



# WILD AND SCENIC River Currents

NPS photo

Welcome to the second edition of *Wild and Scenic River Currents*, an annual newsletter designed to recognize the accomplishments of the National Park Service wild and scenic river (WSR) community. Together, we represent a range of remarkable rivers and a variety of volunteers and organizations that work to protect them. This second edition of *Wild and Scenic River Currents* features a collection of articles that highlight the accomplishments of our community during 2019. From newly designated rivers to exciting new citizen science, there is much to celebrate and appreciate. We hope you enjoy reading this edition, seeing our collective impact, and looking back at the highlights of the past year. We appreciate your contributions to *Wild and Scenic River Currents* and look forward to future editions. Thank you for all you do to keep our rivers clean, healthy, and free-flowing!

*Jennifer Back and Corita Waters, Co-Leaders of the NPS WSR Program*

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Kassi Archambault, Wood-Pawcatuck WSR  
Photo by Ayla Fox

The NPS WSR Program has been hard at work assisting rivers throughout the WSR System. In 2019, their efforts included working with local communities to designate new rivers, providing training opportunities for improved river access, and working to engage citizen scientists in the collection of information about water quality and river health.

## Annual NPS Steering Committee Meeting

The NPS WSR Steering Committee held its 2019 annual meeting along the banks of the Upper Delaware Scenic and Recreational River in Hancock, NY. With a number of recent retirements from the Steering Committee, the meeting was focused on revisiting and reaffirming the original charter of the NPS WSR Program, and identifying the top priorities for the next five years.

While in Hancock, the Steering Committee met with the Friends of the Upper Delaware River, a non-profit organization focused on protecting the river and its tributaries. The Steering Committee also met with staff from the Upper Delaware Council, a formal partnership of local, state, and federal governments.

Portions of the meeting were spent in the field—visiting the Ten Mile River Access point to discuss river access issues associated with sedimentation and channel migration, and visiting the historic Milanville-Skinner Falls Bridge to discuss the cultural significance and repair needs of the bridge. A special thanks goes out to Two Sisters Emporium for their delicious food and friendly meeting accommodations.



NPS WSR Steering Committee



Photos by Corita Waters

Friends of the Upper Delaware River



## John D. Dingell, Jr. Conservation, Management, and Recreation Act

On March 12, 2019, the John D. Dingell, Jr. Conservation, Management, and Recreation Act, more commonly known as the Dingell Act, became Public Law 116-9. The Dingell Act is an omnibus lands bill that sought to improve federal management of natural and cultural resources on public lands. Among the provisions included in the Dingell Act is the permanent reauthorization of the Land and Water Conservation Fund, the expansion of wilderness areas, and improvements to public land access. In addition, the Dingell Act added over 600 miles of new wild and scenic river designations, including the addition of four new rivers to NPS's portfolio of nationally designated WSRs. These include Surprise Canyon Creek in Death Valley National Park, and three new Partnership Rivers in the northeast —the Wood Pawcatuck, the Nashua, and the Lower Farmington River and Salmon Brook WSRs.

### Wood-Pawcatuck Rivers Added to the WSR System

*Content Submitted by Kassi Archambault*

Rhode Island and eastern Connecticut residents, town officials, and organizations celebrated the recent inclusion of the [Wood-Pawcatuck Watershed](#) into the national WSR system as a locally administered Partnership River. Encompassing about 300 square miles, this watershed includes seven major rivers as well as countless lakes, wetlands, and smaller streams. Although Rhode Island may be the smallest and second most densely populated state, this newly added river contains a whopping 24 miles of “wild” rivers, 52 miles of “scenic” rivers and 34 miles of “recreational” rivers. Residents take pride in the dark skies, rural character (87% forests and farms), and abundant wildlife associated with the Wood-Pawcatuck Watershed.

The momentum for designation began when the Study Bill was passed by Congress in 2014. In three short years, the Wood-Pawcatuck Watershed Association and the Study Committee created a Stewardship Plan, with participation from 12 towns, key non-profits, and two state environmental agencies. Although five rivers were originally identified for study, seven rivers totaling 110 river miles were ultimately found eligible and suitable for inclusion in this prestigious collection of rivers and the special recognition and protection that goes along with designation.

The local community celebrated the national designation on the banks of the Wood River amidst a spring downpour. Puddles and a broken down shuttle bus didn't dampen the enthusiasm of 125 hearty New Englanders and their elected officials. The Congressional delegation who

diligently advocated for the inclusion of the Wood-Pawcatuck attended the celebration, including Congressmen Jim Langevin (RI), David Cicilline (RI), and Joe Courtney (CT), and Senators Jack Reed (RI), Sheldon Whitehouse (RI), Chris Murphy (CT), and Richard Blumenthal (CT).

The momentum continues to this day with newly appointed members serving on a Stewardship Council from 12 municipalities, two key non-profits and both CT and RI Environmental Agencies. This Stewardship Council held their kick-off meeting in May of 2019. Commitment is high and organizational start-up tasks are nearing completion. The inhabitants of the Wood-Pawcatuck Watershed are very excited to be a part of the national WSR system and look forward to a wonderful future.



Photo courtesy of Wood-Pawcatuck Watershed Association





## Surprise Canyon Creek Added to the WSR System

*Content Submitted by Taylor Johaneman*

The implementation of the Dingell Act designated a 7.1 mile section of Surprise Canyon Creek as part of the national WSR System under the WSR Act. Surprise Canyon Creek is located in the Panamint Mountain Range about 50 miles northeast of Ridgecrest, California. Lying in both Death Valley National Park and on public lands managed by the Bureau of Land Management (BLM), 3.1 miles of the designated section of river will be managed by NPS and 4.0 miles will be managed by the BLM. Surprise Canyon begins near Panamint City and runs west, dropping about 5500 feet toward the valley floor. Surprise Canyon Creek is fed by three main springs – Water Canyon, Limekiln Spring, and Brewery Spring.

Surprise Canyon Creek harbors a rich cultural history. Archeologic evidence and ethnographic data indicate that the canyon and surrounding areas of the Panamint Mountain Range were used by the Timbisha Shoshone people for its vast resources, including the water found in the canyon's springs and creek. The area is also well-known for its mining operations. Silver ore was discovered in Surprise Canyon in 1873 and prompted the organization of the Panamint Mining District, which includes Panamint City and the lesser known Thompson Camp. Soon after discovering the ore, several roads to Panamint Valley were built, including a road up Surprise Canyon to Panamint City. Due to several severe flash floods, mining operations declined after only two years, but these roads and developed camps would later encourage recreationalists to continue exploring the area.

In the years since the termination of mining operations, Surprise Canyon was a popular destination for various forms of recreation, one of which is the use of off-highway vehicles (OHVs) on the old mining road. Unfortunately, the former road goes directly up the creek in much of the canyon, and repeated passing of OHVs does significant damage to the aquatic and riparian habitats supported by the creek. The designation of Surprise Canyon Creek as a WSR will protect the canyon from OHV impacts, while keeping the area open for other recreation activities. Additionally, the designation will help ensure the preservation of some of the unimpaired features that

speak to the uniqueness of Death Valley National Park and surrounding federal lands within the Mojave and Great Basin Deserts.

Death Valley National Park will work with the BLM's Ridgecrest Field Office to develop a Comprehensive River Management Plan (CRMP). The planning process will involve a river values workshop with the BLM and stakeholders to establish the outstandingly remarkable values of Surprise Canyon. The CRMP will be developed and completed in conjunction with the BLM according to regulations set by the WSR Act to protect these unique waterways, habitats, and landscapes for years to come.



Photo by Richard Frieese





# River Management Society Updates

The River Management Society (RMS) is a national non-profit organization whose mission is to support professionals who study, protect, and manage North America’s rivers. RMS supports the professional development of river managers, and has played a historical role in facilitating training for WSR professionals. Among recent efforts is the River Studies and Leadership Certificate Program ([see pg. 6](#)). NPS is currently working with RMS to create new training opportunities for NPS staff and partners to improve their understanding of river management and protection issues. Look for upcoming training opportunities for river professionals at the [RMS River Training Center website](#).



Photos courtesy of Risa Shimoda



NPS Photo

## CONGRATS, SUSAN!

Pacific West Region WSR Representative Susan Rosebrough received RMS’s 2019 Outstanding Contribution to River Management Award. See the [link](#) for more details.





## Collegiate River Science and Leadership Comes to the Southeast!

*Content Submitted by Jeff Duncan*

The field of river management is as diverse as the rivers and the river users it seeks to engage. Traditionally, becoming a “river manager” has meant getting a degree in one of several sub-disciplines within the general family of natural resource departments, ranging from fisheries to recreation, and then often serving as a seasonal intern to get one’s feet wet. Academic courses within these degree fields have typically done little to address the interdisciplinary and complex nature of on-the-ground river management. Being prepared to step into a job as a river manager has often meant that new hires have had a steep learning curve often requiring many years of on-the-job-training and initiation by fire.

As a result, in 2015 the River Management Society (RMS) along with several university partners embarked on a plan to develop the River Studies and Leadership Certificate (RSLC). The certificate is an add-on credential to an undergraduate diploma from a participating university. The certificate is conferred by RMS once a student has taken a certain pre-set curricula determined by the university and approved by the RMS Advisory Committee. Courses must include an array of river policy, river science, and swift water rescue training in addition to experience working alongside a professional river manager.

In 2018, NPS’s Southeast Region WSR program began partnering with the University of Tennessee at Chattanooga (UTC) to bring the RSLC program to the southeast. As a result, this fall UTC became the first university in the region to offer the certificate, and only the second institution east of the Mississippi to do so.

According to Dr. Jennifer Boyd, Head of Biology, Geology and Environmental Sciences at UTC, “The RSLC program provides opportunity for our students to gain applied knowledge relevant to real world issues given our proximity to a variety of river systems, collaborations with numerous river-centric agencies and organizations in the Chattanooga area, and faculty with relevant expertise.” Thus far, the program has attracted five students in its first semester and is expected to grow substantially as awareness increases.

Other universities that currently offer the RSLC program include Colorado Mesa University, Minnesota State University at Mankato, Northern Arizona University, Prescott College, Sierra Nevada College, University of Utah, Virginia Commonwealth University, Western Carolina University, and Western Washington University. For more information contact [Jeff Duncan](#) or the [RMS website](#).



Photo by Jeff Duncan



# Connection and Protection



From improving recreational opportunities to expanding stewardship through community engagement, this section highlights the many unique projects that NPS and its partners carried out in 2019 to connect people to NPS WSRs.



Photo courtesy of Poudre Heritage Alliance

## Improvements to Recreation

### River Management Society's National Rivers Project

*Content submitted by Jack Henderson*

Tommy Croft and Corita Waters of NPS are working with Jack Henderson of RMS to bring the Partnership WSRs added under the John D. Dingell, Jr. Conservation, Management, and Recreation Act into the National River Recreation Database, which fuels the National Rivers Project. The National Rivers Project is a geospatial database, website, and trip planning tool for WSRs, water trails, and whitewater sections within the US. The National River Recreation Database provides comprehensive river recreation and management information useful to both resource managers and paddlers. Visit [the website](#) or contact [Jack Henderson](#) for more information.

#### OBED WSR RECREATION UPDATES

In partnership with the Morgan County School system in Tennessee, the Obed WSR completed another year of “adopting” all Morgan County sixth graders, with each student getting to spend a day with rangers learning how to kayak along the Obed and rock climb its gorges with the assistance of over ten volunteers.





# Play it Safe on the Poudre

*Content Submitted by Megan Maiolo-Heath*

WSRs appeal to recreationists of all levels, abilities and interests. And, for good reason! These nationally designated rivers offer the public “outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.”

The Cache la Poudre River, located east of the Continental Divide in the Northern Front Range of Colorado, is one of these special rivers. Affectionately known by locals as the “Poudre,” this 126-mile-long river is a recreationist’s heaven and considered a crown jewel of Northern Colorado. As the only WSR in Colorado, the Poudre offers abundant opportunities to a broad spectrum of river users, including rafters, kayakers, anglers, hunters, bikers (who utilize the Poudre River Trail), and birders. The scenic Poudre River runs from mild to wild, attracting people from around the state and the country.

However, many people do not understand the dangers of a flowing river. Rivers can move deceptively fast and exert great amounts of force. Colorado’s melting snowpacks increase river flows in the spring. Exposure to cold water can quickly lead to hypothermia, which can be deadly. The Poudre River also contains hazards such as rocks and boulders, trees, large rapids and bridges.

These hazards, and a history of near-fatal and fatal accidents on the Poudre River, spurred an effort in 2018 to create Play It Safe on the Poudre™. This multi-pronged program raises awareness about approaches to recreating on the Poudre River in safe and sustainable ways, including signs on public and private lands, river safety maps, and public outreach efforts. The program also calls attention to the history of in-river structures on the lower stretch of the Poudre (outside of the WSR designation) that represent

hazards to recreationists, such as low-head dams. While this lower section, known as the “Working Poudre,” is outside of the WSR designation, it is designated as a National Heritage Area and sees heavy recreational use as well as use by many different industries and municipalities.

The river safety tips developed by the Poudre Heritage Alliance and their partners, such as Poudre Fire Authority and the City of Fort Collins Natural Areas, can be applied to recreation on WSRs throughout the country. They hope everyone recreating on any river, Wild and Scenic or not, will “play it safe” so they can continue enjoying their favorite rivers for many years to come!

For more info about the Play It Safe program please visit [the website](#) or email [Megan Maiolo-Heath](#).

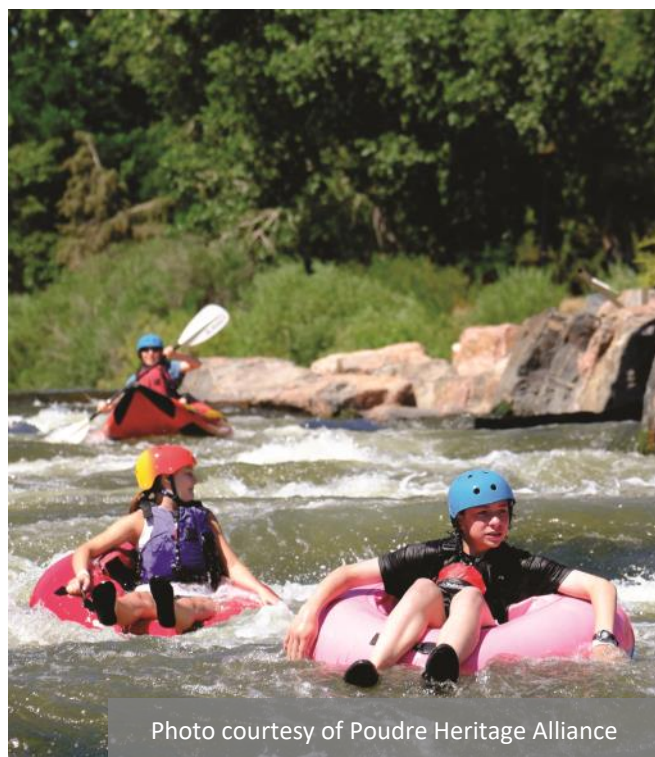


Photo courtesy of Poudre Heritage Alliance



Photo by Corita Waters

## NEW! RIVER ACCESS PLANNING GUIDE

NPS is happy to share the new [River Access Planning Guide](#), an online and downloadable resource for planning river access. This guide details a process for facilitating high quality recreation experiences in rivers and other waterways. It represents an approach for site selection and design to best meet the needs of those seeking to enjoy river recreation on, off, and in the water.





## Eco-Paddle 2019

*Content Submitted by Suzanne Petersen*

Great Bay is stressed, but all is not lost; there is plenty of good news, too. People are actively engaged in research, nutrient removal, restoration of eelgrass and oysters, and rethinking choices at home and work. The Lamprey River Advisory Committee is lending its voice and outreach to help.

As in years past, the 2019 eco-paddle out to Great Bay had a group of people eager to learn about the Lamprey River and the bay. Local experts provided natural interpretation while a local outfitter provided instruction and safety. Win-win!

At the base of Macallen Dam, participants learned about the hard journey that river herring make from the ocean back to fresh water to spawn, only to be blocked by big dams. The NH Fish and Game Department operates a fish ladder here and average runs of 60,000 fish passing upstream make the Lamprey River’s spring run one of the best on the East Coast.

At a citizen scientist’s dock, paddlers learned that oysters start life as tiny zooplankton and then settle onto oyster or clam shells. Participating dock owners suspend cages of tiny oysters (spat) from their docks, remove marine plants and animals that can smother the baby oysters, and take measurements of growth.

Lastly, the tour’s eelgrass expert showed samples of healthy reproductive eelgrass and its seeds, vegetative eelgrass and the new runners it uses to create new plants without seeds, and eelgrass covered by slimy algae and young tunicates. Despite significant declines in Great Bay, the eelgrass meadow at the mouth of the Lamprey River is a bit more expansive and healthier than in recent years, showing some improvement to the system.



Photo by Peter Sawtell

## Welcome to Thompson Forest!

*Content Submitted by Suzanne Petersen*

Good things come to those who wait... Habitat creation, trail work, and signage at the 54-acre Thompson Forest along the Lamprey WSR are now complete. The last project completed is likely to be the first thing that visitors notice: the informational panel on the kiosk.

The kiosk panel was officially unveiled on November 16, 2019. Ellen Snyder, the land conservation steward for Durham, and Dick Lord, long-time LRAC member, offered remarks before Ellen led the group on a guided tour. Participants learned about the wildlife management plan, invasive plants that are being removed, and why structured brush piles are important as they walked the scenic trail and visited the river-side picnic area on the Lamprey WSR.

Despite the chill in the air, all participants came away with warm regards for this new haven for people and wildlife.



Photo by R.C. Grimsley





Photo by Paula Terrasi

## Nashua, Squannacook, and Nissitissit Rivers

*Content submitted by the Nashua River Wild and Scenic River Stewardship Council*

As its first project since securing National WSR designation, the Nashua River WSR Stewardship Council conducted a careful field assessment of current canoe access sites on all three of its designated rivers. Led by Al Futterman, Nashua River Watershed Association (NRWA) Land Programs Director and lead researcher/writer of the NRWA’s Nashua River Canoe and Kayak Guide, teams of volunteers did site visits to approximately 30 sites, and also considered the community’s desire or need for new access sites.

The assessment found the sites to be in various conditions from the premier Petapawag site in Groton, Massachusetts, which is the only concrete ramp site for boat-trailers, to several sites that are rarely used -- perhaps indeed due to difficulty of use. A few sites were impeded by steep approaches from parking to the river, difficult entry from the

river bank into the water, or bank erosion. Some sites are compromised by low summer flow or thick vegetation along the shoreline. Only a few sites are marked with signage; most are “hidden” and only known to locals, and a couple are privately owned, although not posted “No Trespassing”. Most of the sites are logically located where a road crosses or comes closest to the river. Some could be improved through minor fixes while others demand major fixes such as guard rail modifications. Because none of the sites have visitor usage data, it was very helpful to speak with local residents about site usage. Only a few sites seem to be “officially” maintained, while most rely on informal maintenance by users. The next step, currently underway, will be for a sub-committee to review the assessments and formulate an action plan to prioritize potential improvements.



Photo courtesy of Bill Napolitano

### TAUNTON WSR RECREATION IMPROVEMENTS

The Massachusetts’ Gateway City Parks Program recently provided \$568,000 to the City of Taunton’s Pathways Committee to engineer and design a two-mile segment of the planned 22-mile Taunton River Trail blueway/greenway, which is being led by the Taunton River Stewardship Council.





Photo by Allison Brown

## Stewardship and Science



NPS Photo/Christopher Gezon

### Virgin WSR Water Quality Success Story

*Content submitted by Katie Willi*

*Escherichia coli* has been a known issue in the Virgin WSR for some time. In particular, cattle grazing and wildlife have led to high levels of the bacteria in the North Fork Virgin River watershed, and since 2010 the river has been on the 303(d) list of impaired waters for failing to meet its *E. coli* standards. As a result, a group of local landowners, the UT Division of Water Quality, Zion National Park, and BLM began a collaborative effort to develop strategies to curtail *E. coli* loading to the Virgin’s watershed. Since these strategies have been implemented, *E. coli* levels have not exceeded their water quality standard. If no exceedances continue to be observed, the North Fork of the Virgin River could be delisted for *E. coli* as early as this year. Read the full success story on the [EPA’s website](#).

#### RARE MUSSELS FOUND IN OBED WSR

Staff of the Obed WSR recently found live purple bean mussels (*Villosa perpurpurea*; also known as the Tennessee Bean, *Venustaconcha trabalis*) during a monitoring survey. This was the first time a live member of the endangered species has been found in the Obed River proper, or upstream of the Obed/Emory River confluence, since 2001!



# Flexing Mussels on the St. Croix National Scenic Riverway

Content Submitted by Greg Seitz (Originally Published on [StCroix360.com](http://StCroix360.com))

Many mussel species should almost not exist. Their lives are so precariously dependent on specific conditions that their continued ability to survive and reproduce, generation after generation, is remarkable. Even minor disruptions to their homes can cause the whole thing to fall apart. Pollution can poison them. Subtle changes in water chemistry can weaken them, especially by killing young mussels. Increased sediment can smother them. Climate change can disrupt critical ecosystem connections. They may lose access to fish species they trick into carrying mussel babies for a first stage of life.

The threats are abundant, but somehow these species have not just survived over the ages, but become successful specialists. It's one reason why the St. Croix National Scenic Riverway, with its 41 species, is special. Not only is there remarkable species diversity, but the individual populations are typically large. This richness and abundance is why the St. Croix River is one of the best mussel laboratories in America. Here's a summary of some research projects from 2019:

## Part 1: Wading for Wabash Pigtoe

Scientists and citizens search for Wabash pigtoes (*Fusconaia flava*) in the St. Croix River at Wisconsin Interstate Park. The species is relatively common in the St. Croix River, but notably declining one state south, in Iowa. University of Minnesota mussel researcher Mark Hove recruited citizen scientists to help search for specimens that could lead to the answers. They also collected fish in the area, and all the creatures were taken to a lab in St. Paul, MN. Then the scientists watched to see if any of the fish were carrying baby Wabash pigtoes, indicating the fish was a suitable host species. The project has identified 14 new minnow host species for the Wabash pigtoe, and two new killifish species hosts.



Photo by Greg Seitz



Photo by Greg Seitz

## Part 2: Searching for St. Croix River Spectaclecase

A tray of mussels being measured and recorded before being returned to the river rest on the side of a Wisconsin Department of Natural Resources boat on the St. Croix River. DNR diver Jesse Weinzinger is seen in the background working on a study of endangered and secretive spectaclecase mussels (*Cumberlandia monodonta*), providing the hard data that drives management and protection. This project was conducted in partnership with the Minnesota DNR, and funded by the U.S. Fish and Wildlife Service (USFWS) to determine more specifics about where spectaclecase live. Spectaclecase mussels are today found in fewer than half the streams where they lived historically. The St. Croix River is one of its

holdouts.

## Part 3: A Morning with the Winged Mapleleaf Moms

The winged mapleleaf mussel (*Quadrula fragosa*) has come about as close to extinction as possible, but it too hangs on in the St. Croix River. Winged mapleleaf have the highest level of protection possible in the federal Endangered Species Act, and the species listed as endangered by both Minnesota and Wisconsin. The species once inhabited at least 34 river systems in 12 states but now, the entire population has been reduced to four streams: the Ouachita and Saline Rivers in Arkansas, the Bourbeuse River in Missouri, and a small stretch of its former range in the St. Croix River. The St. Croix River is one of the only places where it is known to reproduce. The USFWS has launched a winged mapleleaf reproduction program at its Genoa Fish Hatchery in Wisconsin, and collaborates with NPS to monitor the population and raise mussels for restoration efforts.



Photo by Greg Seitz



## Catching the Rain in White Clay Creek Watershed

*Content Submitted by Shane Morgan*

The White Clay Creek is a major drinking water source for over 130,000 people in the region, but polluted runoff from rain events make it costly and difficult to clean. In fact, stormwater washing off land during rain events is the largest source of pollution to the White Clay Creek watershed.

The Catch the Rain Program provides technical assistance and funding incentives to private landowners to install water quality and habitat improvement projects on private lands for cleaner water and a healthier environment. The program promotes the use of rain barrels, rain gardens, pervious paving retrofits, conservation landscaping, and tree plantings to capture and detain rainfall, simulate natural soil filtering, and reduce stormwater volumes and speeds. Program applicants receive a personalized site visit, followed by a site-specific report outlining potential practices to help capture, detain and filter stormwater runoff. Landowners who implement the suggested practices apply for a 50% cost sharing incentive up to \$2500 per property. The ultimate goal is to increase voluntary involvement in good stewardship practices that help capture and minimize polluted runoff from private lands.

Cue Robert Ritrovato. Robert is a homeowner who was interested in the Catch the Rain Program and contacted us for a site visit. Robert was most interested in protecting and enhancing the protected HOA lands in his community. His



Photo by Shane Morgan

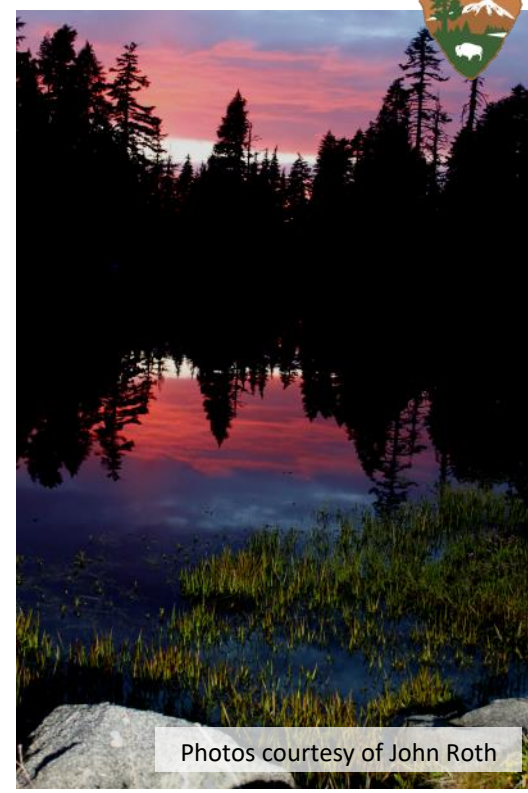
energy was contagious, and right away we enlisted the help of Rob Daniels, Senior Land Use Planner from the Brandywine Conservancy, and selected an area where we saw the best opportunity for success for a streamside tree planting. After gaining the support of his HOA, approximately 300 trees were planted by 30 volunteers along both sides of a 400-foot length of stream in 2019. Robert will help monitor the planting to detect any future issues to help ensure its success, and the HOA board agreed to support his efforts by budgeting for professional work as needed to combat aggressive invasive plant species.

This is just one example of how an outreach program can turn interest into action. Since its inception in 2016, the program has had 80 applicants leading to the installation of 26 rain barrels, 319 trees, two conservation landscapes, two rain gardens, and one permeable paver retrofit. In 2020 another buffer planting is scheduled on protected private land, and a series of rain gardens are planned as a pilot for the commercial district of a more urbanized area in the watershed. In retrospect however, the most often overlooked outcome of the program is its ability to build trust and stronger relationships with our watershed residents to help achieve our watershed goals.



Photo by Scott Morgan





Photos courtesy of John Roth

## Oregon Caves and Subterranean Wild and Scenic Rivers

*Content Submitted by John Roth and Jason Walz*

When Oregon Caves National Monument was expanded to include a 4,070 acre Preserve in 2014, Congress also added the River Styx to the WSR System. The River Styx flows through Oregon Caves itself, as the first underground WSR, and gains much of its flow from groundwater. The legislation expanding the monument and designating the River Styx also directed NPS to study five additional creeks in Oregon Caves National Monument and Preserve for possible inclusion into the WSR System.

The designation of the River Styx helped the park focus on subsurface functions critical to evaluating and protecting the contributing WSR drainages. Therefore, the park is also analyzing subsurface functions associated with Lake Creek, one of the additional creeks being evaluated for inclusion in the WSR System. Geologically, Lake Creek flows through areas with links to glacial activity and areas of karst, and marble bedrock where caves are likely. Like the River Styx, Lake Creek gains much of its flow from groundwater and has been found to contain an outstanding diversity of invertebrates in the creek gravels that may be groundwater associated.

Preliminary investigations have found flux melted chert rock in a small cavity that is part of the groundwater drainage

into Lake Creek. The cavity is located near the geologic contact with a large body of once molten rock called a pluton. Flux melting occurs when water and carbon dioxide are exposed to hot solid rock, and the mixing of these substances lowers the melting point of the rock. This creates magma in places where there was originally solid rock. This process is often associated with plate tectonics and subduction zones.

The chert rock in the cavity is melted on both sides, suggesting the cavity may have been enlarged by processes associated with flux melting and plutonic acids. If these fluids did form a cave here, it would make it among the world's oldest caves, because of the six to ten miles of rock that has been eroded above it.

To investigate further, the Cave Specialist from the National Cave and Karst Research Institute is helping the park to dye trace the sources of groundwater flow into Lake Creek and to use non-invasive electrical resistivity modelling to search for underground caves and small voids in the drainage area. Findings from these additional studies will help the park understand the subterranean component of Lake Creek as it is being considered for possible inclusion in the WSR System.





# Grading a WSR's Health

*Content Submitted by Alison Field-Juma*

OARS, one of two non-profit partners on the Sudbury, Assabet, and Concord WSR Stewardship Council, has monitored water quality for over 30 years in this WSR's 400-square mile watershed just west of Boston, MA. They recognized that they needed to find a better way to communicate their results to the public, and decided to develop a report card—after all, everyone understands the difference between an A and an F!

Using an approach that engaged over 45 local, state, and federal stakeholders, they selected indicators for five river qualities that were valued locally: Recreation, Water Quality, Water Quantity, Scenery, and Habitat, and developed 21 indicators. This was a significant departure from report cards done by other Metro-Boston rivers and the EPA that used only one indicator: bacteria. NPS helped out by providing training in their Visual Resource Inventory methodology—the first time it had been used for assessing the scenic and cultural values of a river.

While it can be scary to have stakeholders holding the steering wheel, the result is a measure of river health that reflects what people care about and support. It can be used by people at many levels, from scientists to policy-makers.

After two years of work, the big reveal in June showed an overall grade of B. Not very exciting! But drill down into the six river segments that were individually graded, and their indicators and grades ranged from A to F. Not surprisingly, the wild and scenic sections of the rivers showed some of the best grades. This is thanks in large part to the work of the local WSR Stewardship Council, the protections under



Photo by Dave Griffin

the WSR Act, and long-term NPS funding of science, stewardship, and land protection.

Not everything that matters could be graded, for example no metrics for economic health were available, but that can be the focus of future improvements. A simple version of the report card is printed and the full deep dive is available on the website [ecoreportcard.org](http://ecoreportcard.org). On the website, users can click on indicators and watch the river segments' color reflect their grade, read about related issues, learn what they can do to raise the grade, and read the full methods report.

OARS is presenting the report card's results throughout the watershed, focusing on the lessons for that local community and what actions they can take. Presentations around the state and to other WSRs show the process and how it can be modified to suit any river's needs. The methodology was developed by [the Center for Environmental Science at the University of Maryland](http://the Center for Environmental Science at the University of Maryland), who were consultants on the project, and has been used on several much larger iconic rivers, such as the Orinoco, the Mississippi, and Chesapeake Bay.

OARS plans to issue the report card every two years and cannot wait to see the trends emerge. Can citizen action and investment mitigate the effects of climate disruption? Will the indicators hold up? Only time—and science—will tell.







## SPLASH Citizen Science Water Quality Project

*Content Submitted by Dr. Allison Brown*

SPLASH, which stands for Student Participation in Learning Aquatic Science and History, is a non-profit organization that offers students a unique, hands-on learning experience aboard their operational steamboat on the Delaware WSR - the source of drinking water for more than 15 million people. As stewards of the beautiful Delaware WSR, SPLASH aims to teach people about the importance of clean water.

With the kind support from NPF through the Swim Splash Smile program, SPLASH's Citizen Science Water Quality monitoring project has been a great success. They now have a water quality data set that spans an 18-month time period thanks to their team of dedicated volunteers and assistance from interns Emily Dallas, Corynn Lewis, and Morgan Lojek. On August 17th 2019 SPLASH hosted a steamboat cruise for their citizen scientists, and a poster summarizing the results of the water quality project was presented. The tools and knowledge gained from this project are now a part of the SPLASH curriculum.

SPLASH continues its partnership with the Lower Delaware WSR Council who helped fund the instrumentation needed for the project. They have also begun networking with the Central New Jersey Watershed Institute and have provided information on monitoring site data for inclusion on a state map. In the coming winter months, SPLASH volunteers will focus on conductivity as a proxy for determining whether road salt is entering the Delaware's waterways. The data will continue to be updated and made available through the [SPLASH Steamboat Floating Classroom website](#).



Photo by Peter Hester



Photo by Allison Brown

## Land Additions

*Content submitted by Paul Kenney, Bill Napolitano, and Niki Nicholas*

**MAURICE:** The New Jersey Department of Environmental Planning has preserved a 1400-acre tract of land that adjoins the Menantico Creek and Manumuskin Rivers - both of which are designated tributaries of the Maurice WSR. The purchase links up with 4,400 acres of protected TNC property located in the Southern Pinelands. The overall benefit could provide miles of recreational trail links for Millville and state residents, and permanently protect water quality for the Maurice mainstem. This effort was decades in the making, and is a result of the dedicated efforts of partner organization Citizens United to Protect the Maurice River and its Tributaries (CU Maurice River). See the official news release [here](#).

**TAUNTON:** The Taunton Wild and Scenic River Stewardship Council (TRSC) provided technical assistance and appraisal funding, and worked with the Town of Dighton to acquire a five-acre parcel abutting critical marsh habitat on Broad Cove.

**OBED:** The Obed WSR received 4 tracts of land within the Obed legislated boundary, totaling 118 acres.





## WSR Steward Spotlight



Photo courtesy of Natalie Warren

A special welcome to Corita Waters! Corita has spent many years advocating for and recreating on rivers. She has been instrumental in developing collaborative partnerships with national nonprofits that actively advance WSRs and provide tools for staff and partners. Corita got her feet wet on wild and scenic rivers while working on the Nationwide Rivers Inventory early on in her 18-year career; she is dedicated to continuing the strong legacy of river protection and partnerships in the NPS. A collaborative leader, Corita's passion is creating connections between all people and nature and each other. She will co-lead the NPS WSR program and provide support for Partnership WSRs and the Interagency WSR Coordinating Council, with a focus on managing rivers for resilience and recreation. Corita found her sense of place rowing on, relaxing by, and researching the St. Mary's River in Maryland and welcomes your invitation so she can get to know your local river.

If you have questions regarding a specific WSR project or want more information on WSRs, please contact the appropriate WSR coordinator from the following list:

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