

WATERSHED AND WATER STEWARDS CAPACITY AND NEEDS ASSESSMENT: UPPER OHIO RIVER BASIN

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EXECUTIVE SUMMARY

The Headwaters to the Ohio (H2O) Water Network wants to improve its understanding of the capacity and needs of community-based groups working to protect local water bodies in the Upper Ohio River Basin with a watershed framework.

This assessment introduces the topic of community-based watershed organizations (CWOs), presents the characteristics, strengths, and challenges of a variety of water- and natural resource-focused stewards and organizations located in 14 counties in western Pennsylvania. Information for the assessment was obtained primarily from surveys and interviews, with supplemental information gathered from literature reviews.

KEY FINDINGS

CWOs have diverse goals and activities in the Upper Ohio River Basin, with most focusing on community outreach and education, general water quality, and ecological integrity. They engage in a wide array of activities, including stream restoration, water monitoring, educational events, and policy advocacy.

Limited capacity (human capital) and funding are the most widespread challenges, affecting nearly every aspect of a CWO's work, impacting their ability to recruit and retain members and volunteers, hire staff or professional services, acquire equipment, conduct monitoring, plan outreach events, write grants—and, ultimately, long-term sustainability.

An aging volunteer and membership base combined with recruitment challenges poses a sustainability risk and limits a CWO's ability to conduct field work and adopt new technologies.

Volunteer-driven groups are stretched thin, with many lacking the time, funding, manpower, or administrative support to implement effective monitoring programs, take advantage of funding or partnership opportunities, or recruit new people.

Desire for collaboration and shared resources is high, but communication is limited. A top need cited was increased collaboration and resource sharing; groups seek opportunities to exchange ideas, coordinate efforts, and access shared services or expertise. However, many CWOs are unaware of others working nearby or in similar-issue areas, as well as currently available resources.

Technical and administrative support gaps limit effectiveness. Groups frequently cited needs such as day-to-day operations, grant writing, legal guidance, accounting, database management, and strategic planning. Additionally, many CWOs lack sufficient technical knowledge for designing effective monitoring programs, interpreting data, and using modern data management tools.

Training and knowledge sharing are key to building capacity. CWOs expressed strong interest in targeted, accessible education on topics like nonprofit governance, monitoring, data interpretation, advocacy, outreach, and more.

Many CWOs generate valuable environmental data, but lack the tools, training, or platforms to manage, interpret, and communicate that data effectively.

Monitoring programs face specific hurdles. While most responding CWOs conduct some form of water quality monitoring, they often desire to monitor more frequently but are limited by a lack of capacity, funding, equipment, and technical expertise. Issues with formal protocols and data validation are also present. Data management often relies on internal spreadsheets or hard copies, and while many do make at least some data public, challenges exist in analysis, interpretation, and awareness and use of suitable database platforms.

Creative partnerships and community connections are powerful tools for addressing resource gaps. Successful CWOs have found ways to overcome some capacity and funding challenges by forming unconventional partnerships with local schools, youth programs, businesses, and individuals, stressing the value of creative outreach for accessing specialized skills and broader community support. However, such partnerships are often underutilized due to limited time or awareness.

There is no single resource or entity currently meeting the full range of CWO needs. A more coordinated, responsive support system—such as a shared services hub or fiscal sponsor/umbrella organization model—could significantly improve efficiency and impact.

These findings highlight the passion and perseverance of CWOs in the Upper Ohio River Basin, as well as the compounding nature of challenges they face. Many of the limitations identified—from funding and capacity to outreach and technical ability—do not exist in isolation, but instead can trigger and reinforce one another. Breaking this cycle requires not just isolated fixes, but coordinated, multipronged strategies.

However, despite operating with limited capacity and resources, many of these groups are actively restoring streams, educating the public, fostering community buy-in, and building meaningful partnerships. Addressing their common barriers—through approaches like targeted support, regional coordination, and shared resources—offers a powerful opportunity to strengthen grassroots stewardship and ensure long-term protection of the region’s water resources.



INTRODUCTION

The **Headwaters to the Ohio (H2O) Water Network** is a coalition of organizations working to improve water quality and access in the Upper Ohio River Basin. The H2O Water Network’s mission is to connect diverse water stakeholders to develop and pursue a shared vision and attract increased resources for safe and clean water. With a focus on collaboration, knowledge sharing, and community engagement, the H2O Water Network works to promote sustainable water management practices, address key water-related challenges, and ensure everyone in the region has access to clean, safe, affordable water.

To better guide these efforts, the H2O Water Network launched this Watershed and Water Stewards Capacity and Needs Assessment to describe the capacity and identify the needs of stewards and community-based groups working to protect local water bodies with a watershed approach.

While the H2O Water Network hopes to expand this initiative to include other geographies in the Upper Ohio River Basin, this phase included a broad array of stakeholders working with local communities around water issues in 14 counties in western Pennsylvania. Through this expansive region, many groups and stewards are actively monitoring water quality, partnering on cutting-edge research, advising local governments on financing and maintaining water systems, and helping to write and implement watershed management plans.

The H2O Water Network contracted Downstream Strategies to carry out this assessment, which included identifying and inventorying relevant groups, designing and distributing a survey, and conducting interviews with representatives. Participants were asked to provide information such as basic organizational details, monitoring program characteristics, desired support, and other aspects.

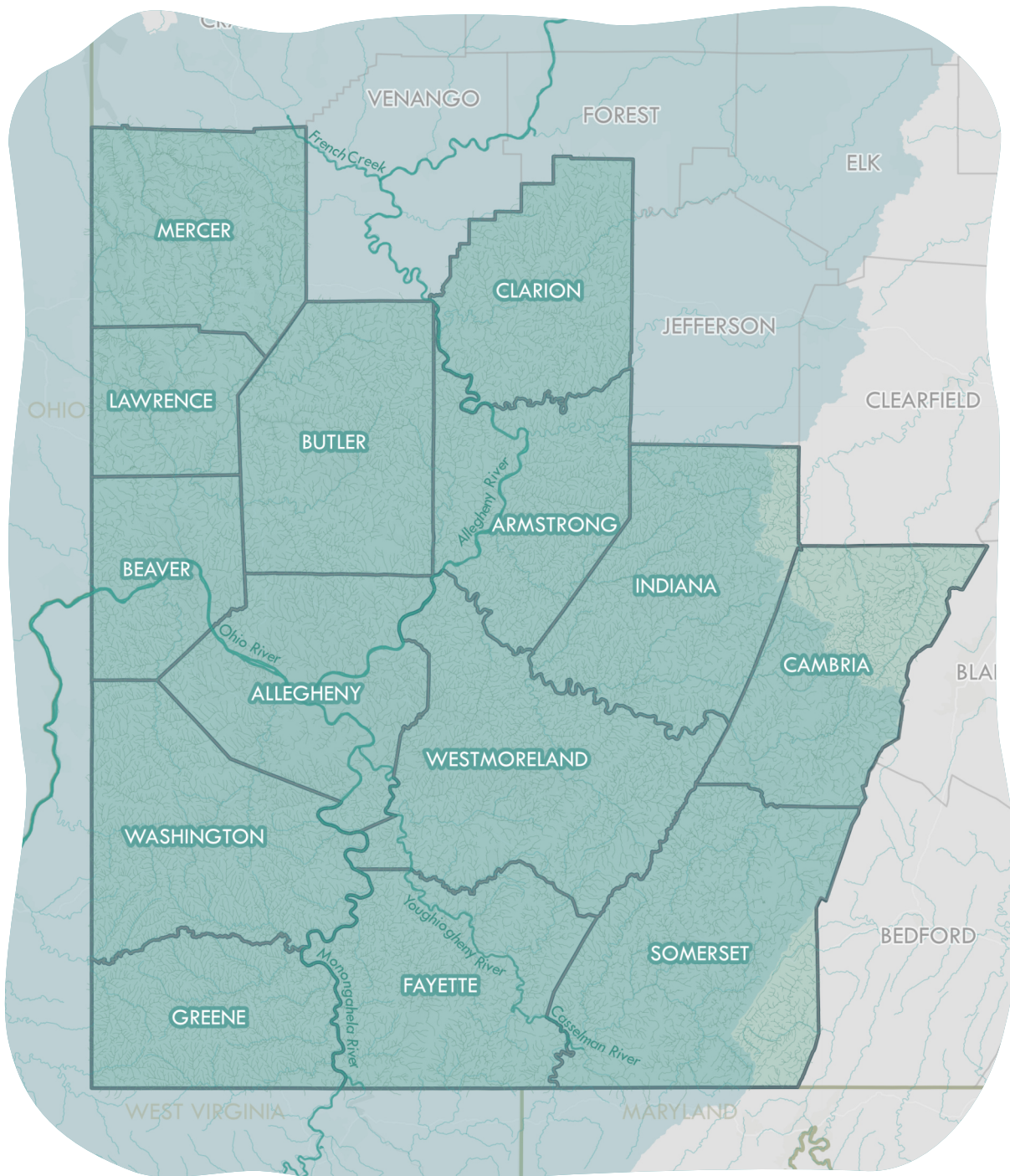
The information gathered from this assessment is intended to help the H2O Water Network assist organizations in accomplishing meaningful watershed stewardship, identify streams actively being monitored, and determine what issues affect the region’s water resources.

This report begins with an overview of the project area, followed by a brief discussion of the watershed approach and the broader landscape of community-based watershed organizations (CWOs). The section titled “Insights from community-based watershed organizations” presents findings organized by survey topic, including response statistics and key themes that emerged from open-ended survey questions and interview discussions. Where relevant, additional interview questions are included to deepen context and add supplemental information. The final section revisits the most pressing themes and challenges identified by respondents and offers potential strategies for addressing them, drawing from the experiences and suggestions shared by CWOs.



PROJECT AREA

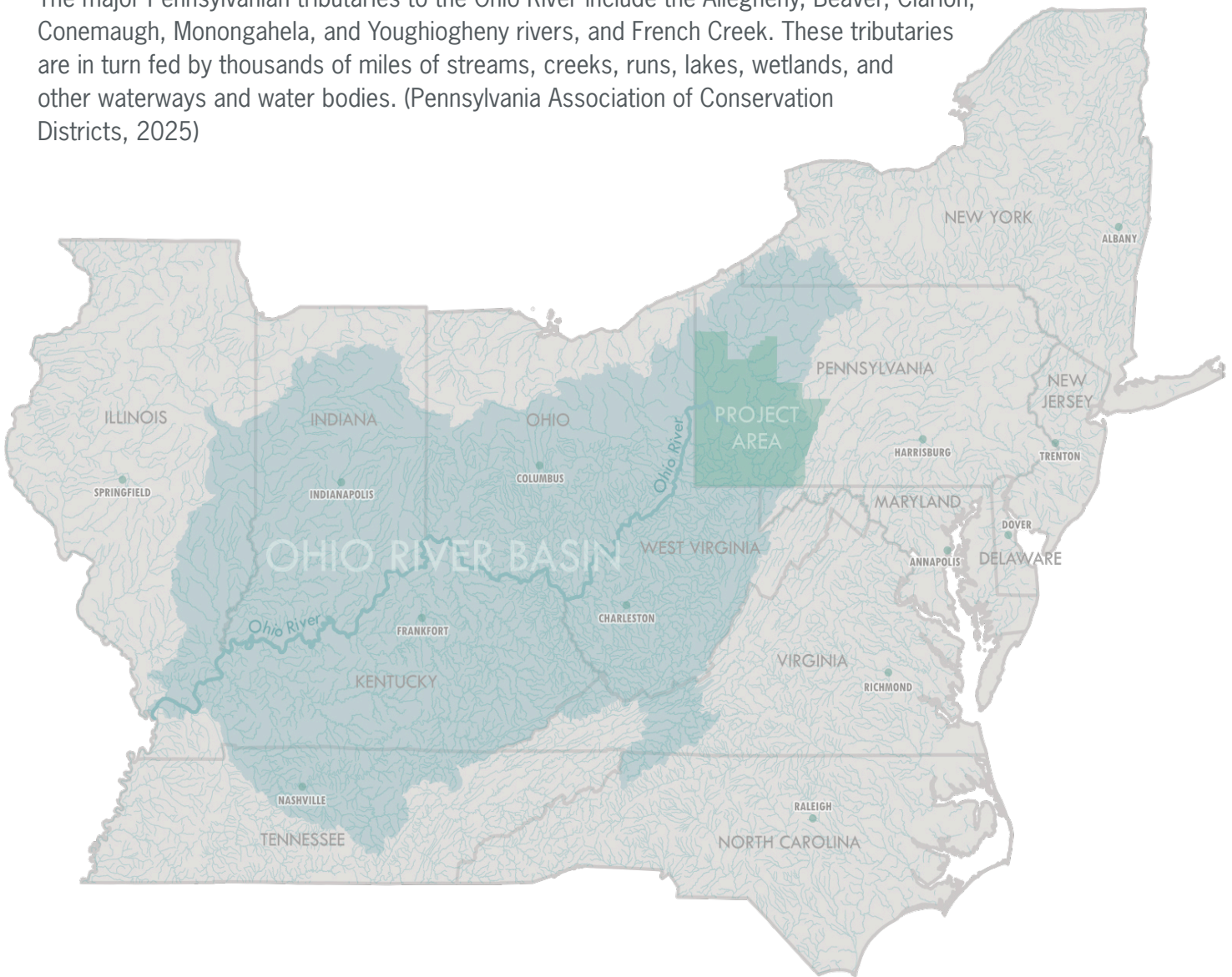
The target geography for this assessment focused on 14 counties in western Pennsylvania: **Greene**, **Fayette**, **Somerset**, **Washington**, **Westmoreland**, **Cambria**, **Indiana**, **Armstrong**, **Allegheny**, **Beaver**, **Lawrence**, **Mercer**, **Butler**, and **Clarion**. Each of these counties is entirely or mostly within the Ohio River Basin, the second largest of Pennsylvania's six major watersheds.



OHIO RIVER BASIN

Although only about 50 miles of the Ohio River flow within Pennsylvania—just 5% of its 981 total miles—the “Headwaters to the Ohio” lie in Pittsburgh, Pennsylvania, formed by the confluence of the Allegheny and Monongahela rivers. From there, the Ohio traverses an additional five states before meeting the Mississippi River in Cairo, Illinois. The Ohio River Basin spans 203,940 square miles (15,614 of which are in Pennsylvania). More than 30 million people—about 10% of the nation’s population—call the basin home, including 3.5 million Pennsylvanians who depend on the Ohio and its tributaries for transportation, drinking water, and power generation.

The major Pennsylvanian tributaries to the Ohio River include the Allegheny, Beaver, Clarion, Conemaugh, Monongahela, and Youghiogheny rivers, and French Creek. These tributaries are in turn fed by thousands of miles of streams, creeks, runs, lakes, wetlands, and other waterways and water bodies. (Pennsylvania Association of Conservation Districts, 2025)



The subbasins and their respective watersheds in the 14-county area are listed below.

Monongahela River subbasin:

Upper and Middle Monongahela River, Casselman River, Tenmile Creek, Upper and Lower Youghiogheny River, and Turtle Creek watersheds

Ohio River subbasin:

Wheeling–Buffalo Creeks, Chartiers Creek, Raccoon Creek, Upper Ohio River, Beaver River, Slippery Rock Creek, and Shenango River watersheds

Lower Allegheny River subbasin:

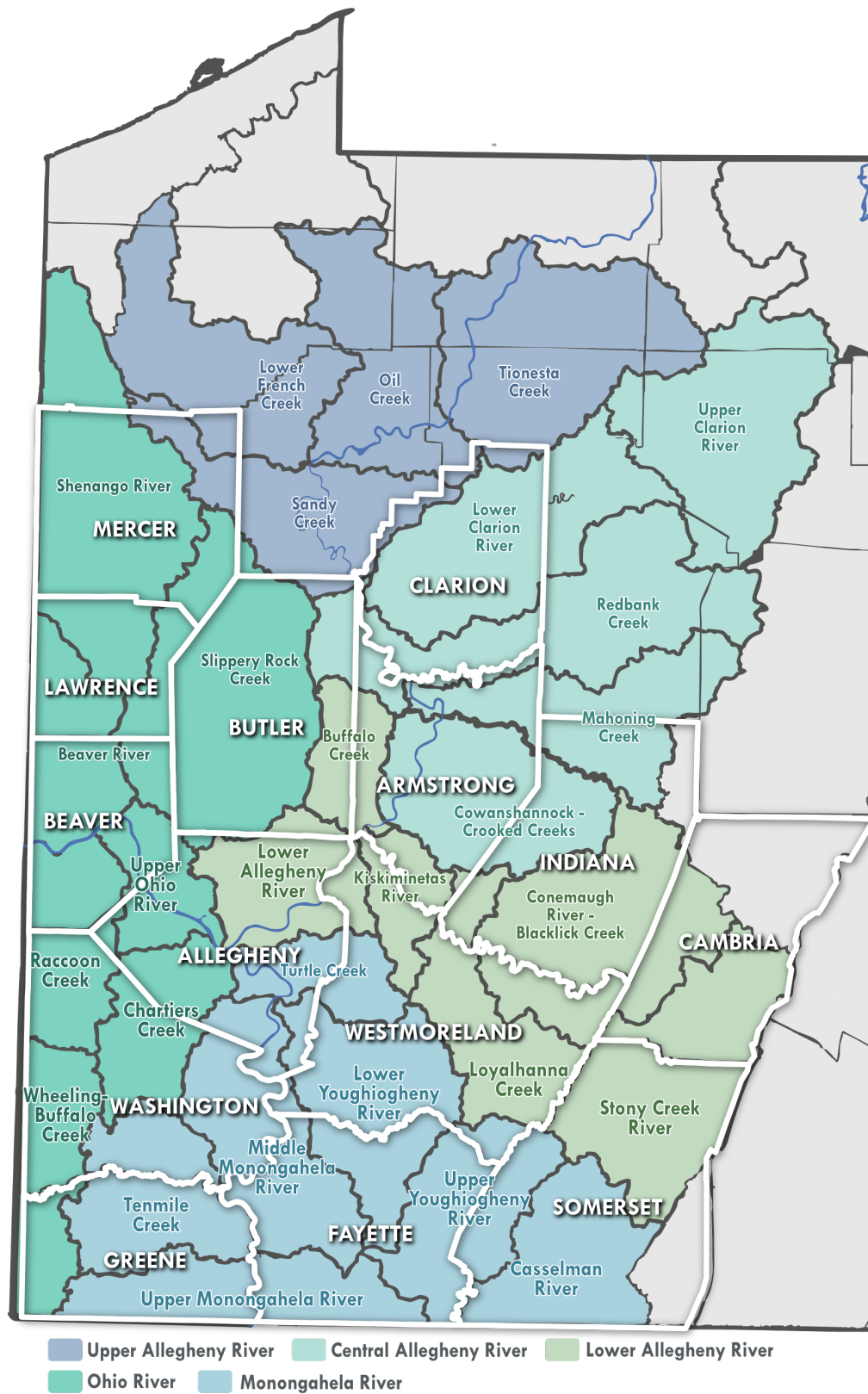
Stonycreek River, Loyalhanna Creek, Conemaugh River–Blacklick Creek, Kiskiminetas River, Lower Allegheny River, and Buffalo Creek watersheds

Central Allegheny River subbasin:

Cowanshannock–Crooked Creeks, Mahoning Creek, Redbank Creek, and Lower Clarion River watersheds

A small portion of the Upper Allegheny River subbasin:

Sandy Creek, Lower French Creek, Oil Creek, and Tionesta Creek watersheds



Adapted from Water Planning Area of PA DEP's Pennsylvania's Watershed Regions: Ohio

The Ohio River Basin in Pennsylvania contains some of the most socially, economically, and ecologically significant waterways in the nation. The region’s fertile river valleys attracted European explorers to present-day western Pennsylvania, which sparked the start of the French and Indian War. During the Industrial Revolution, navigational improvements, including the state’s first lock and dam, helped set the stage for economic expansion in the basin. The Ohio River Basin formed the backbone of a major transportation network for extractive and industrial goods like coal, coke, glass, lumber, and steel, which helped forge cities like Pittsburgh. The combination of the basin’s status as a hub for industry and heavy freight, pervasive acid mine drainage (AMD) from coal mines, and the lack of industrial and sewage treatment in the early 20th century set off a long history of persistent pollution and dismal water quality, leaving many of the tributaries “dead.”

The 1970s saw the passage of the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), and the Surface Mining Control and Reclamation Act (SMCRA), as well as the beginning of water stewardship and restoration in the basin’s tributaries. Additional laws enacted in Pennsylvania include the Clean Streams Law (1937), Chapter 93: Water Quality Standards (1971), the Conservation District Law (1945), the Storm Water Management Act (1978), Dam Safety and Encroachments Act (1978), the Flood Plain Management Act (1978), the Storage Tank and Spill Prevention Act (1989), and others. Through the efforts of many state and local grassroots organizations—including nascent watershed associations—the effects of the industrial boom from over a century earlier began to reverse.

The recovery of the Ohio River Basin is a success story: most of its original fish species have repopulated their former ranges, freshwater mussel diversity abounds, and residents enjoy water-based recreation throughout the area. However, the basin must still contend with both legacy pollution, such as AMD, and other threats, including combined sewer overflows (CSOs), agricultural runoff, industrial discharges, development, and other problems. (DCNR, 2015; POWR, 2024)

More than 20,000 miles of streams run through the 14 target counties, with about 31% considered impaired. Greene County has the lowest proportion of impaired streams (15%), while Allegheny and Clarion counties had the highest (67% and 61% miles impaired, respectively). In terms of total impaired mileage, Allegheny County ranked sixth in the state with 923 miles of impaired streams, and Clarion County ranked tenth with 749 miles. (PA DEP, 2025)




Jacobs Creek Falls
Westmoreland County
Conservation District

DEMOGRAPHICS

The 14-county study area includes a diverse mix of communities, ranging from largely rural (Greene County, pop. 34,000) to the second-most populated county in the state (Allegheny County, pop. 1.2 million). Some of the major cities in the area include Pittsburgh (pop. 308,000), New Castle (pop. 21,000), Johnstown (pop. 18,000), and Greensburg (pop. 15,000). (USCB, 2024)

Approximately 2.9 million people (and 1.3 million households) are estimated to live within the study area's borders, which comprises over 80% of the Pennsylvanians in the Ohio River Basin. The median age for the area is 43.6, with the most populated 10-year cohort being 60–69 years, which makes up approximately 14% of the population. Economically, the median household income is about \$73,600 (95% of the state and 90% of the national average), and the median per capita income is \$44,000. In educational attainment, approximately 34% of those aged 25 and older have either a high school diploma or GED (as compared to 27% for the national average), 34% have an associate or bachelor's degree, and 14% have a postgraduate degree.

Top industries by employment in the area include health care and social assistance (18%), retail trade (11%), manufacturing (10%), educational services (9%), and construction (7%). Top occupations by employment include management (11%); office and administrative support (10%); healthcare practitioners, technologists, and technicians (9%); sales (8%); and transportation and material moving (7%). (Esri Business Analyst, 2025)



Millvale Riverfront Park
Allegheny CleanWays

A WATERSHED APPROACH

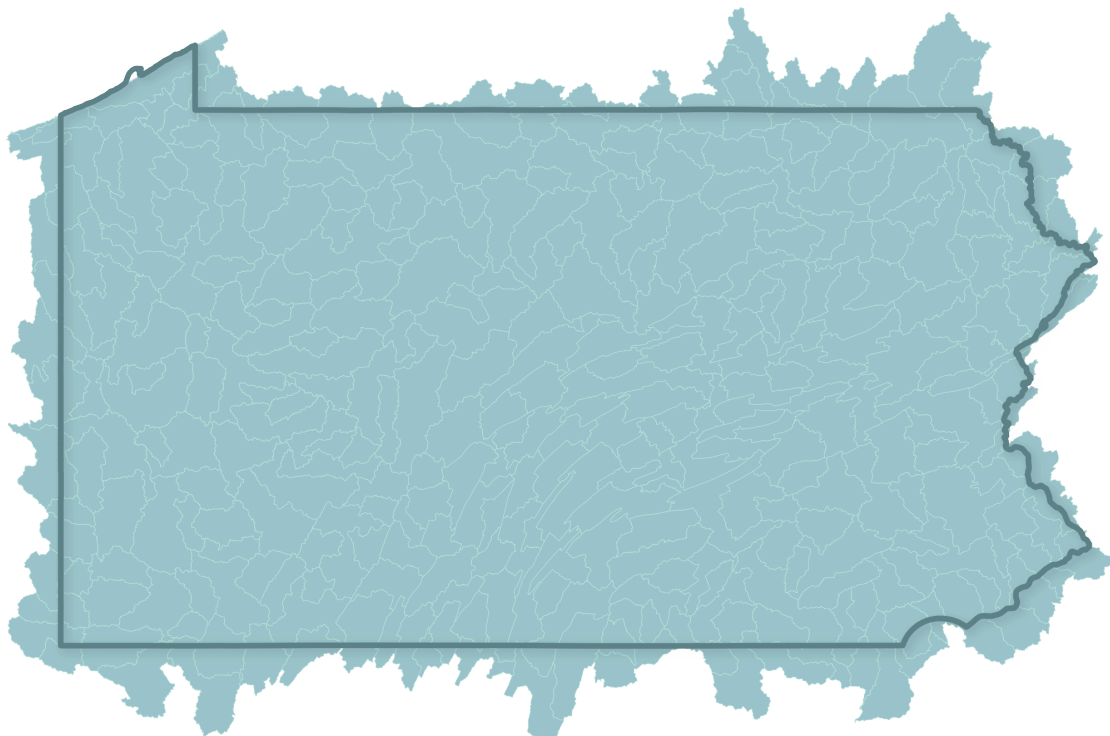
A watershed is any area of land that drains to a body of water. Watersheds are nested, hierarchical systems ranging from small, subcounty stream-level catchments to large, multistate regions containing any number and type of waterbodies.

From a watershed perspective, an unnamed creek in the backyard drains not only into the larger neighborhood stream, but into rivers that traverse multiple states and eventually empty into outlets like gulfs, lakes, and the ocean. In this way, what happens in the creek has the potential to affect many miles of water downstream—water used for drinking water, fishing, recreation, irrigation, power, and many other applications.

A watershed approach has been the reigning framework for managing water quality among watershed organizations, nonprofits, and public agencies since the 1980s. The concept is a coordinating, flexible framework that focuses on public and private sector efforts to manage water resource quality and identify and address high-priority problems within a defined drainage area, or watershed. It is guided by the principles of partnerships with the community and other stakeholders, a focus on specific geographic areas (i.e., watersheds), and the use of sound management techniques based on strong science and data. (U.S. EPA, 1996, 2008)

A watershed approach is especially relevant in Pennsylvania: It boasts 86,000 miles of streams—second only to Alaska.

(PSU, 2022)



Watersheds within or partially within Pennsylvania with a hydrologic unit code of 10 (HUC 10)

The iterative nature of the watershed approach encourages multidisciplinary, multijurisdictional, and community-oriented collaboration in which goals and projects are informed by shared information and data that are continuously evolving in order to help direct efforts toward the most pressing issues affecting a watershed. These collaborative efforts are often voluntary and driven by a diverse range of stakeholders—including informal community groups and watershed organizations, environmental-focused nonprofits, landowners, local governments, and others—all working toward the common goal of enhancing and protecting watershed health. In doing so, they help preserve and expand vital ecosystem services that support both community well-being and local economic opportunity. (U.S. EPA, 1996; Novak and Woodwell, 1999).

Defined benefits of a watershed approach include the following.

- Through various grassroots research and higher level assessments across a range of watershed-related issues—including drinking water protection, pollution, invasive species, infrastructure, mine drainage, habitat restoration, and recreation—stakeholders and decision makers can have a comprehensive understanding of critical issues within each watershed. This information helps set priorities, allocate resources effectively, and track progress toward environmental and community goals.
- The emphasis on communication and coordination between groups working within and across watersheds can translate into more efficient, cost-effective programming by minimizing redundant efforts, avoiding conflicting actions, and pooling knowledge and resources.
- The watershed approach encourages teamwork among public and private sectors at every level, beginning with the individual. This inclusive and broad model empowers communities by giving them a meaningful role in stewarding their local watershed resources, builds a sense of shared purpose and local ownership, strengthens community ties, and builds lasting commitment to collective goals—ultimately increasing the likelihood of achieving and sustaining lasting environmental improvements. (U.S. EPA, 1996, 2008)

Because “we all live in a watershed,” understanding their interconnected nature highlights the importance of community-scale action through a watershed approach—and CWOs form the backbone of this work.



INSIGHTS FROM COMMUNITY-BASED WATERSHED ORGANIZATIONS

CWOs and related groups play a vital role in protecting water resources across western Pennsylvania, the Upper Ohio River Basin, and beyond. While each group has its own focus—ranging from coldwater fisheries and advocacy to litter cleanup, land use, or AMD—they are all united by a shared commitment to healthy water, ecosystems, and communities. Despite their differences, this assessment revealed many common challenges and needs, reflecting the inherently interconnected nature of their work.

METHODS

This assessment was informed by a combination of literature reviews, survey results, and interviews with representatives from CWOs and other related natural resource-focused organizations.

TARGET GEOGRAPHY

This assessment focused on 14 counties in western Pennsylvania: Greene, Fayette, Somerset, Washington, Westmoreland, Cambria, Indiana, Armstrong, Allegheny, Beaver, Lawrence, Mercer, Butler, and Clarion.

COMMUNITY-BASED WATERSHED ORGANIZATIONS

A master list of all CWOs and related groups was developed to serve as both an inventory and as the target audience for the survey. The H2O Water Network shared a preexisting list of CWOs as a starting point. Downstream Strategies then expanded the list to include additional groups that had the potential to provide relevant input for the assessment; the final list was informed by a comprehensive online search that included watershed and conservation group directories, lists provided by select authorities and watershed specialists from each county's conservation district, and feedback from contacted CWOs.

For the purpose of this assessment, a community-based watershed organization/CWO was considered to be any group that is monitoring, surveying, or conducting any work to improve the health, safety, or drinkability of a water body or watershed. Organizations did not need to work directly in the field or possess a water quality monitoring program to be included, provided they perform some activity that supports the efforts of other water- or conservation-focused organizations. Therefore, the final list was very inclusive in an effort to not overlook the efforts of groups or individuals who do not fall under the umbrella of a traditional watershed association. The list included watershed organizations, sportsman's clubs, land trusts, nature centers, educational affiliates and institutions, faith groups, individuals, and others.

SURVEY

Downstream Strategies developed a survey that was composed of a mix of multiple choice and open-ended questions. The survey was created in Google Forms. Google Forms provides a cost-effective, simple, and flexible way to collect data. Additionally, Google Forms imposes no limits on the number of submissions and allows surveys to be open indefinitely, which can be helpful for long-term data collection. The survey can easily be reused as is, modified, or duplicated for use in future assessments in other geographies. With this in mind, the survey was made using a separate Gmail account created specifically for the survey, so the H2O Water Network may assume ownership and have access to the existing survey and responses.

The survey was designed to balance brevity and accessibility with the ability to acquire sufficient data for the assessment. Therefore, while the survey covers an array of pertinent topics, it should not be considered comprehensive. Interviews were conducted to help retrieve more nuanced information and expand on select survey questions.

The survey broadly included questions covering the information below.

- ◆ Organizational details (e.g., contact information, goals, tenure, membership, service area, etc.)
- ◆ Monitoring (e.g., purpose, monitoring locations, parameters, etc.)
- ◆ Data management (e.g., storage systems, public access, use, etc.)
- ◆ Concluding thoughts (e.g., strengths and successes, challenges, desired support, etc.)

The full survey is available in the appendix.

Survey dissemination and subsequent reminders were conducted approximately monthly between the end of January and early June of 2025. Using the contact information collected in the master list, Downstream Strategies primarily shared the survey via email, but social media messaging and phone calls were also used when warranted. Additionally, Downstream Strategies shared the survey over social media, and several other organizations and individuals shared the survey with their networks for broader reach.

In total, 47 organizations completed the survey.

INTERVIEWS

Downstream Strategies created a series of questions for use as a guide when conducting interviews. Talking points closely followed the survey questions, but discussion was encouraged to flow naturally. The purpose of the interviews was to obtain more nuanced information and additional context for survey responses. Interviews were conducted over the phone or through video calls.

The list of general interview questions is in the appendix.

Each survey respondent was contacted to request an interview, and three interviews were conducted with groups who did not complete the survey.¹ **In total, 33 organizations were interviewed.**

Overall, 50 organizations completed the survey, were interviewed, or both:

Allegheny CleanWays	Pennsylvania Interfaith Power and Light
Alpine Hunting and Fishing Club	Pennsylvania Senior Environmental Corps
Big Sewickley Creek Watershed Association	Pigeon Creek Watershed Association
Blackleggs Creek Cooperative Trout Nursery and Watershed Association	RiverWise
Buffalo Creek Watershed Association	Roaring Run Watershed Association
Chalfant Run-Thompson Run Watershed Association	Save Slippery Rock Creek
Church in Society Committee/Creation Care Task Force of the Southwestern Pennsylvania Synod of the Evangelical Lutheran Church in America	Sewickley Creek Watershed Association
Clarion Conservation District	Slippery Rock Watershed Coalition
Community Tree Resources/Restoreth Roots	Somerset County Conservation District
Conemaugh Valley Conservancy	Stream Restoration, Incorporated
Connoquenessing Watershed Alliance	Ten Mile Creek Watershed Association
Dunkard Creek Watershed Association	The Mon River Project
Evergreen Conservancy	Three Rivers Waterkeeper
Fern Hollow Nature Center	Trout Unlimited Pennsylvania Council
Friends of the Riverfront	Trout Unlimited Chestnut Ridge Chapter
General Braddock's Fish Club	Upper Chartiers Creek Watershed Association
Glade Run Lake Conservancy	UpstreamPgh
Independence Conservancy, Inc.	Washington County Watershed Alliance
Jacobs Creek Watershed Association	Watersheds of South Pittsburgh
Jefferson County Conservation District	West Mifflin Area High School Environmental Club
Kiski Watershed Association	Western Pennsylvania Coalition for Abandoned Mine Reclamation
Little Sewickley Creek Watershed Association	Western Pennsylvania Conservancy
Mill Creek Coalition	Westmoreland County Conservation District
Mountain Watershed Association	West Virginia Rivers Coalition ²
Murrysville Watershed Association	West Virginia Stream Partners Program ³

^{1,3}Of the three organizations who were interviewed but not surveyed, two intended to but did not complete the survey, and one—the West Virginia Stream Partners Program—was not asked to complete a survey, was interviewed only for informational purposes, and its answers are not reflected in the data.

²West Virginia Rivers Coalition primarily works in West Virginia but participates in a number of initiatives in the Ohio River Valley, including in Pennsylvania, so its answers were not excluded.

FINDINGS

This section presents the results from survey responses and interview discussions, following the general order in which topics were introduced to participants. Alongside response statistics, it highlights key themes and challenges identified by participants. These findings set the stage for deeper discussion in the following section.

All survey results are presented as proportions of all responding organizations for that question. For some questions, further analysis was done on a subset of 28 respondents who either identify as or closely fall under the definition of a traditional watershed association (denoted by “TWA”); a significant difference was found in only one response. When discussing findings, “CWO” and related terms are used when referring to any responding organization.



Slippery Creek Watershed Coalition

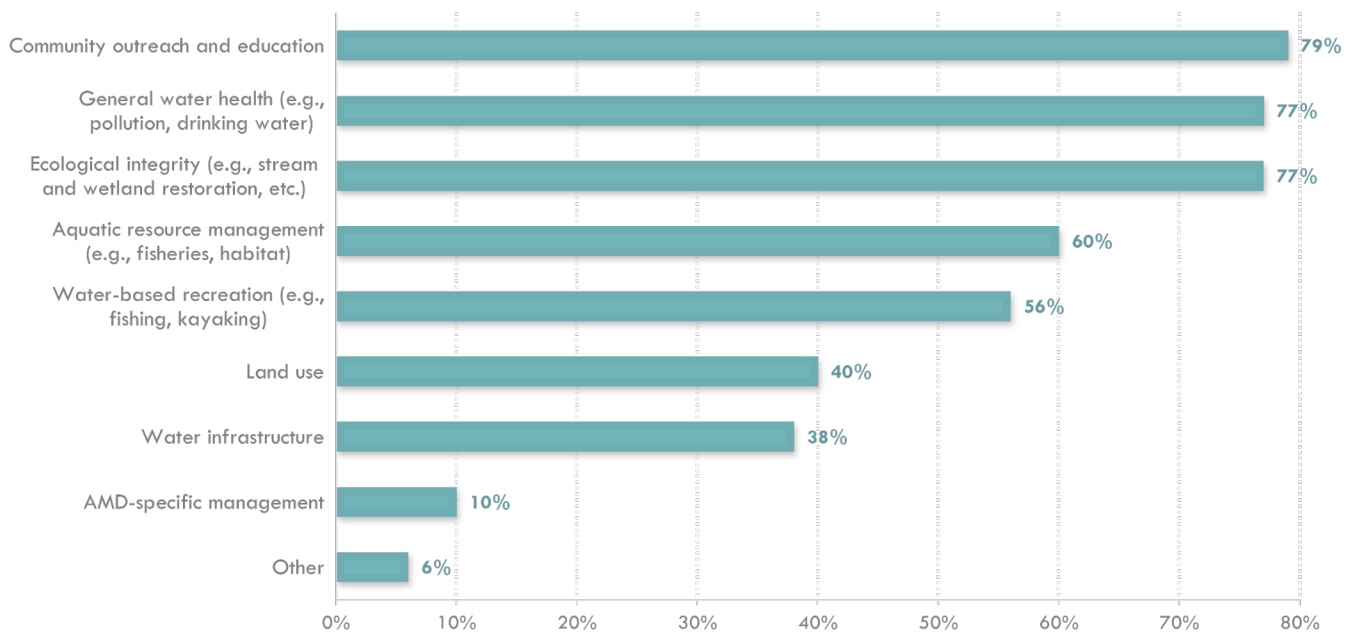
ORGANIZATIONAL DETAILS, CAPACITY, AND ACTIVITIES

Respondents were asked to provide basic information about their organizations, including their goals, structure and operations, and other details.

PRIMARY GOALS

The surveyed groups had a diverse but complementary set of goals, with many CWOs citing more than one. The most common goal was **community outreach and education**, named by 79% of respondents. Close behind were goals related to **general water quality** and **ecological integrity**—such as addressing pollution, protecting and improving drinking water, and restoring streams and wetlands—both cited by 77%. Over half (60%) emphasized **aquatic resource management** like trout hatcheries and aquatic habitat and/or **water-based recreation** (56%), including boating and fishing. Additionally, **land use** and **water infrastructure**, such as development and stormwater management, were identified as priorities by 40% and 38% of groups, respectively.

Additional goals specified included abandoned mine land and drainage reclamation, erosion/sedimentation, pollution control and permitting, riparian buffer protection, legal water access, climate change, water heritage, and community and economic development.

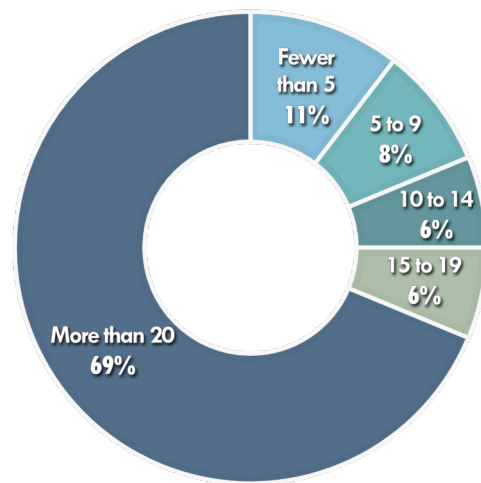


Interviews revealed a range of motivations behind the creation of the groups. Some CWOs formed around overarching stewardship values and big-picture goals, like protecting local waterways, fostering coldwater ecosystems, cleaning up litter, reclaiming industrial waterfronts for community access, and shifting public perceptions of historically polluted waters.

Other groups emerged to accomplish a single task or were prompted by an event. Examples included organizing to oppose planned development in a natural area, restoring a stream following a fish kill, refilling and rejuvenating a drained lake, preventing a mine from being permitted, installing a passive AMD treatment system, and other more short-term objectives. Once these tasks were accomplished or underway, these CWOs often broadened their focus beyond their original scopes to include activities such as connecting with subject matter experts or other watershed/conservation groups, identifying new water issues to tackle, expanding their geographic service areas, educating the public, promoting recreational opportunities on waterways, participating in policy and advocacy efforts, or simply maintaining their home watersheds.

ORGANIZATION AGE

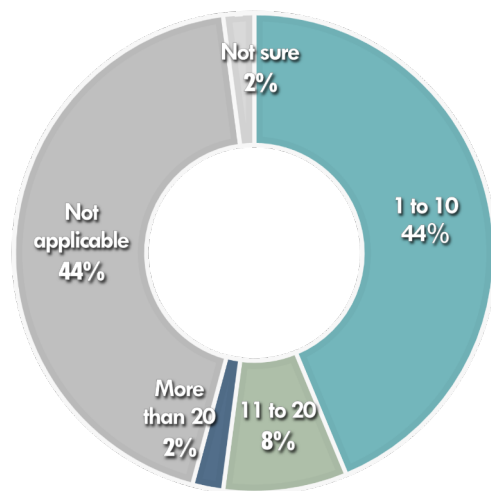
The vast majority of CWOs (69%) were **more than 20** years old. Conversely, the second and third largest categories were represented by emerging groups who have been operating for **fewer than five** years (10%) or between **five and nine** years (8%). The remainder were evenly split between **10–14** (6%) and **15–19** (6%) years old.



PAID STAFF

Most (88%) responding CWOs were either entirely run by volunteers with **no staff** (44%) or employed **10 or fewer** staff members (44%). A smaller proportion (8%) employed **11–20** staff members. Only one group employed **more than 20** staff members, though it is a well-established nonprofit and not considered a traditional watershed association.

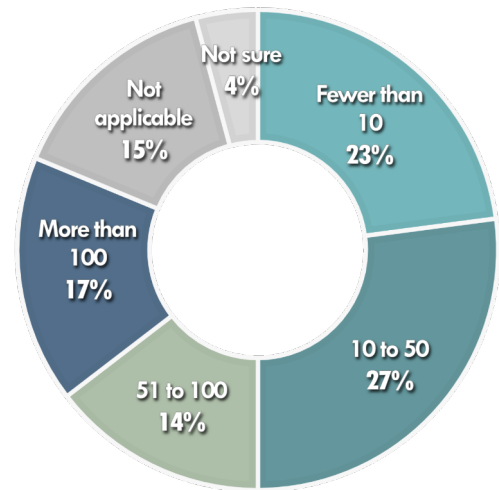
Staffing—or lack thereof—was one of the most frequently cited challenges among CWOs. While not all CWOs felt that they wanted or needed full-time paid staff, many reported the lack of sustainability, capacity, and productivity associated with a volunteer-only structure where bandwidth among members is already stretched thin. Funding for staff was also difficult to secure, with groups noting that few grants allow sufficient funds to go toward administration and personnel.



ACTIVE MEMBERS

Half of all respondents had **50 or fewer** active members, with 27% having **10–50** members and 23% having **fewer than 10**. The rest were fairly evenly distributed among the remaining size categories. Note that some respondents consider “active members” to be those paying dues, signed up on their email list, or some other metric that may not reflect true active participation numbers.

Among the 26 interviewed CWOs who remarked on a change in membership numbers over time, 42% reported growth (primarily in Allegheny, Washington, and Fayette counties), 42% maintained relatively stable numbers, and 16% saw a loss in active members. Those who reported growth (Of the five who measured growth, the average yearly increase was approximately two new members.



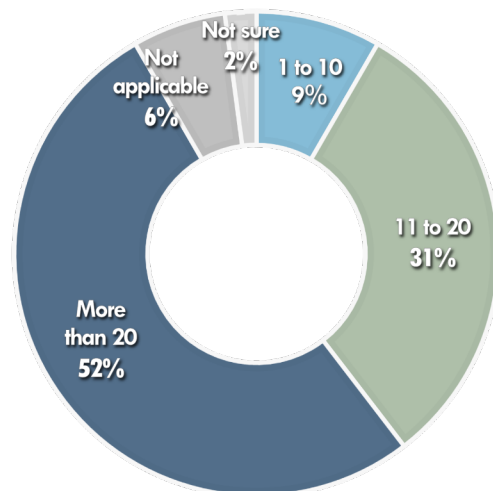
Interviewees discussed some of the contributing factors to membership fluctuations they observed.

- Several respondents specifically cited seasonal shifts in active members, where more individuals participated during warmer months when organizational activities and monitoring efforts are more feasible and appealing. This trend also affected groups that rely on students, whose involvement varied based on school schedules, academic demands, and availability.
- The COVID-19 pandemic seemed to have mixed effects. Some groups saw increased interest as people turned to outdoor recreation during lockdowns, while others became temporarily inactive and have since struggled to regain momentum.
- Membership spikes reportedly aligned with external events, such as pollution incidents and even cultural events. For instance, after a 30-year downward trend, one statewide organization enjoyed record membership numbers in the early 1990s following the release of a popular fly-fishing film; while this unprecedented upturn did not last, it did establish a more consistent base.
- Several long-standing groups reported concerns about aging membership combined with limited success in attracting or retaining younger or newer participants. As the original members age, the risk of organizational decline grows if no one steps in to carry the work forward.
- Some CWOs also struggled with passive participation, where members may attend meetings but rarely initiate projects or take on leadership roles. This often left the bulk of the work to continually fall on the same handful of individuals, contributing to burnout and limited organizational advancement.

VOLUNTEERS

Most CWOs (52%) engaged with **more than 20** individual volunteers over the course of a year, and 31% averaged **11–20** volunteers.

Volunteers often form the backbone of the work of watershed groups, and many CWOs enjoy at least some level of regular, committed volunteers outside regular members. However, sufficient manpower was consistently a top need among those surveyed and interviewed. Most CWOs stated that volunteers contribute significantly to their capacity and ability to complete projects.



Some of the general observations regarding volunteerism included the below.

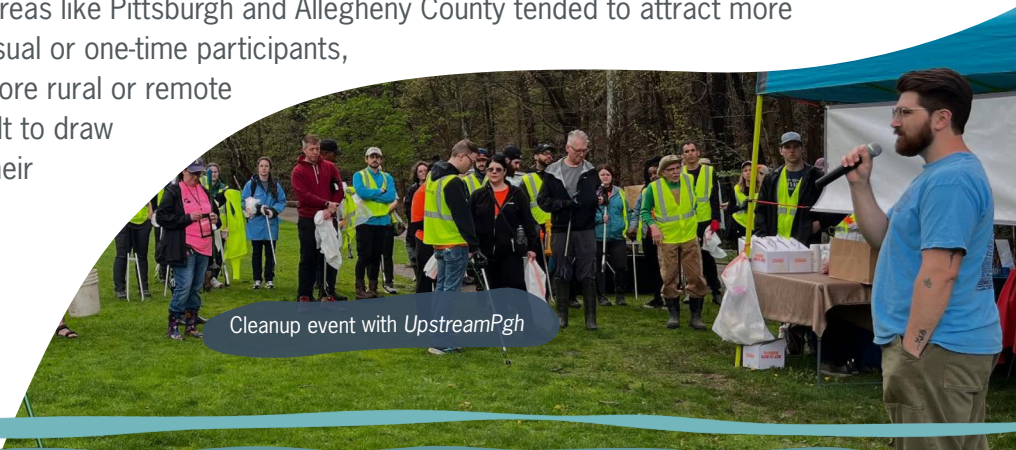
- Volunteer integration into technical tasks, particularly water quality monitoring, is crucial for many CWOs. CWOs often struggle with insufficient volunteer participation, limiting their ability to conduct frequent monitoring, track desired parameters, expand their monitoring reach, or even sustain a monitoring program.

- Retirees—and, to a lesser extent, college students in areas near universities—appeared to be the primary sources of volunteer support. Due to the physically demanding nature of many monitoring and related tasks, many CWOs expressed a strong desire to engage more students and younger adults.

- As with active organizational membership, the COVID-19 pandemic had varied impacts on volunteerism. Some groups experienced a surge in interest from people seeking outdoor or community-based activities (though this uptick did not always last), while others saw a noticeable decline in participation during and after the pandemic.

- The type of activity offered strongly influenced volunteer turnout. Various forms of cleanup events, ranging from litter removal to tire collection, were especially popular. One group, focused on waste removal, reported over 1,000 annual volunteers, attributing this success to the "tangible, visible results" of these activities, a quality they noted is often absent in other environmental work.

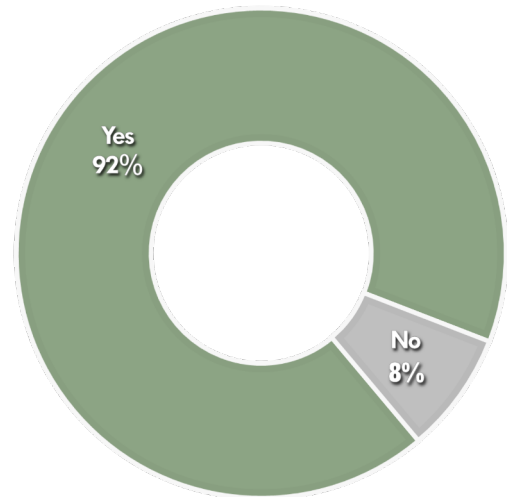
- Geography and population density further shaped volunteer engagement. Groups in more densely populated urban areas like Pittsburgh and Allegheny County tended to attract more volunteers, particularly casual or one-time participants, while those operating in more rural or remote areas found it more difficult to draw consistent support from their communities.



Cleanup event with UpstreamPgh

COMMUNITY INVOLVEMENT AND PARTNERS

Nearly all (92%) of survey respondents had **some level of involvement** with partners and/or the residents in their respective communities. These partners encompassed a wide array of organizations, including fellow CWOs, conservation districts, conservancies, nature centers, educational groups, local school districts, universities, businesses, congregations, faith communities, local governments, convention and visitors bureaus, municipal authorities, state government agencies, elected officials, and advocacy groups.



Collaborative activities. Respondents described working closely with a variety of partners—including other watershed groups, state agencies, conservation districts, water authorities, colleges, and environmental consultants—to carry out a wide range of professional activities. Some examples of activities done in collaboration with partners included the below.

- ◆ Completing stream and habitat restoration projects
- ◆ Conducting water monitoring and testing in partnership with professors, student groups, and consultants
- ◆ Coordinating with agencies and conservation organizations to host equipment trainings, mentored youth fishing events, and ecological education sessions
- ◆ Advising local water authorities on watershed issues
- ◆ Writing letters of support for CWOs engaged in environmental litigation
- ◆ Collaborating on grant applications to secure larger amounts of funding for large-scale restoration projects like fish habitat improvements
- ◆ Partnering on innovative projects, such as a feasibility study for installing an automated trash interceptor on the river
- ◆ Managing trout hatcheries in collaboration with state agencies and partner organizations
- ◆ Receiving and responding to incident reports from community members about pollution or waterway concerns; relaying that information to appropriate authorities



Collaborative challenges. Most CWOs considered their partnerships and collaboration as top priorities—and among the most rewarding aspects of their work. However, some also noted persistent challenges that hindered these efforts, listed below.

In municipally dense areas like the Pittsburgh metropolitan area, Allegheny County, and Washington County, the challenge of coordinating across multiple jurisdictions' local governments, water authorities, and waste management entities created additional complexity.

While some CWOs said this aspect is improving, they still pointed to limited communication between watershed groups, which made it difficult to know what others are working on or which streams are being monitored, raising concerns about duplicated efforts and missed collaborative opportunities.

Similarly, some respondents reported a lack of awareness about available collaborative resources, saying it is difficult to find or access information on things like joint projects, training programs, tools, or events. Likewise, some respondents offered resources that groups do not take advantage of, implying a level of disconnect.

Several groups mentioned that the idea of contacting elected officials can feel daunting to some members, which may hold them back from engaging in advocacy.

CWOs emphasized that developing strong relationships with regulatory agencies often involves building trust and shifting perceptions—helping agencies see them as collaborative partners and valuable local resources, rather than as sources of opposition.



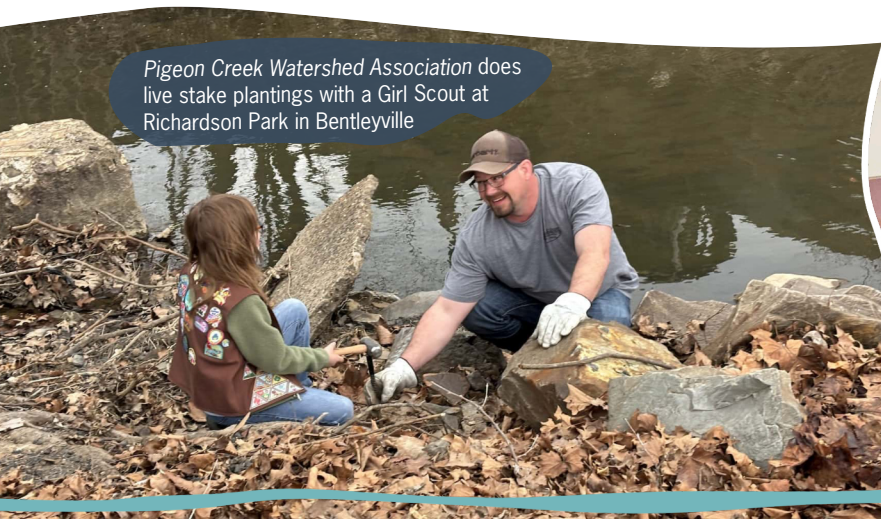
Three Rivers Waterkeeper engages with the public



PA DEP holds public meeting for comments regarding quarry in Rockwood Mountain Watershed Association

Community activities. Respondents also hosted or participated in a variety of public-facing events aimed at education, engagement, and stewardship. Some examples of these community-focused activities included the below.

- ◆ Holding and/or tabling at community festivals, municipal events, and local gatherings to spread awareness and education
- ◆ Promoting water recreation and education with activities like pop-up kayak floats, sojourns, regattas, and lock-through demonstrations
- ◆ Organizing conservation-themed summer camps for youth and teens
- ◆ Leading community cleanups focused on litter and tires both on land and water
- ◆ Producing a wide range of outreach content—newsletters, journalism, storytelling projects, videos, and social media campaigns
- ◆ Offering hands-on demonstrations such as stream sampling, electrofishing, and macroinvertebrate identification
- ◆ Coordinating trail maintenance, tree planting events, and habitat restoration with community volunteers
- ◆ Sponsoring college scholarships for high school students
- ◆ Hosting creative public events such as outdoor film festivals, firefly hikes, and after-dark 5K races
- ◆ Organizing fishing tournaments for both youth and adults
- ◆ Bringing ecological education programs, such as the Pennsylvania Envirothon and Trout Unlimited's Trout in the Classroom, to local school districts to help connect students with their environment
- ◆ Engaging corporate sponsors by organizing trail workdays and river outings for employees of companies like Google and Duquesne Light



Pigeon Creek Watershed Association does live stake plantings with a Girl Scout at Richardson Park in Bentleyville



PA Trout in the Classroom
Christine Fernandes

Community challenges. While many CWOs reported being very pleased with and motivated by their efforts to connect with their communities, they also described several challenges that limited their outreach and impact, listed below.

- ◆ CWOs said that water-based recreation, in particular, came with some unique barriers. In areas like Pittsburgh, some residents remain hesitant to engage with rivers due to lingering concerns about water quality and safety in historically industrial waterways. CWOs also noted a lack of recreation infrastructure, including few local outfitters serving major rivers like the Ohio and Monongahela.
- ◆ Legal access to waterways was another persistent issue, as many potential access sites are on land that is privately owned or restricted by industrial use.
- ◆ Some groups struggled to host events due to a shortage of volunteers, limited time among active members, and insufficient financial resources.
- ◆ CWOs also described difficulty in engaging residents who are culturally resistant or disengaged from environmental issues, making outreach and education efforts more difficult in certain communities.



Hazelwood riverfront, which has water access issues
Laura Ellis

NATURAL RESOURCE AND CONSERVATION ACTIVITIES

All contacted organizations participated in an assortment of conservation, water-based, and natural resource activities that aligned with their missions.

In addition to the efforts mentioned earlier, the following examples further reflect the breadth and diversity of work carried out by CWOs.

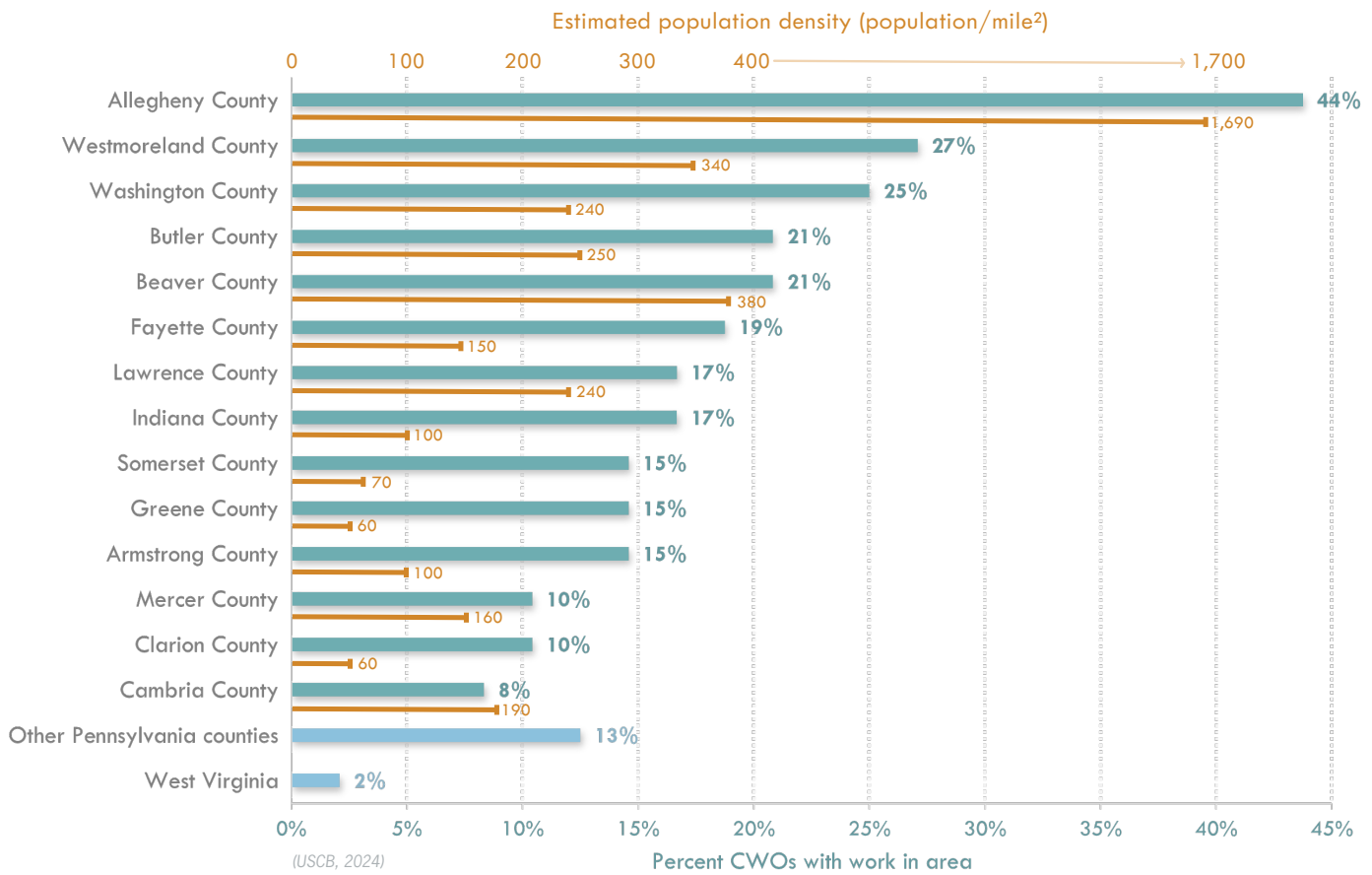
- ◆ Contributing to both land- and water-based trail plans to help increase legal stream access and outdoor recreation opportunities
- ◆ Undertaking reclamation projects that address legacy coal mine issues
- ◆ Remediating the banks and riparian buffers of streams and rivers through planting native vegetation
- ◆ Testing roadside springs for potable water
- ◆ Acquiring waterfront properties for preservation, expanded stream access, and enrollment in conservation easements for continued protection
- ◆ Addressing human health hazards from combined sewer overflow (CSO) systems
- ◆ Leading citizen science projects to monitor eastern hemlocks and track the spread of the invasive hemlock woolly adelgid
- ◆ Conducting wildlife surveys, such as for herpetofauna or for the identification of bat hibernacula and other wildlife habitat in abandoned mines
- ◆ Installing informational signage about local flora and fauna
- ◆ Engaging in smart growth and green infrastructure planning, design, and implementation
- ◆ Advancing environmental justice by promoting equitable access to clean and safe natural resources
- ◆ Promoting sustainable agricultural practices, including alternatives to commercial fertilizers

Watershed challenges. While the primary threats to the waters of the Ohio River Basin are largely established, the specific issues this sample of CWOs were working to address included: AMD, sediment and other effects from development, stream bank erosion, eutrophication, CSOs, culverts and stream crossings, flooding and infrastructure, road salt runoff, industrial pollution, trash, water/riverfront access, recreation, and public perception of historically polluted waterways.

GEOGRAPHY

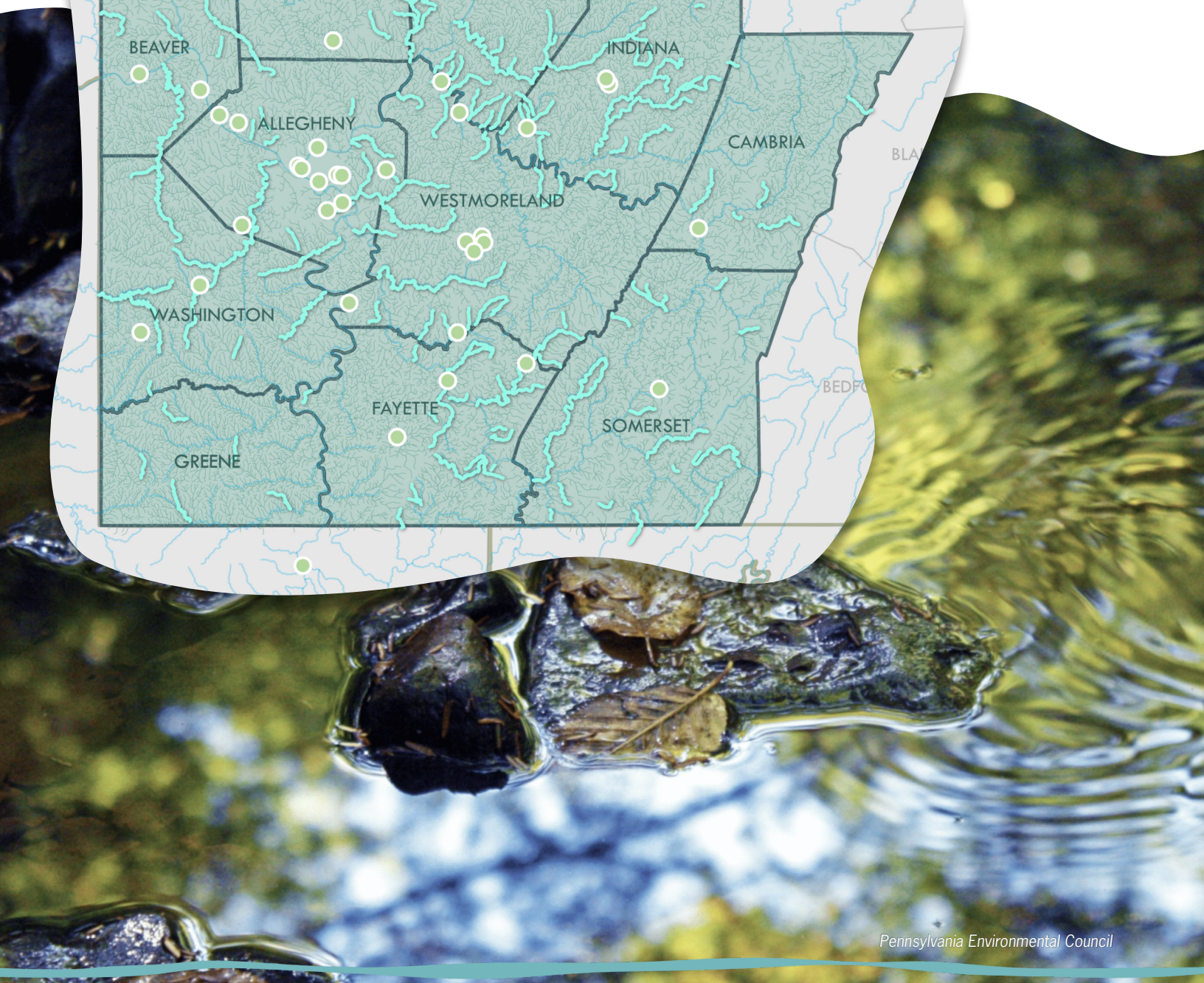
Each of the 14 counties was represented in the survey respondents in terms of service area. Many CWOs cover multiple counties with some extending outside this assessment's geography, including other counties in Pennsylvania and into West Virginia.

Allegheny County received the most coverage, with 44% of respondents reporting they conducted work there, followed by **Westmoreland** (27%) and **Washington** (25%) counties. The counties with the least coverage included **Mercer** (10%), **Clarion** (10%), and **Cambria** (8%). Note these statistics do not represent the true numbers of CWOs doing work in each county, just of those who responded to the survey.





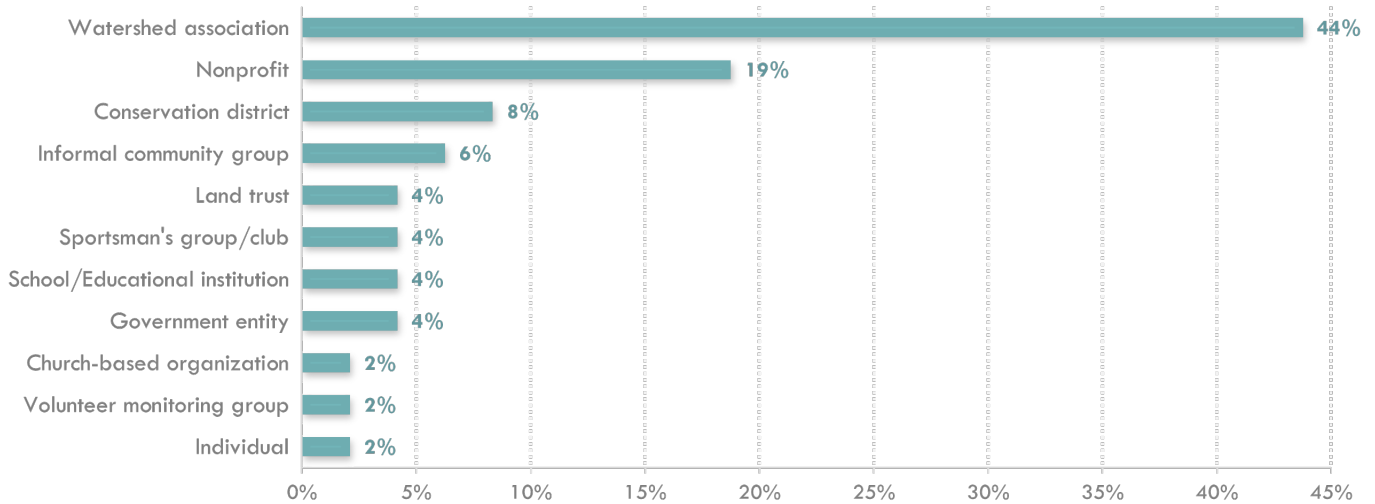
This map shows the locations (though not necessarily service area) of the responding CWOs and the streams they reported monitoring or conducting work in.



ORGANIZATIONAL CATEGORY

A wide array of organization types were represented among respondents. While many of the respondents functionally fell under multiple categories (e.g., both a sportsman’s group and a watershed association), the most commonly cited included **watershed association** (44%) and **nonprofit** (19%), with nonprofit acting as a catchall for groups with multiple focuses.

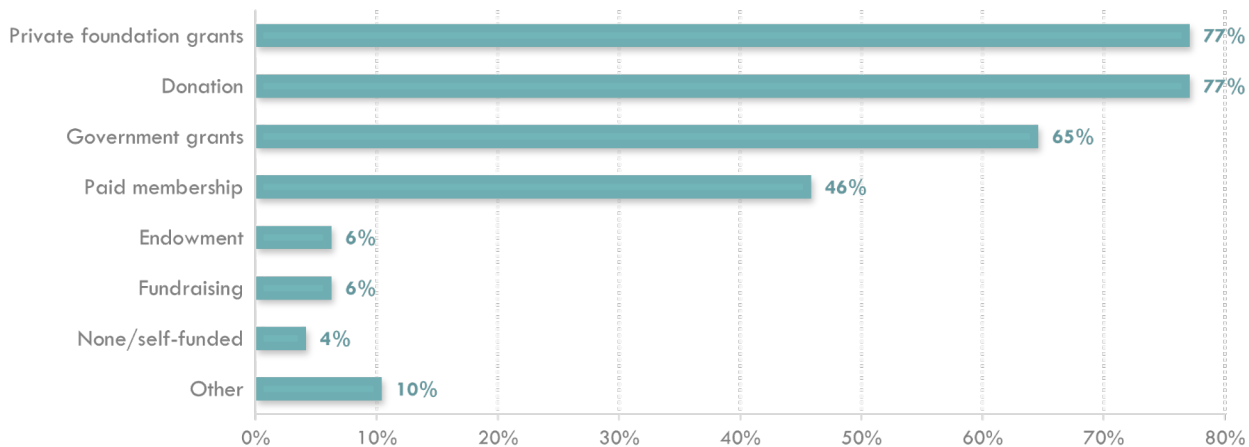
Some community groups said they would like to attain 501(c)(3) nonprofit status but lack the capacity to take on the administrative overhead.



REVENUE SOURCES

Most organizations draw from multiple revenue streams. The two most common revenue sources included **donations** and **private foundation grants**, both of which were used by 77% of respondents. **Government grants** were used by 65% of respondents, and **paid membership dues** were used by 46%. “Other” included corporate sponsorships, program revenues, partnerships, and gas well funds.

Some CWOs reported that securing grant funding can be challenging, largely due to limited time or ability for writing and managing grants. In addition, changes in the public funding landscape has caused some groups to delay or scale back planned projects.



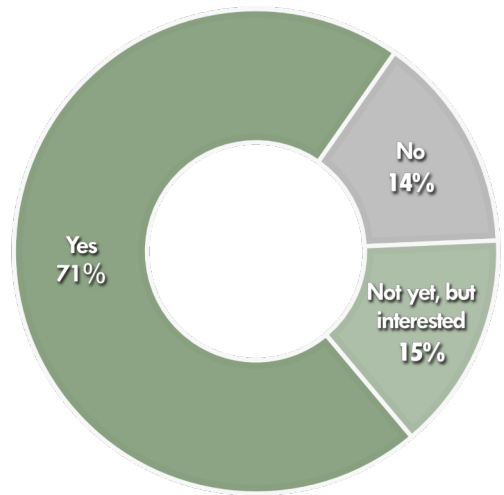
MONITORING

Many CWOs fulfill their missions effectively without monitoring water quality or other conditions. However, CWOs that do monitor support a variety of monitoring program structures, goals, and provide crucial data to government agencies, other nonprofit organizations, and educational institutions. This data helps maintain current trend awareness, facilitate early issue detection, and support the development of new testing methods and best practices.

PRESENCE OF A MONITORING PROGRAM

Nearly three-quarters (71%) of surveyed CWOs **conduct some form** of water quality monitoring. Of those who did not have a monitoring program, approximately half were interested in starting one.

Statistics in this and the "Data management" section are derived largely from the 34 groups that reported having a monitoring program. Where specified, relevant insights from interviews with these organizations are also incorporated.



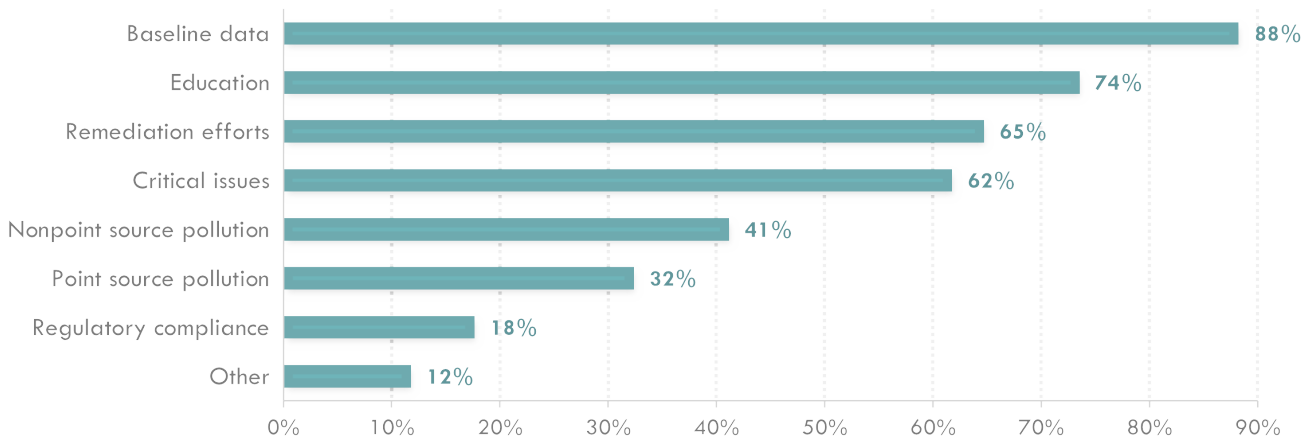
PFBC electrofishing with Connoquenessing Watershed Alliance



PURPOSE OF MONITORING PROGRAM

Most respondents reported more than one purpose for their monitoring program. Large proportions monitored to **obtain baseline data** (88%) and for **educational purposes** (74%). Additional common purposes included **supporting remediation efforts** (65%) and **monitoring critical issues** (62%). “Other” purposes specifically mentioned were for measuring impacts of green infrastructure, the efficacy of AMD treatment systems, and fish populations.

Compared to all respondents, TWAs were almost twice as likely to monitor point source pollution.



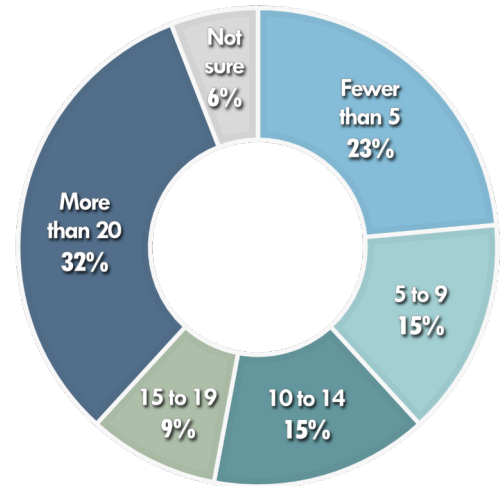
A sample of more detailed information respondents offered that highlights the variety of monitoring applications is below.

- ◆ Maintain trout hatcheries and the quality of both stocked and wild trout streams
- ◆ Assess biodiversity and ecological integrity
- ◆ Identify polluting facilities and permit violations
- ◆ Audit trash/litter amounts and types
- ◆ Determine whether publicly accessible springs used by the public contain potable water
- ◆ Test popular swimming, wading, and paddling spots for *E. coli* to see if they are safe for recreational use (e.g., Swim Guide, Swimmable Waters)
- ◆ Assess the impacts of green infrastructure projects
- ◆ Monitor sodium chloride spikes from road salt (e.g., Izaak Walton League’s Salt Watch)
- ◆ Demonstrate monitoring techniques for educational purposes
- ◆ Evaluate the effectiveness of AMD treatment systems



AGE OF MONITORING PROGRAM

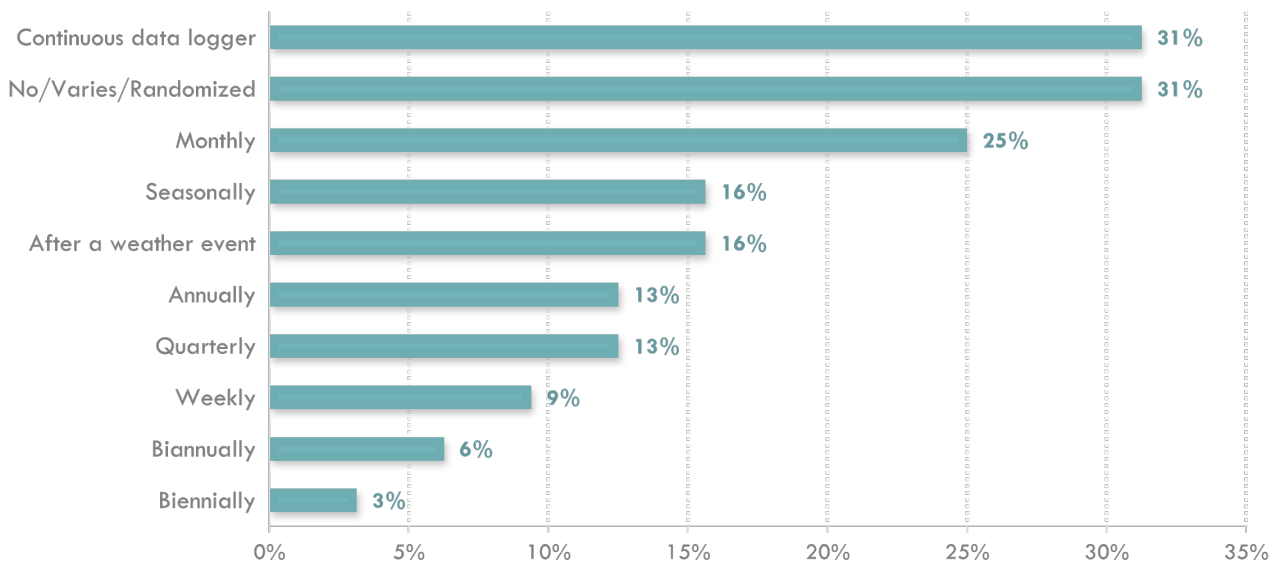
Most monitoring programs had either been operating for **more than 20** years (32%) or **fewer than five** years (24%). Other programs were either **fewer than nine** (15%), **10–14** (15%), or **15–19** (9%) years old.



MONITORING FREQUENCY

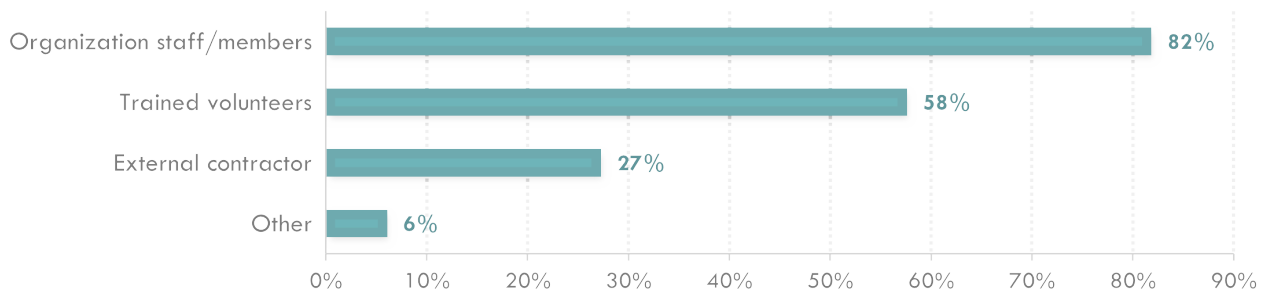
A variety of monitoring frequencies were used by respondents. The two most commonly used frequencies were **continuous** (such as through data loggers) and **random** (i.e., intentionally randomized, as needed, or as resources were available), both at 31%. **Monthly** (25%) was the next most used interval. More frequent (**weekly**, 9%) and less frequent (**biannually**, 6%; **biennially**, 3%) were the least commonly used intervals.

Many CWOs desired to monitor more often than they are currently able to due to lack of capacity.



INDIVIDUALS CONDUCTING MONITORING

Most monitoring was done by respondents' **own staff or members** (82%), but **trained volunteers** (58%) and **external contractors** (27%) were also used. Many groups used a combination of different individuals to conduct monitoring.



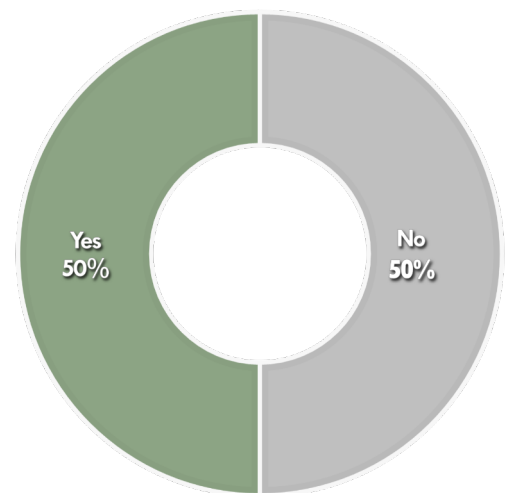
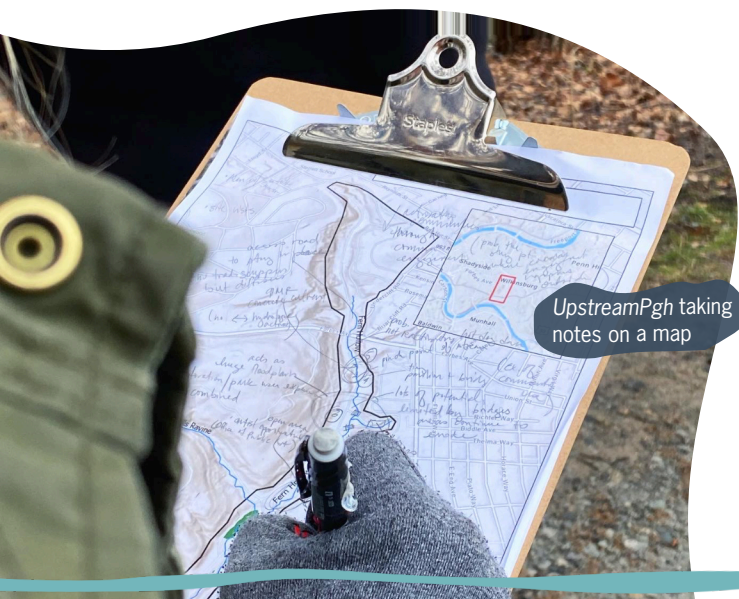
According to interviews, just over half (53%) of those who conducted monitoring were **regulars**, meaning the same individuals did the monitoring each time. Approximately 14% were cited as **mostly or somewhat regular**, and one-third did not specify the regularity of their samplers.

Just over one-third (34%) of groups said they had **four to six** individuals who conducted monitoring, and about one-fifth (21%) of groups had only **one or two** samplers. Four groups said they had a pool of **10 or more** samplers.

Several groups employed third parties for their monitoring programs, including other watershed associations, student organizations, or consulting firms.

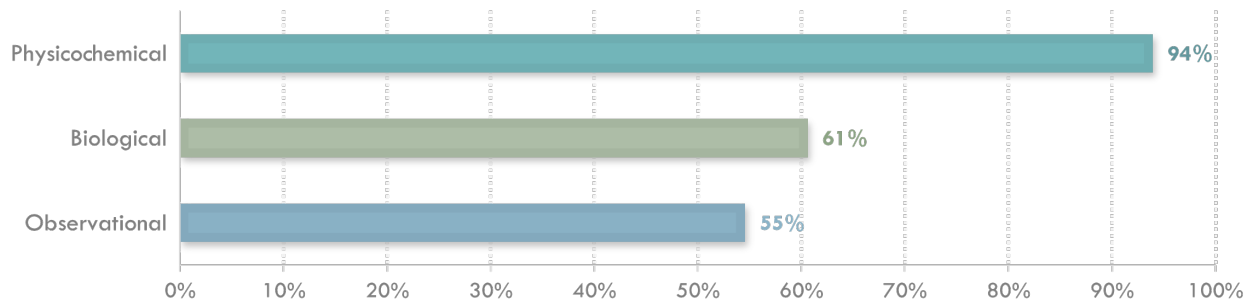
GEOSPATIAL INFORMATION SYSTEMS (GIS)

Respondents were evenly split on whether they used GIS in their work.



PARAMETERS MONITORED

Many different parameters were monitored among surveyed CWOs. The most common parameter category monitored was **physicochemical** (94%), and over half of respondents monitored **biological** (61%) and/or **observational** (55%) parameters. Most groups monitored more than one category of parameters.



The most frequently monitored parameters for each category are listed below. The full list of monitored parameters and their corresponding rates of use are on the following page.

PHYSICOCHEMICAL

- Conductivity | 81%
- pH | 81%
- Temperature | 75%
- Alkalinity | 63%
- Iron | 63%

BIOLOGICAL

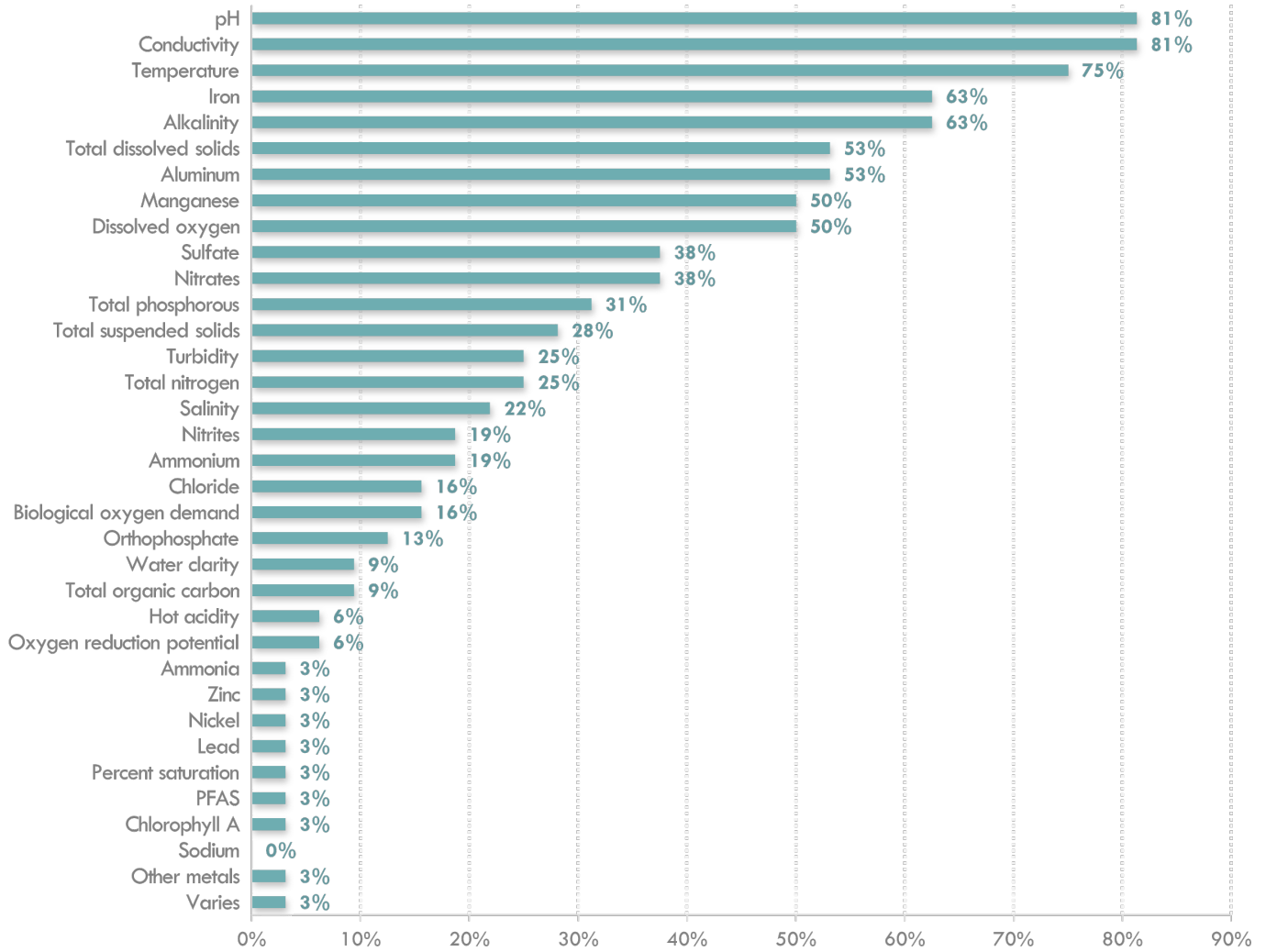
- Benthic macroinvertebrates | 57%
- Fish/Fish tissue | 33%
- Bacteria | 20%

OBSERVATIONAL

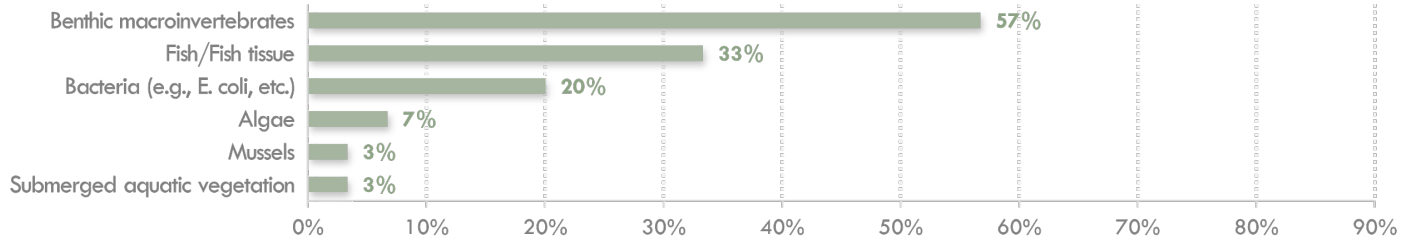
- Flow rate/Water level | 68%
- Stream bed and bank | 55%
- Riparian buffer | 45%
- Trash/Debris | 36%

Brook trout
Mountain Watershed Alliance

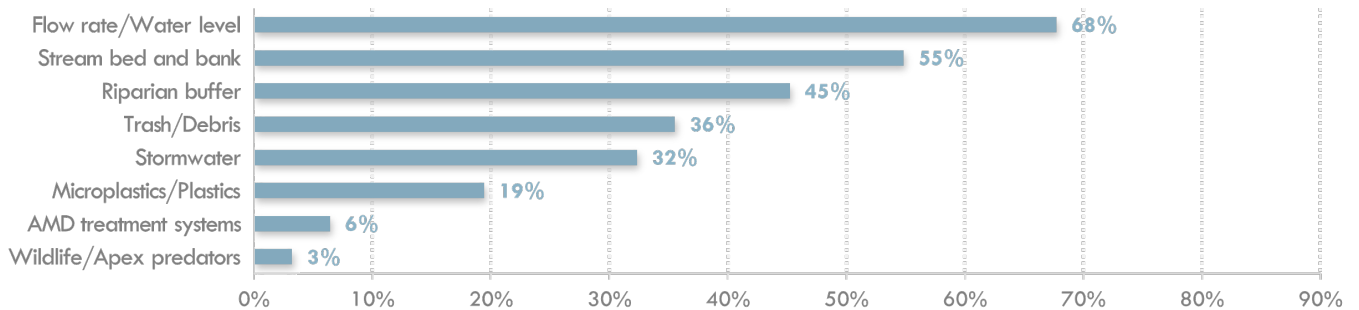
PHYSICOCHEMICAL



BIOLOGICAL

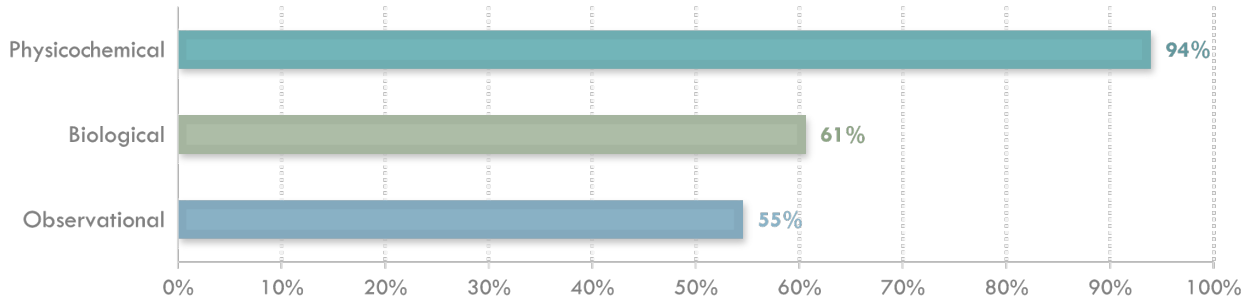


OBSERVATIONAL



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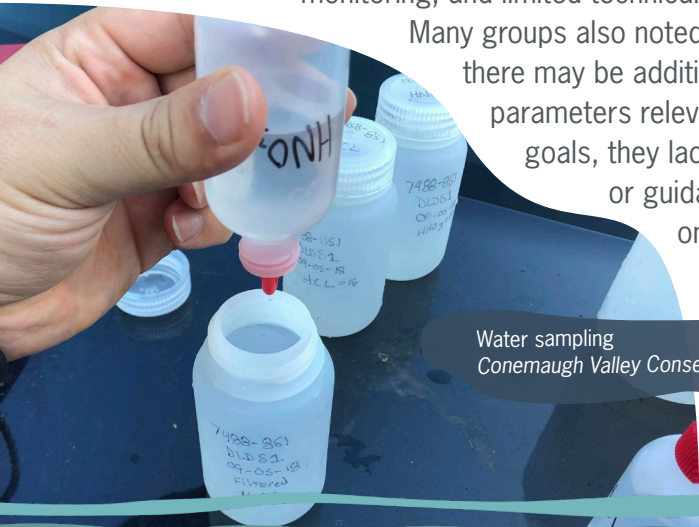
Additional data collected by some groups included surveys of Allegheny hellbenders and freshwater sponges, testing for per- and polyfluoroalkyl substances (PFAS), soil and air quality monitoring, tracking mine pool water levels to anticipate blowouts, observing visitor numbers and activities at recreational sites, monitoring hatchery fish feed quantities, assessing tree canopy cover for shading potential, recording weather conditions, measuring water captured by green infrastructure, and tracking invasive species.

Several CWOs expressed interest in expanding their monitoring to include new parameters such as volunteer demographics, 6PPD-quinone runoff from tires, impacts of hydraulic fracturing ("fracking") waste, macro pebble counts, streamgaging, and other parameters previously mentioned that they currently lack the capacity to monitor.

Barriers to incorporating these additions included insufficient funding for necessary equipment or lab analysis, lack of available personnel to conduct the monitoring, and limited technical expertise.

Many groups also noted that while there may be additional parameters relevant to their goals, they lack the knowledge or guidance to identify which ones would be most valuable to track.

An emerging threat. Vehicle tires contain the chemical 6PPD which forms 6PPD-quinone upon reacting with ozone in the air. In addition to the practice of illegally dumping tires in and near waterways, 6PPD-quinone particles are released from tire breakdown on roads and transported to water bodies via stormwater runoff. New research shows 6PPD-quinone is very toxic to aquatic life, especially salmonid fish like trout. Researchers are actively addressing information gaps about 6PPD-quinone. (U.S. EPA, 2024)



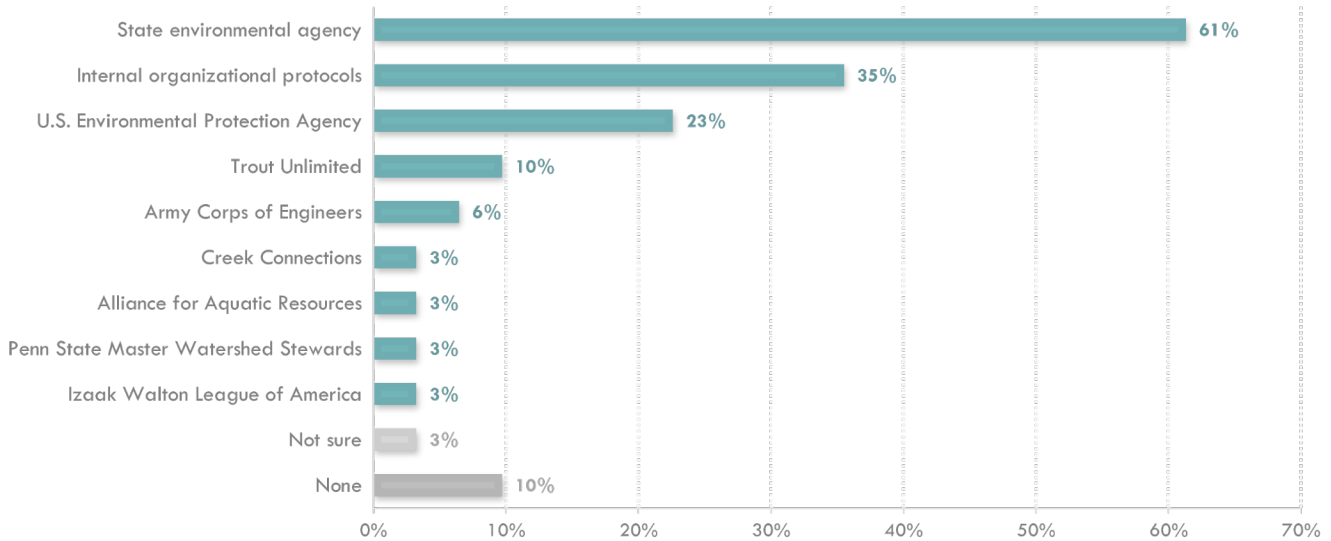
Monitoring parameters by county. Additional analysis was done to determine whether certain counties had distinct monitoring patterns that might reveal site-specific water issues. Significant differences were found in 11 of the 14 counties studied, each showing at least one parameter that was monitored at a notably different rate than the regional average. The table below lists these findings. For statistical methods and full results, see Appendices C and D.

COUNTY	PHYSICOCHEMICAL	BIOLOGICAL	OBSERVATIONAL
Allegheny	Nitrites Total phosphorus Turbidity	Bacteria Benthic macroinvertebrates Fish/fish tissue	<i>No parameters were statistically significant</i>
Armstrong	Aluminum Manganese	Fish/fish tissue	
Beaver		Fish/fish tissue	
Butler			
Cambria		Benthic macroinvertebrates	
Clarion	Aluminum	Benthic macroinvertebrates Fish/fish tissue	
Fayette	Aluminum Total dissolved solids Total suspended solids Total nitrogen Total phosphorus	Fish/fish tissue	
Greene	Total dissolved solids	Fish/fish tissue	
Indiana		Benthic macroinvertebrates Fish/fish tissue	
Lawrence			
Mercer			
Somerset	Aluminum	Benthic macroinvertebrates	
Washington		Benthic macroinvertebrates	
Westmoreland		Benthic macroinvertebrates	



PROTOCOLS

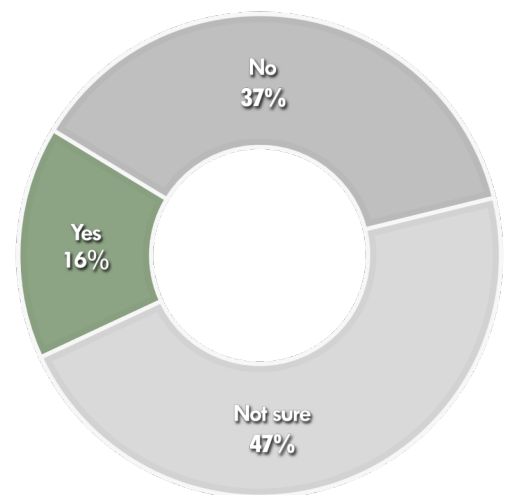
CWOs reported employing a variety of protocols, often using multiple approaches. Over half of respondents used protocols issued by **state environmental agencies** such as Pennsylvania Department of Environmental Protection (PA DEP) and Pennsylvania Fish and Boat Commission (PFBC) (55%), 19% used **EPA protocols**, and 36% used their organization's own **in-house protocols**, which had varying levels of formality. However, 10% reported using **no official protocols**.



Several CWOs noted they were interested in or in the process of formalizing their methods and creating monitoring guides. Some of those with internal protocols were unsure of their validity. Additionally, some CWOs who claimed to use a standardized protocol in the survey appeared to more frequently use internal or informal protocols in practice.

QUALITY ASSURANCE PROJECT PLANS (QAPPS)

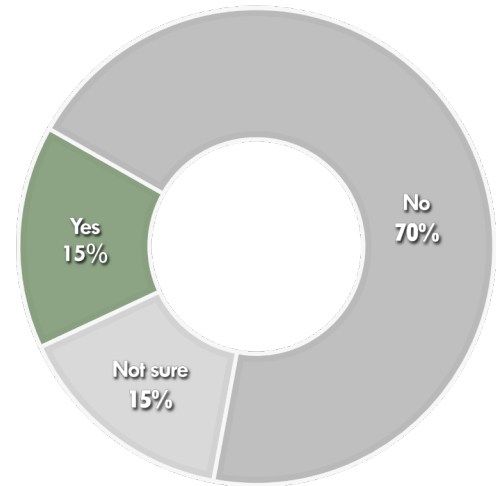
A QAPP is a formal planning document that details how an environmental monitoring project must collect and analyze data in order to ensure the quality and credibility of results; QAPPs are required by projects funded by entities such as the U.S. EPA. Only 16% of groups who responded claimed to **use a QAPP**. Nearly half (47%) were **not sure** if their organization followed a QAPP, and approximately 37% stated they **did not use one**.



EQUIPMENT TRAINING PROGRAM

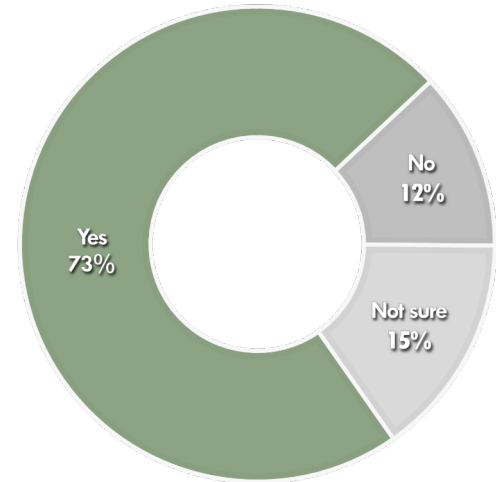
Only 15% of surveyed CWOs reported having a **formal, ongoing** equipment training program, while 70% said they had **none**.

However, according to those who specified in interviews, at least 58% of monitoring groups had **some level** of training among their samplers even without the presence of a recurring or official program. In some cases, training was provided by entities like PA DEP or PFBC or by fellow CWO members or organizations who were certified or experienced.



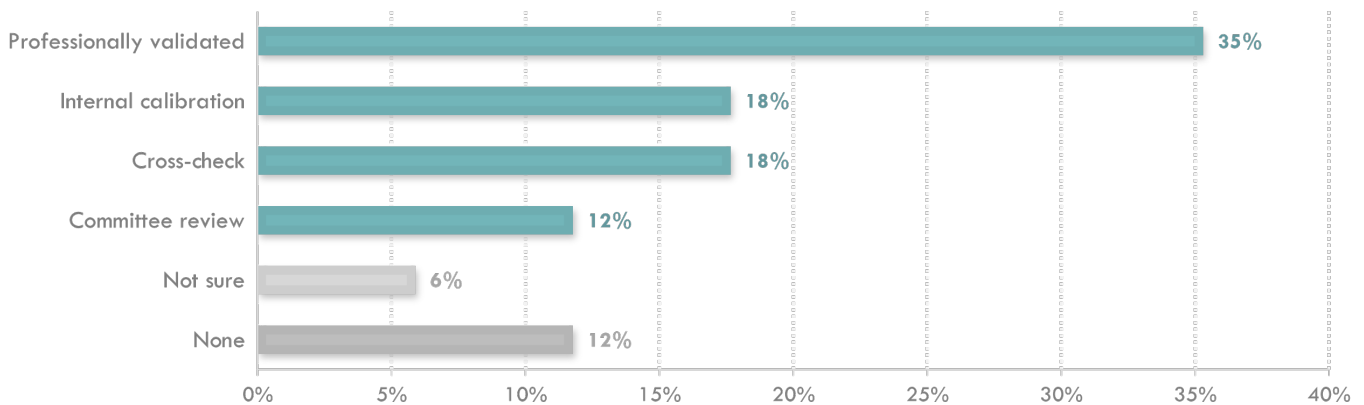
EQUIPMENT CALIBRATION

Nearly three-quarters (73%) of respondents reported that they **regularly calibrate** their monitoring equipment while 12% **did not**.



DATA VALIDATION

Of the 17 interviewees who remarked on whether or not they validated their data after collecting it, 35% said their data is **professionally validated** (such as in a lab), 15% **cross-checked** with different tests, 15% relied on **internal calibration**, and 10% had a **committee** review their data (note that four CWOs reported using multiple methods). However, 10% stated they **did not** review their data for accuracy, and 5% said their organization **likely did** but were not sure.

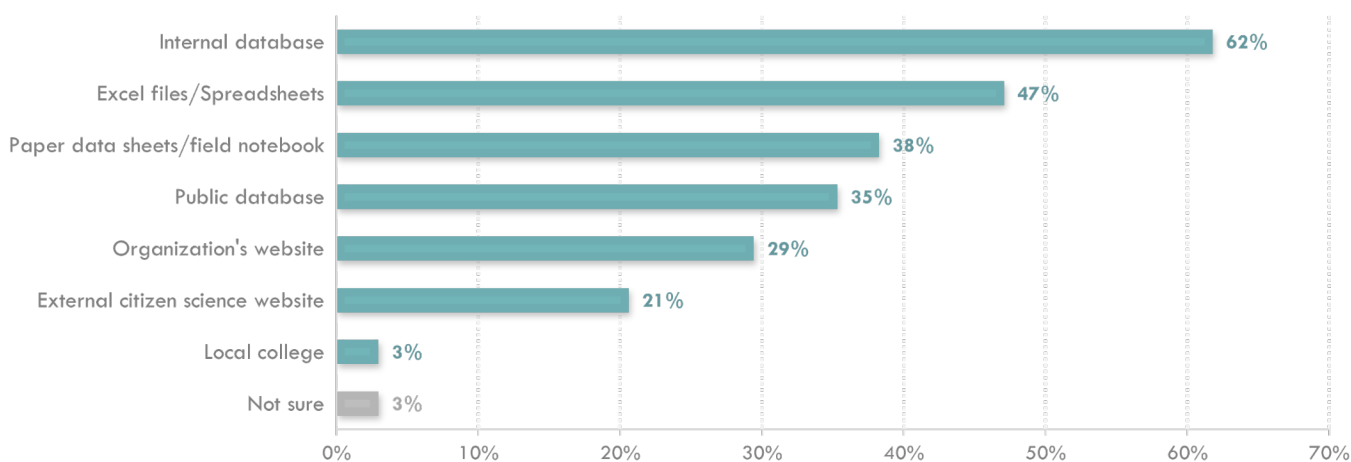


DATA MANAGEMENT

This section details the management of collected data, including storage methods, sharing practices, and how data is utilized to enhance watershed stewardship.

LOCATION OF DATA

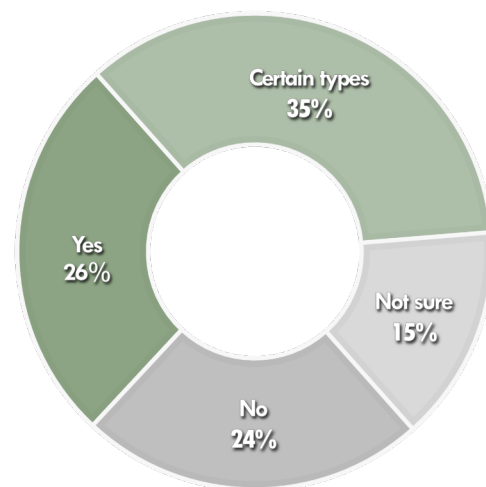
Many organizations housed their data in multiple locations, with the most common locations being an **internal database** (62%), **internal spreadsheets** (47%), and **hard-copy paper data sheets** or **field notebooks** (38%).



DATA AVAILABILITY

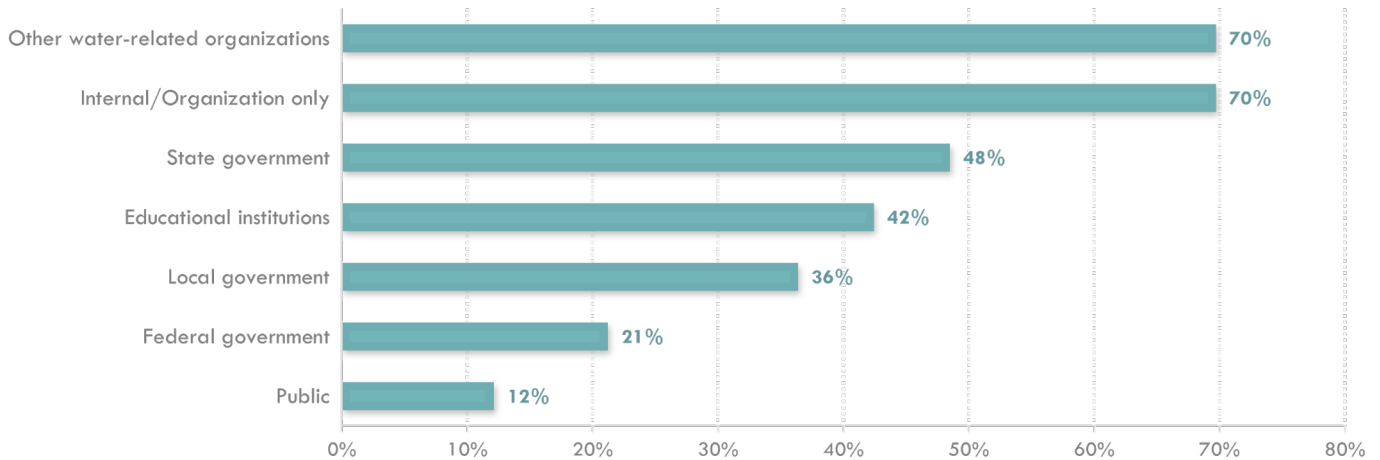
More than half (61%) of respondents reported that they make **all or some** of their monitoring data available to the public, whereas approximately 24% keep their data **internal**, and 15% were **not sure** whether their organization's data was publicly available.

For those who make their data available, platforms included CWOs' own websites, Datashed, Three Rivers Quest (3RQ)'s Watershed Assessment Tool for Education & Research Studies (WATERS) portal, Esri ArcGIS Online, in published reports, state databases, local conservation districts, and citizen science sites such as Swim Guide, iMapInvasives, iNaturalist, and Monitor My Watershed by way of the Stroud Water Research Center. Additionally, some CWOs said they provide data upon request.



DATA USE

Respondents noted that a variety of entities used the data they collected to some degree. The most prevalent users were **other water-related organizations** (73%) or their **own organization** (70%). Many organizations shared their data with different levels of government as well, with the **state** being the most common (49%), as well as **educational institutions** (46%).



On top of supporting the goals of their monitoring programs (see “Purpose of monitoring program”), additional ways CWOs and other organizations used data included the below.

- ◆ Track against goals and inform organizational strategies
- ◆ Support grant applications
- ◆ Ensure certain water quality standards are maintained
- ◆ Detect emerging problems in order to inform the public and authorities
- ◆ Support litigation efforts against polluting facilities
- ◆ Influence local and state policy
- ◆ Petition for higher stream classifications
- ◆ Assess efficiency of and identify maintenance issues in AMD treatment systems
- ◆ Engage the public with citizen science and educational programs



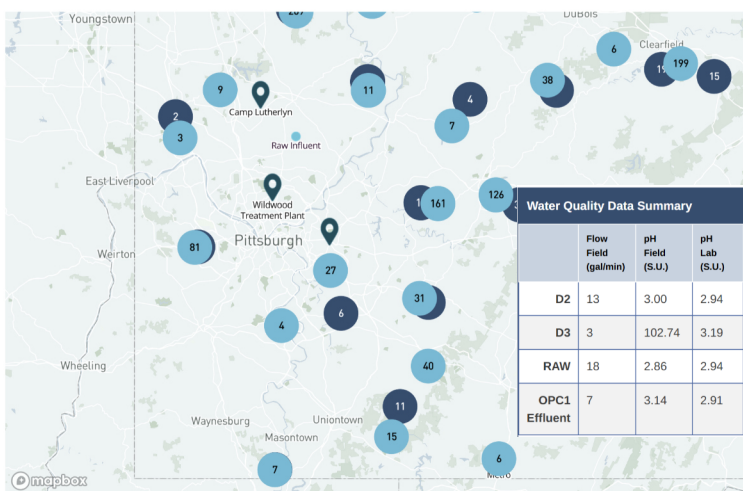
In interviews, CWOs cited several capacity, financial, technical, and cultural challenges with data management.

- ◆ The most commonly reported issue with data management was capacity. Data entry usually fell on one individual in an organization who often did not have the time to devote to the lengthy task of organizing, compiling, and inputting data.
- ◆ Data analysis and interpretation were cited as obstacles, especially with how to best convey data in an engaging and digestible manner for the public.
- ◆ Technical ability was a challenge, particularly for groups with older members confronted with a rapidly changing technological landscape. A complaint was that government agencies or other entities managing data platforms often assumed user proficiency without providing adequate guidance or explanation for navigating their programs.
- ◆ Some members resisted the implementation of modern systems to streamline data management, preferring familiar, albeit obsolete, methods (e.g., outdated websites, paper-based data storage and sharing, etc.).
- ◆ Several CWOs stated that they would like to share their data with the public but were not sure which platform to use. Still others had no real desire to make their data public and were content with internally using their data to ensure they are meeting their goals.
- ◆ Maintenance costs with long-term data hosting and difficulty with finding funding that stretches over a long period of time to cover were also mentioned.
- ◆ While CWOs provided a range of examples of how their data is used, some also felt they could be doing much more with it.



PROJECTS MAP

STREETS
 TOPOGRAPHIC
 SATELLITE
 TOGGLE PROJECTS
 TOGGLE SAMPLE POINTS



Excerpts from **Datashed**, *Stream Restoration Incorporated's* public database platform for water quality data, reports, schematics, drawings, and other documents, primarily for AMD treatment systems

	Flow Field (gall/min)	pH Field (S.U.)	pH Lab (S.U.)	ORP Field (mvolts)	DO Field (mg/L)	Temp Field (C)	Cond Lab (umhos/cm)	Alkalinity Field (mg/L)	Alkalinity Lab (mg/L)	Acidity Lab (mg/L)	T. Fe Lab (mg/L)
D2	13	3.00	2.94	--	1.98	20.1	6,540	0	0	4,973.4	1,055.78
D3	3	102.74	3.19	--	7.77	2.5	1,358	0	0	450.7	94.72
RAW	18	2.86	2.94	364	6.42	12.5	5,413	0	0	3,948.0	579.26
OPC1 Effluent	7	3.14	2.91	234	9.30	3.0	3,232	0.50	0	1,845.0	187.34

STRENGTHS, CHALLENGES, AND NEEDS

The following statistics were compiled from answers to open-ended survey questions and categorized by recurring themes. Applicable interview responses were also coded and included.

STRENGTHS AND SUCCESSES OF MONITORING PROGRAM

Survey. Even while contending with limited resources and capacity, respondents shared a wide range of positive impressions and accomplishments related to their organizations and monitoring programs. Many CWOs (36%) identified the **dedication of their people**—motivated staff, volunteers, and members—as their most valuable asset. While small in number, these individuals brought essential value to their organizations through a broad mix of skills, fresh ideas, institutional knowledge, and sustained commitment that made the work possible.

Nearly as many CWOs (33%) pointed to the progress they have made toward **accomplishing their goals**, such as transforming a formerly polluted waterway into a state-designated Wild Trout stream, confirming significant improvements to AMD-impacted waters, holding polluters accountable in court, and spurring government agencies to pursue specific issues.

Strong partnerships and collaborative networks, also noted by 33%, have helped many CWOs expand their impacts beyond what they could achieve alone. Additionally, 26% of groups expressed pride in their **longevity and sustainability**, referencing decades-old programs in education and water quality monitoring that have been passed down through multiple generations of volunteers, and the wealth of local knowledge earned through years of consistent data collection.

Other responses emphasized innovative approaches to **practice and policy** (18%), including investigating the feasibility of a passive trash interceptor and exploring the study of urban sewersheds. Also mentioned by 18%, **effective educational initiatives** for students and the public helped to garner community goodwill and support, provide engaging experiences for hundreds of local youths, and challenge negative perceptions of urban rivers as a recreational asset. A few respondents (8%) also noted recent strides in **formalizing monitoring protocols**, establishing training systems, and developing plans, helping their work become more consistent and reliable.



PFBC Cooperative Nursery with Chestnut Ridge Trout Unlimited Chapter

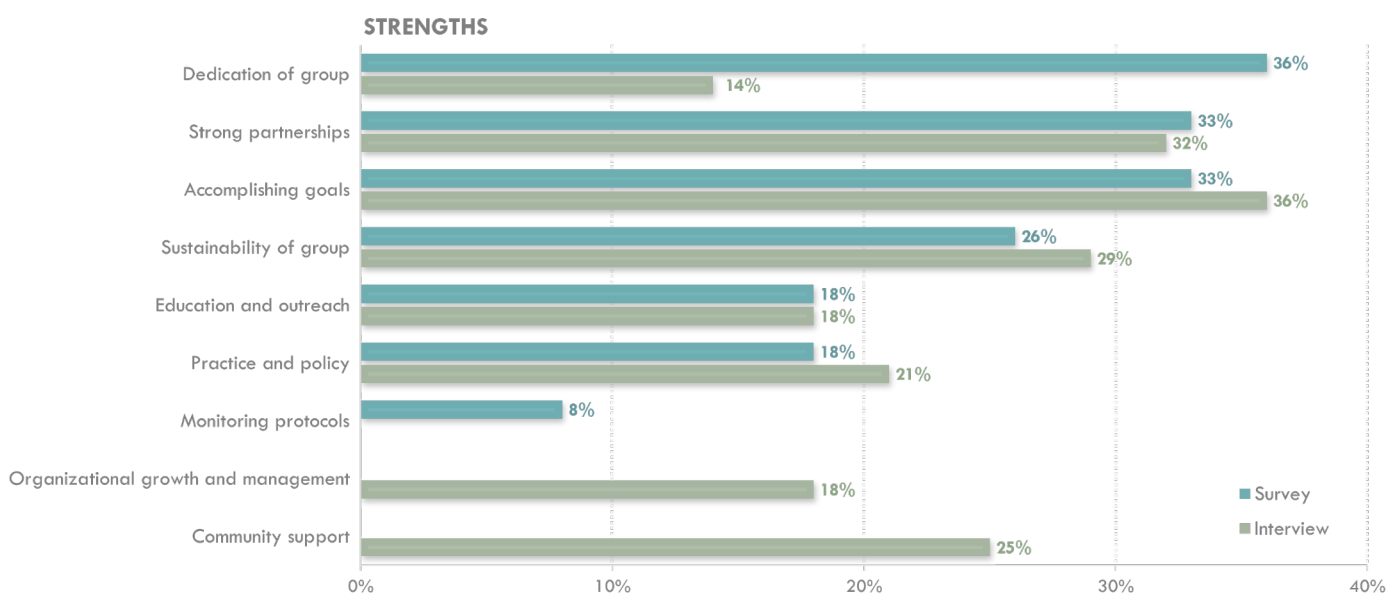
Interview. Interviews with CWOs further revealed an underlying sense of optimism and pride, even in the face of persistent difficulties. Progress toward organizational goals was highlighted by 36% of respondents and included successes such as enacting long-term policy change to fund restoration projects in the Ohio River Valley, preserving sensitive areas from development, and restoring an endangered trillium species to a reclaimed mine land.

Partnerships and collaboration with entities like state agencies, local governments, conservation districts, nonprofits, and other CWOs was emphasized by 32% of respondents, noting success in building mutual trust and incubating ideas. Additionally, 29% identified **longevity and sustainability** as a key attribute, noting portfolios of active projects at different stages and consistent operation over decades with minimal governmental support.

One-quarter of the respondents underscored the importance of **community support**, with examples being consistent attendance with activities and events, positive public perception, and general goodwill from disparate stakeholders. Just over one-fifth (21%) highlighted **practice and policy**, citing success in influencing agencies and policymakers with collected data, advocating for a new total maximum daily load (TMDL) parameter, and the extra care taken in organizational safeguards, such as retaining multiple legal resources for different applications.

Education and outreach was mentioned by 18%, with respondents pleased with the reception of unique initiatives such as an art-based perceptual ecology course, bioblitz events, and nighttime hikes; collaboration between a high school club and the local municipal authority; and successful introductory events for water-based recreation. **Organizational growth and management**, cited by 18% of CWOs, encompassed efforts to expand monitoring to additional watersheds and increase the efficiency of organizing volunteers, executing events, and watershed monitoring activities.

Finally, 14% of interviewees stressed that **motivated and committed members, volunteers, and staff** were a crucial strength, acknowledging their consistent, dedicated, and engaged network of volunteers and members. While many CWOs said they struggle with recruiting new people, they often have a small, core group that is able to lead initiatives and accomplish meaningful work.



CHALLENGES AND LIMITING FACTORS OF MONITORING PROGRAMS

Survey. The most common challenge reported by survey respondents was a lack of **human capital and capacity** (62%), an overarching challenge that permeates a number of issues, including internal staffing/membership constraints, an aging volunteer/membership base, the labor-intensive nature of monitoring, difficulties in recruiting and retaining volunteers, as well as other challenge categories identified below. Closely linked to capacity was **insufficient funding** (35%), which is another foundational barrier that underpins other difficulties and impacts the ability to cover staff time, equipment purchases, laboratory testing, and other monitoring and operational expenses.

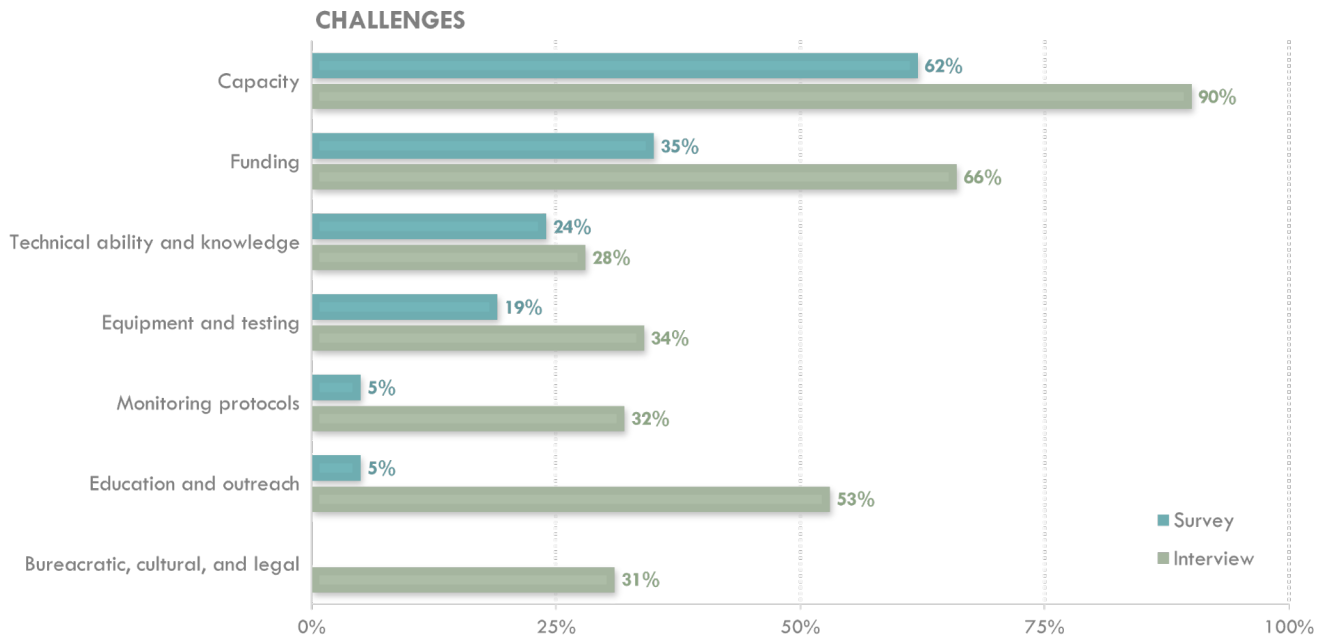
Approximately one-quarter of respondents (24%) cited challenges with **technical ability and knowledge**, including designing effective monitoring programs, performing specific tests, and proper data interpretation or management. Other issues included inadequate or **outdated equipment and testing limitations** (19%), a **lack of formal monitoring protocols or consistent methods** (5%), and difficulties with **community outreach and education**, including presenting data in an engaging way (5%).

Interview. Interviews affirmed many of these concerns and offered additional insight into their practical implications. A significant majority (90%) of interviewees reported struggling with **capacity**, attributing this dearth to the previously mentioned constraints as well as inadequate time to support both administrative and watershed activities. **Funding limitations** were a predictably prevalent issue, cited by 66% of groups. Many CWOs highlighted challenges with identifying opportunities, writing and submitting proposals, and managing awarded grants, the restrictions of what grants will fund (e.g., often not administration or equipment) as well as with competing with similar or allied organizations for the same financial resources.

More than half (53%) of the discussions touched on problems with **community outreach and education**. This included difficulties attracting new—and particularly younger—people; effectively marketing their organizations both in person and online; and successfully raising awareness and educating their communities about watershed issues, especially among uninterested individuals or landowners whose specific land use could negatively affect the watershed.

Access to **equipment and testing** was frequently mentioned (34%), which was limited not only by general funding shortages but also by skyrocketing lab fees, the relatively few options for local labs, and concerns about the reliability of lab data. Approximately 31% of interviewees cited broader **bureaucratic, cultural, or legal** obstacles. Examples included imperfect permitting processes, cultural resistance to either organizational changes or environmental initiatives, navigating multiple municipalities and zoning ordinances in highly fragmented geographies, difficulties engaging with large or adversarial industries, and exclusion of water resources from governmental budgets and planning.

Finally, 28% of interviewees stressed deficiencies in **technical ability and knowledge**. These gaps were related to using monitoring tools, addressing specific ecological problems, or navigating limited training and planning resources.



EXTERNAL SUPPORT NEEDS

Survey. To help the H2O Water Network prioritize its support efforts, CWOs were asked what kind of assistance would be most valuable to their work. While the survey responses varied, many echoed the same core challenges they had previously identified. Two of the most frequently cited needs were for **organizational capacity building** (41%) and **funding and grant support** (38%). These fundamental issues often underlie other barriers and may contribute to or compound challenges in other areas.

Beyond those top needs, several more specific forms of support emerged. Along with funding, 38% of respondents expressed a need for **technical assistance**, including training opportunities, designing restoration or monitoring projects, selecting water quality parameters, conducting lab analyses, obtaining and using equipment, and analyzing and interpreting data.

The importance of **collaboration and resource sharing** was highlighted by 19%, especially in coordinating efforts or accessing shared service providers. **Community outreach** was also noted in 19% of responses, reflecting a common desire to spur public interest, and strengthen local involvement.

Other notable needs included **administrative support** (12%)—such as help with financial management, securing and/or maintaining nonprofit status, and operational logistics—and **legal, policy, or advocacy assistance** (7%).

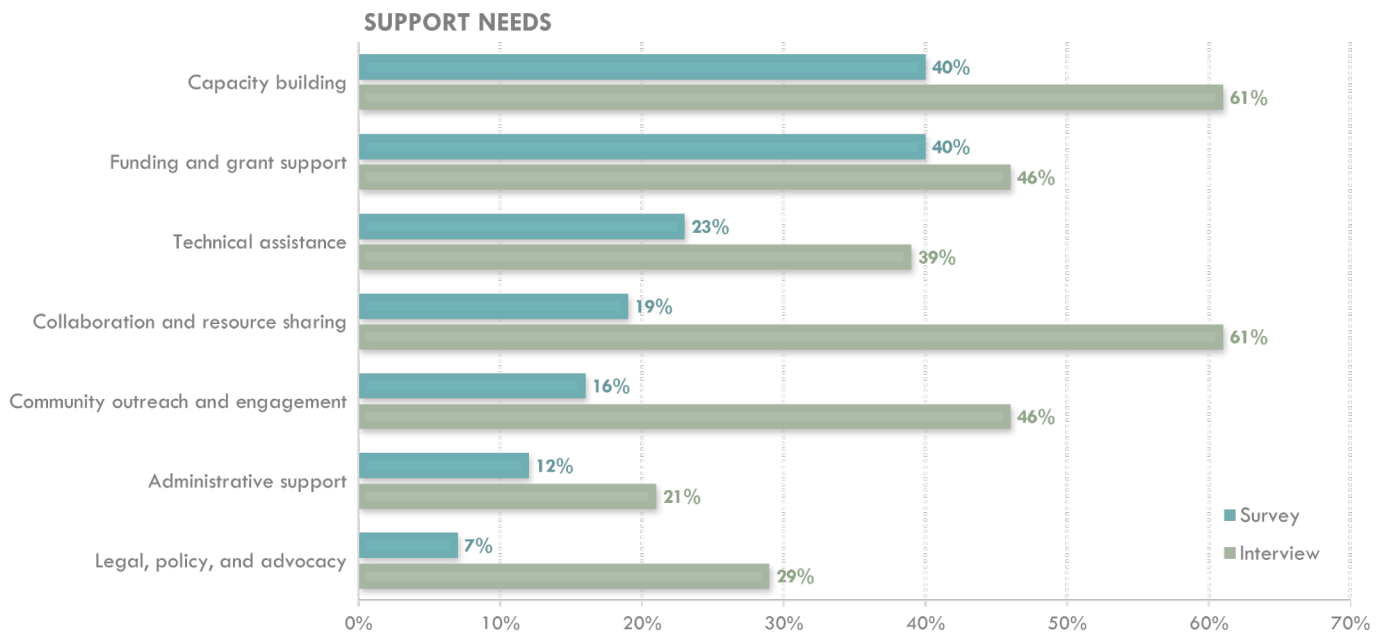
Interview. Interviewees identified a range of support needs, with the greatest emphasis on targeted **capacity building** (61%) and **collaboration and resource sharing** (61%). Capacity building combined with collaboration and resource sharing are broad needs that, in practice, could help address many of the other support areas. CWOs expressed a strong desire to better their own aptitude in various trouble areas, increase their manpower, and improve interorganizational communication and coordination to help increase awareness of each other’s work, highlight opportunities for partnership, reduce duplicate efforts, and foster the exchange of knowledge, ideas, and experiences.

Community outreach and engagement was also frequently mentioned (46%). CWOs emphasized the need for help with recruiting and retaining volunteers, marketing themselves and their projects, effectively communicating with and educating the public, organizing and promoting events, and strengthening ties between rural and urban communities.

Funding and grant support was cited by 43% of respondents who were seeking help identifying grant opportunities, writing competitive applications, and ultimately managing awards—particularly complex federal grants, whose intricacies often exceed the administrative capabilities of small, volunteer-led groups. Close behind was the need for **technical assistance** (39%), including project design, protocols review, training, GIS support, equipment use and lab analyses, and access to subject matter experts.

Additionally, 29% of groups pointed to needs in the **legal, policy, and advocacy** space—from navigating and improving permitting systems and coordinating across jurisdictions to building relationships with elected officials and advancing watershed-focused policy goals.

Finally, **administrative support** was cited by 21% of interviewees. This included support with day-to-day operations and nonprofit administrative burdens like bookkeeping, paperwork, and compliance tasks, as well as grant management and legal forms.



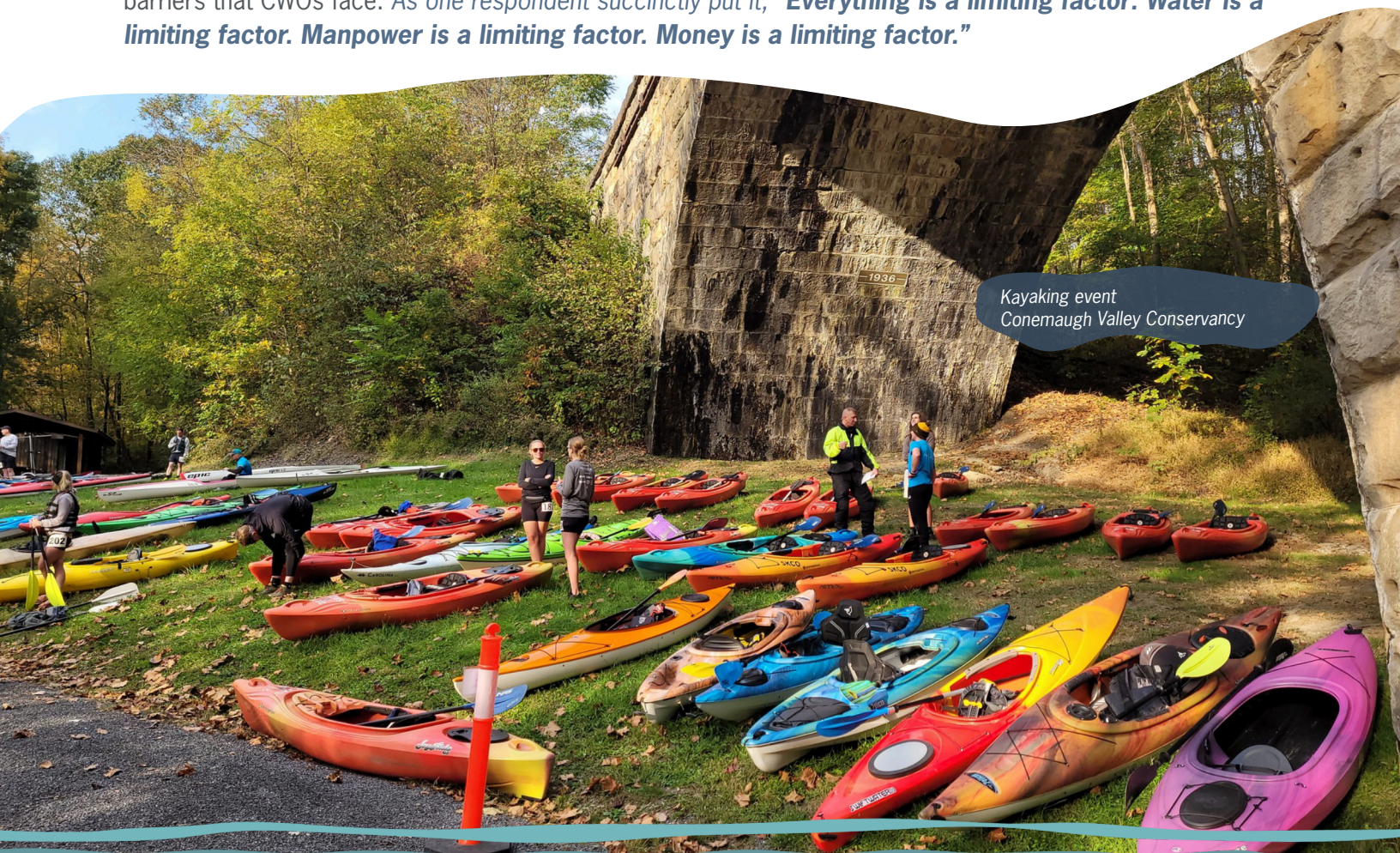
DISCUSSION

This section reiterates the primary challenges and limiting factors CWOs faced as indicated by surveys and interviews. It will then offer subsequent strategies—largely derived from the suggestions, intertwined and often overlapping, each strategy will detail the specific challenges it aims to address.

SHARED CHALLENGES

While many CWOs report facing similar categories of challenges, the ways these issues manifest—and each organization’s ability to respond—vary widely. Some groups are significantly underresourced and working to stay afloat or revitalize their efforts, while others are actively implementing restoration projects and enjoy strong community backing and partners. However, even among these more established CWOs, core challenges like limited capacity and funding persist—though they can be in different forms or degrees.

While capacity and funding emerged as the two most frequently cited obstacles, these broad categories often give rise to a host of corresponding difficulties. While classifications such as “capacity” or “funding” may help frame the discussion, they often oversimplify the interdependent and compounding nature of the barriers that CWOs face. *As one respondent succinctly put it, “Everything is a limiting factor: Water is a limiting factor. Manpower is a limiting factor. Money is a limiting factor.”*



Kayaking event
Conemaugh Valley Conservancy

Most of the reported challenges discussed included the following.

- ◆ Need for sheer manpower in numbers of volunteers, members, and staff; this affects a range of activities
- ◆ Not enough people (including younger and able-bodied people) to conduct monitoring/field research in the type, frequency, or locations desired
- ◆ An aging volunteer/membership base, combined with the inability to recruit younger people and lack of succession planning
- ◆ Administrative and organizational burdens, such as not having enough time or people to complete backend operations, including bookkeeping, legal forms, funding management, etc.
- ◆ Grant writing capacity and skillset, including identifying funding opportunities, determining a fundable project that suits both the needs of the watershed and donor priorities, crafting the proposal, and managing an awarded grant
- ◆ Grant funding restrictions for necessary components such as administrative/operational support, personnel, and equipment purchases
- ◆ Insufficient budgetary funding for water resources from governments
- ◆ Inexperience with how to operate a nonprofit, including the creation and function of boards, executive committees, task forces, etc.
- ◆ Effectively communicating with and engaging the public, including about specific issues affecting their respective watersheds, interpreting and sharing data in an accessible and engaging way, and highlighting the significance of the watershed association, its mission, and the value of water quality and ecological integrity
- ◆ Organizing public outreach events that attract an audience
- ◆ Equipment issues, including not having the funding for the appropriate equipment to conduct desired monitoring/tests and not knowing how to use certain equipment
- ◆ Technical and subject matter knowledge and ability, including access to trainings/education, skilled professionals, and keeping staff certified; not knowing how to address the issues affecting their watersheds or designing an effective monitoring program
- ◆ Laboratory testing issues, including high fees, unreliable results, and few options in the region
- ◆ Data integrity issues, including the use of informal and potentially unsound monitoring protocols, lack of data validation controls, and unclear data analysis and interpretation
- ◆ Data management issues, including technical problems with database management, not knowing where to upload data, and time commitment in data entry
- ◆ Lack of awareness of resources and opportunities currently available
- ◆ Lack of collaboration and communication between CWOs, leading to missed opportunities, duplication of efforts, and service gaps
- ◆ Navigating complex municipal structures, with no cohesiveness across multiple local governments in a fragmented geography
- ◆ Effectively engaging with indifferent or potential adversarial individuals, community groups, and industries; additionally hesitation with approaching elected officials
- ◆ Cultural pushback from long-standing CWO members against modernizing systems and new perspectives

Many of these challenges are deeply interconnected, so addressing one in isolation is rarely sufficient—each limitation often triggers or intensifies others, creating a self-reinforcing cycle. Consider the below scenario of a fictional CWO facing what might seem like a simple, singular problem that unfolds into a positive feedback loop of other common challenges:

Riverbend Watershed Association, a CWO serving a largely rural area in western Pennsylvania, was founded over a decade ago by several community members concerned about sedimentation in their local stream. With support from other residents, they organized planting events to establish a riparian zone along the stream, which largely resolved the sedimentation issue. Since then, Riverbend has successfully organized stream cleanups, expanded the riparian buffer, and partnered with local schools for field trips. Their efforts helped turn a previously neglected waterway into a place used for recreation and community events.

Despite these accomplishments, Riverbend operates with extremely limited resources. The group is entirely run by volunteers, and its core leadership consists of a few older members. While passionate and committed, they are stretched thin and increasingly concerned about the future of their work—and the stream.

Recently, Riverbend began seeing signs of a pollution source upstream, including dead fish and cloudy water. They recognized the need for water quality monitoring to gather data, identify the problem, and build a case for action. While monitoring was new territory for them, they were determined to rise to the challenge in order to restore the stream. However, the challenges quickly multiplied.

To begin, they lacked basic monitoring equipment as well as the funds to purchase it. Riverbend started exploring grant opportunities, though navigating the funding landscape was overwhelming. After spending a good bit of time wading through confusing requests for proposals (RFPs), they identified several options that seemed promising. Although Riverbend was intimidated by the prospect of proposal writing and the idea of managing the grants, which required time and skills they simply did not have, one member took on the task but still struggled with the technical language and the required documentation to support the proposal.

Compounding this, the group had no experience with designing a monitoring program. Even if they were awarded the grant, it only covered equipment costs—not personnel time nor funds to put toward training or consulting. Riverbend reached out to a university partner but found that the support available was limited and geared toward more established groups with existing programs. The learning curve for setting up a monitoring system—including parameters selection, protocols, QAPPs, and data analysis, interpretation, and storage—was steep, especially for volunteers unfamiliar with digital tools and scientific methods.

At the same time, Riverbend was facing volunteer fatigue. Their once-strong base of local support had dwindled, and efforts to engage new members—especially younger residents—had not yielded lasting involvement. Although the group knew stronger outreach could help grow their capacity, without the time or digital communication skills to effectively market their mission, their visibility remained low.

Eventually, Riverbend secured a small grant that allowed them to acquire basic monitoring equipment. The group now faced the daunting challenge of identifying qualified trainers or seeking additional funding just to learn how to use the tools they finally acquired. However, when they reached out to an established CWO nearby with a monitoring program, the group sent someone to informally train a few Riverbend volunteers, who then managed to collect data at three sites. But when a key volunteer moved away and another fell ill, monitoring halted. The group lacked redundancy in skills and struggled to find replacements. Without consistent and reliable data, it became difficult to advocate for regulatory action or to attract additional funding. Frustration grew, and momentum waned.

This scenario illustrates one way that challenges around funding, capacity, technical expertise, and outreach are interconnected. One limitation leads to or intensifies another: The inability to secure funding constrains capacity. Limited capacity restricts outreach. Weak outreach hampers volunteer recruitment. Without volunteers or staff, technical training and data analysis become difficult. And without data, progress stalls—often reinforcing the very conditions that groups are working to change and leaving CWOs “stuck.”

Riverbend’s story is not an outlier. While most CWOs may not experience every challenge simultaneously or to a great degree, many encounter overlapping constraints that create a cycle that can be difficult to break. At the same time, their successes—however modest—underscore these groups’ determination and potential. But to truly thrive, CWOs like Riverbend need holistic, coordinated support that helps them build capacity across multiple fronts, not just in isolated areas. Effective interventions must recognize and address these interdependencies, and provide layered, multi-pronged solutions that allow groups to sustain progress over time.



COMMUNITY-INFORMED STRATEGIES

The following section outlines actionable, community-informed strategies—drawn directly from CWOs or inferred through survey and interview insights. While some of these ideas reflect efforts already underway, research suggests that no existing initiative or organization currently fulfills all of the roles or meets the full range of needs expressed by CWOs in the Upper Ohio River Basin. These strategies are not intended as comprehensive solutions, nor will all of them be practical or relevant for every group or circumstance; they also do not address every challenge identified above. However, aspects of these approaches can be selectively adapted and combined to create a customized, mix-and-match approach to help address the most pressing and recurring needs.



Washington County Watershed Alliance

Develop a clearinghouse of shared resources. A popular suggestion among CWOs was the development of a comprehensive clearinghouse of pooled resources. For instance, it could include guides and tools on useful topics and, particularly, a directory of individuals and groups willing to provide services or offer guidance. These areas of support would include needs frequently cited by CWOs, including accounting and bookkeeping, marketing and promotion (e.g., social media, video production, website development, etc.), grant writing and management, legal and advocacy aid, scientific/technical experience and expertise (e.g., AMD treatment systems, freshwater mussel surveys, equipment use, etc.), subject matter experts and panel speakers, and other resources that, together, would effectively create a network for on-call peer support. Helpful information such as service geography, contact details, availability, and fees can act as search filters and provide additional functionality.

As an example of how this could be used, one CWO said, *“Maybe if there was someone they could call on for the Young Naturalists Camp who has certain skillsets like how to do archery, fishing, things like that... We could have like a list of people who could act as a resource for different areas of expertise. Or if we run into an issue with our sampling program, have a list of like on-call volunteers for sampling knowledge.”*

An **equipment lending library** could be one component of this clearinghouse, which can help expand access to monitoring and laboratory equipment for groups that would otherwise be restricted by funding. Equipment loans can be paired with relevant technical assistance, protocols, training, and even data review. Such a program might have the potential to get more groups monitoring their waterways or help others increase their tested parameters.

For example, the U.S. EPA runs several small monitoring equipment loan programs (none of which are available in Pennsylvania) for items such as Garmin GPS units, turbidity tubes, YSI multiparameter sondes, manta trawls, colorimeters, and test strips. The program provides technical training and requires an application with a project proposal, the use of a QAPP, and monthly and final reports (U.S. EPA, 2025). Additionally, Mountain Watershed Association hosts an outdoor lending library geared toward education. It includes field guides, equipment like waders and fishing poles, themed backpacks, and a variety of educator resources, such as curriculum guides, science equipment, wildlife replicas, crafts, and other items.

Pennsylvania Organization for Watersheds and Rivers (POWR) provides a range of assistance geared toward helping CWOs, including mini-grants, insurance, webinars, and activities. POWR’s website lists open funding opportunities and actionable tools and resources on topics like volunteerism, support providers (organizational, technical, and monitoring), and education and planning information. (POWR, 2025)

River Network, one of POWR’s partners, has an online community platform for nonprofits, agencies, tribal groups, and utilities focused on water stewardship to connect and collaborate. River Network provides a membership plan with a cost that varies based on the member’s annual budget. However, a free, limited membership option is also available. (River Network, 2025)

Create opportunities for organizations to connect and collaborate. CWOs noted the lack of awareness and communication between groups, leaving many unaware of what other groups are out there, what they are working on, where they are working, whether certain projects have already been done, and other details. As a result, CWOs were especially keen on forging and strengthening partnerships in order to to exchange ideas, collaborate on projects, promote and plan outreach events, coordinate resources, and take advantage of opportunities and resources that emerge only through open and active communication. So, a pathway toward this goal could be increasing the frequency, inclusion, and awareness of gatherings and creating communication pathways between CWOs and other organizations that share interests and goals.

“One of the best things we’re looking forward to is having more interactions with other watershed and water-related groups. Pulling ideas and coordinating our efforts will be helpful, and learning how other groups are solving problems—many of which are shared among different groups. Being able to look outside of the snapshot of the watershed and the work we do. For our county, all of its waters flow out into other areas—we aren’t the terminus.”

The lack of communication between and awareness of group activities can unnecessarily deplete scarce resources on duplicate efforts, as a respondent pointed out: **“Regional support is needed.** Just knowing what other people are doing would be super valuable. Not just small community groups but nonprofits as well. For instance, I’m often concerned I’m building a program that accidentally replicates a program that already exists. So, being plugged in to other groups can help prevent that from happening.”

The H2O Water Network already holds successful Confluences twice a year throughout the Upper Ohio River Basin. These events bring together a tapestry of individuals and organizations—local leaders, government agencies, businesses, watershed associations, community members, and others—from across the region to discuss critical issues facing water resources, share knowledge, network, and collaborate on solutions. One CWO said, **“The Confluence events are a great way to connect with people,”** and proposed bringing one to “a more urban area, like Pittsburgh or in a suburb, to make that connection between the rural and urban watershed groups.”

“I think the biggest hurdle is getting us out of our bubble. Organizations like to put themselves in a bubble, saying ‘This is what we’re doing, and this is how we’re doing it.’ You’ve got to be open to new things—step outside the box.”

Discussions with CWOs revealed that some groups possess resources—such as equipment, knowledge, or volunteer capacity—that go unused by others who could greatly benefit from them. Events like the Confluence present an opportunity to highlight these underutilized assets and introduce CWOs to peer organizations working on similar issues or within the same geographic area. By fostering these connections, such events can spark new partnerships, encourage collaborative problem solving, and promote the sharing of resources across groups.

For example, CWOs said, *“Knowing a group has overcome some sort of barrier means that we can come to them to see how we can address that same obstacle,”* and *“Seeing examples of how other groups do things: Like, if one group has successfully held a Salt Watch volunteer day—what did they do to prepare for this event? We can compare different events and activities to find out what worked best.”*

The **Pennsylvania Water Trails Partnership (PWTP)** collaboratively manages the state's water trails under a unified brand. Each water trail has a designated manager who, along with local partners, is responsible for attending official meetings, keeping in contact with PWTP regarding adherence to program guidelines, and for activities like water trail maintenance, wayfinding, access points, and education. PWTP holds an annual statewide meeting and offers topical conference calls, summits, technical and financial assistance, training, workshops, and other resources to participating water trail managers.

One CWO who is involved in PWTP said, *“The Water Trail Managers Program connects water trail managers throughout the area to promote certain things that are happening and share resources that can be used. That support is great—something similar for watershed groups would be helpful.”*



Three Rivers Water Trail
Friends of the Riverfront

Build a regional event calendar and volunteer board to promote events and match people with opportunities across organizations.

Improving communication and collaboration among CWOs is closely tied to addressing one of their most pressing challenges: recruiting and retaining human capital. Most groups reported needing more manpower to carry out projects, host events, or expand initiatives. Yet many also noted that they often do not know what other watershed groups are working on—whether technical efforts or community outreach—which may also stem from limited capacity for marketing and promotion. Plugging into other groups’ events can also help bolster outreach, influence, and capacity for all groups by broadening the audience and reducing upfront capital through shared contributions.

To combat these issues, some CWOs proposed a **crowdsourced bulletin board-type online platform and community forum**. This platform would include a calendar of events submitted by verified CWO accounts, ranging from larger community events like floats and festivals to smaller, technical activities such as monitoring or field work. Events and forum posts could include help requests and sign-ups for volunteers, supplies, or technical assistance.

In addition, the nature of a forum could serve as a hub for sharing practical knowledge (such as with the concept of the resource clearinghouse). CWOs could post how-to guides on organizing and experiences on various topics, like how to organize community events, share useful contacts for engaging with municipal leaders, or upload data for public or interorganizational or public use.

If built with filters for geography and event type (e.g., outreach versus monitoring), the platform could facilitate more relevant and efficient regional coordination. A tool like this—or even some other real-time, collaborative venue—would support what one respondent described as a key need: *“providing easy ways for groups to get involved with what other groups are doing and help out with what they need.”*

POWR already maintains a useful statewide calendar that promotes sojourns, floats, festivals, conferences, workshops, and educational series. Organizations can submit event information online, which is then reviewed and added to the calendar by staff. However, CWOs may be unaware of this resource, so raising awareness about POWR’s calendar and other offerings could be a simple, immediate step forward.

While reinventing the wheel should be avoided, a more regionally tailored platform that caters to groups in the Upper Ohio River Basin could better serve smaller scale or hyperlocal events—such as sampling days or key municipal meetings—that may not be relevant statewide. It would also be more conducive to incorporating the type of interactive and communication-focused features that CWOs expressed interest in.

MON
3
March 3 @ 12:00 pm - 1:00 pm
Webinar: General Liability Insurance
Virtual Event PA, United States
POWR is hosting an informational webinar: Managing Risk- General Liability Insurance and more, which will be presented by representatives from Simpson McCrady, our Insurance provider and their broker. Please join us on Monday, March 3, 2025 at 12 noon via zoom. To receive the zoom link, please contact avtikoski@pecpa.org

SAT
15
March 15 @ 10:30 am - 1:30 pm
NMS Watershed Alliance and Others Clean-up Event
Sun Village Park, Chester
The Delaware County Office of Sustainability is hosting a clean-up day on Saturday March 15th at Sun Village Park as a launch event for Keep Delco Beautiful. Marcus Hook Area Neighbors & NMS Watershed Alliance will be there and they hope you will too! Keep Delco Beautiful is a partnership of many organizations in Delaware County which are tirelessly working to make our community safe, clean, and beautiful. To bring awareness to this important partnership, and provide an opportunity for [...]

SAT
29
March 29 @ 9:00 am - 2:00 pm
Lebanon County Community Water Day
Mount Gretna Firehall 41 Boulevard Ave, Mount Gretna
Community Water Day in Mount Gretna will be this Sat, Mar 29, from 9 am to 2 pm. The Swartara Watershed Association and the Tri-County Conawago Creek Association are hosting Community Water Day. There are plenty of activities for kids to enjoy. See the Flyer for all the details. The event will be held at the fire hall in Mount Gretna.

Excerpt from POWR’s calendar

Establish a fiscal sponsor/nonprofit umbrella organization structure. One of the most commonly cited challenges among CWOs was the administrative burden of operating a 501(c)(3) nonprofit—*“The weight of a 501(c)(3) is immense,”* noted one CWO. Conversely, not having the capacity to secure tax-exempt nonprofit status and, thus, being excluded from certain resources only available to nonprofits. This burden is compounded by the difficulty and expense of accessing skilled resources, the fact that many CWOs are led by a small handful of volunteers with external full-time employment, and the very small allotment to administration that most grants allow.

Many participants noted that these and other problems could be addressed in part through the creation of a fiscal sponsor/nonprofit umbrella organization that holds the 501(c)(3) and serves as the administrative—and possibly resource—hub.

An increasingly popular structure for increasing the capacity of smaller groups, such an organization has the potential to reduce administrative overhead, expand and provide direct resource access, foster regional collaboration, secure and distribute funding, and offer a more formal infrastructure to help underresourced CWOs focus on mission-driven work.

In this scenario, prospective members pay in, and the designated organization can provide insurance, handle membership processing and paperwork, and provide services to member CWOs. The umbrella organization would have shared staff or secured retainer agreements or memorandums of understanding (MOUs) with professionals who can provide various administrative and technical services, including a set number of hours for legal aid, grant writing, accounting, GIS, donation management, database management, and other aspects. In this way, the umbrella organization would take on the administrative burden of a 501(c)(3) while also offering these vital, shared resources directly to the groups who need them, thus freeing up and increasing the capacity of CWOs for conservation work that supports their missions.

This type of structure can help incorporate the capacity and expertise found in full-time staff members (or their equivalent) into the day-to-day operations and technical projects of CWOs without the CWOs needing to amass the resources required to have their own staff. Many individuals remarked on this fact.

“The power of a single employee is incredible. Every watershed that would like to function in their community needs staff. The most important part of a watershed group’s sustainability is staff. All-volunteer organizations in this world are not a sustainable model.”

“We need shared staff. We do not want a paid staff member, but we need some of the services of non-volunteers. All of the financial paperwork is always a headache for volunteers. We can host events that attract over 200 people, but we just don’t have backend office support.”

A member of one CWO that has already successfully secured multiple grants for restoration projects still struggles with balancing administration and other activities like grant writing: *“There was a \$4,000 grant we would have been a good candidate for, but the administration part was just too much to do... If we had the capacity, then we could have done it.”*

This system can also help very small, underresourced nonprofits who, despite their limited activity, still see the value in maintaining a presence and working to revitalize. As one rural CWO leader said, *“While we don’t do much right now with our few members, I still think it’s important for the watershed organization to exist as a vehicle for the community. However, we still have to pay the registration and renewal fees for the 501(c)(3) every year, which can be demanding.”* Such organizations who might otherwise fold could be reinvigorated by new access to collaboration, critical resources, and alleviated operational burdens.

Some umbrella organizations only provide membership for a defined period of time, after which the CWO is pushed out in order to secure its own 501(c)(3); however, these CWOs indicated that they enjoyed the flexibility this type of structure affords and expressed a desire for a long-term union.

Several groups within the study area already operate under organizations with an umbrella-like structure, including the Washington County Watershed Alliance (which contains five watershed associations), Trout Unlimited Pennsylvania Council (a statewide organization that contains 49 local chapters across six regions), and the Allegheny Land Trust.

A countywide umbrella organization: One respondent that functions as a countywide umbrella organization was PA Watersheds (PAW)—a pseudonym. PAW was founded in the late 1990s and served as the motivating factor for watershed groups throughout the county to form. PAW operates as an umbrella organization for participating watershed groups in the county and is closely linked with the county’s conservation district. Both PAW and its respective associations have their own officers and bylaws.

A representative from one of PAW’s partnering CWOs said, *“The idea was that the different watershed associations would go out and do the watershed activities and monitoring, then they would come back monthly and share their work with [PAW] and its members. [PAW] would serve as the 501(c)(3) and provide the insurance, bookkeeping, and other administrative functions, giving groups freedom outside of all the clerical work. We also have some great grant writers that have helped pull in funding. Different watershed groups have put out some grants under the auspices of [PAW], which has helped yield more successful applications. The groups have secured Growing Greener grants, a Next Generation grant to complete a sign project for stream crossings and wayfinding, monitoring equipment grants, and another grant to do a promotional drone video for a regatta. **The great thing about [PAW] is that it’s such an incubator for ideas. Another thing we do well is work with other groups. In this way, we’re able to accomplish large projects throughout the county.**”*

Other work PAW and its member groups have done include education, stream bank stabilization, continuous monitoring with multimeters, events in local schools, live stake nurseries to prepare their own cuttings for plantings, working with local universities and fish nurseries, organizing assessments for river conservation plans, electrofishing data analysis, and other activities.

“We have a core group that is dedicated and really enthusiastic about [PAW] and all the work we do... And sometimes it just takes a few people to get things moving. The biggest thing is drawing new members.”

Leverage unconventional partnerships and overlooked resources to achieve shared goals.

Several CWOs have shown that creative thinking and nontraditional partnerships can help overcome persistent capacity and funding challenges. Instead of relying solely on grants, fundraising, or internal resources, these groups found success and closed some capacity gaps by tapping into community talent and underutilized local assets.

Examples of unique partnerships some CWOs have used included the following.

- ◆ Local Boy Scouts built a wooden pathway around a lake and constructed wildlife-viewing bird blinds—projects that were both cost-free for the organization and fulfilled the Scouts’ Eagle Scout requirements
- ◆ Three pre-law college students from a local university drafted an organization’s bylaws, allowing the group to gain specialized legal/administrative support while giving the students valuable real-world experience and a resume entry
- ◆ A Master Naturalist built a new website for a CWO to satisfy the program’s community service hours
- ◆ A volunteer was hosted by a CWO through the local school’s “Life After High School” program, which pairs students with participating organizations; once the program concluded, the student decided to stay on and is now a part-time staff member, helping the CWO expand its data collection ability while also gaining valuable hands-on professional experience
- ◆ A local high school’s science class with access to a biotechnology lab worked with one watershed group to conduct an environmental DNA (eDNA) study using fish metabarcoding; this partnership gave students experiential and collaborative learning opportunities and provided the organization with a unique dataset
- ◆ A local outdoor recreation store has provided financial assistance for conservation easements, has been a great source of volunteers, provides demonstrations at events, and allows the CWO to set up educational and promotional exhibits in the store
- ◆ A museum has allowed a portion of its property to be converted into a live stake nursery for a CWO to grow vegetation for riparian buffer plantings; the nursery includes a footpath that can be used by the public

These examples highlight the value of these unconventional partnerships in helping CWOs expand their impact without overextending limited resources. Exploring these collaborations requires both strategic outreach and creativity. By actively promoting partnerships with schools, youth programs, local businesses, and conservation initiatives, CWOs can not only recruit new members and volunteers, but also gain access to specialized skills, fresh perspectives, and broader community support. In this way, marketing and relationship-building become not just tools for visibility, but a means toward strengthening capacity and completing projects.

Help groups navigate the full grant life cycle. Nearly all CWOs, especially informal groups and smaller, volunteer-led watershed associations, cited funding as a major challenge. However, the most commonly requested support was not direct funding itself, but help with accessing it—particularly through grants. Many groups expressed a desire to strengthen their capacity to successfully identify, pursue, and manage grant opportunities.

The grant life cycle includes not only writing and submitting proposals, but also scoping projects, understanding funder priorities, assembling required documentation, and ultimately complying with reporting and financial requirements. Federal grants in particular can be complex: *“There’s big federal money out there for these issues, challenges, and the monitoring that needs to happen, but it’s hard for small groups to manage the intricacies of these huge grants. They need people to help manage and know what is going on with grants—they really need someone who knows the ropes.”*

Because many CWOs are small and/or volunteer-run, and their grant writers typically wear many hats and perform many duties, groups are often forced to choose between maintaining core programs and diverting time toward grant-related tasks. CWOs reported needing support not only in writing grant applications, but in related areas that support the process.

- ◆ Finding relevant grant opportunities that suit their specific needs, such as for administration/personnel, equipment, and long-term funding for data storage
- ◆ Adapting to ever-evolving public and private funding priorities and sources
- ◆ Interpreting and responding to complex RFPs
- ◆ Designing competitive, fundable projects that align with both organizational goals and funding priorities—balancing what a watershed actually needs with what will reasonably be funded
- ◆ Clearly communicating a project’s rationale and its measurable benefits for the watershed and community alike
- ◆ Collecting letters of support and preparing documentation, which can require significant time and coordination
- ◆ Understanding post-award responsibilities like budgeting, reporting, and performance tracking

Given these needs, several potential strategies may help CWOs more effectively navigate the grant process.

- ◆ **Offer shared or regional grant writing support.** Establish a program to connect CWOs with experienced grant writers—such as on a rotating basis, per-project basis, or as part of a centralized administrative/technical assistance hub. This could involve contracting several freelance grant writers, partnering with universities, or creating a shared staff position among several CWOs.
- ◆ **Provide hands-on grant writing training.** Host workshops or bootcamps tailored to watershed-focused funding sources, with practical guidance on how to develop proposals, align with funder priorities, and manage awards. To accommodate capacity-constrained volunteers, training should be recorded and offered as self-paced modules.

- **Create a grant navigation toolkit.** Develop a practical, user-friendly guide that walks CWOs through each phase of the grant life cycle and includes items like sample language, templates, common funders, reporting tools, and a directory of potential partners or service providers (e.g., labs, municipalities, consultants).
- **Connect CWOs with skilled volunteers or pro bono professionals.** Several online platforms—such as Taproot, Points of Lights, VolunteerMatch, and Catchafire—can connect groups with skilled volunteers or local universities who have grant writing or financial management experience. However, many of these resources operate on a membership model, so subsidizing some or all of potential fees should be ensured to avoid draining existing funds.

Because grant writing is time consuming, technical, and strategic, any solution should seek to balance immediate support (e.g., actually securing a grant) with long-term capacity building (e.g., learning how to navigate the grant life cycle). As a result of education and training, CWOs will not always need someone to help write their grants—but most would benefit from guidance, mentorship, and systems that make the process more navigable and less intimidating.

Despite being one of the largest, economically significant, ecologically rich, culturally diverse, and historically neglected river basins in the country, the Ohio River Basin does not have a coordinated, basin-wide restoration plan, nor does it receive dedicated federal funding—unlike most of other major water systems in the nation.

Many of the CWOs discussed in this assessment are members of the Ohio River Basin Alliance (ORBA). In June 2025, ORBA, the National Wildlife Federation, and the University of Louisville’s Christina Lee Brown Envirome Institute released the Ohio River Basin Restoration and Protection Plan, a comprehensive report that recognizes the numerous environmental improvements in recent decades while calling attention to existing and emerging threats that command a basin-wide, collaborative effort to ensure drinking water, healthy ecosystems, and vibrant economies throughout the region. (ORBA, 2025)

As one interviewee stated: ***“The Ohio is our forgotten watershed... But we’re a success story, and that success story needs to come to light. The Ohio doesn’t have a river basin commission, but some of the greatest advancements in AMD treatment have happened right here. We’ve adopted minimization of organic loading here. With no [governance], we’re making strides in water quality science. We don’t have the funding of the Susquehanna or the Delaware, but we have the funding of the common people because they want to see their watershed get better. We don’t have federal funding, but we’ve worked with what we have. We’ve managed to abate pollution better than those federally funded areas—we’re the litmus test for how you do it. In this watershed, we take it one stream with a time—’cause that’s all we’ve got, and we’ll do it good!*”**

Ohio River in Pittsburgh
Port Pitt Commission

Focus on attracting and retaining young stewards and prioritize early engagement.

Considering retirees—generally those in their 60s and older—appeared to make up the bulk of the active volunteer pool, most CWOs expressed a strong desire to attract younger volunteers, not only to assist in physically demanding monitoring tasks but to introduce new skills, fresh perspectives, and, ultimately, take up the reins to ensure the organization carries on into future generations. Without intentional efforts to engage younger volunteers and develop pathways for leadership transition, many organizations risk losing institutional knowledge and momentum as core members age out of active roles. **This accentuates the need for strategic succession planning, youth engagement initiatives, and more flexible, accessible ways for people of all ages to get involved in watershed stewardship.**

The primary target for these organizations tended to be adults in their 30s and 40s, though some respondents pointed out that those in this demographic often have limited capacity themselves as they tend to be juggling the demands of mid-career and families, leaving little time or energy for volunteer work. While these limitations may be true, this demographic is the largest in number, has modern workplace experience and technical ability, and often holds the hidden opportunity of young children.

Research consistently shows that regular and early exposure—before around age 11 or 12—to outdoor activities like camping, hiking, stream exploration, fishing, and hunting, is a top predictor for and significantly associated with lifelong environmental interest and stewardship behaviors as these children become adults (Chawla, 1999; Wells and Leikies, 2006; Giusti et al., 2018; Kellstedt et al., 2024). Adult participation in fishing, an activity strongly tied with watershed stewardship, is notably influenced by childhood introduction. According to the 2025 Special Report on Fishing, 85% of today’s anglers started fishing before age 12, and 21% of these cited sharing the fishing experience with a child as a key motivator in continuing to fish as an adult. (Outdoor Foundation and Recreational Boating and Fishing Foundation, 2025)

This critical window of early outdoor introduction underscores the long-term value of investing in programs that engage younger age groups in hands-on, water-related experiences—which CWOs are uniquely positioned to do.

While the strategy of prioritizing children is a long-term one, it can help plant the seed for the next generation of watershed stewards, volunteers, and advocates. It will also help involve the cohort of their parents, who can provide more practical volunteer support as well as institutional knowledge, by giving them a venue for engaging with and occupying their children while accomplishing tasks.

Youth programming at Fern Hollow Nature Preserve



One interviewee observed how this played out in their own group: ***“We get so enmeshed in our projects that we lose sight of the fact that we don’t have any young people involved...We like to think that [volunteer interest] would happen organically, like it did with us. We fished when we were young and continue to do so.”***

Another key demographic includes individuals who are in middle/high school, college, and early career (teen to 20s age range). This demographic may require more modern strategies to reach, such as social media campaigns and engaging digital content, but they have the benefits of physical ability, free time, independence, and motivation. High school and college students specifically may be interested in many of the same activities that CWOs need support with—including boots on the ground work, grant support, modernization, marketing, and outreach—in order to meet new people, seek novel experiences, and learn transferable skills that can be added to their resumes.

Rather than taking an “if you build it, they will come” approach, the CWOs that reported having more young people tended to make targeted outreach efforts to youth and college students. Another individual said, *“One of the things I’ll hear about [a CWO] is they’re good at getting into schools, interacting with the school systems, and prioritizing interactions with the science students at local universities—like getting their attention with activities, and listening to their ideas.”*

Some ways to expand outreach and plan for the future include the following.

- ◆ **Develop youth-focused outreach** by partnering with local schools, camps, scout troops, and youth service organizations in addition to family-oriented events. Activities like citizen science, water sampling, fish stocking, kayaking, fishing tournaments, and land and water cleanups can be tied to educational standards, community service hours, or resume-building opportunities.
- ◆ **Create low-barrier entry points** for young adults, families, and working professionals. Flexible volunteering options, project- and task-based participation, and virtual or hybrid involvement can reduce time and access barriers.
- ◆ **Break down projects and opportunities into actionable chunks**, which can help focus volunteer/member efforts and make the participation less overwhelming and more effective.
- ◆ **Offer leadership development** through mentorships, internships, or rotating board seats for students and early-career individuals to learn and contribute meaningfully to organizational planning and governance.
- ◆ **Highlight transferable skills**—such as project management, communication, nonprofit operations, field research, equipment use, or data analysis—that younger members can gain and apply in their careers.
- ◆ **Celebrate legacy and invite new energy** by publicly honoring longtime members while making space for new voices and perspectives. This fosters a culture that values both experience and innovation.

By building pathways for intergenerational collaboration, CWOs can better ensure the sustainability of their efforts and deepen their impact in the years to come.

Formalize volunteer management and implement a tracking system. Volunteers make up a crucial component of the CWO labor pool and bring economic, social, and practical value to organizations and projects that utilize them—however, their contributions can be overlooked and “invisible” if not tracked.

Although the topic of tracking volunteers was not specifically discussed in this assessment, some larger organizations recorded volunteer statistics while others (typically smaller, more informal groups) tended to have a rough idea of their volunteer information, which were generally engaged casually. While the added task of formalizing and tracking a volunteer program may not be a high priority for already overtaxed CWOs, the practice can beget an array of benefits that can help alleviate challenges like volunteer recruitment and even funding.

Many free resources are available to help nonprofits with volunteer management, which broadly includes recruitment, training, retention, tracking, recognition, and more. 501 Commons' Volunteer Management Guide is a good starting point for best practices, workshops, guides, templates, and more.

Some ways to expand outreach and plan for the future include the following.

- **Secure and maintain funding.** While many possible volunteer outputs can be measured, the simplest and most important metrics are the **number of volunteers** and the **number of volunteer hours contributed**. Combined, these immediately convey the scale of a project and can easily be translated into a monetary value.

Independent Sector is a national organization that sets the industry standard for the monetary value of one volunteer hour for each state annually. **In 2024, the estimated value of a volunteer hour nationwide was \$34.79, and the value for Pennsylvania was \$32.28 per hour.** (Independent Sector, 2025)

Organizations that accurately measure volunteer impacts can better understand and account for the monetary value of the contributions from their volunteers and supporters. These figures can provide in-kind match for grants, strengths proposals, improves grant eligibility, and provides accountability to funders by demonstrating where their dollars are going. Knowing how many hours certain activities require, based on existing volunteer logs, can help proposal budget estimates, as well.

For instance, five volunteers who cumulatively worked 1,000 hours over the course of one year would have recorded \$32,280 worth of labor using Pennsylvania’s hourly volunteer value time of \$32.28. That \$32,280 puts a number to and substantiates the work volunteers commit and can be used as in-kind matching funds for grants (Burger, 2019).

Support volunteer engagement through clear, flexible expectations. While many CWOs understandably take an inclusive and casual approach to volunteer participation and welcome help in any form, some organizations find that clarifying expectations—while accommodating individual preferences—can improve volunteer follow-through and satisfaction as well as the completion of CWO objectives. For example, volunteers can be invited to complete a brief intake form, interest survey, or informal agreement that outlines mutual goals. Such tools can serve as conversation starters about roles and how they fit into a CWO's projects as well as the volunteer's desired experiences. When volunteers understand what is expected and also feel their contributions are meaningful and matched to their skills and interests, they are more likely to stay engaged over time.

Build and show community buy-in. By tracking and sharing volunteer impacts, a CWO can quantitatively demonstrate its value to the surrounding community. This can help build support and name recognition, encourage partnerships, and even attract new volunteers.

Demonstrate accountability and transparency. These can be particularly important for stakeholders, donors, community members, and other partners who might require an official record of volunteer time and activities when solicited for sponsorships and collaborations.

Identify reliable and specialized volunteers. Tracking volunteer details such as attendance, qualifications/certifications, and prior experience can help take the guesswork out of volunteer assignments, especially for technical tasks like monitoring that might require certain skills or knowledge.

Improve volunteer morale, retention, and recruitment. A log of volunteer metrics can be meaningfully compiled and presented to volunteers to concretely demonstrate the impact they have had in their watersheds. Volunteer recognition is vital for maintaining a stable and enthusiastic volunteer base, as volunteers do not work for financial gain but for the social and psychological rewards of the act—including seeing their watersheds improve. So, having statistics of volunteer impacts will encourage volunteer effort. (Johns Hopkins Volunteer Management Project, 2011; InitLive, 2021)

While tracking volunteer metrics might seem overwhelming, simple and straightforward methods can be easy to implement. Tracking can be done in spreadsheets or in designated volunteer management software to help streamline the process and reduce time and effort needed on the part of the CWO.



A cleanup event at Chartiers Creek
Allegheny CleanWays

Identify public outreach and community/political engagement strategies that forge meaningful connections between the individual and the natural resource.

One of the most persistent challenges CWOs face is generating public interest in watershed health—and by extension, in watershed organizations themselves. While each community is different, many CWOs noted that public apathy or even resistance to environmental messaging can make outreach particularly difficult. These barriers are not only logistical—they can be cultural, behavioral, and emotional.

Still, community buy-in is critical to the long-term success of watershed stewardship. As one interviewee put it, *“We all live downstream.”* Effective engagement requires helping people see themselves in that statement.

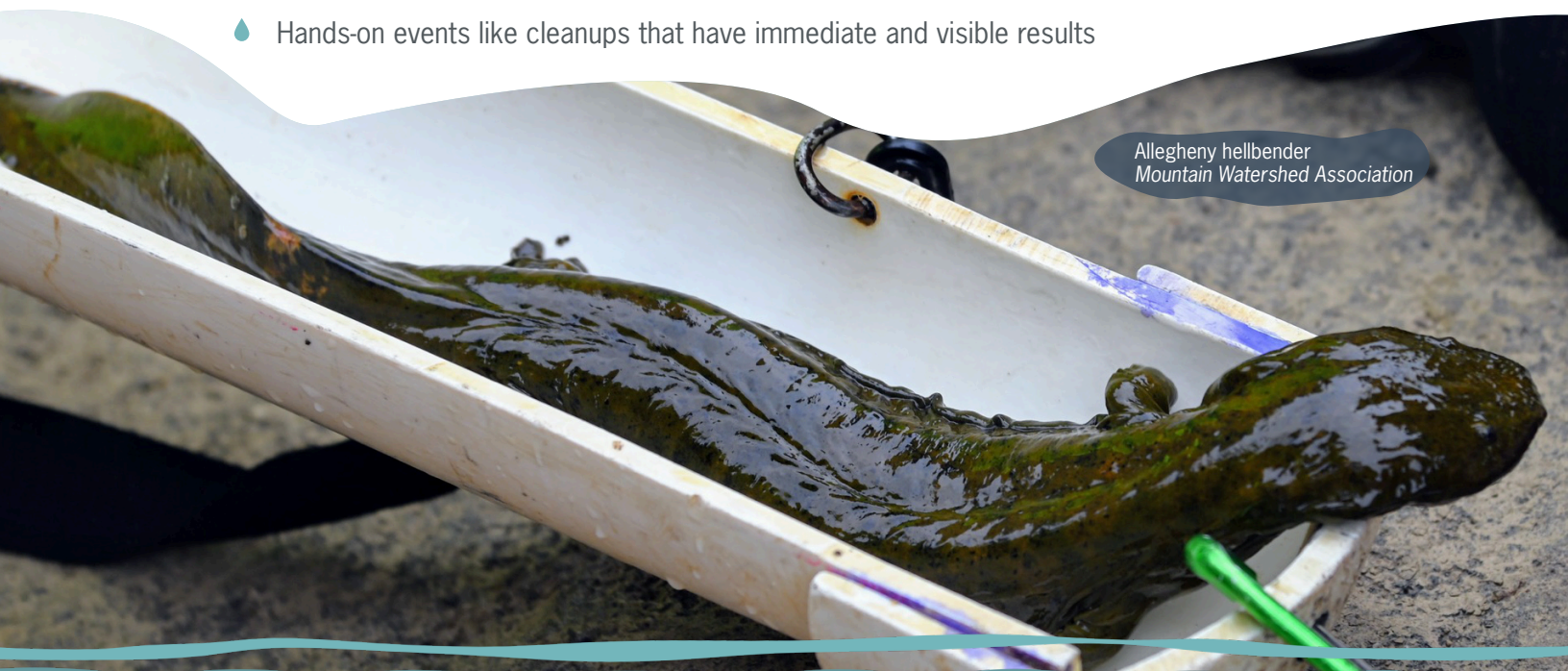
While compelling data and informational resources play a vital role in identifying and communicating environmental issues, many CWOs emphasized that emotional and experiential connections are what most successfully foster community interest. Activities that are hands-on, social, and recreational—especially those that take place on the water—tend to resonate most.

These outings and events do not just build interest—they also build comfort and ownership. As one group explained, *“We’ve hosted floats in the past...once people go a few times, they start doing it on their own. That familiarity can eventually lead to deeper engagement like picking up trash or planting trees.”*

Many CWOs also found success through more creative or unconventional programs, especially for audiences less inclined toward traditional recreation. One group remarked on an art-based ecology program using natural pigments to explore seasonal changes in the environment: *“People really enjoy this program—and it’s great for folks who might not want to go out on the water.”*

Other successful outreach activities included:

- ◆ Firefly hikes and other nocturnal outdoor events
- ◆ Fishing tournaments and events that include families
- ◆ Fundraisers and community gatherings at breweries
- ◆ Hands-on events like cleanups that have immediate and visible results



Allegheny hellbender
Mountain Watershed Association

These programs work not only because they are fun, but because they build an emotional bridge to the natural world. As one participant reflected: **“From blue crayfish to bald eagles... if people knew what’s under the rocks, they would get more captivated by what we’re doing.”**

Another CWO echoed this sentiment: **“We’re definitely looking to start more ‘intro to kayaking’ events, birdwatching, and other low-stakes activities that just get people out to enjoy the river and local wildlife.”**

Many CWOs found being inclusive and welcoming is key to engage with hard-to-reach individuals: **“We talk to everyone we can and keep it as warm and sunny as possible. We don’t want to eco-shame anyone or elicit a negative gut response. What we do impacts society in ways that people may have been divided over before—but conservation can be a unifying factor. We’re just trying to get people to care.”**

Public engagement also plays a critical role in securing policy support and funding. While many CWOs feel hesitant or intimidated when it comes to engaging elected officials, some found these fears unfounded, citing that “We were shocked at how accessible our elected officials are.”

One group successfully brought 50 elected officials out for a kayaking and lock-through event, using the experience as a platform to discuss the importance of Army Corps of Engineers funding. Another group described a Bike and Hike fundraiser that culminates in a direct meeting with policymakers.

Additionally, for groups with limited capacity, collaboration with towns, other nonprofits, or other regional CWOs can provide valuable opportunities to expand reach without needing to organize large events on their own.



Kayaking event
Ten Mile Creek Watershed Association

Provide or promote targeted educational trainings, informational sessions, and resources that cover key challenges. Building organizational capacity is foundational to the success of CWOs and underpins nearly all aspects of their work—from project implementation to community engagement. Many challenges faced by CWOs can be at least partially addressed through tailored education and training designed to meet their specific needs. Further, surveys and interviews suggested a great demand from CWOs for accessible, practical workshops and resources that they can easily and inexpensively access.

Discussions with CWOs demonstrated that many groups are simply unaware of some of the resources available. Therefore, promotion and raising awareness of these opportunities is critical to ensuring they reach the right people.

A handful of topics that could be helpful to cover include the below.

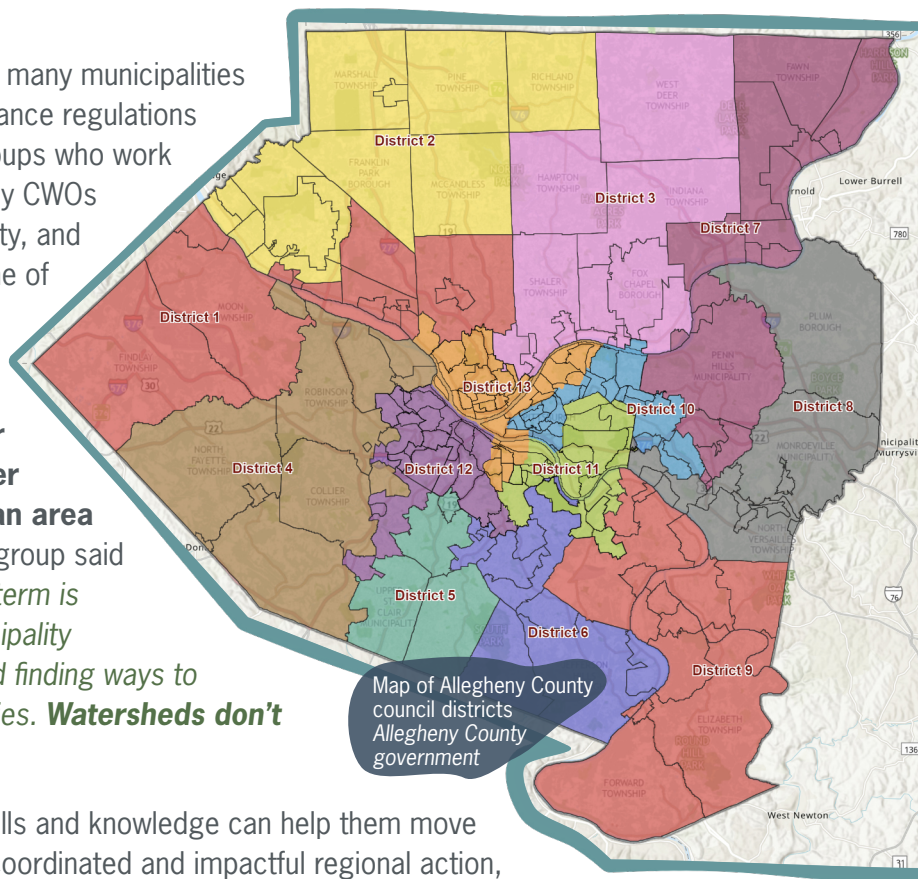
- ◆ **Tailored organizational capacity building.** Small-scale, focused trainings and guides that address key capacity areas would be highly valued by CWOs. These could cover essential topics such as nonprofit governance (including how boards function, mission alignment, and navigating cultural and generational differences), administrative best practices, volunteer management, and strategic planning.

As one respondent noted, understanding how nonprofit boards work and how to coordinate missions across stakeholders is necessary for cohesion, effective leadership, and strategic planning, especially for some less experienced groups: *“A lot of our board members haven’t been on a board before. At the board level, you don’t micromanage and plan out your projects—you don’t discuss what cookies we should bring to this or that event—you just make sure committees stay on mission, work on the budget, file taxes, make plans to raise money, things like that. That’s what’s holding us back. I think we need to start forming committees that will handle the more fun stuff. And because of this inefficiency, we kind of just do things as the opportunity arises instead of preplanning... which would really help when we’re looking for grants to see what’s a good match.”*

- ◆ **Advocacy and policy engagement.** CWOs expressed a strong desire to become more confident and effective advocates for watershed protection, especially as some of the groups cited moving on from more technical tasks to advocacy. Training sessions focused on how to collectively engage elected officials, communicate the impacts of policies on water quality, and organize advocacy campaigns could empower groups to amplify their influence and make the task seem less daunting.

One individual who leads advocacy efforts for their group said that elected officials in the region are extremely accessible and that *“We need to show people they don’t need to be afraid of coming together to advocate and inform elected officials of the impacts of certain policies on our water quality... We need to train folks on advocacy—like, how to approach someone and say, ‘Hey, this is the impact of what this trash dumping is doing...’”*

Relatedly, resources for navigating many municipalities and their specific zoning and ordinance regulations were cited often, especially for groups who work in the greater Pittsburgh area. Many CWOs work in Pittsburgh, Allegheny County, and Washington County, which are some of the most municipally dense and fragmented geographies in the entire nation. **The Pittsburgh area in particular contains over 460 governments—the most per capita of any major metropolitan area** (Maciag, 2019). One urban-based group said *“Something we’d love to see long term is improved cohesiveness with municipality ordinances and the watershed, and finding ways to more closely work with municipalities. **Watersheds don’t listen to political boundaries.**”*



Equipping CWOs with advocacy skills and knowledge can help them move beyond individual efforts to more coordinated and impactful regional action, which can include understanding regulatory processes, communicating data-driven concerns clearly in projects, and mobilizing community support around critical water issues.

- ◆ **Data management, interpretation, and communication.** Many CWOs generate valuable environmental data, but face challenges in managing, analyzing, preserving, and sharing it effectively. One group referenced their collaboration with a group that provides cloud-based data storage accessible to multiple stakeholders. This approach supports long-term data preservation, especially as organizations evolve or disband: *“One of our concerns is that watershed associations create a lot of data but it just kind of disappears. We’re working with a group that will take our data and preserve it in the cloud for anyone to access it. Watershed groups and members come and go... So we’re looking at the longevity of the data.”*

Beyond storage, CWOs emphasized the need to better present data for technical, outreach, and policy applications. One group who collects an array of data reflected, **“How do we share the data in a way that is understandable to people and not just numbers on a screen? We need to interpret and decipher the data in a way that’s factual and truthful rather than fear mongering—how can we be as realistic as possible? For instance, when we tell people about the types of permits these polluting facilities have, how do we disseminate the data in a way that’s helpful and accessible?”**

Interpreting complex scientific information into clear messages that resonate with diverse audiences—including policymakers, funders, and the public—is critical for informed decision-making and effective outreach. Training on data visualization, storytelling with data, and translating technical results into accessible language would also help CWOs strengthen community trust and engagement.

- ◆ **Leveraging technology for outreach and sustainability.** Transitioning legacy systems to modern, user-friendly platforms remains a challenge. The fast-paced changes in technology combined with older members who might lack digital literacy or receptiveness causes additional difficulties.

For example, one CWO's experience updating their website and database showed the difficulties of launching digital infrastructure that meets the expectations of today's audiences, who prefer mobile access and real-time updates over traditional methods like mailing printed reports: *"We face an immense amount of challenges with [technology and resistance]. For years, we have operated off of an old website and database and everything was obsolete. Today, we are rebuilding our website and database to be more accessible, but again the challenges we face are just the stalwart people who want to say, 'Why are we doing this?' The answer is: 'Because we have to.' No one wants to get copies of data via mail, they want to get it on their phone. It's launching what we do into the future that is the biggest hurdle."*

Workshops or technical assistance focused on digital tools for data management, website design, social media, and mobile communication could help CWOs overcome these hurdles, streamline their processes, reach more people, and modernize their public engagement.

- ◆ **Technical training on water quality monitoring and related topics.** Many CWOs desired to strengthen their technical capacity around water monitoring and other environmental topics that support their missions. Some groups wanted to further improve their existing monitoring programs, whereas others were starting from the ground up.

When asked about additional parameters their group might be interested in monitoring, one CWO members said, *"I have limited knowledge. So I'm not sure what all is out there to do but always open to learning, exploring, and expanding what we monitor."*

Another CWO who did not yet have a monitoring program said, *"We'd like to begin proper water quality monitoring, but we don't have the equipment or knowledge to start it up."*

Potential trainings could include guidance on selecting appropriate parameters to measure for each CWO's unique circumstances and objectives; understanding monitoring protocols; properly calibrating, using, and maintaining equipment; and ensuring consistency and accuracy in data collection. Offering practical, hands-on sessions—as well as accessible written or video online resources—would help standardize approaches across groups; improve data quality and project implementation across watersheds; and build confidence in using monitoring data to inform restoration projects, advocacy, community education, and other applications.



Mussel survey
Washington County Watershed Alliance

CONCLUSION

Across the Upper Ohio River Basin, CWOs are doing critical work—often quietly, with limited means, and little recognition—to protect and restore local waterways. Despite vast differences in size, structure, focuses, ability, and resources, these groups share a deep-rooted commitment to watershed stewardship and show resilience in the face of persistent and pervasive challenges.

This assessment is only a broad snapshot of CWOs in the region, and a more in-depth study of specific organizations, geographies, and subject areas covered—organizational capacity, water quality monitoring and technical work, or community engagement, for instance—could yield more nuanced and individualized insights and recommendations. Nevertheless, this assessment has attempted to demonstrate that, while capacity and funding gaps are real and pressing across the board, so too are the opportunities for connection, collaboration, and support.

The outlined strategies are not one-size-fits-all solutions, but stepping stones toward a stronger, more coordinated movement—one where watershed groups are not just surviving, but thriving. Great potential exists when these groups are supported, connected, and equipped to carry out their missions. By investing in shared tools, training, and organizational infrastructure, and by lifting up the voices and knowledge already present in these communities, organizations like the H2O Water Network can help sustain the momentum CWOs have built—honoring their efforts and ensuring that their impact endures for generations to come.



Youghiogheny River
Tim Dusenberry

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