



Accomplishments of Vermont's Watershed Groups 2023





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B. Morrison, Connecticut River Conservancy

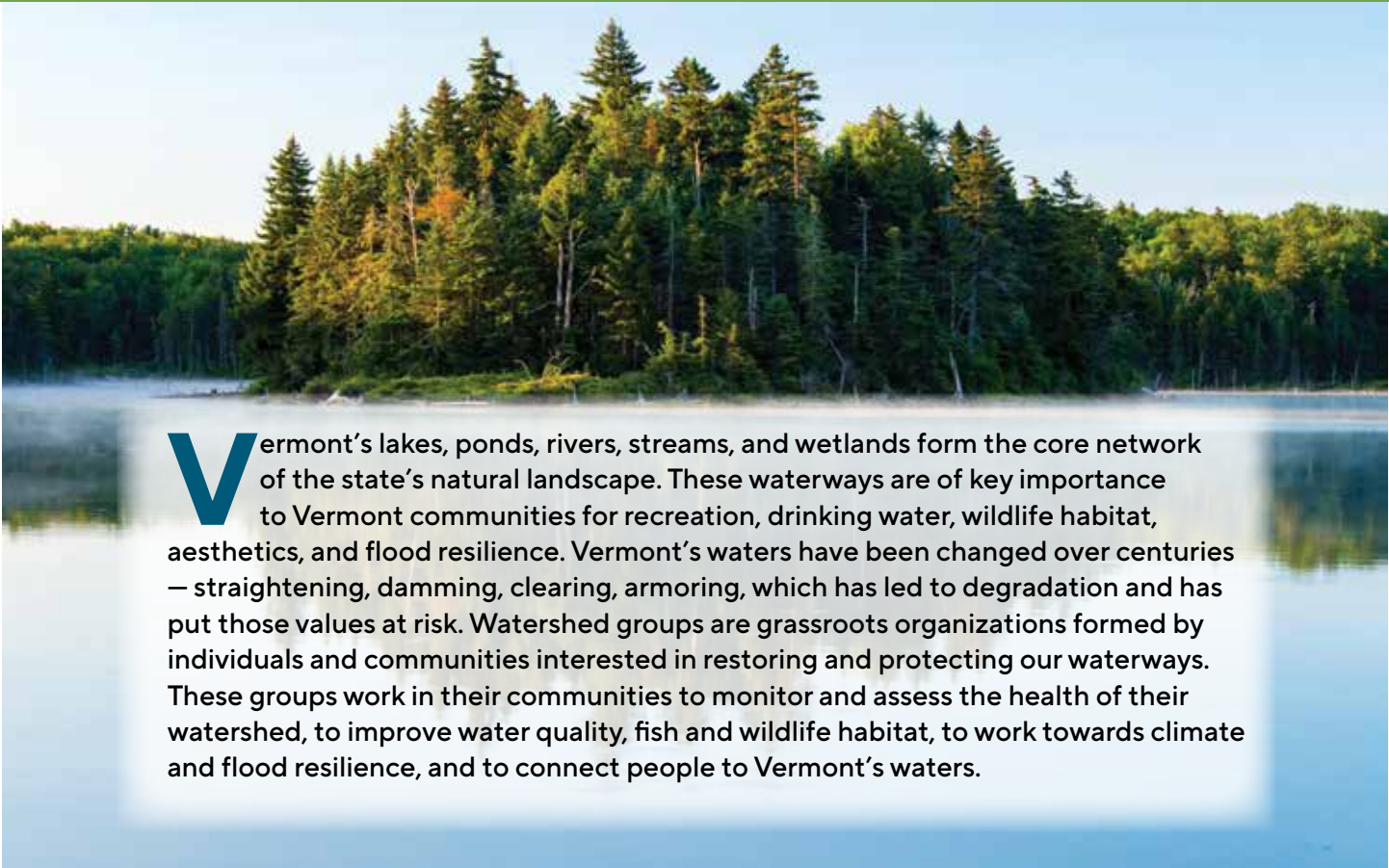
A publication of Watersheds United Vermont

Watershed groups are community-based organizations working to protect and restore Vermont's rivers, streams, and lakes.

Watershed groups work in their communities on a suite of restoration and protection activities that improve water quality and lead to healthy and resilient waters and watersheds.

This report highlights the activities and projects of 15 watershed groups across Vermont. Each section of this report focuses on a type of watershed restoration work and includes a few of the many watershed group success stories during 2023.

Watersheds United Vermont's mission is to empower community-based watershed groups to protect and restore Vermont's waters.



Vermont’s lakes, ponds, rivers, streams, and wetlands form the core network of the state’s natural landscape. These waterways are of key importance to Vermont communities for recreation, drinking water, wildlife habitat, aesthetics, and flood resilience. Vermont’s waters have been changed over centuries – straightening, damming, clearing, armoring, which has led to degradation and has put those values at risk. Watershed groups are grassroots organizations formed by individuals and communities interested in restoring and protecting our waterways. These groups work in their communities to monitor and assess the health of their watershed, to improve water quality, fish and wildlife habitat, to work towards climate and flood resilience, and to connect people to Vermont’s waters.

Highlights of watershed groups’ work across Vermont in 2023:

Planting Riparian Buffers

Riparian buffers play a key role in the function of Vermont’s waterways. These zones minimize erosion and flood damage, improve water quality, and improve habitat for aquatic and terrestrial organisms. Watershed groups carry out planting projects during spring and fall of each year, often employing community volunteer teams or work crews to assist in planting thousands of native trees and shrubs. By working with partners and landowners, watershed groups are able to plant on private, municipal, and state lands, benefitting waterways all over the state.

In 2023:

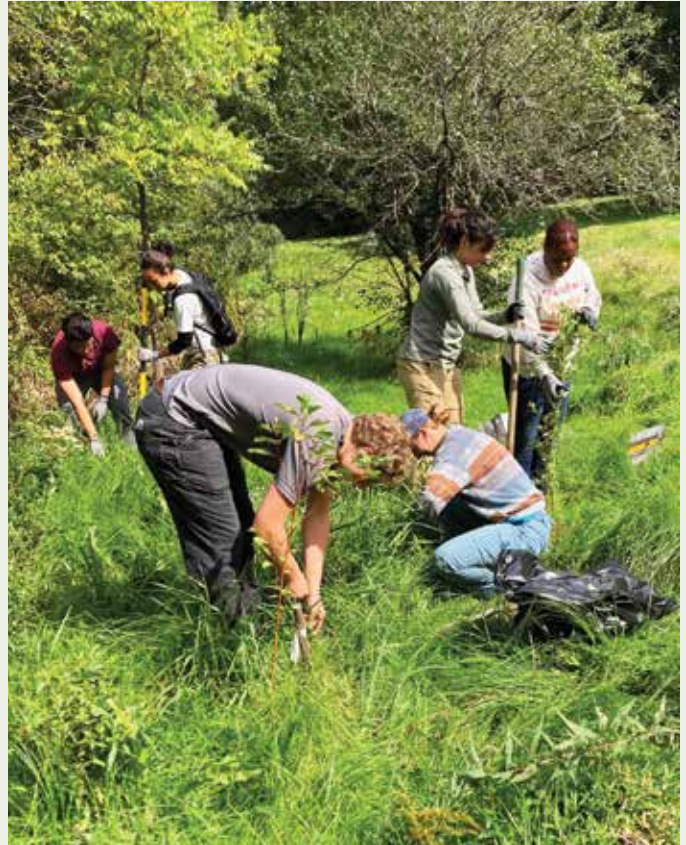
Over **195** volunteers and over **60** work crew members helped plant, over **24,170** trees or shrubs at **44** stream sites and **3** upland sites across the state.



Volunteers with the Addison County River Watch Collaborative planting a buffer zone.

Tree Planting

On March 20, 2023 the Addison County River Watch Collaborative (ACRWC) planted 40 trees and 40 live willow stakes along the banks of the Barnes Brook, which runs along the lawns of Overbrook Condos in Middlebury. The catalyst for the planting of this buffer zone occurred in 2022 when an Overbrook Condo Association board member read an article written by Matthew Witten of the ACRWC on the importance and benefits of buffer zones. The decision was then made to stop mowing a buffer area next to the brook to the chagrin of other members who did not originally like the appearance of the unmowed zone. Eventually a discussion about planting a full buffer began and condo owners expressed interest in shrubs and berry bushes being planted. In 2023 funding was granted through the Department of Environmental Conservation Clean Water Initiative Program, and the planting could begin. During this time an effort to remove poison parsnips also occurred and was largely successful, with few reappearances of the plant. A purple loosestrife removal effort also happened later in fall and was repeated in July of 2024 due to the reemergence of the plant. These efforts alongside continual management have allowed the buffer to begin maturing, increasing its



Matthew Witten

benefits, which have already been seen. The condo association now loves the buffer and have noticed increased wildlife sightings. Additionally, during a flood event in Middlebury on August 8, 2023, the buffer was inundated with swift waters but helped keep soils in place, minimizing erosion.



Kate Kelly, Lewis Creek Association

Monitoring Water Quality

Water quality has wide ranging impacts on both environmental and human health. As a result, water quality monitoring provides highly important information for public safety and management decisions.

The majority of watershed groups monitor phosphorus, nitrogen, *E. coli* bacteria, and turbidity levels, while some additionally monitor pH, chloride, nitrate, and nitrite levels, as well as conductivity and temperature. Many groups choose to partner with the Department of Environmental Conservation's LaRosa Partnership program, which specifically monitors

In 2023:
167 volunteers across Vermont spent more than **1,750** hours helping to monitor water quality at **279** sites in more than **2000** sampling events!

phosphorus, nitrogen, and chloride. Other groups have their own lab or partner with other professional labs to monitor other parameters.

Water Quality Collaboration

In the wake of the Vermont Flood of 2023, Friends of the Winooski River (FWR) worked diligently to field questions about water quality from concerned community members. However, lacking a lab they were unable to do the testing required to fully answer questions regarding water quality safety at swimming holes. Hearing about this, the White River Partnership (WRP), who have a lab set up in their office in Royalton, offered to help. Using funding from the Vermont Community Foundation

to pay associated costs, on August 14th the two groups worked together to test ten samples from popular swimming holes on the Winooski River to determine the levels of *E. coli* bacteria present. After the 24-hour processing period the results were in and showed that only two out of ten sites had elevated *E. coli* levels. Of these two sites, one was slightly over the standard and one was slightly under. However, neither approached excessive or worrying levels. It was determined that these

two slightly elevated results were likely a result of a recent rainfall event and were not indicative of a systemic effect due to flooding. These results support the general rule of thumb for swimming in Vermont's rivers: avoid swimming for one month after a flood event, immediately after a rainfall event, or in muddy waters.



Shawn White of FWR hands off samples to Christian Pelletier of WRP.

Lyn Munno

Cleaning Up Vermont's Rivers

Every year Vermont watershed groups organize extensive river and stream cleanups, often employing the help of community volunteer teams to get the work done. Trash in the waterway accumulates over the course of the year, and flooding or extreme weather events can exacerbate its accumulation.

Not only does the trash look unappealing, but it is also harmful to aquatic and terrestrial organisms and can contaminate water with chemicals and other pollutants. Most river cleanup events happen in September, which has been deemed Vermont's River Clean-up Month. The warm water temperatures and

In 2023:

Watershed groups cleaned up 142 river sites, over 820 volunteers assisted in clean-up efforts, removing more than 25,000 pounds of trash from Vermont's rivers.

low river levels make it easier and safer to locate and remove trash, streamlining the process for clean-up crews.

MRBA Westfield Community Cleanup

On July 26th, 2023, the Missisquoi River Basin Association (MRBA) held a community clean-up event on a 2 mile stretch of the upper Missisquoi in Westfield. During the event, 21 volunteers removed approximately 150 pounds of trash from the river. This river clean-up was planned by the MRBA's two highschool interns who were tasked with choosing the section of river, advertising the event, and coordinating with clean-up volunteers. MRBA's interns excelled at their roles by connecting with local partners, like Jay Peak Resort, to spread the word and provide a shuttle for participants. During their paddle, MRBA staff and volunteers removed tires, tire rims, plastic hoses, tarps, and a large water tube. River clean-ups like these offer a fun canoe experience for the community while helping clean up and protect the waters we recreate in!

Volunteers participate in MRBA's river clean up events!



MRBA



MRBA

Engaging Communities

In order to restore and protect our watersheds, it is critical for people to be connected to their rivers, lakes, and wetlands. Watershed groups work with all communities to raise awareness about the importance of our waters and watersheds. Educational programs, as well as outreach and volunteering events, help to connect students, town officials, landowners, and community members to the watershed around them. This in turn helps to both generate support for watershed groups' projects and programs and gives people the information they need to do their part in protecting their local watershed.

In 2023:

Over **2,310** students from **60** schools engaged in educational activities in their watersheds. Watershed groups organized **38** public workshops or trainings to educate more than **710** Vermonters about watershed topics.

Lewis Creek Association Community and Elementary School Events

In May 2023, the Lewis Creek Association hosted two community "walk-and-talks" in Shelburne and Hinesburg. During these events, community members walked along McCabe's Brook/the LaPlatte River and Patrick Brook respectively, while event leaders explained the connections between neighborhood land use, water quality, local wildlife, and the watershed. Participants observed and learned about amphibians, reptiles, bats, and birds. These events were targeted to areas shown to have poor water quality conditions. Follow-up materials provided to participants included recommendations for how to make changes to

properties and roads in their neighborhoods to improve water quality. Engagement and turnout for these community "walk-and-talk" events was much higher than previous presentation style events, and one participant said: "I learned so much, and knowing more makes me feel better connected to my backyard."

Lewis Creek Association also held educational programs for elementary school students providing hands on lessons examining soils, tracing water flow paths, and teaching students about how they can play a role in protecting local waters.



Participants walk along the McCabe's Brook during a community event in Shelburne.



Students at Hinesburg Community School participate in an educational event.



Students at Hinesburg Community School examine the path of storm drains in their parking lot.

Restoring Watersheds

Watershed groups work to develop, design and implement a wide range of watershed restoration projects. Such projects are often quite complex, and watershed groups work to implement these projects alongside landowners, municipalities, other conservation partners, engineers and construction contractors, and funders. These projects including stormwater projects, river and floodplain restoration projects, dam removal and culvert replacement projects, lakeshore restoration projects and wetland restoration projects are critical for reducing sediment and nutrient runoff, improving aquatic and riparian habitat and making our watersheds and communities more flood resilient. Stormwater runoff can transport large quantities of nutrients, sediments, and pollutants into lakes and waterways. Stormwater management projects work to

In 2023:

10 stormwater projects designed,
5 stormwater projects implemented,
15 river, wetland, and lakeshore projects designed; **9** river, wetland, and lakeshore projects implemented, and many more projects on the way!

diffuse and store runoff to slow the water down before it reaches a river or lake. These projects vary widely in complexity and type from grass swales to rain gardens to gravel wetlands to underground filtration and storage systems.



Addison County River Watch Collaborative

Stormwater Management: MWA Newport Marina Stormwater Treatment

The Newport Marina Stormwater Improvement Project, carried out by the Memphremagog Watershed Association, is the culmination of more than six years of planning and design efforts. Constructed between July and October of 2023 along Farrant Street in Newport City near the shore of Lake Memphremagog, the project diverts stormwater runoff from 125 acres of developed land uphill of Prouty Bay and the Newport Marina. The project focuses on conveying, filtering, and treating stormwater before it is released into the bay, and also takes into account extreme rainfall and flooding events. Over 750 feet of storm drain and numerous catch basins work to collect and funnel runoff into an underground hydrodynamic separator, which removes oil, grease, sand, grit, and other particulates from the stormwater. The runoff then flows to a 4,500 square foot gravel treatment wetland which mimics the processes of natural wetlands, further cleansing the water and removing dissolved and suspended pollutants. After percolating through the treatment wetland, the treated stormwater is then discharged into Prouty Bay. The project was designed with “first flush” rainfall events in mind and can easily handle the runoff from a ½ inch rainstorm. For



Gravel wetland from intersection of Farrant and Lake Streets, September 29, 2023.

extreme rain events, an overflow pipe allows excess runoff to safely bypass the treatment wetland, minimizing damage to the project and surrounding area while continuing to provide preliminary treatment thanks to the hydrodynamic separator. This project represents collaboration between the Memphremagog Watershed Association and private, public, state, and other nonprofit partners. It is estimated that the practice will stop 22,000 pounds of sediment and 19.8 pounds of phosphorus from reaching Lake Memphremagog each year. Its implementation is a large step towards managing urban runoff and improving water quality in Lake Memphremagog.



Aerial photo of the Newport Marina and the gravel treatment wetland near Prouty Bay on October 4, 2023.



New gravel wetland swelling with stormwater immediately after construction.

Improving Habitat Connectivity

Obstructions to the natural flow of rivers can cause a plethora of issues ranging from increased flood and washout risk to restricted habitat connectivity to unbalanced sediment regime. The cause is often outdated or undersized culverts and dams. As a result, projects minimizing these damages and improving habitat connectivity are central to the annual activities of many watershed groups. Removing deadbeat dams and upgrading culverts to the right size can benefit both the health of the organisms in the streams and rivers, and the safety of the communities around them.

In 2023:

30 culverts were assessed for replacement or retrofit and **2** culverts were replaced at an appropriate size, **2** dams were assessed for removal, **1** dam was removed, which reconnected **2.5** miles of river.

FWR Lockwood Brook Culvert Project

In August and September of 2023 Friends of the Winooski River (FWR) oversaw the installation of a new culvert in Fayston, Vermont. The culvert is located at the German Flats Road crossing over Lockwood Brook. The original culvert was undersized and perched, and was identified as an erosion, road washout, and habitat connectivity problem. The project replaced the undersized culvert with an open bottom arch culvert more than twice as wide as the original. Not only does it allow for greater water flow, but the open bottom allows for the presence of a natural streambed, improving connectivity for 2.5 miles of upstream habitat. One key aquatic creature this affects is the brook trout, Vermont's state fish, which depends on access to colder waters for survival.



Before (top) and after the Lockwood Brook Culvert project

Photos by Friends of the Winooski River

The 2023 Flood

In early July of 2023, Vermont experienced some of the worst flooding in the state's history, exceeded only by Irene in 2011 and the Great Flood of 1927. Excessive rain earlier in the summer caused saturated soils, which significantly worsened the effect when on July 10th and 11th a stormfront dropped torrential rains across the state, up to 9 inches in some regions. The resulting flooding caused catastrophic road, culvert, and dam washouts, infrastructure and building damage, pollution, and severe risk to communities in the flood zone. In the aftermath, a complex emergency response materialized made up of first responders, road crews, volunteers, watershed groups, and local, state and federal support. Though the flood damage was extreme, the response highlighted the tight-knit communities and grit that Vermont is known for.

In the midst of this disaster watershed groups played many key roles from fielding questions from



community members to helping organize volunteer efforts. Once the floodwaters receded their work continued. By helping direct cleanup efforts and land buyouts, surveying culverts and dams, informing communities, and continuing to develop and implement projects their work has been crucial to long term recovery post flood.



Downtown Montpelier during the 2023 flood.

Bryan Pfeiffer

White River Partnership: “The Trees Worked!”

Hurricane Flats Farm of South Royalton, Vermont had experienced flooding before. Situated right on the high banks of the lower third of the White River, during Irene in 2011, rushing waters accumulating from upstream rainfall created a cratered area the size of nearly two football fields on the downstream side of the property where the river formed a jug handle. The White River Partnership (WRP) has worked on this property and with its various landowners for many years creating a heterogenous blend of planting projects. The two primary buffer zones on the property lie upstream and downstream. The upstream zone is around 50 to 75 feet, mature, and marshy. The downstream zone is around 30 feet and has been well maintained for 20 years. Another notable characteristic of the downstream zone pre-Irene was many large rock pieces, called riprap, placed on a bank to prevent erosion. Though these rocks were intended to have a preventative effect during a flood event, their presence also made it difficult for a riparian buffer to establish on the steep bank. This was part of what contributed to the intense flood damage on the downstream side of the property during Irene. In the wake of the flood the WRP and landowners agreed that something had to change and began the planning process. Using trees uprooted by the flood, they inserted the trunks horizontally into the bank and anchored them, leaving the root balls protruding. The interwoven and organic structure of the roots made the perfect lattice for a buffer zone to establish on. The benefits of this were seen during the 2023

flooding during which the fields were submerged but minimal erosion occurred. This contrasts to the experience of neighboring mown properties that experienced significant erosion damage. This story highlights not only the power of planting a tree, but the importance of committed landowners and continual buffer maintenance. In the case of the Hurricane Flats Farm all three things occurred, resulting in protection and mitigation in the midst of a harrowing flood event.



May-July 2013 project on the Hurricane Flats Farm in South Royalton, Vermont

Friends of the Winooski: The Floodplain Did Its Job!

The town of Northfield, Vermont, lies within the Winooski watershed, which received some of the highest rainfall totals in the state during the July 2023 flood event. Though the low-lying Water Street neighborhood did flood during this event, it is estimated that the flood elevation was 6 inches lower than it would have been had a floodplain reconnection project not been completed by the Friends of the Winooski River (FWR). This projected 6-inch difference prevented flooding from reaching the first floor of many homes, something that would have caused significant damage and difficulty for these households. The catalyst for the project was the catastrophic flooding

that resulted from Tropical Storm Irene in 2011. In the aftermath of Irene, the town of Northfield bought out 18 flooded properties along the Dog River, a major tributary of the Winooski River, and asked FWR to redesign a 4-acre area where seven homes were demolished. Working with engineers, architects, and the town, FWR turned the space into a floodplain park with a large lawn on Water Street, a wildflower meadow in the middle, and a tree and shrub zone along the Dog River. This project is a success story for both buyouts and floodplain restoration, and without it the town of Northfield would have experienced significantly worse flooding in the Vermont flood of 2023.

Friends of the Winooski River: Plainfield Cleanup

The flooding in July 2023 had devastating impacts on the town of Plainfield. The rushing waters of the Winooski River, which runs along the length of the village, picked up and carried a massive quantity of trash and debris, and deposited it in the floodplains. After the flood, Friends of the Winooski River responded to a landowner inquiry and went to survey the damage to a riverside property. The landowner was extremely distressed due to the state of the forest and the quantity of debris left behind. This began a massive cleanup effort carried out by town, state, and independent groups, as well as many local volunteers and organizers. Once the landowner's property was cleared, the group agreed that they should expand their

efforts to the entire Plainfield village. In the end, around 6.5 tons of trash and debris were removed from the flooded area.



Vermont DEC staff (above) and Dealer.com (left) volunteer with Friends of the Winooski to clean up trash from the Flood of 2023 in Plainfield.

Black River Action Team: Mud Puppies

The day after the catastrophic flooding in July 2023, Kelly Stettner of the Black River Action Team (BRAT) reached out to local authorities in Ludlow to ask how she could help post-flood. With the help of two community members, Stettner worked to organize the volunteer effort. Hundreds of volunteers began to show up, and a joke in an email eventually led to the christening of the volunteer force as “Mud Puppies”. This lighthearted name and a rallying cry of “come be a part of the

solution!” led to an engaged and caring community effort. The Mud Puppies worked on over 80 cleanup projects doing all manner of tasks such as outdoor cleanup, shoveling mud out of basements, moving furniture, and connecting impacted people with the necessary resources and help. Since the 2023 flood event the Mud Puppies continue to work as an official crew of BRAT, responding whenever there is need.



Mud Puppies remove mud from a lakeshore property in Ludlow, Vermont.



White River Partnership

The White River near Bethel.



Amy Polaczyk, Friends of the Mad River

Mad River Watch Volunteers practice taking temperature and conductivity measurements along the Mad River.

Watersheds United Vermont is an association of community-based watershed groups across Vermont. WUV provides information, resources and training to watershed groups; encourages collaborations and connections among watershed groups and with partner organizations; and acts as a voice and a representative for watershed groups at the state level.

WUV's Subgrant Programs: WUV provides funding to watershed groups and partner organizations for projects to improve water quality and watershed health! For the past five years, WUV has been administering grant programs to provide funding to watershed groups and partners for the development, design and implementation of clean water projects to restore Vermont's waters. This funding through the Department of Environmental Conservation and private funders allows WUV to provide subgrants for the design and implementation of riparian buffer planting, dam removal, river, floodplain, lakeshore, wetland restoration, and stormwater management. The subgrants also support groups' important work engaging with landowners, communities, and partners to develop these voluntary clean water projects. In 2023, WUV expended more than:

\$1.7 million in funding to watershed groups and partners and supported:

12 Riparian Buffer Planting Projects

25 Stormwater Management and Natural Resources Restoration Design and Implementation projects

10 watershed groups working with landowners, town officials and other partners to develop water quality improvement projects.

13 Watershed groups working with Vermont Department of Environmental Conservation to develop and implement the State's Tactical Basin Plans.

WUV and watershed groups partner with a diverse set of community-based partners working to protect and restore clean water, including Natural Resources Conservation Districts, Lake Associations, municipalities and conservation organizations. WUV and watershed groups also partner with regional and statewide Technical/ Service partners, including state and federal agencies, land trusts, Regional Planning Commissions, and water advocacy organizations. These collaborations and partnerships are critical for tackling complex challenges to protect and restore Vermont's waters.

www.watershedsunitedvt.org

Lyn Munno, *Director*

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WUV obligated an additional \$2.6 million in 2023 to support the design and implementation of projects in 2024 and 2025 to restore Vermont's rivers, streams, lakes and ponds!

WUV Supports, Connects, Informs and Represents Watershed Groups.

- Provides updates on funding opportunities, events, trainings, and relevant resources to keep watershed groups and partner organizations informed, engaged and connected,
- Convenes watershed group trainings and gatherings to provide opportunities for watershed groups to collaborate and connect to share about successes, common challenges and opportunities,
- Acts as a Core Partner for the Vermont Community Foundation to support a cohort of Watershed Groups through the Healthy Watersheds Initiative,
- Connects watershed groups to each other and partner organizations to allow for peer learning and collaboration,
- Represents watershed groups at the state agency level to foster engagement with policy makers,
- Participates in statewide sector-based groups to ensure that statewide efforts take into consideration the expertise and the needs of community-based groups,
- Works with multiple partners and funders to ensure that watershed groups have the resources and tools they need to best protect and restore Vermont's waters, and
- Advocates for a holistic and comprehensive approach to clean water and healthy watersheds statewide!

Watershed Groups: Restoring and Protecting Vermont's Waters!

The following groups are represented in this report:

Addison County River Watch Collaborative

Battenkill Conservancy

Black River Action Team

Connecticut River Conservancy

Franklin Watershed Committee

Friends of the Mad River

Friends of Northern Lake Champlain

Friends of the Winooski River

Hoosic River Watershed Association

Lake Champlain Committee

Lewis Creek Association

Memphremagog Watershed Association

Missisquoi River Basin Association

Northwoods Stewardship Center

White River Partnership