



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

Ohio

## Dam Modification Project Helps Restore Water Quality in the Middle Cuyahoga River

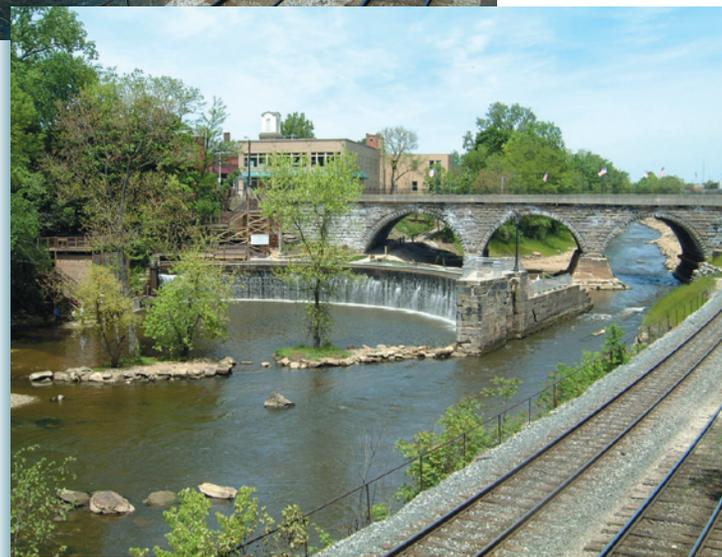
### Waterbody Improved

The Kent Dam on Ohio's Middle Cuyahoga River was a barrier to fish migration and contributed to water quality problems due to stagnant flows within the dam pool, preventing the river from meeting its designated use for warmwater habitat (WWH). As a result of modifications to the dam that restored a free flowing river channel and other activities implemented both above and below the dam, the Cuyahoga River is now meeting the full attainment of its WWH aquatic life use designation, and it is expected to be removed from the state's 303(d) list of impaired waters in the next listing cycle.

### Problem

In 1999 the Ohio Environmental Protection Agency (Ohio EPA) completed a total maximum daily load (TMDL) study on the Middle Cuyahoga River that found the river was only partially attaining objectives for its WWH designation. In 2000 it was placed on the state's 303(d) list as impaired by nutrients, siltation, low dissolved oxygen, flow alteration, and other habitat alteration. Major sources of impairment included municipal point sources, combined sewer overflows, septic systems, urban runoff, channelization, and dam construction. The TMDL indicated that point source regulation alone would be insufficient to achieve water quality goals within the river and recommended the modification or removal of dams in the cities of Kent and Munroe Falls.

Ohio EPA determined that the Kent Dam was contributing to water quality problems due to stagnant flows and eutrophication within the dam pool, causing dissolved oxygen levels to fall well below water quality criteria during periods of low flow. The dam pool altered aquatic habitat, impairing both the health and diversity of indigenous fish species. Additionally, the dam posed a physical barrier to fish migration.



The dam pool was eliminated by removing an old canal lock and allowing the river to return to free-flowing conditions.

## Project Highlights

The Middle Cuyahoga River Restoration Project required consideration of complex science and engineering, cultural and archaeological sensitivity, regulatory finesse, and public involvement. The Kent Dam project initially faced fierce public resistance due to the dam's historic value and location in a designated historic district. The dam itself was listed on the National Register of Historic Places because it was one of the first recorded arched dams constructed in the United States.

An independent committee composed of the general public and various local, state, and federal representatives determined that the dam could be successfully modified without destroying its historic character. The project involved removing an old canal lock east of the dam to provide for a free-flowing river channel, while at the same time preserving and restoring the arched dam structure. The former dam pool area was converted into Heritage Park, and extensive interpretative signage chronicles the history of the area as well as the environmental benefits of the project. To further restore water quality and aquatic habitat, the project incorporated extensive natural stream channel and streambank restoration above the dam.

## Results

Prior to the project, the Index of Biological Integrity (IBI)—an objective measurement of the diversity of the fish community—indicated that fish life within the river failed to meet WWH standards. Physical habitat conditions within and along the river were measured using the Qualitative Habit Evaluation Index (QHEI) and also failed to meet WWH standards.

Following completion of the Middle Cuyahoga River Restoration Project, IBI scores within the Kent Dam area increased by 57 percent and QHEI scores increased by 56 percent. Modified Index of Well Being (MiWb) scores—used to

### Ohio EPA Kent Dam Pool Bio-Survey Data

	Pre-Construction	Post-Construction
IBI	28.0	44.0
MiWb	8.2	8.9
QHEI	51.0	79.5

WWH Criteria: IBI ≥ 40; MiWb ≥ 7.9; QHEI ≥ 60

measure the general health of fish communities within a waterbody—increased slightly from 8.2 to 8.9. As a result, the Cuyahoga River fully attained its WWH aquatic life use designation, and it is expected to be removed from the state's 303(d) list of impaired waters in the next listing cycle.

As an additional benefit, the city of Kent saved several million dollars in wastewater treatment upgrades that otherwise would have been required to address impairments caused by the dam. Developing the city of Kent's Heritage Park in the former dam pool also preserved an important connection to Ohio's history. Continued water quality improvements are expected upon the completion of additional projects such as modification of the dam downstream at the city of Munroe Falls.

## Partners and Funding

The city of Kent, in partnership with the cities of Ravenna and Massillon, Summit County, and agencies such as the U.S. EPA, Ohio EPA and Ohio Department of Natural Resources (ODNR), secured more than \$5 million for the Kent Dam Project. Funding was provided as follows: Ohio EPA's Clean Water Act (CWA) State Revolving Loan Fund's Water Resource Restoration Sponsor Program—\$3.94 million; The Clean Ohio Fund—\$636,000; CWA section 319 Grant—\$500,000; and ODNR—\$6,400. The section 319 grant funds were used to restore degraded and exposed streambanks following removal of the dam pool.



U.S. Environmental Protection Agency  
Office of Water  
Washington, DC

EPA 841-F-05-004Y  
October 2005

### For additional information contact:

**Russ Gibson**  
Ohio Environmental Protection Agency  
614-644-2020  
[russ.gibson@epa.state.oh.us](mailto:russ.gibson@epa.state.oh.us)