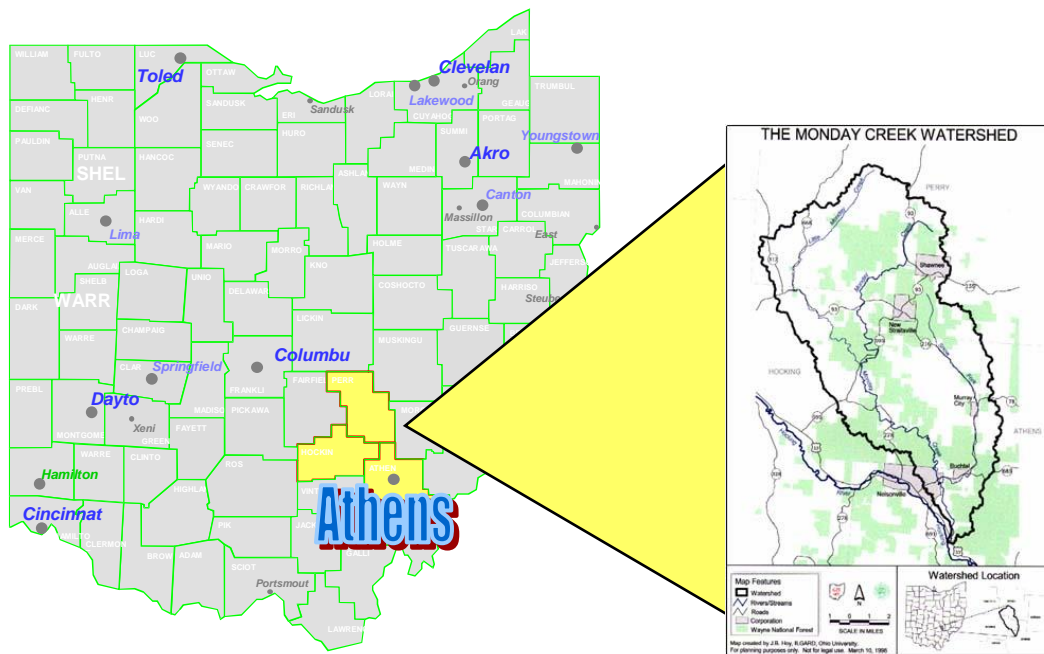


Figure 1. The Monday Creek Watershed is located in southeastern Ohio and covers 116 square miles in Athens, Perry and Hocking Counties.

Study Purpose

The purpose of the feasibility study is to conduct a thorough investigation of the problems and needs of the area, develop alternative plans to address these problems and needs and to select the optimum plan based on the projected benefits. The feasibility report serves to document the findings of the feasibility study and document the cost of the optimum plan. The results are based upon the analysis of both data collected during the feasibility study and historical data accumulated from previous studies and/or other sources. Technical designs for this study include biological, engineering, and economic evaluations of various alternatives along with required real estate and planning evaluations. An Environmental Assessment is also being prepared to accompany the feasibility report. The Environmental Assessment will evaluate the optimum plan's positive and negative impacts to the environment, outline steps for mitigating any negative impacts, and compare them with the continuing negative impacts to the watershed if the plan is not constructed. Once the feasibility report is completed it must go to Corps Headquarters for review, then to the Assistance Secretary of the Army for Civil Works for approval, then to the Office of Management and Budget to make sure its recommendation is consistent with Administration policy, then to Congress for construction authorization.



Figure 2. Acid mine drainage seeps from the former Majestic Mine complex.

The Partners

The \$1.2 million dollar feasibility study is being 50/50 cost-shared between the U.S. Army Corps of Engineers (USACE), the Federal sponsor, and the Ohio Department of Natural Resources (ODNR), which is the non-Federal sponsor. The U.S. Forest Service (USFS) is also a stakeholder in the project because it owns over 40% of the Monday Creek Watershed as part of the Wayne National Forest. In addition to the ODNR and USFS, other agencies involved include the U.S. Fish and Wildlife Service (USF&W), the Monday Creek Restoration Project (MCRP) which is a local citizens group dedicated to restoration of the Monday Creek Watershed, the Ohio Environmental Protection Agency (OEPA), Ohio University's Institute of Local Government Administration and Rural Development (OU-ILGARD), the U.S. Department of Energy's National Energy Technology Laboratory (DOE-NETL) and West Virginia University (WVU). The ODNR provided nearly half of its cost-share in cash and the other half is being provided through in-kind services. These services are activities required for the study, but which are done either by the ODNR or some other non-Federal stakeholder. For example, the ODNR has contractual agreements with OU-ILGARD and the MCRP to provide support to the project.

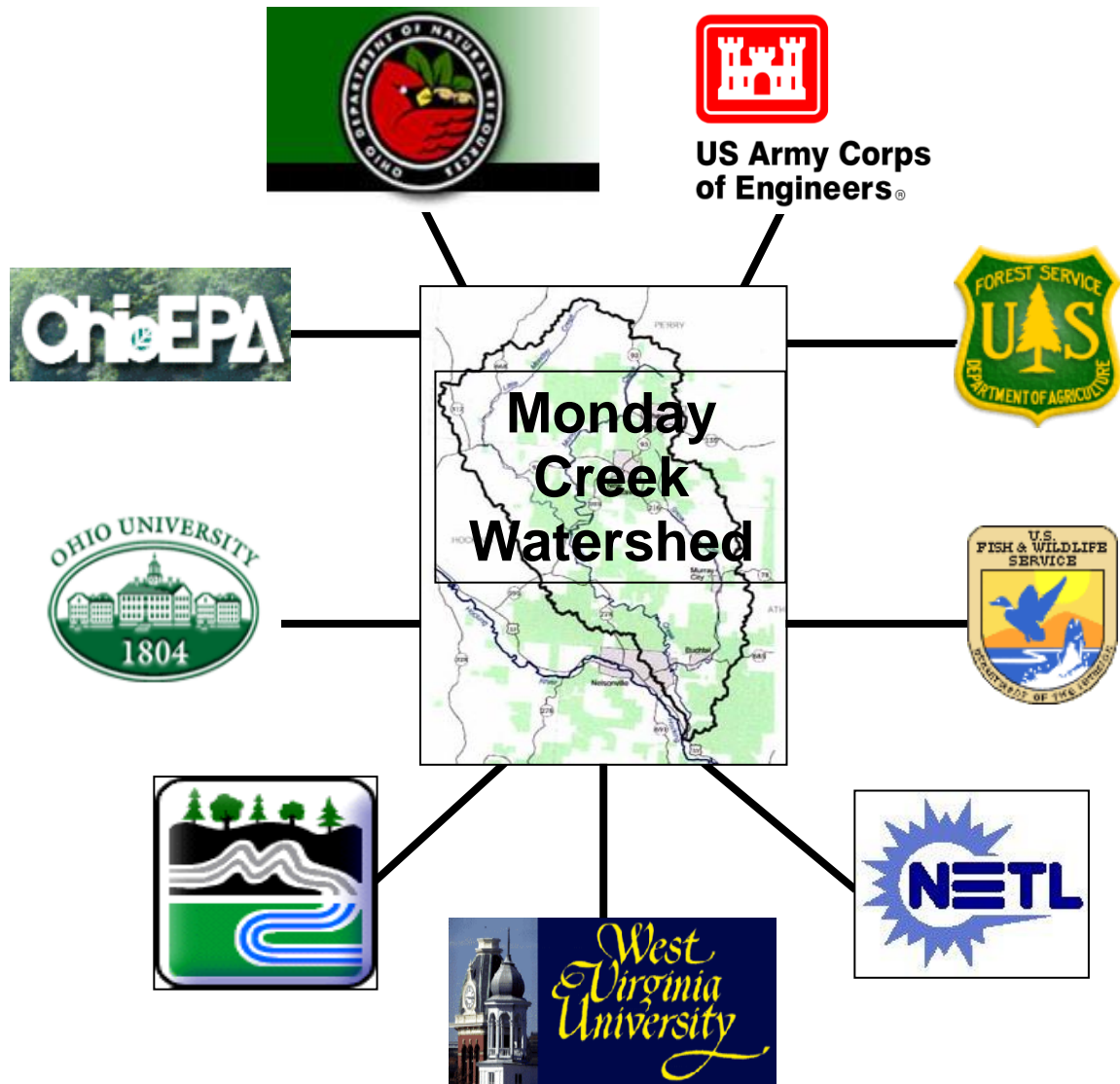


Figure 3. Nine federal, state and local agencies are working together closely to restore the Monday Creek Watershed.

Roles and Responsibilities

U.S. Army Corps of Engineers (USACE)

Each partner has a valuable role in the feasibility study process. USACE is the Federal lead for the study and in addition to providing half of the study funding, is responsible for the overall development of the feasibility report and its submission to Congress. During the initial stages of the feasibility study, the Corps identified over 4,300 problem areas related to abandoned mine

lands within the Monday Creek Watershed including deep mine seeps, gob piles, subsidence features, spoil blocks and stream captures.

Ohio Department of Natural Resources (ODNR)

As the non-Federal sponsor, the ODNR not only has a financial responsibility for the other half of the study cost, but also addressing any hazardous substances existing on any of the lands required for construction of the project. Hazardous substances have not been found in the study area but this is always a possibility once construction begins. The ODNR also has the responsibility for acquiring private lands needed for the project through either purchase or easement.

U.S. Forest Service (USFS)

As owner of much of the land needed for the project, the USFS is responsible for providing access to its lands and maintaining and operating projects sited on its property. USACE will use the USFS's recreation analysis for the Wayne National Forest as part of the study for determining recreational benefits and the USACE will also incorporate the USFS's Endangered Species Plan that was developed for the forest.

Monday Creek Restoration Project (MCRP)

The MCRP has been collecting water quality data in the watershed for several years and this data has been critical in establishing baseline conditions for the study. In addition, members of the MCRP have the most knowledge of the locations of the acid mine drainage seeps and other problem areas in the watershed.

Ohio Environmental Protection Agency (OEPA)

The OEPA has collected data from approximately 130 sampling stations on Monday Creek Basin. It collected 19,877 fish and determined they were from 26 species including 4 hybrid species. It correlated this information, along with data on ambient chemistry, with biological indicators for streams that meet Ohio's warm water habitat biocriteria to arrive at the target values this project will try to attain. The OEPA will also be conducting a Total Maximum Daily

Load (TMDL) study for Monday Creek using much of the data developed for the feasibility study.

Ohio University's Institute of Local Government and Rural Development (OU-ILGARD)

OU-ILGARD has developed much of the socioeconomic data that will be used in the feasibility report, has compiled mapping for surface and underground mines in the watershed in a geographic information system (GIS), and is maintaining the master data base for the project. In addition, staff from Ohio University has provided technical oversight and students have volunteered for collecting water quality samples and have written several thesis papers to address water quality issues in Monday Creek.

U.S. Fish and Wildlife Service (USF&W)

The USF&W has previously written the Biological Opinion Endangered Species Plan for the Wayne National Forest and this plan is being adapted for use for the Monday Creek Feasibility Study. The USF&W will also assist in identifying and considering potential environmental impacts from the alternatives being evaluated for the Monday Creek Watershed.

Department of Energy National Energy Technology Laboratory (DOE-NETL)

The DOE-NETL conducted a mass balance study in an attempt to account for the additions and reductions to in-stream flows within Monday Creek. The results of the study indicated that flows used for the model study are reasonably accurate. NETL also is providing contract administration and quality assurance review of West Virginia University's model study.

West Virginia University (WVU)

WVU was added to the team to conduct a Total Acid Mine Drainage Loading (TAMD) Model for the study in order to design a cost effective AMD treatment strategy for the Monday Creek Watershed. The TAMD model simulates the evolution of stream water quality affected by AMD and its improvement due to passive and active AMD treatment structures for each affected subwatershed. The feasibility of the designed structures was tested by incorporating them into the Monday Creek model and comparing the simulated stream pH, aluminum and iron concentrations against the corresponding remediation endpoints. The model was used to

calculate the required load reductions from each of the Monday Creek subwatersheds in order to satisfy the remediation endpoints specified by the Ohio EPA. The required reductions in AMD load were used to develop an AMD treatment strategy that will bring the mainstem of Monday Creek back into compliance with the remediation endpoints. This strategy consists of construction of over 140 projects throughout the watershed consisting of low head dams, limestone leach beds, open limestone channels, slag leach beds, aerobic wetlands and a lime kiln dust doser. The ultimate feasibility of this treatment strategy was tested by directly simulating the actions of the designed structures in the Monday Creek TAMDL model. The model indicated that over 140 projects are necessary to treat and remove approximately 80,000 tons of acid at a cost of over \$5 million.

Benefits From Partnering

Through partnering, preparation of the feasibility study has been more thorough and complete because of collaboration among the stakeholders. This study was more cost effective because a lot of information on water quality data, biological data, recreational benefits and endangered species was provided by the stakeholders and did not have to be generated by the Corps. For example, the ODNR only had to provide \$280,000 in cash as part of its \$600,000 cost-share because \$320,000 will be contributed as in-kind services from the ODNR itself, the OEPA, OU-ILGARD and the MCRP. In addition, future studies on the watershed will be less costly due to the use of information developed from this study. For example, the OEPA met its requirement to the USEPA for a Total Maximum Daily Loading (TMDL) report on Monday Creek by using the results from WVU's TAMDL model. This saved the State of Ohio approximately \$150,000. Likewise, construction costs for implementing the project will also be significantly reduced because the USFS owns the lands required for construction of 81 of the restoration projects; thus reducing the cost of purchasing real estate by nearly \$1 million dollars. Generally, the state is required to cover all operating and maintenance expenses associated with the projects. But the USFS has agreed to assume responsibility for operating and maintaining the projects on its lands; therefore greatly reducing the O&M burden for the State of Ohio.

Conclusion

In the past, some agencies who partnered with the Corps have said the Corps has a cultural bias because “they’ve done something a particular way for years”. That partnering with the Corps is a process that is, “too bureaucratic and too slow.” And that federal cost-sharing, “is frustrating and generally carries a lot of strings with it.” However, feedback from all of the agencies involved indicates the Monday Creek Project has been successful because the Corps is taking a new, collaborative approach that integrates the input of all of the stakeholders in order to develop a comprehensive solution and saves money.