Appendix C
Section 319 Success Stories
Volume III:
The Successful Implementation of the Clean Water Act's Section 319 Nonpoint Source Pollution Program
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Section 319 Success Stories
Volume III:
The Successful Implementation of the Clean Water Act’s Section 319 Nonpoint Source Pollution Program

United States Environmental Protection Agency
Office of Water
Washington, DC
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Buffalo River Watershed, Arkansas

The Buffalo River watershed in north-central Arkansas covers 860,000 acres. From the headwaters in the Boston Mountains, the Buffalo River flows unobstructed for 150 miles eastward to the confluence with the White River. Because of the unique scenic and scientific features associated with the free-flowing river, Congress established the Buffalo National River Watershed in 1972 to preserve this national treasure for future generations. The federal and state governments own 40 percent of the watershed, primarily in the headwaters and along a narrow riparian corridor of the river. About 60 percent of the basin is privately owned, including most of the larger tributaries.

The Arkansas Department of Environmental Quality (ADEQ) has designated the Buffalo River an Extraordinary Resource Water and a Natural and Scenic Waterway, the highest water quality designation given by the state. Although the water quality in the Buffalo River at present is very good, several tributaries have been affected or threatened by agricultural activities. In 1992 there were 39 confined animal operations within the watershed, including 12 swine farrowing operations, one broiler operation, and 26 dairy facilities. All of the swine operations and 10 of the dairy facilities had Liquid Animal Waste Management Systems (LAWMS). At that time, the ADEQ Water Division received notice of intent from a watershed farmer to construct a 540-sow/pig farrowing operation adjacent to National Park property and less than a mile from the river. Manure land application sites for the proposed swine facility were as close as ¼ mile to the river. All of the existing watershed swine operations were located on the southern edge of the drainage basin in an area underlain by sandstone and shale. If the proposed swine facility was built, it would be the first swine operation located in such close proximity to the river and within a karst terrain.

Both citizens and resource agencies expressed concern over the construction and operation of a confined swine facility so close to the river. Personnel from the ADEQ Water and Environmental Preservation Divisions performed an investigation of confined animal operations within the watershed, visiting and evaluating 16 swine and dairy operations. Results of the watershed investigation showed that most LAWMS were not being operated and maintained in a manner that would eliminate or minimize the amount of waste leaving the farms. Subsequently, the ADEQ secured grant money to further study the problems revealed during the watershed investigation.

Project goals and methodology
The Buffalo River Swine Waste Demonstration Project was initiated in 1995 with the primary goal...
of protecting the high-quality water in the Buffalo National River watershed by working with the local farmers and government agencies to identify and address the problems associated with the LAWMS. This 5-year, 319-funded project evaluated existing swine liquid waste management practices and demonstrated the benefits of new or improved best management practices (BMPs) in protecting water quality. The project objectives included evaluating the effectiveness of existing LAWMS BMPs (including design, training, and management aspects) by monitoring water quality and waste management practices at cooperating farms, improving existing BMPs or implementing new BMPs, and evaluating changes in the water quality and the operation of the LAWMS as a result of improved or new BMPs implemented at cooperating farms.

Other project goals included demonstrating to farmers and various government agencies the effectiveness of proper waste management at confined animal operations in protecting water quality. Nutrient loads in surface water were estimated before and after BMP implementation. Storm water runoff studies also were conducted to document nutrient loss from manure land application sites. In addition, waste management practices were documented before and after BMP implementation through frequent site visits and farm management surveys.

**Waste management and water quality improvements**

New or modified BMPs were implemented at the six cooperating farms based on site-specific problems and included the following:

- Storm water diversions were improved or installed.
- All-weather access to LAWMS was improved or installed.
- Storage capacity for liquid waste was increased.
- Waste collection systems were repaired.

New or modified BMPs associated with operational practices were also implemented and included decreasing fresh water usage; performing routine manure solids removal; and improving overall farm nutrient management by using a waste pumping service for solids handling, properly sampling manure holding structures to determine nutrient content, reducing phosphorus application rates, and increasing available acres for land application. In addition, 91 percent of the watershed’s farmers had accumulated solids removed from the LAWMS, reestablishing the maximum available manure storage capacity at their facilities.

As a result of the new or modified BMPs, substantial improvements were documented in waste management practices. Free-board problems associated with waste storage ponds were reduced by 66 percent at cooperating farms. Overall, farmers began to manage the manure generated at their facilities for its fertilizer value, which reduced the time and expense associated with the LAWMS.

Using water quality monitoring data collected on a stream (less than 1 square mile drainage area) adjacent to a poorly operated swine facility, preliminary estimates indicated that 3,000 pounds of total nitrogen and 400 pounds of total phosphorus were lost to the stream on an annual basis. Following BMP implementation, preliminary estimates indicated that nutrient loads in the stream were decreased by approximately 90 percent.

**Partnerships to solve complex problems**

This project involved building working relationships with watershed swine farmers, the swine industry, local Natural Resources Conservation Service staff, the Newton County Conservation
A Community Approach to Managing Manure in the Buffalo River Watershed: Local Watershed Assistance Program Helps Dairy Farmers

The Environmental Preservation Division of the Arkansas Department of Environmental Quality (ADEQ) was awarded a section 319 grant in 1997 to evaluate the effectiveness of “dairy manure management alternatives,” designed for facilities with 100 cows or fewer, in minimizing nutrient and bacteria loads leaving farm sites. The dairy 319 project worked with dairy farmers and government agencies in the Buffalo River watershed, as well as with state and federal agencies, to develop and implement solutions to better manage manure in the watershed.

From the beginning of the dairy 319 project, the ADEQ project staff sought out cooperation with other agencies, the dairy cooperative, and dairy farmers in the Buffalo River watershed by forming a task force with representatives from all interested parties. Key relationships were devel-
oped between the ADEQ project staff and the Conservation District Boards, Natural Resources Conservation Service staff, and the dairy farmers in the watershed.

Most of the dairy farm owners in the Buffalo River watershed volunteered to participate in the dairy 319 project. The Buffalo Conservation District staff contacted farmers and requested individual meetings with them at their farms. During these meetings, the project staff explained the project to the farmers and requested their participation on a voluntary basis. In exchange for participation in the study, farmers hoped that the project would result in developing better information regarding the operation of manure management systems or finding a source of funding for improving their manure management systems.

Dairy operations and manure management

In 1994 there were 27 dairy facilities operating in the Buffalo River watershed. Recent financial difficulties have taken their toll on Arkansas dairy farmers, and today only 18 dairy facilities still operate in the watershed. Finding economic solutions to improve manure management at these small dairy facilities continues to be a challenge.

After an exhaustive investigation into the manure management practices of the dairy industry in the Buffalo River watershed, it became apparent that the 18 watershed farmers did not have the specialized equipment required to handle the different waste streams generated from the confinement of the cows at their farms. Although several individual problems were identified, such as ineffective fertilizer utilization and improper land application practices that increase the potential for contaminants to be transported in storm runoff, all of these problems originate from the lack of adequate manure handling equipment in the watershed. Therefore, the funding set aside for implementing best management practices (BMPs) in the watershed as part of the dairy 319 project was focused on solving identified manure handling problems.

Local watershed assistance program

To help accomplish the dairy 319 project goal of improving dairy manure management, partnerships were formed among the ADEQ, local NRCS, and the Buffalo Conservation District to develop a local watershed assistance program (LWAP). The program is administered through the Buffalo Conservation District office. It has been designed to provide a low-cost, effective solution to the manure handling problems identified throughout the watershed. In addition, the program will enable farmers to receive the maximum fertilizer benefits of their dairy manure while minimizing farm impacts on the environment. The LWAP includes the development of a local clean-out service, long-term clean-out scheduling, initial cost-share assistance, and comprehensive nutrient management planning.

As part of the LWAP, the Buffalo Conservation District provides a manure clean-out service for dairy farmers and an operator to maintain and operate the equipment. Easily transportable equipment for manure removal, including a side-discharge manure spreader, submersible pump, and pit agitator, will be purchased as part of the LWAP. This service provides dairy farmers in the Buffalo River watershed with a method to handle dairy manure without having to purchase and maintain specialized and seldom-used equipment. Additionally, by providing an operator, the program allows the dairy farmer more time to spend on milk production and other farm management responsibilities.

With the hope of increasing participation, up to 75 percent of the cost-share money will initially be available for watershed dairy farmers who use the program’s manure handling service. To be
eligible for the program, the farmer is required to develop a long-term clean-out schedule for the dairy facility. ADEQ and NRCS staff will assist participating dairy facilities with the development of the 12-month clean-out schedules. This will ensure that solids are removed within the designed storage time for each manure management system.

Meetings were held to present the results of the dairy 319 project and introduce the LWAP, and they were attended by most of the dairy farmers in the watershed. Farmers in the Buffalo River watershed understand the importance of preserving water quality and were receptive to the LWAP. They realize that the program can help them economically manage and utilize dairy manure while protecting water quality in the watershed in which they live.

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Grassland Bypass Project: Economic Incentives Program Helps to Improve Water Quality

Grassland Drainage Area, California

Agricultural runoff is one of the primary sources of discharge to rivers and streams that do not meet water quality standards, affecting 70 percent of these impaired waters. This problem is particularly challenging in the western United States, where roughly 50 million acres of land are devoted to irrigated agriculture and where agricultural drainage and runoff provide a significant proportion of river flows during dry seasons.

The Grassland Drainage Area is an agricultural region on the west side of California’s San Joaquin Valley. The agricultural land there is productive, but the soil contains a high level of selenium, a naturally occurring trace element. Selenium accumulates in the agricultural drainage water that collects in the tiles installed to drain excess water from the fields. In 1983 this problem received national attention when deaths and deformities in wildlife at the Kesterson Reservoir were attributed to selenium-contaminated drainage from outside the Grassland Drainage Area. In the early 1990s, selenium-laden drainage from the Grassland Drainage Area was still being discharged into other federal and state wildlife refuges, threatening important ecosystems and associated fish and wildlife.

An innovative tradable loads program

The Grassland Bypass Project is an innovative program designed to improve water quality in the channels used to deliver water to wetland areas. In 1996 several irrigation and drainage districts formed the “Grassland Area Farmers,” a regional drainage entity that includes some 97,000 acres of irrigated farmland.
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<td>District of Columbia</td>
<td>The Watts Branch Initiative: Community Involvement Key to Success</td>
<td>36</td>
<td>Submitted by Sheila Besse, D.C. Department of Health.</td>
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