Chapter 6

Watershed Planning in Southwest Ohio

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Introduction and Purpose

The purpose of this chapter is to explain watershed planning by watershed groups in Butler, Clermont, Hamilton and Warren counties. Particular attention is given to the role that Southwest Ohio's watershed groups fulfill in nonpoint source pollution management planning. Because nonpoint source pollution is diffuse, diverse and difficult to regulate, watershed groups are needed to help address this widespread problem.

As defined by the U.S. EPA a watershed plan is "a strategy that provides assessment and management information for a geographically defined watershed, including the analyses, actions, participants, and resources related to developing and implementing the plan. The development of watershed plans requires a certain level of technical expertise and the participation of a variety of people with diverse skills and knowledge." In Butler, Clermont, Hamilton and Warren counties, watershed groups are vital to providing "the participation of a variety of people with diverse skills and knowledge."

Southwest Ohio's watershed groups deal with an array of competing priorities but all share at least one underlying function: they help generate consensus among people and organizations with a stake in the health of their watersheds. In short, they are forums for watershed stakeholders. This makes watershed groups a key part of what the U.S. EPA calls the watershed approach. The watershed approach is "a coordinated framework for environmental management that focuses public and private efforts on the highest priority problems within hydrologically defined geographic areas taking into consideration both ground and surface water flow." (*Terms of Environment*: *Glossary, Abbreviations and Acronyms;* U.S. EPA, 2010)

Public efforts to manage watersheds generally originate with units of government and their agencies. Private efforts are undertaken by large corporations, small businesses and landowners. Watershed groups are predominantly non-profit organizations, placing them somewhere between the public and private sectors. Having neither the regulatory powers of the public sector nor the proprietary interests of the private sector, watershed groups can be impartial facilitators. Ideally, watershed groups can serve as brokers of mutually beneficial solutions. At the very least, they usually help diverse stakeholders and competing interests move closer to a common understanding of watershed issues.

The importance of watershed groups is fully recognized in Ohio. U.S. EPA credits the state with supporting watershed groups. In its *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* (U.S. EPA, 2008), the federal agency states: "Ohio has adopted a program philosophy that strong and effective local watershed stakeholder groups are necessary to develop and implement integrated watershed plans. According to Ohio, the key to watershed organization capacity-building is active stakeholders that provide technical knowledge, financial ability, networking ability, organizational skills and legitimacy (decision-makers with the authority to implement and support problem and solution statements and recommended action items)."

In Butler, Clermont, Hamilton and Warren counties, the organizational capacity of local watershed groups is often judged by their effectiveness in dealing with nonpoint source pollution. The U.S. EPA states that, "Nonpoint source pollution poses the greatest threat to

water quality and is the most significant source of water quality impairment in the nation." (*Handbook for Developing Watershed Plans*) Despite the magnitude of this problem, it wasn't until 1987 that amendments to the Clean Water Act required states to address nonpoint source pollution with expanded programs. "These amendments did not provide a government body with the authority to enforce compliance with the programs. Rather, they directed states to establish nonpoint source programs that provided limited funds for voluntary projects." (*A Guide to Developing Local Watershed Action Plans in Ohio*; Ohio EPA, 1997)

As a complex issue that relies on voluntary projects with limited funding, nonpoint source pollution engenders three major functions for the watershed groups in Southwest Ohio:

1. tapping local expertise for pertinent, timely information
2. identifying and pursue locally based water quality solutions
3. encouraging voluntary actions by key stakeholders

Among the key stakeholders (#3 above), are units of government and their agencies. In some parts of the country, governments and their agencies have been more closely tied to compulsory actions than voluntary actions, and some watershed groups have distinguished themselves more through confrontation than collaboration. The watershed groups and governments of Butler, Clermont, Hamilton and Warren Counties, however, generally cooperate with each other.

Watershed planning in Southwest Ohio holds true to the findings of a Wisconsin research project. In its Four Corners Watershed Innovators Initiative, the University of Wisconsin found: "There is a myth that the watershed movement consists of spontaneous 'bottom-up' local efforts that find alternatives to the rigidity of intransigent bureaucracies and one-size-fits-all solutions." Researchers noted that although local support and the energy and resources of watershed groups are vital, "the governmental role is generally critical to successful watershed approaches, particularly if plans and solutions proposed by watershed groups are to be implemented."

Ohio EPA acknowledges the importance of the "governmental role," but not without recognizing the importance of watershed groups. The agency says a watershed action plan "is an itemization of the problems, priorities and activities the local watershed group would like to address." (*A Guide to Developing Local Watershed Action Plans in Ohio*) This perspective exemplifies the watershed planning process, which U.S. EPA describes as "iterative, holistic, geographically defined, integrated and collaborative." (*Handbook for Developing Watershed Plans*)

It should be noted that the watershed planning process for watershed groups differs from the water quality management planning process for the OKI Regional Council of Governments. While Section 208 of the Clean Water Act places responsibility for water quality planning on the state and designated areawide planning agencies such as OKI, plans created out of the 208 process have often focused on wastewater treatment capacity and planning on a regional scale because of the legal tie between such planning and permits for wastewater treatment facilities.

A local watershed action plan, on the other hand, is typically a framework for addressing all water resource issues within a smaller sub-regional area. These water resource issues, to a growing extent, arise from nonpoint source pollution. Ohio EPA has stated, "Success in implementing programs to control point sources of pollution has revealed that nonpoint sources and habitat degradation account for most of the nation's remaining water quality problems. This national trend is also reflected in Ohio . . . The proportional increase in nonpoint sources as a

major source of impairment is due largely to the emergence of pre-existing problems that were masked by the historically more severe point source impairments." (*A Guide to Developing Local Watershed Action Plans in Ohio*)

In collaboration with county conservation districts, Ohio EPA, OKI and other stakeholders, the watershed groups of Southwest Ohio are addressing nonpoint source pollution and other water quality issues. OKI continues to prepare analyses and tools that can be used by watershed groups. For example, earlier sections of this plan in Chapter 3 and Chapter 5 describe and demonstrate the significance of impervious surface for water quality in a watershed, and Appendix C provides maps and data about impervious surface for each of the 82 watersheds that are wholly or partially within the OKI region.

The next section of this chapter describes the work of eight watershed groups that have a presence in their chosen watersheds of Butler, Clermont, Hamilton and Warren counties.

The Watershed Groups of Southwest Ohio

The watershed groups of Butler, Clermont, Hamilton and Warren Counties share the common purpose of improving conditions in their chosen watersheds, but they pursue that purpose from a variety of starting positions. Some of the Southwest Ohio groups serve as land trusts, while most do not. Nearly all of the groups have one or more paid staff members, but at least one of the groups relies completely on unpaid volunteers. Some of the groups have taken part in the Ohio Watershed Coordinator Grant Program, while others have not. Some of the groups have clear ties with local governments and agencies, while other groups declare themselves to be citizen-based organizations. And while all of the groups are non-profit organizations, their legal footings range from the more intricate workings of a limited liability corporation with extensive tax reporting requirements to a simpler non-profit with a small budget that allows it to satisfy Internal Revenue Service rules by filing one simplified tax form each year. These differences diversify the work of those groups, providing a broad cumulative benefit to the watersheds of Butler, Clermont, Hamilton and Warren counties.

OKI posed the same nine questions to each watershed group:

1. What was the impetus for the watershed group's founding?
2. What is the group's mission?
3. What is the geographic focus of the group's work?
4. What water resource priorities do you perceive for this geographical area?
5. What are the group's initiatives? (including grant-funded projects, education programs, etc.)
6. What water quality monitoring data or habitat evaluation data has the group gathered or used?
7. What is the group's role in watershed management planning?
8. What is the group's role in total maximum daily load planning?
9. What notable partnerships has the group forged with other stakeholders, including local governments, state government, universities or other watershed groups?

Responses follow. Summarization and paraphrasing are intrinsic to these descriptions. To varying degrees, a watershed group's website, newsletters, annual reports, news releases, pamphlets or brochures were used to supplement replies from the organization's spokesperson. The groups are addressed in alphabetical order.

East Fork Watershed Collaborative

Watershed group's founding, mission and geographic focus

In 2001, the soil and water conservation districts (SWCDs) in Clermont, Brown, Clinton and Highland counties partnered with Clermont County to participate in the Ohio Department of Natural Resources Watershed Coordinator Grant Program. These stakeholders recognized the need to merge the diverse interests within the East Fork and develop a unified approach to restoring and protecting the watershed.

Though it has been considered on several occasions, the Collaborative has not incorporated as a nonprofit 501(c)(3) organization. It is based at offices of the Clermont SWCD and operates under the guidance of an Advisory Committee, which includes representatives of four county SWCDs, a representative of Clermont County's Office of Environmental Quality, a representative of Ohio State University Extension, Ohio EPA, the Ohio Department of Natural Resources, and local citizens and community groups. Meetings are open to the public.

On its website, the Collaborative states that its mission is "to protect and enhance the biological, chemical and physical integrity of the East Fork Little Miami River and its tributaries." The organization carries out that mission primarily by developing watershed action plans and implementing stream restoration or protection projects.

The Collaborative's geographic focus is the East Fork Little Miami River and its 500-square-mile watershed in Clinton, Highland, Brown, Warren and Clermont counties. Most of the watershed lies in Clermont County, where it ends at the City of Milford's confluence of the East Fork Little Miami River and Little Miami River.

Watershed group's water resource priorities and initiatives

The Collaborative's watershed coordinator identified three major water resource priorities for the East Fork Little Miami River watershed:

- developing watershed action plans
- monitoring water quality monitoring in collaboration with the Clermont County Office of Environmental Quality
- engaging in source water protection activities

In December 2009, the Ohio Lake Erie Commission and the Ohio Water Resources Council awarded the Clermont Soil & Water Conservation District a Balanced Growth Strategy grant to develop a watershed balanced growth plan for the Middle East Fork subwatershed. The Collaborative and the Clermont County Transportation Improvement District are partners in this $98,250, two-year grant.

The Collaborative's watershed coordinator said balanced growth planning will strengthen existing land use plans and existing watershed action plans by identifying priority areas for development and conservation. State guidance says the project should also address infrastructure planning for water, wastewater, transportation and other aspects of sustainable infrastructure, such as pervious surfaces and wetland management for stormwater control. Planned extensions of sewer lines and transportation, water and wastewater projects should be included. The

infrastructure component also may include planning for existing capacity as well as any anticipated growth. Where applicable, there should be clear planning ties to the Section 208 water quality management plan and source water protection plan.

The Middle East Fork subwatershed covers 56 square miles, all in Clermont County. Forest is still the predominant land cover, but Clermont County is one the fastest growing counties in Ohio. Eleven political jurisdictions will be involved in the balanced growth planning project.

The Collaborative's watershed coordinator said other current and recent initiatives include:

- Monitoring water quality and habitat with Clermont County's Office of Environmental Quality
- Collaborating with the U.S. EPA, Ohio EPA and U.S. Army Corps of Engineers
- Source Water Protection for Harsha Lake, which is a surface water source of drinking water for more than half the population of Clermont County
- Working on stream restoration projects with Cincinnati Nature Center
- Working with Clermont County General Health District to replace or repair failing septic systems with federal funds under Section 319 of the Clean Water Act
- Working with Clermont County Park District and the Clermont County Office of Environmental Quality to protect riparian corridor along the East Fork main stem through land purchases or conservation easements
- Working with Highland County SWCD, Highland County Health Department and Brown County Health Department to repair or replace failing septic systems in the headwaters
- Habitat monitoring and water quality monitoring in primary headwater streams in collaboration with CCOEQ
- Working with Clermont County Storm Water Management Department on education and outreach, as well as promoting urban BMPs
- Installing rain gardens on the campuses of 10 public schools in collaboration with the Clermont County SWCD and several school districts
- Offering a program to reimburse up to $100 of the cost of installing a home rain garden
- Collaborating with Clermont County Stormwater Management Department on a low-impact-development workshop
- Reaching out to property managers and homeowners associations on proper maintenance of stormwater detention basins through pond clinics with Clermont County SWCD
- Sponsoring the East Fork River Sweep each April
- Organizing East Fork cleanups in the fall, as requested by volunteer groups

<u>Group's role in watershed management planning and total maximum daily load planning</u>
The Collaborative took the lead role in developing five watershed action plans (WAPs). Of the East Fork's five subwatersheds, four have WAPs endorsed by the Ohio EPA:

- East Fork Headwaters
- East Fork Lake and Tributaries
- Middle East Fork
- Lower East Fork

The other subwatershed, Stonelick Creek, has a conditionally endorsed WAP.

In 2006-2007, with a grant from the U.S. EPA, the Collaborative hired consultants to perform total maximum daily load (TMDL) modeling with existing data from Ohio EPA and Clermont County's Office of Environmental Quality for an East Fork TMDL demonstration project. The Collaborative and its consultants found that flashy stream flow, stream cover and in-stream habitat were the most significant factors impacting biological communities. Accordingly, the Collaborative did not develop a TMDL because the Qualitative Habitat Evaluation Index of streams outweighs the importance of reducing selected chemical components. The TMDL focus on pollutant loads would not directly address flow and habitat. Eventually, the Collaborative decided to pursue the implementation of a phased watershed management plan to improve habitat, decrease flashiness and reduce high priority pollutants.

U.S. EPA has determined that some categories of water quality impairment, including flow and habitat alterations, are best resolved through measures other than TMDLs, which normally address impairments caused by discrete "pollutants," such as nutrients and sediment. These pollutants are thought to be less important causes of impairment in the East Fork watershed.

The 2006-2007 study followed parallel approaches to better understand biological impairment of the East Fork watershed. The Stressor Identification approach utilized a weight-of-evidence process that considered the universe of potential stressors and evaluated the relative probability of each one to contribute to biological impairment. Alternatively, a biostatistical modeling approach relied upon statistical evaluations of the relationships between available biological, physical, and chemical water quality data. Both approaches confirmed the finding that habitat factors, such as stream cover and pools, had more influence on East Fork impairments than pollutant loadings. Flashiness (or the frequency and rapidity of short term changes in stream flow) was also found to be strongly correlated to fish scores and therefore the control of stormwater runoff should be a high priority in the watershed. Another interesting finding of the biostatistical analysis was that there is only a weak relationship between biological impairment and nutrient concentrations in the watershed, even though nutrients have long been considered one of the primary reasons for non-attainment.

<u>Water quality monitoring or habitat evaluation data collected or used by the watershed group</u>
The Collaborative works with Clermont County's Office of Environmental Quality (OEQ) to gather water quality monitoring data and habitat evaluation data. Ohio EPA has certified the OEQ as a Level III laboratory for Credible Data, which is the highest level.

The watershed coordinator said the Collaborative also uses:

- Ohio EPA's water quality monitoring and assessment data in the biennial integrated reports developed under Section 305(b) of the Clean Water Act
- U.S. EPA research data from a refurbished lab formerly operated by Procter & Gamble in the Lower East Fork watershed. The federal agency monitors throughout the watershed.
- U.S. Army Corps of Engineers monitoring data collected for Harsha Lake, which is a drinking water source and a public recreation area

Partnerships forged by the watershed group

The East Fork watershed coordinator said the Collaborative has forged partnerships with:

- Clermont County's Office of Environmental Quality
- soil and water conservation districts for Clermont, Brown, Highland and Clinton counties
- Cincinnati Nature Center
- health departments for Clermont, Brown and Highland counties
- Clermont County's Stormwater Department
- Ohio State University Extension Service
- Clermont County Park District
- Ohio Department of Natural Resources, Division of Parks
- Ohio EPA
- U.S. EPA
- U.S. Army Corps of Engineers
- University of Cincinnati, Clermont Campus
- Miami University, which assists with water quality monitoring
- Rivers Unlimited, which helps assess the watershed with low-altitude aerial photography
- Buckeye United Fly Fishers
- Clermont County Farm Bureau
- Clermont County Farm Service Agency
- Natural Resources Conservation Service
- Clinton County Open Lands
- Valley View Foundation
- townships and villages in the watershed
- Little Miami River Partnership, especially on its application for the Conservation Reserve Enhancement Program
- Little Miami Inc., which helps with the East Fork River Sweep

Friends of the Great Miami

Watershed group's founding, mission and geographic focus

Founded by and originally funded by Rivers Unlimited, Friends of the Great Miami (FOGM) is a grassroots environmental organization dedicated to the reclamation and remediation of the Great Miami River and its surrounding corridor. Its first meeting in December 1998 sought to bring together interested parties in the remediation of environmentally unfriendly practices along the river as well as preserving those areas that may qualify ultimately for State or National Scenic River status. The group incorporated in 1999 as 501(c)(3) nonprofit organization.

The watershed group's bylaws and leaders say FOGM's mission is to serve as a citizen-based education and watershed group that helps conserve, restore and enhance the Great Miami River system for the benefit of wildlife, residents, and the public interest.

FOGM engages in source water protection and planning efforts throughout the lower 54 miles of the Great Miami River, from Middletown, Ohio, to the Ohio River. The volunteer organization has been coordinating citizen's volunteer monitoring efforts, educational canoe floats and races, public outreach events, waterway cleanups and tree plantings primarily south of Hamilton, Ohio. Although most events and restoration projects take place on or near the Great Miami River, various monitoring initiatives extend into the Great Miami's watershed and tributaries.

Watershed group's water resource priorities, initiatives and partnerships forged

Several members of the FOGM board of trustees were consulted about the organization and its work, including a board member who is the stream specialist for Hamilton County Soil & Water Conservation District. He said the lack of riparian cover along the lower Great Miami River is a key water resource priority because it leads to habitat loss, water quality degradation and stream bank erosion.

Dam removal will be an important initiative in order to address water quality, safety and fish migration. With increasing development, control of stormwater volume in the watershed will need to become a greater priority in order to maintain stability and prevent excessive sedimentation within the headwater areas. Additionally, greater residence time for stormwater runoff will help filter some of the stormwater pollutants. Pre-treatment storm water practices, such as rain gardens, pervious pavement and bio-swales will be vital in enabling removal of soluble contaminants such as road salts and nitrates, associated with snow removal and fertilizer practices, respectively. Reducing both agricultural and urban pesticide and fertilizer application is also a key in improving water quality. These needs may be addressed through education and regulation. Overall, the lower Great Miami watershed needs resources to assemble a watershed action plan to prioritize and address water resource issues.

Two other members of the FOGM board of trustees described the following initiatives that forged key partnerships:

The Great Miami River Runoff Reduction Project was a federally funded project that built and monitored a rain garden and pervious pavement area at Colerain Township's Heritage Park. It also educated local officials and the public about stormwater best management practices. Partners on this project included OKI Regional Council of Governments, U.S. EPA, Miami

Conservancy District, Hamilton County Soil & Water Conservation District, Hamilton County Storm Water District, Colerain Township, Greenacres Foundation and University of Cincinnati.

Riverside tree planting initiatives have been undertaken at Rentschler Forest Preserve in Butler County, Heritage Park in Colerain Township, Dravo Park in Colerain Township, Water Works Park in the City of Fairfield, and the Oxbow Wetland at the confluence of the Great Miami River and Ohio River. Partners on these initiatives have included Butler County Metroparks, Izaak Walton League of America, Oxbow Inc., Colerain Township, Hamilton County Soil & Water Conservation District, Procter & Gamble Co., MillerCoors, University of Cincinnati, OKI Regional Council of Governments, City of Fairfield, Boy Scouts of America, Cub Scouts of America and numerous citizen volunteers.

Riverbank cleanups have been conducted at numerous locations south of Hamilton. Partners have included Benchmark Outfitters, Hamilton to New Baltimore Ground Water Consortium, Butler County Storm Water District, Butler Soil & Water Conservation District, Izaak Walton League of America, Oxbow Inc., Colerain Township, Hamilton County Soil & Water Conservation District, Hamilton County Park District, OKI Regional Council of Governments, University of Cincinnati, Total Quality Logistics and numerous volunteers.

Educational canoe trips have been undertaken from Hamilton to Colerain Township and from Colerain Township to Whitewater Township with Hamilton County Commissioners, members of the Hamilton County Regional Planning Commission, township officials and other stakeholders of the Great Miami River watershed. Partners have included Great Miami Riversports Canoe Livery, Hamilton County Soil & Water Conservation District, OKI Regional Council of Governments, University of Cincinnati and the Ohio River Way.

The Fremont Cup canoe float and race has been sponsored from Hamilton to Miamitown. Partners have included Great Miami Riversports Canoe Livery and Rivers Unlimited.

The Great Miami River Citizen's Volunteer Monitoring Laboratory involves citizens taking samples throughout the lower Great Miami watershed for analysis at the University of Cincinnati's Center for Field Studies near the New Haven community in western Hamilton County. Partners have included Rivers Unlimited, Hamilton County Park District, University of Cincinnati, OKI Regional Council of Governments, Hamilton County Soil & Water Conservation District, volunteer samplers and volunteer lab analysts.

Interactive educational displays have been provided at the Great Miami River Days educational festival in Hamilton, Cincinnati Hunting & Fishing Show at Cincinnati Convention Center, Earth Day celebration in Hamilton, Earth Day festival at Sawyer Point in Cincinnati, Heritage Park opening ceremony in Colerain Township, Izaak Walton League Lodge near Hamilton, Miamitown Town Hall in Whitewater Township, annual meetings in Hamilton, Miamitown and New Baltimore, Kiwanis Club meeting in Middletown and many other meeting places or event sites. Partners have included Butler County Storm Water District, Hamilton to New Baltimore Ground Water Consortium, Rivers Unlimited, Oxbow Inc., OKI Regional Council of Governments, University of Cincinnati, Ohio Department of Natural Resources Division of Wildlife and U.S. Coast Guard.

The Great Miami Drinking Water Protection Project involved developing a drinking water protection plan for the Village of New Miami and conducting inventories of potential sources of water pollution along the Great Miami and several tributaries. FOGM members served on an advisory committee for this federally funded project and provided extensive assistance for the inventory work. FOGM also facilitated many of the project's public education and outreach activities. Partners included the Ohio Environmental Protection Agency, OKI Regional Council of Governments, Hamilton to New Baltimore Ground Water Consortium, Greater Cincinnati Water Works, the Village of New Miami, St. Clair Township, Butler Soil & Water Conservation District, Butler County Storm Water District, and Hamilton County Soil & Water Conservation District.

Site surveillance and public comment has been provided by FOGM to Ohio EPA on the Fort Scott residential development project near the Great Miami River in Crosby Township, Hamilton County; Stonecreek shopping center near Banklick Creek in Colerain Township, Hamilton County; and the proposed Legacy Place commercial development near Taylor Creek in Green Township, Hamilton County. Partners have included the Land Conservancy of Hamilton County and Citizens for the Preservation of a Safe Clean Green Township.

Consultations and comments have been provided by FOGM concerning the remediation of hazardous waste sites along the Great Miami River, including Middletown brownfields, the AK Steel site at New Miami and the Chevron/Texaco site near Cleves. Partners have included the U.S. EPA, Ohio EPA, City of Middletown, and Chevron Citizens Advisory Panel.

Water Trail designation for the lower Great Miami River has been supported by FOGM in communication with the state. Partners have included the Ohio Department of Natural Resources, Miami Conservancy District and Rivers Unlimited.

Group's role in watershed management planning

No watershed management plans have been prepared or proposed for the lower Great Miami River watershed. As a citizen-based, all-volunteer organization with a small treasury and modest budget, the Friends of the Great Miami have not had the financial and human resources to undertake a watershed management planning process. As noted above, however, FOGM has taken part in the preparation of a drinking water protection plan for the Village of New Miami. The organization also engages in water quality planning through its involvement with certain committees, especially the Chevron Citizens Advisory Panel.

Water quality monitoring or habitat evaluation data collected or used by the watershed group

Through the recently launched Great Miami River Citizen's Volunteer Monitoring Laboratory, FOGM and Rivers Unlimited are collecting monthly water chemistry samples at 12 or more sites throughout the lower Great Miami watershed. FOGM works to coordinate with organizations like the Metropolitan Sewer District of Greater Cincinnati, which is also monitoring in the lower Great Miami River watershed. For selected projects or permits, FOGM has requested wastewater treatment plant effluent data or stream quality data from the Ohio EPA.

Greenacres Water Quality Project

Watershed group's founding, mission and geographic focus

Greenacres Water Quality Project LLC (limited liability corporation) was founded in 1992 by the Greenacres Foundation. The project grew out of an Indian Hill High School (IHHS) Senior Search project. Seven students from IHHS worked to develop a way to test and monitor the North Branch of Sycamore Creek to determine if it was safe to allow children to enter the stream for Greenacres education programs. Students developed a protocol that could be used to monitor any stream. The Greenacres Foundation staff and science staff at IHHS then transformed the Senior Search Project into the Greenacres Water Quality Project. It consisted of two critical components: monitoring and reporting.

Monitoring is done by students as a hands-on method of learning biology, chemistry and physics. The reporting process involves students using statistics to analyze their results, comparing their findings to prior years, writing an annual report, and making a presentation to a local community council. The local community supports the project by funding the monitoring expenses and by receiving the student's final presentation. It was the interaction among the three partners− Greenacres, the school and the local community council −that allowed this project to have a significant impact in the communities that have adopted it. Twenty-four schools have been involved with this school-based, community-linked monitoring since 1992. Since 1999 the Greenacres Water Quality Project has expanded to include a variety of other elements including school support, community outreach and research, but stream monitoring is still the core of the Project.

The mission of Greenacres Water Quality Project is to serve as an educational, community outreach project that works with Southwest Ohio schools, citizens, environmental organizations, local communities, government agencies and youth organizations to spread knowledge about water resource issues and to protect and improve water resources. It provides a relevant hands-on science education experience that allows students to impact local water quality and pollution issues in their communities.

The main geographic focus of the Greenacres Water Quality Project is Southwest Ohio including Hamilton, Butler, Warren, Clinton, and Clermont counties. Most of its programs are conducted in Hamilton and Clermont counties.

Watershed group's water resource priorities and initiatives

Through its extensive monitoring activities, the Greenacres Water Quality Project has gained a well-documented perspective on water resource issues. The project's databases show that sanitary and combined sewer overflows are negatively impacting urban streams that feed into larger rivers like the Little Miami, Great Miami and Mill Creek. Failing septic tanks and leaking sewer lines are also contributing bacteria and nutrients to urban streams. Greenacres data also show that recent wastewater treatment plant upgrades are having a positive impact on lowering bacteria and nutrient levels but that nonpoint source inputs continue to be an issue.

Increased impervious surfaces from urban development have caused local streams to erode and become wider to accommodate flows from peak rainfall events. During low flow-events streams

that once had continuous flows have become interstitial with some contribution from groundwater. Greenacres has noticed an increase in filamentous algae as once shaded stream segments become exposed to full sun when habitat is lost. In stream segments where certain blue-green algae are prevalent, Greenacres has seen a decline in aquatic life. The project has only recently begun to test chloride conditions, and found that they are particularly high in winter due to road salting, but also are a problem in areas where septic tanks are prevalent.

Given what Greenacres has learned, its managers believe the following measures would improve water quality conditions in local streams: more effectively treating the effluent being discharged from wastewater treatment plants, identifying and fixing failing septic systems, protecting riparian zone buffers, and encouraging best management practices that cause rain water to soak into the ground and recharge aquifers. The Water Quality Project's initiatives are funded by the Greenacres Foundation. Special projects, teacher workshops, and the Saturday Stream Snapshot Program also receive outside funding in the form of grants, cash donations, and in-kind donations.

Greenacres continues to provide middle and high schools an opportunity to conduct water quality monitoring projects with meaningful real-world scientific research and reporting. Greenacres also works with students to design and conduct original water-related research projects that benefit the community. It operates the Greenacres River Lab in Loveland, Ohio.

In 2003, the Greenacres Water Quality Project founded the Saturday Stream Snapshot Program to collect water quality data from the main stem and tributaries of the lower Little Miami River watershed with money obtained from a Supplemental Environmental Project Grant from Ohio EPA. On the second Saturday of the month from March to November, citizen volunteers collect water samples to get a "snapshot" of water quality conditions from neighborhood streams. Volunteers also process the samples under the supervision of Ohio-certified lab analysts using U.S. EPA-approved standard methods to test for pH, conductivity, turbidity, total phosphates, nitrate-nitrogen, and fecal coliforms. All sample points are mapped. Data is compiled and shared with volunteers, local and state agencies, and watershed groups. Students are encouraged to participate and can earn community service hours for their involvement.

In addition to the activities above, the Greenacres Water Quality Project offers a variety of hands-on water related classroom presentations to area schools for grades 6 through12 and maintains a "Grab-and-Go" educational library filled with inquiry-based activities that are linked to Ohio Academic Science and Math Standards. Greenacres also conducts a variety of workshops which are linked to Ohio Academic Standards for teachers of grades 3 through 12, and can cover specific curricula or custom design a workshop upon request.

Greenacres River Lab is a field trip destination to study the Little Miami River and O'Bannon Creek. Greenacres also plans and leads field trips to other local streams, lakes, ponds, and wetlands. Greenacres is an experienced facilitator of such educational programs as Project WET; Project WILD; WOW: The Wonders of Wetlands; Healthy Water Healthy People; and Project Learning Tree. Greenacres-sponsored workshops include Aquatic Ecology for the Classroom, Water Concepts and Make A Splash.

Recently, Greenacres became involved in the Greater Cincinnati Rain Garden Alliance and has conducted a variety of workshops for schools and citizens on how to plant and maintain rain gardens. The Greenacres Water Quality Project partnered with the Clermont County Soil and Water Conservation District and Clermont County Storm Water District to create a grades 3 through 12 Rain Garden Lesson Guide for local schools to encourage them to plant rain gardens on school campuses.

The Greenacres Water Quality Project also provides assistance to groups interested in implementing other water-related community projects such as stream walks, cleanups, streambank tree plantings and related activities. It participates in a variety of family events including Earth Day, Ohio River Paddlefest, Family Fishing Day at Greenacres, the Ultimate Teacher Expo, Great Outdoor Weekend and others.

Group's role in watershed management planning and total maximum daily load planning

Greenacres Water Quality Project was involved in developing watershed action plans for the upper Mill Creek subwatershed and five subwatersheds of the Little Miami River basin. It also helped plan and implement public meetings and symposia on water quality topics. Greenacres has worked with a variety of local municipalities and uses its Saturday Stream Snapshot (SSS) program to help them meet Phase 2 Storm Water Management goals of monitoring and community education. SSS volunteers have been active in local water quality issues in their communities and have used SSS data for public hearings and written public comments. The SSS Program regularly shares announcements for public meetings and public comments from Ohio EPA and other agencies. SSS has worked on several federally funded projects to monitor the effectiveness of best management practices such as oil and grit separators, constructed wetlands, pervious pavement, riparian zone restoration and rain gardens.

The Greenacres Water Quality Project took part in developing total maximum daily load (TMDL) reports for both the Mill Creek and the Upper Little Miami watersheds. For the Lower Little Miami TMDL study, Greenacres SSS volunteers helped to move up the work, which was originally scheduled for 2013, to 2007, and SSS data was used in that process. Ohio EPA also asked Greenacres to comment on their monitoring plan and site selection. Several TMDL study sites were located at SSS sampling sites. Greenacres also assisted the Little Miami River Partnership with setting up Ohio EPA public meetings and sharing the TMDL information with the community through the SSS network of volunteers. Greenacres has also worked with the Little Miami River Partnership on using the SSS Program as part of an application for federal funds from the Conservation Reserve Enhancement Program.

Water quality monitoring or habitat evaluation data collected or used by the watershed group

The Greenacres Water Quality Project has been collecting data since 1992, and current staff have state certification for Level II Chemical, Level II Habitat, and Level II Macroinvertebrate data collection. Indian Hill High School (IHHS) and Cincinnati Country Day School have joint annual monitoring reports for their work with Greenacres from 1992 to 2004. IHHS has monitoring reports from 2005 through 2010. These reports include data on South Branch Sycamore Creek, North Branch Sycamore Creek, Raiders Run, Walton Creek, Red Bird Hollow, and Kugler Mill. Two additional schools prepared reports in 1997 and 1998: Deerfield Junior High School for Indian Camp Creek and Taft High School for Duck Creek. Walnut Hills has

data from 2004 to 2008 on an unnamed tributary to the Mill Creek at Lindner Park in Norwood. Milford Junior High has data from 2004 to 2010 for the Little Miami River at Milford, Ohio.

The SSS Program of the Green Acres Water Quality Project has collected monitoring data for 126 sampling sites in the lower Little Miami watershed since 2003. The data is available in Excel spreadsheets and is correlated by longitude and latitude in decimal degrees. Monitoring data has also been collected for 12 sampling sites in the Great Miami River watershed, one in the Whitewater River watershed, 16 sites in the Mill Creek watershed, six sites that are tributaries to the Ohio River, and four lakes.

As a part of two federally funded Section 319 projects to reduce nonpoint source pollution in the Mill Creek watershed, the Greenacres Water Quality Project has collected data along the upper Mill Creek and the West Fork Mill Creek. The monitoring helped evaluate the effectiveness of two manmade riffles, streamside plantings, streambank stabilization, a constructed wetland, two bio-retention ponds and two oil and grit separators. Greenacres reported its findings to Ohio EPA, which awarded both Section 319 grants, and OKI Regional Council of Governments, which locally sponsored the two projects.

As a part of a federally funded Targeted Watershed Grant to reduce polluted stormwater runoff in the Great Miami River watershed, the Greenacres Water Quality Project collected data along the Great Miami at Heritage Park in Colerain Township. The monitoring evaluated the effectiveness of a rain garden and pervious parking area. Greenacres reported its findings to U.S. EPA and the Miami Conservancy District, which awarded the grants, and to OKI, the local project sponsor. Greenacres has collected additional data for the Metropolitan Sewer District of Greater Cincinnati as part of a Rain Garden Evaluation Study.

Habitat evaluation data was collected by the Greenacres Water Quality Project on Citizen Qualitative Habitat Evaluation Index sheets during stream walks on West Fork Mill Creek, the upper Mill Creek, Taylor Creek in the Great Miami River watershed and an unnamed tributary of the Little Miami River.

Partnerships forged by the watershed group

Saturday Stream Snapshot has forged the most notable partnerships for the Greenacres Water Quality Project. It partners with Metropolitan Sewer District of Greater Cincinnati, Warren County Water and Sewer Department, Clermont County Storm Water District, OKI Regional Council of Governments, the University of Cincinnati, Ohio EPA, Little Miami Inc., Little Miami River Partnership, Buckeye United Fly Fishers, Izaak Walton League, Warren County Soil and Water Conservation District, Deerfield Township and many others.

Through the Section 319 projects to reduce nonpoint source pollution in the Mill Creek watershed with a variety of best management practices, Greenacres has partnered with OKI Regional Council of Governments, Schumacher Dugan Construction, Inc., University of Cincinnati, MACTEC Engineering and Consulting, Butler County Department of Environmental Services, Metropolitan Sewer District of Greater Cincinnati, Hamilton County Soil & Water Conservation District (SWCD), Butler SWCD, Mill Creek Watershed Council of Communities,

West Chester Township, Sysco Foods, Hamilton County Engineers Office, City of Cincinnati Storm Water Division, and others.

As a part of a watershed signage project to build public awareness by identifying waterways with roadside signs at river and stream crossings, Greenacres partnered with Mill Creek Watershed Council of Communities, Hamilton County SWCD, Butler SWCD, Clermont SWCD, Village of Indian Hill, Village of Fairfax, City of Cincinnati, City of Madeira, City of Montgomery, Village of Mariemont, the Linwood community, Anderson Township, Miamiville community, City of Loveland, Symmes Township, Sycamore Township, and City of Blue Ash.

As part of the Great Outdoor Weekend, Greenacres worked with 48 environmental education organizations and organized its own site at the Izaak Walton League's lodge near Loveland with the Ohio Department of Natural Resources (ODNR) Scenic Rivers, ODNR Division of Watercraft, ODNR Division of Wildlife, and Buckeye United Fly Fishers.

Other Ohio partners involved with the Greenacres Water Quality Project between 1999 and 2010 have included: Archdiocese of Cincinnati Schools, Bass Pro Shops, Batavia School District**,** Bellbrook Canoe, Benchmark Outfitters, Bethany School, Bethel-Tate School District**,** BHE Environmental, Burgess & Niple Inc., Butler County Horticulture Program, California Woods Advisory Council, Camp Joy, CDP Engineers, public television station WCET, Cincinnati Bass Club**,** Cincinnati Earth Institute**,** Cincinnati Hills Christian Academy, Cincinnati Health Department, Cincinnati Homeschoolers, Cincinnati Horticultural Society, Cincinnati Museum Center, Cincinnati Nature Center, Cincinnati Public Schools, Cincinnati Waldorf School, Cincinnati State Technical & Community College, City of Forest Park, City of Norwood, City of Reading**,** CityScapes, Cincinnati Zoo & Botanical Gardens**,** Civic Garden Center, Clermont General Health District, Clermont County Education Service Center, Clermont County Water and Sewer Department, Clinton County Recreation Commission, Clinton Streamkeepers, Clinton County SWCD, Crystal Clear Science, Dan Beard Boy Scout Council, Deer Park Community School District**,** Deerfield Township, Earthscapes, East Fork Collaborative, ECO (Environmental Community Organization), Felicity Franklin School District, Forest Park Environmental Awareness Program**,** Forest Park School District, Forest Park Public Works Department, Friends of Polk Run, Friends of the Great Miami, Fuller Mossbarger Scott & May Engineers, GBBN Architects, Girl Scouts Great River Council, Gorman Heritage Farm, Grailville, Great Oaks Vocational School, Greater Cincinnati Environmental Educators, Greater Cincinnati Water Works, Green City Resources, Green Explorers, Goshen School District**,** Hamilton County Engineers Office, Hamilton County Health District, Hamilton County Park District, Hamilton County Solid Waste District, Harmony Community School, Hillside Trust, Heidelberg University Water Quality Lab, Imago Earth Center, JF New Inc., Kassner Nursery, Keep Cincinnati Beautiful, Landen Lake Association, Lakota School District, Land Conservancy of Hamilton County, Loveland Canoe, Loveland School District, Madeira School District, Madisonville Community Council, Mariemont School District, Mason City School District, Miami Township Public Works Department, Miami University, Miami Conservancy District, Miami Valley Resource & Conservation District, Milford School District, Mill Creek Restoration Project, Mt. Healthy School District, Morgan's Canoe, Nature Conservancy of Ohio, Natures Outfitters, New Richmond School District, North College Hill School District, Northwest Local School District, Norwood City School District, Ohio Department of Education,

Ohio Environmental Council, Ohio River Foundation, Ohio River Valley Water Sanitation Commission (ORSANCO), Project Learning Tree – Ohio, Project SIGNs, Princeton School District, Raymond Walters College, Reading Community Schools**,** R.D. Zande & Associates, Inc., Rivers Edge Canoe, Rivers Unlimited, Riverworks Discovery**,** Rumpke, Seven Hills Schools, Sierra Club – Cincinnati Chapter, St. Ursula Academy, Sycamore Community School District**,** Turpin Farms, Underhill Landscaping, URS Corporation, U.S. Green Building Council – Cincinnati, Amberley Village, Village of Terrace Park, Vivian Lambe Inc. , Xavier University, XCG Consultants, WAVE Foundation**,** West Clermont School District, Williamsburg School District, Wilmington College, Winton Woods School District, Woolpert Consultants, and Wyoming Local School District.

Little Miami Inc.

Watershed group's founding, mission and geographic focus

Little Miami, Inc. (LMI) was founded in 1967 as a 501(c) 3 nonprofit organization dedicated to the restoration and protection of the Little Miami River. This mission has involved LMI in leading efforts that achieved the Little Miami's designation as Ohio's first State Scenic River and National Wild & Scenic River, and ongoing work to restore full ecological health to the highly rated river.

LMI serves the entire 1.1 million acres of the Little Miami River watershed, which includes parts of these 12 counties in Southwest Ohio: Clark, Fayette, Madison, Greene, Montgomery, Clinton, Warren, Butler, Hillsboro, Brown, Clermont and Hamilton. The Little Miami River mainstem flows for 105 miles through five counties, 20 townships and 12 communities, and 3 million people live within a 30 minute drive.

Watershed group's water resource priorities and initiatives

Development pressure is at the heart of most water resource priorities addressed by LMI. Located on the eastern edge of the Cincinnati-Dayton metropolitan area, the Little Miami River has a predominantly agricultural watershed experiencing growing pressure on its natural resources, as urban development removes natural habitat and increases point and nonpoint discharges into the Little Miami and its tributaries.

As a National Scenic River, the Little Miami is subject to the National Wild and Scenic Rivers Act, which states: "It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations."

Historically, LMI's initiatives have used a "win-win" approach to find the balance between economic development and environmental protection. Over 95% of the residential development that has come into the Little Miami corridor has adopted conservation plans that include the donation of land and conservation easements along riverfront areas.

LMI owns more than 50 nature preserves along the Little Miami and several tributaries, preserving more than 12% of the Little Miami's riverfront forests. An additional 39% of the riverfront lands are protected through public and quasi-public ownership. Forty-nine percent of the riverbank forests are under some form of permanent natural protection, either through land ownership or conservation easements held by LMI and other conservation agencies.
Another 24% of the riverfront forests receive some protection through local zoning ordinances. Little Miami Inc. played a key role in turning the old Little Miami Railroad into a very popular riverside multi-use trail.

A 12-member Board of Trustees meets bimonthly to direct LMI's efforts. LMI employs a full-time Executive Director and two part-time staff members. These milestones in LMI's history provide a brief summary of past major initiatives:

1967-Little Miami Inc. was founded.
1968-LMI acquires its first nature preserve.
1969-The Little Miami becomes Ohio's first State Scenic River.
1974-The Upper Little Miami (Clifton to Foster) becomes Ohio's first National Wild & Scenic River.
1980-The Lower Little Miami (Foster to Mouth) is added to the National Wild & Scenic River System.
1984-The first section of the Little Miami bike trail opened.
1985-Little Miami Forest Preserve legislation was passed.
2003-The Little Miami was designated an Audubon "Important Bird Habitat."
2006-The LMI Scenic River & Trail Center opens.

Looking ahead, LMI's ongoing initiatives are:

A Conservation Action Plan

LMI has undertaken comprehensive conservation action planning to guide its efforts in the coming years, using a planning approach developed by The Nature Conservancy.

Floodplain Management

LMI plans to continue monitoring floodplain use and reporting on illegal use to the responsible government agency.

Water Quality Monitoring and Improvement

Due to funding shortfalls in Ohio EPA's budget, in-depth agency studies of the river were delayed from the late 1990's until 2007. LMI intends to partner with Ohio EPA and other agencies to foster better and more frequent water quality monitoring to enable more timely and effective implementation of improvement strategies.

Habitat & Species Protection

LMI will also continue its permanent protection of key riverfront lands to provide maximum assurance that the river's health and immediate environs will provide wildlife habitat, water quality buffers, public recreation where appropriate, and clean drinking water.

Conservation Education

LMI uses special meetings, informative publications and guided float trips to reach out to future generations about its scenic river conservation mission. In 2006 LMI opened its Scenic River & Trail Center in downtown Loveland along the Little Miami Scenic Park trail. From this center, LMI educates trail and river users on how they can help restore and protect the Little Miami River.

Group's role in watershed management planning and total maximum daily load planning

LMI served as a key stakeholder participating in watershed management planning processes for these sub-watersheds of the Little Miami River watershed: Todd's Fork (to Little Miami River), headwaters (to East Fork Little Miami River), East Fork Lake tributaries, Middle East Fork Little Miami River, Lower East Fork Little Miami River. LMI provided some of the information found in the Stonelick Creek Watershed Action Plan (to East Fork Little Miami River), which is under review by the Ohio EPA.

LMI participated in preparation of a total maximum daily load (TMDL) report for the upper Little Miami River. That report has been approved by the U.S. EPA and is being implemented. LMI also is participating in current preparation of a TMDL report for the lower Little Miami River. The Executive Director of LMI serves on the Board of Directors for Little Miami River Partnership, which facilitated TMDL meetings for the lower Little Miami River.

LMI has also contributed to developing a TMDL report for the East Fork Little Miami River. That report is nearing completion. Some implementation is already proceeding.

Water quality monitoring or habitat evaluation data collected or used by the watershed group
LMI shares a building with the Greenacres Water Quality Project LLC, which manages Saturday Stream Snapshot, a prolific source of water quality monitoring data for the Little Miami River watershed since 2003.

Partnerships forged by the watershed group
LMI has partnered with Ohio EPA, public officials and agencies to reduce nutrient pollution and protect riparian forest lands. LMI has also partnered with the Natural Resources Conservation Service and county soil and water conservation districts to help area farmers place conservation measures on 60% of the farmlands in the Little Miami watershed. In 2007 Ohio EPA researchers found that, for the first time, the Little Miami's main stem was satisfying Exceptional Warmwater Habitat water quality and biological ecosystem standards.

LMI and the South Lebanon have signed an agreement aimed at preserving the natural state of several miles of riverfront through the Village if a recent annexation proposal is approved. The Village would adopt river buffer zoning along several miles of the Little Miami within its boundaries, and perpetual conservation easements would also be given to LMI on Village-owned lands.

In the fall of 2008, Martin Marietta Aggregates (MMA) signed a legally binding agreement with LMI regarding a proposed MMA deep limestone mine in the Ancor industrial area of Anderson Township, Hamilton County, Ohio. MMA proposes to mine limestone between 400 and 800 feet below the surface. The agreement focuses on zero discharge to the Little Miami and its tributaries and a prohibition on the discharge of any hazardous or polluted materials into the "North Lake", a former gravel pit into which runoff from the proposed MMA processing plant is to be directed. About 61 acres of MMA property would also be donated to LMI if the MMA proposal receives local approval.

Little Miami River Partnership

Watershed group's founding, mission and geographic focus

The founding of the Little Miami River Partnership began in 1995 when representatives from the U.S. Department of Agriculture, the Miami Valley Resource Conservation and Development Council, the Ohio EPA and Miami University held a Regional Water Quality Symposium in Southwest Ohio. From this symposium a number of individuals from the Little Miami River area started to talk of their interest in working on environmental issues on a watershed basis.

In 1996, the Miami Valley Resouce Conservation and Development Council, the Ohio Department of Natural Resources Southwest Ohio Scenic Rivers Office, and the Ohio EPA worked together to form a group of interested people who would like to address environmental issues for the Little Miami watershed. Formative meetings with communities of the Little Miami River watershed confirmed the belief that a lot of environmental work was being accomplished, but efforts were often times isolated and uncoordinated. This led to the formation of an organization that elected interim leadership in 1997, seated the first Board of Directors in 1998, and incorporated as the Little Miami River Partnership (LMRP) in 1999.

LMRP is now a service-oriented, non-profit, 501 (c) (3), organization whose aims are to develop community based watershed plans and projects to help restore and protect water and environmental quality in the Little Miami River Watershed. LMRP's mission statement is: "promote a healthy Little Miami River watershed through collaboration, planning, education and action."

The Little Miami River watershed is the focus of LMRP's work. It does not focus only on the mainstem, but strives to serve the entire watershed, which covers 1,757 square miles in parts of 12 counties in Southwest Ohio. Of the nine seats on LMRP's Board of Directors, five seats are reserved for representatives of the following sub-watersheds within the Little Miami watershed in the OKI region:

- Upper Little Miami River, which drains part of northern Warren County
- Caesar Creek, which drains a small part of eastern Warren County
- Todd's Fork, which drains southeastern Warren County
- East Fork, which drains a large area in central Clermont County and includes the villages of Batavia and Williamsburg
- Lower Little Miami River, which drains central Warren, northwest Clermont and northeast Hamilton counties and includes Waynesville, Lebanon, Mason and northeastern Cincinnati

Watershed group's water resource priorities and initiatives

LMRP has made a priority of developing watershed action plans, and has helped to complete plans for the Todd's Fork and East Fork Little Miami River sub-watersheds. Watershed action plans have not yet been undertaken for the other three sub-watersheds recognized by LMRP's bylaws: upper Little Miami River, Caesar Creek and lower Little Miami River.

In pursuit of federal funding for a Conservation Reserve Enhancement Program, LMRP and its interagency project partners have identified these goals as priorities for the watershed:

- attain Ohio EPA's water quality standards for the watershed's stream and river segments, in accordance with Clean Water Act's rules on total maximum daily loads of pollutants
- reduce sheet rill erosion and streambank erosion
- reduce nutrient loads for both nitrogen and phosphorus
- reduce risks of flooding
- protect drinking water supplies from both surface waters and groundwater
- protect and improve habitat for endangered aquatic terrestrial species
- reduce nutrient loading that contributes to the Gulf of Mexico problem with hypoxia
- develop a management and monitoring program to quantify and document environmental benefits attributable to the CREP initiative
- integrate the goals of the CREP with other watershed communities' water quantity and quality improvement initiatives, such as
    - stormwater management programs
    - rural home sewage treatment system programs
    - urban green infrastructure initiatives

The organization had been focusing on the development, endorsement and implementation of watershed management plans for the entire Little Miami River watershed. However, in 2009 funding and staffing deficiencies caused LMRP to scale back a significant portion of its operations, including discontinuation of formal watershed planning activities.

LMRP's primary initiative now is the finalization and negotiation of a Conservation Reserve Enhancement Program (CREP) with the U.S. EPA office in Washington, D.C. Administered by the U.S. Department of Agriculture's Farm Service Agency, CREP is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat and safeguard ground surface water. CREP addresses high-priority conservation issues such as impacts to water supplies, loss of critical habitat for threatened and endangered wildlife species, soil erosion, and reduced habitat for fish populations. CREP contracts require a 10- to 15-year commitment to keep lands out of agricultural production. CREP provides payments to participants who offer eligible land. A federal annual rental rate is offered, plus cost-share of up to 50 percent of the eligible costs to install the practice. The program generally offers a sign-up incentive to install specific practices.

LMRP has submitted a preliminary application for a $50 million CREP that could lead to more than 20,000 acres of riparian corridor protection. Local funding is a key component of the CREP application process. LMRP and its coalition garnered $185,000 in commitments from publicly owned treatment works (sewage treatment plants) in the Little Miami River watershed to hire a project director who is developing information for the lengthy CREP application process. LMRP also rounded up commitments for more than $10 million worth of matching funds from local programs for the CREP. Among the practices that the CREP would fund in the Little Miami River watershed are grassed waterways, grass filter strips, riparian forest buffers and wetlands. A Joint Board of soil and water conservation districts in the watershed has been formed to serve as the implementing sponsor of the CREP as it moves forward.

Aside from watershed management plans and CREP, the Partnership has pursued initiatives in:

Education − LMRP has sponsored annual water quality symposiums, organized a photo contest, facilitated watershed festivals, provided schoolroom presentations, published newsletters, launched a website, and sponsored annual meetings with educational presentations.

Collaboration − LMRP has worked with the ABX Air and DHL corporations to address concerns about Indian Run in the Todd's Fork watershed, helped conservation districts and the Ohio Department of Natural Resources set policies on local matching funds in relation to the districts' operational funds, served on an oversight group that ultimately opened the Little Miami Scenic River and Trail Center in Loveland, and helped the Miami Valley Resource Conservation & Development Council sponsor a Livable Landscapes Conference.

Funding − LMRP helped Warren County sponsor $9.8 million worth of environmental projects through the Water Resource Restoration Sponsor Program, helped the Warren County Soil and Water Conservation District apply for $3.2 million worth of projects to restore and protect Lick Run, and helped Little Miami Inc. with two grants totaling $6.6 million for restoration projects on the Little Miami main stem. LMRP also worked with Ohio EPA to develop a simplified, one-page form to deliver funds from enforcement actions to organizations that can perform Supplemental Environmental Projects, and worked with U.S. Fish and Wildlife Service staff to qualify two watershed projects for more than $25,000 in funding.

Group's role in watershed management planning and total maximum daily load planning

As previously stated, LMRP played a part in the completion of watershed management plans for the Todd's Fork and East Fork Little Miami River sub-watersheds. In 2000, the Partnership received a six-year grant from the Ohio Department of Natural Resources to fund a full-time watershed coordinator. In 2007, LMRP received a three-year grant to continue having a watershed coordinator responsible for writing the Upper Little Miami River Watershed Action Plan and to implement the other watershed action plans already endorsed by Ohio EPA. Financial problems forced a premature ending to this grant. Currently, the organization's objectives for the CREP serve as a management plan for the Little Miami River watershed. Those objectives are:

- implement 20,000 acres of approved conservation practices on eligible agricultural cropland and marginal pastureland in prioritized floodplain, riparian and upland areas
- implement up to 5,000 acres of conservation practices on highly erodible escarpments in need of protection
- implement up to 5,000 acres of voluntary permanent conservation easements on critical landscape features, in conjunction with non-federal funds
- install riparian buffers on up to 3,406 lineal stream miles
- meet Ohio EPA's water quality standards for attainment, based on designated uses
- reduce annual sediment loading by 30 percent
- reduce annual total phosphorus loading by 60 percent
- reduce total nitrogen loading by a percentage yet to be determined

LMRP earned a grant from the Ohio Environmental Education Fund to work on the public outreach portion of the total maximum daily load process for the lower Little Miami River

watershed. In partnership with Ohio EPA staff, the organization convened and helped facilitate watershed stakeholder meetings. This work was completed in the fall of 2009.

Water quality monitoring or habitat evaluation data collected or used by the watershed group
LMRP has gathered water quality and habitat data for the management plans that were completed for the Todd's Fork watershed and the East Fork Little Miami River watershed. The Todd's Fork plan is posted on the LMRP website and the East Fork plan is posted on the website for Clermont Soil and Water Conservation District.

Partnerships forged by the watershed group
LMRP has forged many public and private partnerships, including these recent examples:

- Wilmington College
- ABX Air
- publicly owned treatment works (sewage plants) throughout the watershed
- YSI, Inc., developer and maker of instruments and software for environmental monitoring

LMRP's 2008 annual report listed more than 90 partnerships in these categories:

- land trusts
- non-governmental organizations
- local governments
- publicly owned treatment works
- federal agencies
- state agencies
- regional planning organizations
- universities
- foundations
- park districts and departments
- local businesses
- corporations

Mill Creek Restoration Project

Watershed group's founding, mission and geographic focus

Mill Creek Restoration Project was founded in January 1994 under the name of Rivers Unlimited Mill Creek Restoration Project, Inc. (RUMCRP). The private non-profit organization resulted from an out-of-court settlement of an industrial pollution lawsuit. The Ohio Public Interest Research Group and other plaintiffs had alleged in federal court that the General Electric aircraft engine plant in Evendale violated the Clean Water Act. The U.S. Department of Justice approved a consent decree and U.S. District Judge S. Arthur Spiegel ordered GE to provide $360,000 to RUMCRP for "a school-based restoration project for the Mill Creek."

An exhibit to the decree stated the project should run at least two years "to advance restoration of the Creek; to train middle and high school teachers and students in the Cincinnati area, and especially, the Mill Creek watershed; to perform water-quality monitoring, research and other activities (which may, but not necessarily include, stream trash pickups, development of stream histories and data gathering, in the Creek and its watershed); to share the results of their efforts with the community and others; and to link school and community education and restoration efforts regarding the Creek."

Shortly after the incorporation of RUMCRP, its board of directors decided to hire an executive director who had been a primary author of the Hamilton County Environmental Action Commission's report titled *Creating a New Vision for the Mill Creek.* RUMCRP became increasingly self-sufficient and by 1998 was referring to itself as the Mill Creek Restoration Project (MCRP).

MCRP's website states that its mission is "to serve as catalyst for developing sustainability in the Mill Creek watershed through community-based planning and empowerment, environmental education, and economically sound ecological restoration."

According to MCRP's executive director, "The organization carries out its mission by collaborating with people most affected by Mill Creek conditions, by forging diverse public/private partnerships, and by building community capacity through education and training. Simply put, MCRP's work centers around youth, environmental education, clean water, planting trees, building trails and meaningful public engagement."

The geographic focus of MCRP's work is twofold: (1) the Mill Creek watershed, and (2) the school district for Cincinnati Public Schools. On its website, MCRP describes the watershed as follows:

"Half a million people live in this industrial and urban watershed, and another half million or more work in and travel through the watershed on a daily basis. Historically, the creek served as an extremely valuable and significant resource, supporting the economic growth and development of the Greater Cincinnati region. Internationally recognized companies like Procter & Gamble, General Electric Aircraft Engines and the Ford Motor Company still operate facilities along the banks of Mill Creek.

Unfortunately, over the past 100 years, as the quality of the watershed's environment progressively deteriorated from the cumulative impacts of intense urbanization, channelization and industrial use, the economic health of the area also dramatically declined. Today, thousands of people of color and Appalachian descent live in economically-depressed neighborhoods and communities along and near the creek. These watershed residents bear a disproportionate share of the problems resulting from a degraded environment and associated health risks and diminished quality of life. According to the 2000 census, in some floodplain neighborhoods the unemployment rate is as high as 37.5 percent and the poverty rate and percent of minority population has significantly increased over the previous ten years."

MCRP's geographic focus on the Cincinnati Public Schools District is an extension of the education program that has characterized the organization since its founding.

Watershed group's water resource priorities and initiatives

As stated by MCRP's executive director, the water resource priorities of the Mill Creek watershed are:

- eliminate combined sewer overflows and sanitary sewer overflows
- reduce sediment loads from streambank erosion
- install green infrastructure to slow, filter and absorb stormwater
- accelerate reforestation of the riparian corridor
- repair damages from channelization and hydromodification
- build greenway trails to bring people to the stream so they care about water quality
- stop spraying herbicides into the stream and onto to the streambanks
- stop mowing and vegetation removal along the streambanks
- regenerate riverine and riparian resources by recognizing their full ecology

Since 1994, MCRP has undertaken many initiatives and programs including environmental education programming to over 24,000 Greater Cincinnati students from 55 schools within the watershed. MCRP has also successfully completed 28 ecological regeneration and Mill Creek Greenway Trail projects, with the participation of students, teachers and community volunteers.

MCRP's website lists four major program areas:

Freedom Trees Program – MCRP has partnered with the National Underground Railroad Freedom Center and Paul Hemmer Companies to create a ten-year urban reforestation effort that is linked to the history of the Underground Railroad. The goal is to plant at least 10,000 four- to-eight-foot-high native trees in the 28-mile Mill Creek corridor.

Greenways -- In 1999, MCRP agreed to take on the responsibility for launching the implementation of the *Mill Creek Watershed Greenway Master Plan*. Fourteen pilot projects are under way. The Greenway Program helps to remove urban blight, restore and protect natural resources, conserve greenspace, and develop recreational trails and other amenities.

Environmental Education – MCRP educates up to 2,000 students each year through a multidisciplinary school program that includes stream surveys, water quality and biological monitoring, wildlife habitat restoration, and other classroom or fieldwork learning experiences. Additionally, MCRP recruits and trains teachers and community volunteers, provides river and

stormwater restoration training for environmental professionals and government officials, and provides on-the-job training opportunities for qualifying watershed residents.

Laughing Brook – Located along the lower Mill Creek in Salway Park, Laughing Brook is a combination of public environmental art, educational signage, short walking trails, a functioning wetland, and stormwater management practices. It features wildlife habitat, native vegetation, rain gardens, porous surfaces, reused or recycled project materials and solar-powered water pumping to the wetland from an underground cistern during dry weather.

Among the MCRP programs and initiatives cited by its executive director are:

- implementing stream, floodplain and wetland restoration projects throughout the Mill Creek watershed, including five in Butler County
- providing capital funds to the Village of Woodlawn for a trail along West Fork Mill Creek
- sponsoring projects to stabilize streambanks, remove invasive plants, install stream grade controls, restore native habitat, plant tree groves and install rain gardens
- developing sub-watershed studies
- modeling a stormwater management plan for an inner city brownfield site
- educating students in site reconnaissance, design, prioritization, monitoring and evaluation

Group's role in watershed management planning and total maximum daily load planning

In 1999, the U.S. EPA awarded MCRP a $250,000 grant to test and implement the management of wet weather flows and the improvement of ecosystem health in the Mill Creek watershed. Titled the "Mill Creek Wet Weather Watershed Action Plan," the project stated goals to:

- develop a Mill Creek Watershed Action Plan
- develop an effective model process for management, protection and regeneration of urban watersheds
- become a national demonstration model for watershed-based wet weather impact management
- achieve consensus on a common watershed vision, goals, objectives and priorities
- undertake one or more demonstration projects
- undertake a public outreach program

While the project consultant assessed stream conditions, addressed model management strategies, summarized watershed improvement efforts and presented their findings at public meetings, the work did not earn endorsement by the U.S. EPA or Ohio EPA as a watershed management plan.

The March 1999 completion of the *Mill Creek Watershed Greenway Master Plan* has provided MCRP opportunities to pursue streamside improvements systematically. This plan is not endorsed by Ohio EPA as a watershed management plan, but it continues to guide greenway projects along the Mill Creek and tributaries. Fourteen greenway projects are under way.

MCRP served on the advisory committee to help guide development of Ohio EPA's September 2004 report titled *Total Maximum Daily Loads for the Mill Creek Basin;* the report lists Mill Creek Restoration Project as one of the six organizations or agencies that contributed to preparation of the TMDL document.

Water quality monitoring or habitat evaluation data collected or used by the watershed group
MCRP has used data from the Ohio EPA, Metropolitan Sewer District of Greater Cincinnati, the September 2004 report titled *Total Maximum Daily Loads for the Mill Creek Basin,* and its environmental education program for the students of Cincinnati Public Schools.

With its focus on student education, the MCRP's school program does not go to the expense of quality assurance/quality control measures that qualify its monitoring data for regulatory actions. It has, however, shown where more professional monitoring is needed. For example, the school program alerted the Ohio EPA to a fish kill along the West Fork Mill Creek.

MCRP's water quality monitoring program regularly visits about 15 sites along the Mill Creek main stem, several tributaries and some headwaters. The organization also has monitored a school rain garden and plans to monitor stormwater quality on a school campus.

For the sake of scientific validity, MCRP collects a wide range of information on a restoration project site. This work entails: database research on site history, phase I environmental site assessments, phase II environmental site assessments where necessary, subsurface investigations where needed, and surveillance on site soils, slopes, invasive non-native plant species, native plant species, habitat conditions, hydrology, hydraulics and engineering.

Partnerships forged by the watershed group
As a community-based, non-profit organization, Mill Creek Restoration Project has partnered with dozens of cities, villages, schools, Cincinnati neighborhood councils, city departments. county departments, business associations and churches to pursue its many projects.

In addition to the Freedom Trees Program with the National Underground Railroad Freedom Center and Paul Hemmer companies, MCRP's notable partnerships since 1994 have included:

- Publishing the book, *The Mill Creek: An Unnatural History of an Urban Stream* by biologist Stanley Hedeen
- Developing a nonpoint source pollution reduction program with the Butler Soil and Water Conservation District for education and demonstration projects in Butler and Hamilton counties
- Launching a pollution prevention initiative with the Institute for Advanced Manufacturing Sciences to provide technical assistance and training to businesses, civic groups and schools
- Working with the Mill Creek Watershed Council and local governments to have the U.S. Army Corps of Engineers re-evaluate the Mill Creek Flood Damage Reduction Project
- Coordinating with the Port of Greater Cincinnati Development Authority on brownfield cleanup and development proposals
- Commissioning the Applied Economic Research Institute at the University of Cincinnati to evaluate the economic impact of a proposed $23.98 million investment in extending the Mill Creek Greenway Trail to 13.5 miles in Cincinnati, Elmwood Place and St. Bernard
- Collaborating with natural resource economists at Ohio State University to identify and quantify potential benefits from fully implementing the *Mill Creek Watershed Greenway Master Plan*

- Working with the Ohio Public Works Commission to secure $500,000 from the Clean Ohio Trail Fund for the second phase of the Queen City-South Mill Creek trail to begin in 2010
- Generating commitments, letters of support or endorsements for greenway trail funding proposals from a variety of local, state and federal elected officials
- Partnering with Cincinnati Public Schools and collaborating with the following to continue the environmental education program: General Electric Aircraft Engines, Hamilton County Department of Environmental Services, Cincinnati Parks and Hamilton County Park District

Mill Creek Watershed Council of Communities

Watershed group's founding, mission and geographic focus

In December 1991 Ohio EPA created the Hamilton County Environmental Action Commission (HCEAC) to address agency and public concerns about toxic material releases into Hamilton County's environment. The HCEAC studied the Mill Creek watershed and distributed its findings with the April 1993 publication of *Creating a New Vision for the Mill Creek.* This 16-page report recommended that political jurisdictions along the Mill Creek enter into an intergovernmental agreement "which serves to pledge – one to another – to commit and cooperate toward the restoration of the Mill Creek."

On April 8, 1993, the Ohio•Kentucky•Indiana Regional Council of Governments (OKI) called a special meeting of interested Executive Committee members to discuss the HCEAC's call "for the establishment of a Mill Creek Restoration Committee." Having previously met with the mayor of Cincinnati and other community leaders concerned about the Army Corps of Engineers proposal to leave the Mill Creek Flood Damage Reduction Project unfinished, OKI's director sent a letter to political jurisdictions of the Mill Creek watershed explaining that OKI had been asked to provide administrative and technical support for the committee, but that it would succeed only with inter-jurisdictional cooperation and commitment.

By mid-1993, OKI was providing staff support and a meeting place for what was then called the Mill Creek Watershed Steering Committee. This committee formulated plans, recruited support and put the finishing touches on the *Mill Creek Watershed Intergovernmental Agreement*, which served as the founding document for the Mill Creek Watershed Council. Delegates for 17 political jurisdictions of the Mill Creek watershed signed the agreement on June 21, 1995, alongside the Mill Creek in Reading's Koenig Park.

In August 1993, Ohio EPA released an executive summary of its *1992 Biological and Water Quality Study of the Mill Creek*. Early findings from the study and its subsequent publication provided added impetus for founding the Mill Creek Watershed Council. The Ohio EPA study attracted stakeholders who had not already been drawn to the watershed group by concerns about discontinuation of the Mill Creek Flood Damage Reduction Project.

In 2005, the organization modified its name to Mill Creek Watershed Council of Communities to signify a re-dedication to the organization's inter-jurisdictional mission. MCWCC's amended bylaws state: "The mission of the Mill Creek Watershed Council of Communities shall be to promote the improvement of the Mill Creek Watershed." This will be done via actions to address the following: (1) flooding in the watershed, (2) environmental quality of the watershed, (3) facilitation of improvements in the watershed, (4) cooperation in the watershed, (5) public awareness of the watershed, and (6) public use of the watershed.

A membership form says: "The Mill Creek Watershed Council of Communities is a 501(c)(3) nonprofit organization. Through collaborative action and balancing environmental protection with economic development needs, the Council enables 36 Mill Creek communities to enhance the value of the Mill Creek, its tributaries and watershed."

MCWCC's geographic focus is the Mill Creek watershed, which covers 166 square miles in southeast Butler County and central Hamilton County. The Mill Creek main stem flows for 28 miles from Liberty Township in Butler County to the Cincinnati neighborhoods of Queensgate and Lower Price Hill in Hamilton County. The stream's elevation decreases from 780 feet at its source to 444 feet at its mouth with an average descent of 11.9 feet per mile. From upstream to downstream, major tributaries and their lengths are: East Fork Mill Creek (7.1 miles), Sharon Creek (5.5 miles), West Fork Mill Creek (15.2 miles), Ross Run (4.9 miles), and West Fork (5.0 miles). Other tributaries include Beaver Run, Town Run, Gorman Brook, Cooper Creek (formerly Rossmoyne Creek), Amberley Creek, Congress Run, Bloody Run and Lick Run. The last two tributaries now flow beneath the surface in culverts and storm sewers. As they carry upland waters to the broad Mill Creek Valley, the tributaries have a much deeper descent than the Mill Creek main stem.

Of the 37 political jurisdictions that are wholly or partly in the Mill Creek watershed, 16 are cities (including much of Cincinnati), nine are villages, nine are townships, two are counties, and one is the Millcreek Valley Conservancy District. The Mill Creek watershed is predominantly urbanized in Hamilton County and continues to rapidly urbanize in Butler County.

Watershed group's water resource priorities and initiatives

MCWCC's watershed coordinator noted the Mill Creek watershed is complex, giving rise to priorities for grant funding, economic sustainability, education, communication and coordination. The group's water resource priorities include:

- Achieving more flood damage reduction, especially through projects that re-connect the stream to its floodplain
- Attaining state water quality and stream habitat standards for the designated beneficial uses of recreation and aquatic life
- Sponsoring or aiding stream restoration projects
- Collaborating with Metropolitan Sewer District of Greater Cincinnati on the continuing elimination of combined sewer overflows and sanitary sewer overflows
- Reducing stormwater runoff with rain gardens, wetlands and other best management practices
- Working with government agencies to reduce pollution from streamside dump leachates and stream sediment contaminants
- Reducing stream channelization, relocation or submersion into storm sewers or culverts
- Reducing streamside encroachments from development, paving or filling
- Addressing point source pollution from spills, emergency releases or illicit discharges

MCWCC's more specific initiatives include:

- Constructing the Mill Creek Confluence Restoration Project, which will restore stream floodplain, meanders, riffles and more natural habitat to segments of the Mill Creek main stem and the East Fork Mill Creek in Sharonville, south of Crescentville Road. This $1.77 million project is being funded by Ohio EPA's Water Resource Restoration Sponsor Program.
- Creating wetland conditions and increasing water storage capacity between the Mill Creek main stem and the East Fork Mill Creek at the confluence project site. This $350,000

project is being federally funded by a nonpoint source pollution reduction grant from the Ohio EPA, under Section 319 of the Clean Water Act.

- Concluding projects initiated with the Greater Cincinnati Rain Garden Alliance. Through the leadership and staff support of MCWCC, the Rain Garden Alliance has sponsored 12 rain garden projects in the Mill Creek watershed and two rain garden projects outside the watershed
- Seeking additional state, federal or foundation grants for continuing implementation of the Watershed Council's *Upper Mill Creek Watershed Management Plan* and the Ohio EPA final report entitled *Total Maximum Daily Loads for the Mill Creek Basin*
- Collaborating with the Mill Creek Restoration Project in its work to continue implementing streamside trails and other components of the *Mill Creek Watershed Greenway Master Plan*
- Performing flood damage reduction services for member local governments by helping them qualify for flood insurance premium reductions under the Federal Emergency Management Agency's Community Rating System
- Maintaining relations with the Millcreek Valley Conservancy District and the U.S. Army Corps of Engineers for potential follow through on the Mill Creek Flood Damage Reduction Project and the associated General Re-evaluation Report
- Maintaining relations with soil and water conservation districts, local governments, public works directors and the Ohio Department of Transportation for maintenance of signs posted by the regional watershed signage project
- Building consensus in the watershed by serving as a public forum and by facilitating a partnership among the watershed's governmental units, agencies, local firms, organizations, institutions and corporations
- Pursuing grants and other opportunities for multi-objective floodplain management
- Assisting the watershed's stormwater districts and conservation districts with educational programs, such as developing a Green Business Program for Reading to educate the city's businesses and business managers about stormwater management
- Providing general education and outreach on nonpoint source pollution, sustainable yard care, and best management practices on both water quality and water quantity
- Providing technical training to such target audiences as engineers, landscape architects, public works officials, elected officials, garden clubs and water resource organizations
- Teaching teachers by educating individuals who can effectively spread the message among their communities
- Preparing to develop online geographic information system data on the Mill Creek watershed

<u>Group's role in watershed management planning and total maximum daily load planning</u>

MCWCC developed the *Upper Mill Creek Watershed Management Plan*, which was submitted in final draft form in December 2005 and endorsed in 2006 by the Ohio EPA. The plan itemizes the problems, priorities and action items identified and supported by local watershed communities and stakeholders. It was initiated as part of the implementation strategy for the

Mill Creek's total maximum daily load process undertaken by the Ohio EPA. Although the Mill Creek's TMDL report focuses on nutrient loading, the *Upper Mill Creek Watershed Management Plan* states: "System-wide biological attainment based solely on nutrient reduction is likely not possible given the complexity of the Mill Creek system. Other conditions and constraints in the Mill Creek watershed must be taken into consideration including, but not limited to, flooding, channelization, erosion, storm water runoff impacts, riparian corridor loss, public health issues, lack of recreational opportunities, and local economic conditions. The complexity of the Mill Creek watershed lends itself to a more comprehensive watershed approach recognizing that there is not a single solution, but a myriad of actions that can be taken at the local level to improve the quality of the Mill Creek and tributaries."

Major goals of the management plan include:

- improve habitat through riparian restoration
- Reduce sediment loading for the basin
- reduce nutrient loading towards meeting TMDL-specific goals for the basin
- stabilize stream banks using bio-engineering techniques
- restore natural stream functions where channel alterations have occurred
- improve stewardship of local streams and watersheds through public education

The upper Mill Creek watershed encompasses about 45 square miles in southeastern Butler County and north central Hamilton County. It includes parts of these political jurisdictions in Butler County: West Chester Township, Liberty Township, Fairfield Township, City of Hamilton and City of Fairfield. In Hamilton County, it includes parts of Springfield Township and the cities of Forest Park, Sharonville and Springdale.

The Metropolitan Sewer District of Greater Cincinnati and other stakeholders have suggested that MCWCC consider management plans for the Mill Creek's four other subwatersheds:

- Mill Creek at Sharonville
- Mill Creek at West Fork
- Middle Mill Creek
- Lower Mill Creek

<u>Water quality monitoring or habitat evaluation data collected or used by the watershed group</u>
MCWCC was one of the key organizations that helped Ohio EPA develop *Total Maximum Daily Loads for the Mill Creek Basin*, which was released as a final report in September 2004. MCWCC collaborated with OKI Regional Council of Governments and Ohio EPA as facilitators of the TMDL process. Other major contributors were the Butler County Department of Environmental Services (now Water and Sewer Department), Metropolitan Sewer District of Greater Cincinnati, Mill Creek Restoration Project and Millcreek Valley Conservancy District.

The TMDL report's study area is the entire Mill Creek watershed. Its goal is the attainment of water quality standards for the designated aquatic life uses of the Mill Creek and tributaries. Three aquatic life use designations apply: warmwater habitat along the upper Mill Creek and most major tributaries, modified warmwater habitat along the lower Mill Creek, and limited warmwater habitat along parts of Ross Run and West Fork. The entire watershed's causes of impairment are phosphorus, nitrogen and habitat modifications. Sub-watersheds of the Mill

Creek basin have additional impairment causes. The watershed's sources of impairment are municipal and industrial discharges, combined and sanitary sewer overflows, urban and agricultural runoff, onsite sewage systems, construction, hydromodification and channelization. The restoration options are the reduction of pollutant loadings and the increase of the stream's capacity to assimilate pollutants through such measures as improved habitat. The report acknowledged the impact of MCWCC and its member local governments, stating, "Very strong stakeholder participation existed in the Mill Creek watershed prior to Ohio EPA's activities in the official TMDL process."

Partnerships forged by the watershed group

The Mill Creek Watershed Council of Communities strives to maintain relations with nearly all off the 37 political jurisdictions within the watershed while simultaneously collaborating closely with the communities or stakeholders participating in MCWCC projects. This two-pronged approach has forged MCWCC's relationships with these partners through these respective activities:

- OKI Regional Council of Governments − Section 319 grants, office space, organizational governance and guidance
- Butler County Water and Sewer Department − Mill Creek Confluence Restoration Project, Section 319 grants, organizational governance and guidance
- City of Sharonville − Mill Creek Confluence Restoration Project, Mill Creek Flood Damage Reduction Project, organizational governance and guidance
- Liberty Township − organizational finances, governance and guidance
- Butler County Storm Water District − education, outreach, organizational governance and guidance
- Greater Cincinnati Water Works − fundraising, education, outreach, organizational governance and guidance
- Village of Evendale − financial oversight and support, organizational governance and guidance
- Metropolitan Sewer District of Greater Cincinnati − financial support, organizational governance and guidance, Mill Creek Confluence Restoration Project, rain gardens and the total maximum daily load report
- City of Wyoming − education, outreach and organizational governance and guidance
- Duke Energy Corp. − corporate sponsorship, rain gardens, Mill Creek cleanups, education and outreach
- City of Forest Park − rain gardens, education and outreach
- CDS & Associates − rain gardens, membership, fundraising and volunteer technical support for the Millcreek Valley Conservancy District
- MACTEC Engineering & Consulting − technical support, organizational guidance and the Mill Creek Confluence Restoration Project
- Ohio EPA − grant funding and administration, technical support, organizational guidance, watershed management planning, total maximum daily loads
- Cognis Foundation − financial support and fundraising
- League of Women Voters − organizational governance and guidance
- West Chester Township − Section 319 grant, membership recruitment
- General Mills Corp. − financial support for the Mill Creek Confluence Restoration Project

- Greater Cincinnati Rain Garden Alliance − initial staff support for the Alliance, 12 rain garden projects for the Mill Creek watershed
- Marvin's Organic Gardens − rain gardens, education and outreach
- Hamilton County Park District − fundraising, education and outreach, membership recruitment
- Hamilton County Storm Water District − storm water mini-grant for rain gardens in Colerain Township, Cincinnati Zoo & Botanical Gardens and Amberley Village
- Amberley Village − rain garden, fundraising, education and outreach
- Colerain Township − rain garden, membership recruitment
- Public Allies (an Americorps program to place interns) − rain gardens, education and outreach
- Community Building Institute (supported by Xavier University and United Way) − strategic planning guidance, interns

Three Valley Conservation Trust

Watershed group's founding, mission and geographic focus

The need for a conservation group to protect stream corridors and farmland in the Oxford area gave impetus to the founding of a land trust that later became the Three Valley Conservation Trust (TVCT). TVCT's website describes the group's founding as follows: "In 1993, Wallace I. Edwards founded a trust to preserve open land in the Four Mile Creek Valley in southwest Ohio. The Four Mile Valley Conservation Trust was incorporated as an Ohio non-profit organization in 1994."

"On May 3, 2000, the Board of Trustees voted to change the organization's name to Three Valley Conservation Trust and to extend the Trust's service area to the watersheds of Seven Mile and Indian Creeks and to the watershed of Four Mile Creek north of Acton Lake in Butler and Preble Counties, Ohio. The Trust's service area was eventually expanded to include all of the Four Mile Creek watershed, the Twin Creek watershed, portions of the Whitewater River watershed in Butler and Preble Counties, the Elk Creek watershed, and all land in Butler County drained by eastern tributaries of the Great Miami River."

In 2001, The Trust hired its first Executive Director and established an office to help achieve the TVCT mission. TVCT's mission statement is short and direct: "Three Valley Conservation Trust works with people and communities to conserve the natural, environmental, and cultural heritage of southwest Ohio."

TVCT's original geographic focus was on the Four Mile Creek Valley, south of Acton Lake. That confined its activities to Butler County for the most part. With a May 2003 expansion of service area, the group has dedicated itself to watersheds in these respective counties:

- Four Mile Creek watershed − north and south of Acton Lake, Butler and Preble counties, Ohio; plus small parts of Wayne and Union counties, Indiana
- Seven Mill Creek watershed − Preble and Butler counties, Ohio
- Indian Creek watershed − Butler County, Ohio; plus Union and Franklin counties, Indiana
- Twin Creek watershed − significant parts of Darke, Preble and Montgomery counties, Ohio; plus small parts of Butler and Warren counties, Ohio
- Elk Creek watershed − Preble, Montgomery and Butler counties, Ohio
- parts of the Whitewater River watershed − Preble and Butler counties, Ohio
- all land in Butler County drained by the Great Miami River's eastern tributaries, including Banklick Creek, Pleasant Run, Gregory Creek, Panther Run, Hunts Creek, Coldwater Creek and Dicks Creek

Cumulatively, TVCT's watershed-oriented service area includes all of Preble and Butler counties, Ohio, and fairly significant portions of Darke and Montgomery counties, Ohio.

Watershed group's water resource priorities and initiatives

The land trust recognizes the importance of water resources to its service area. Its membership pamphlet states: "Our valleys are blessed with beautiful waterways, magnificent woodland, scenic bluffs, diverse wildlife and distinctive farm heritage."

TVCT's website identifies three major priorities for its service area: (1) land protection, (2) conservation planning, and (3) environmentally responsible development. These priorities are furthered by TVCT in the following ways:

- promoting responsible development while preventing the loss of prime farmland, water resources and sensitive ecosystems
- leading by building partnerships that respect property rights and agricultural, conservation values
- providing tools that help landowners retain control of their land and preserve rural heritage
- providing tools that help communities create land use and watershed protection policies, including subdivision and stormwater management policies
- negotiating land conservation easements

In the course of assessing a property's conservation values, the Trust pays close attention to stream valleys, which have served as the organizing units for TVCT's expanding service area.

The organization's latest annual report identifies another major priority: "monitoring and securing the 87 properties whose easement protections have been entrusted to us, and finishing the easements that are 'in the pipeline.'"

TVCT's executive director said other organizational priorities that are beneficial to water resources include:

- enhancing protection programs for drinking water source protection efforts, such as the Great Miami Drinking Water Protection Project in which OKI, the Trust and other project partners created a drinking water protection plan for the Village of New Miami while taking inventories of potential water pollution sources.
- adopting farm conservation plans with best management practices such as grassed waterways, cattle exclusion, invasive plant species eradication, native plant species plantings and riparian buffers
- conserving headwater streams

As a land trust, TVCT centers most of its initiatives on land protection. It provides expert assistance to landowners who consider one of these options for land conservation:

A Conservation or agricultural easement is a voluntary legal agreement between the landowner and TVCT to limit certain uses of the land without changing its ownership. The landowner may later sell the land or transfer it to heirs, but future owners are bound by the easement's terms. TVCT's duty is to uphold the easement's terms in perpetuity. Most conservation or agricultural easements are donated, but some are funded by programs such as the Clean Ohio Green Space Conservation Program, Ohio Department of Agriculture's Agricultural Easement Purchase Program, Ohio EPA's Nonpoint Source Pollution Reduction Program or the U.S. Department of Agriculture's Farm and Ranch Lands Protection Program. Donated easements usually qualify the landowner for a property tax deduction and may reduce estate taxes.

Land donation can be structured to allow the owner to live on the land or to receive lifetime income. Land donation is ideal for people who don't have heirs, have property they no longer can use or manage, wish to limit their estate taxes. Land donation often provides significant

income tax deductions and estate tax benefits, and negates capital gains taxes arising from sale income.

Bargain sale involves selling land to TVCT at less than its fair market value. This method has similar tax benefits as described above, in proportion to the difference between the land's fair market value and its bargain sale price.

Over the course of 15 years, TVCT's initiatives have protected 11,600 acres of land, of which 10,784 acres are under conservation easement. About 42 miles of stream flow through the protected lands. In addition to the 87 easements that it holds, TVCT has another 16 in process.

TVCT's executive director cited other initiatives that ultimately benefit water resources:

- acquiring a federal grant under Section 319 of the Clean Water Act to protect 420 acres of riparian corridor along a two-mile stretch of Indian Creek
- studying European migration patterns into the region to provide information on site history and natural conditions, which is vital to ecological restoration projects
- facilitating land conservation projects by local government agencies, such as helping Butler County Metro Parks acquire a 460-acre tract with about a mile of riparian corridor and a 250-acre hardwood forest.

Group's role in watershed management planning and total maximum daily load planning

TVCT undertook a significant role in watershed management planning for the Twin Creek watershed, but then later decided to refocus on its core mission as a land trust. After receiving a watershed coordinator grant from the Ohio Department of Natural Resources in late 2004, TVCT worked on the Twin Creek Watershed Action Plan for about two years, and Ohio EPA conditionally endorsed the *Twin Creek Watershed Action Plan* in late 2007.

The conditionally endorsed *Twin Creek Watershed Action Plan* is now a responsibility of the Twin Creek Watershed Coordinator based at Miami University, Ohio. Though the watersheds of Four Mile Creek, Seven Mile Creek and Indian Creek had originally been intended for watershed action planning, TVCT later decided to address those watersheds through land conservation work and technical assistance to advisory panels for the Twin Creek watershed coordinator, a stormwater district, a public water system, and a sewer system.

In 2009 Ohio EPA published *Total Maximum Daily Loads for the Twin Creek Watershed,* and noted that Miami University agreed to assume TVCT's watershed coordinator grant for implementation of the *Twin Creek Watershed Action Plan*.

The land trust's executive director said TVCT strives to fulfill the Ohio EPA's TMDL goals while working on riparian corridor conservation projects and farm conservation plans. TMDL benefits are achieved from the land trust's efforts to connect landowners with technical resources at federal, state and county conservation agencies as well as other nonprofit conservation groups.

Water quality monitoring or habitat evaluation data collected or used by the watershed group

For the conditionally endorsed *Twin Creek Watershed Action Plan*, TVCT compiled water quality monitoring data and watershed assessment data developed by the Ohio EPA. For each subwatershed of the Twin Creek watershed, the plan reports an attainment status narrative,

causes of stress, sources of stress, subwatershed background and the full complement of biocriteria data.

Beyond water quality monitoring, TVCT monitors the compliance status of properties for which it holds a conservation easement. This land monitoring familiarizes the trust with the condition of dozens of headwaters, intermittent streams, perennial streams and river segments. Volunteers conduct the monitoring under the supervision of experienced lead monitors in accordance with a training course and monitoring procedures manual. They use geographic information system (GIS) mapping, global positioning system (GPS) readings, digital photos and standardized data forms that generate baseline and present condition reports. The process is labor intensive, costing TVCT an average of $400 per easement per year. It must be done because TVCT is legally obligated to annually ensure that each of its 87 conservations easements is honored. Essentially, the properties with easements can never be developed for housing, retail, commercial or mining activity, and will forever preserve blocks of greenspace or productive agricultural lands.

TVCT also conducts field surveys of environmental and geologic conditions to help prioritize where more conservation easements should be sought.

Partnerships forged by the watershed group

Over the course of 15 years, the Three Valley Conservation Trust has partnered with dozens of organizations, including but not limited to:

- Whitewater Valley Land Trust
- U.S. Department of Agriculture
- U.S. EPA
- Ohio EPA
- Natural Resources Conservation Service
- U.S. Fish and Wildlife Service
- Ohio Department of Natural Resources
- Ohio Public Works Commission
- Miami Conservancy District
- OKI Regional Council of Governments
- Miami Valley Regional Planning Commission
- county soil and water conservation districts
- Land Trust Alliance
- Five Rivers Metroparks
- Butler County Metroparks
- Pheasants Forever
- Ohio Farm Bureau offices in Butler and Preble counties
- Izaak Walton League of America
- Audubon Society of Miami Valley
- Ohio Historic Preservation Office and Citizens for Historic and Preservation Services
- Twin Valley Heritage Association
- Miami University
- Oxford Community Foundation

- Dupps Co. Charitable Foundation
- The Ohio State University Extension Service
- Butler County Department of Development
- Earthshare of Ohio
- county commissioners, engineers, auditors and recorders
- Miami Valley Resource & Conservation Development Council
- Ohio Department of Agriculture, Office of Farmland Preservation
- City of Oxford
- township trustees
- chambers of commerce
- banks
- The Hillside Trust
- daily and weekly newspapers
- Duke Energy
- Tecumseh Land Trust
- local development companies
- JF New

The Relevance of Total Maximum Daily Loads to Watershed Action Planning

In *Getting the Point about Nonpoint: Ohio Nonpoint Source Pollution Management Plan −2005-2010*, state environmental officials make a direct connection between total maximum daily load (TMDL) plans and watershed action plans. They portray the connection as significant by writing: "The key implementation mechanism for achieving non-regulated nonpoint source-related TMDL targets is locally led watershed action planning and implementation."

The *Ohio Nonpoint Source Pollution Management Plan* acknowledges the relevance of TMDLs to watershed action plans (WAPs) by having a table titled "Summary Comparison of TMDL Status with Watershed Action Planning Status." For watersheds at the scale of 11-digit hydrologic unit codes, the table shows whether the watershed's TMDL study is planned, in progress, submitted, receiving public comments, or approved. For the same watersheds, the table also shows the status of watershed action planning. WAP status is shown in one of four categories:

1. Watershed group identified
2. Watershed group has committed to development of a state-endorsed WAP
3. WAP is fully or conditionally state endorsed
4. Fully or conditionally state-endorsed WAP is being implemented

The Summary Comparison of TMDL Status with Watershed Action Planning Status clearly reinforces the concept that total maximum daily load plans, watershed action plans and watershed groups are closely linked. For state environmental officials, this linkage is highly pertinent to the "ultimate goal" of providing a roadmap "for achieving aquatic life use attainment."

Given the relevance of total maximum daily loads to watershed action planning, this chapter on Watershed Planning in Southwest Ohio concludes with Figure 6-1 and Figure 6-2, which are maps indicating the status of watershed action plans and total maximum daily load plans for the watersheds (HUC-12) of Butler, Clermont, Hamilton and Warren counties.

Figure 6-1: The Status of Watershed Action Plans in Southwest Ohio

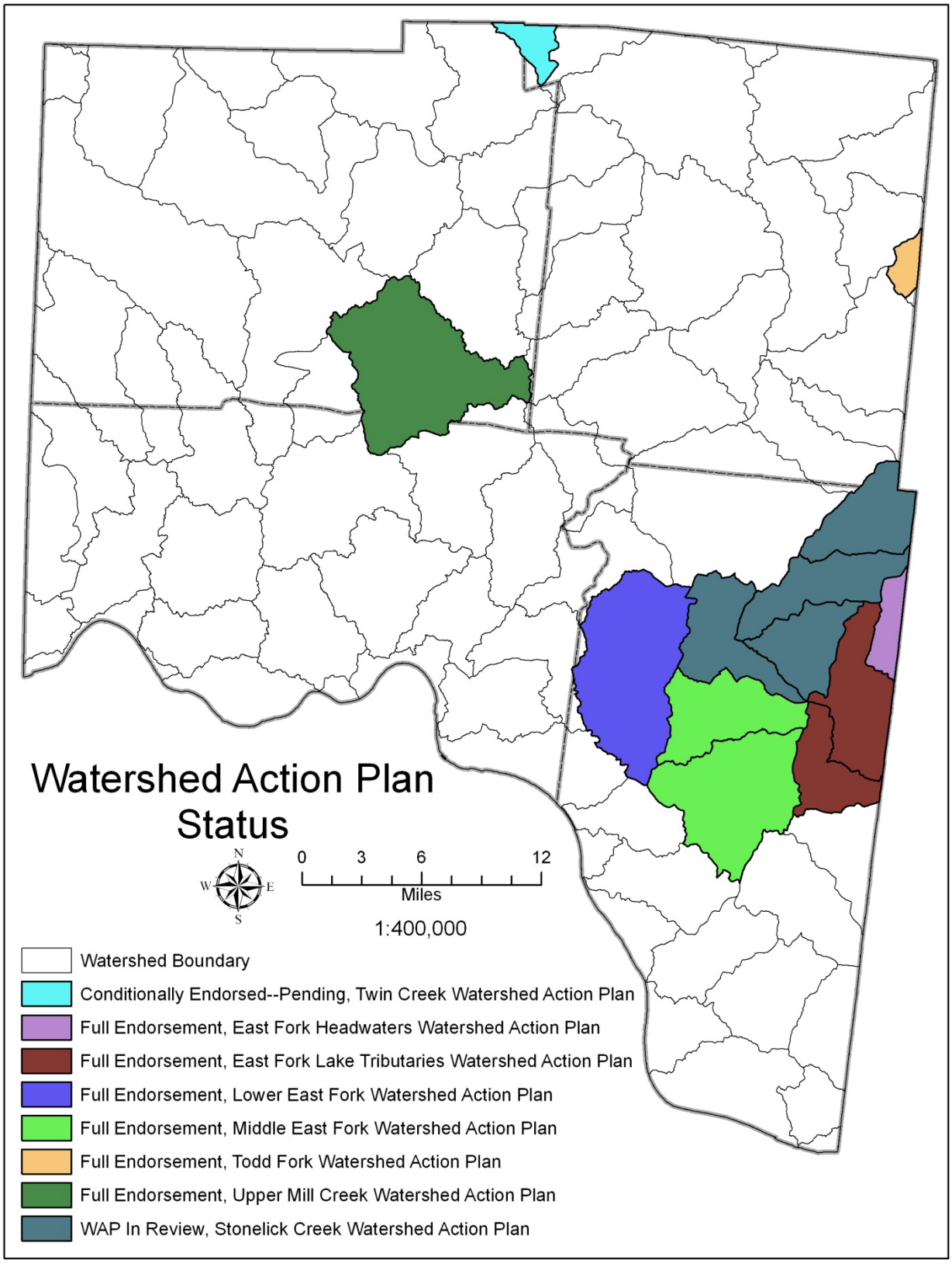

Figure 6-2: The Status of Total Maximum Daily Load Reports in Southwest Ohio