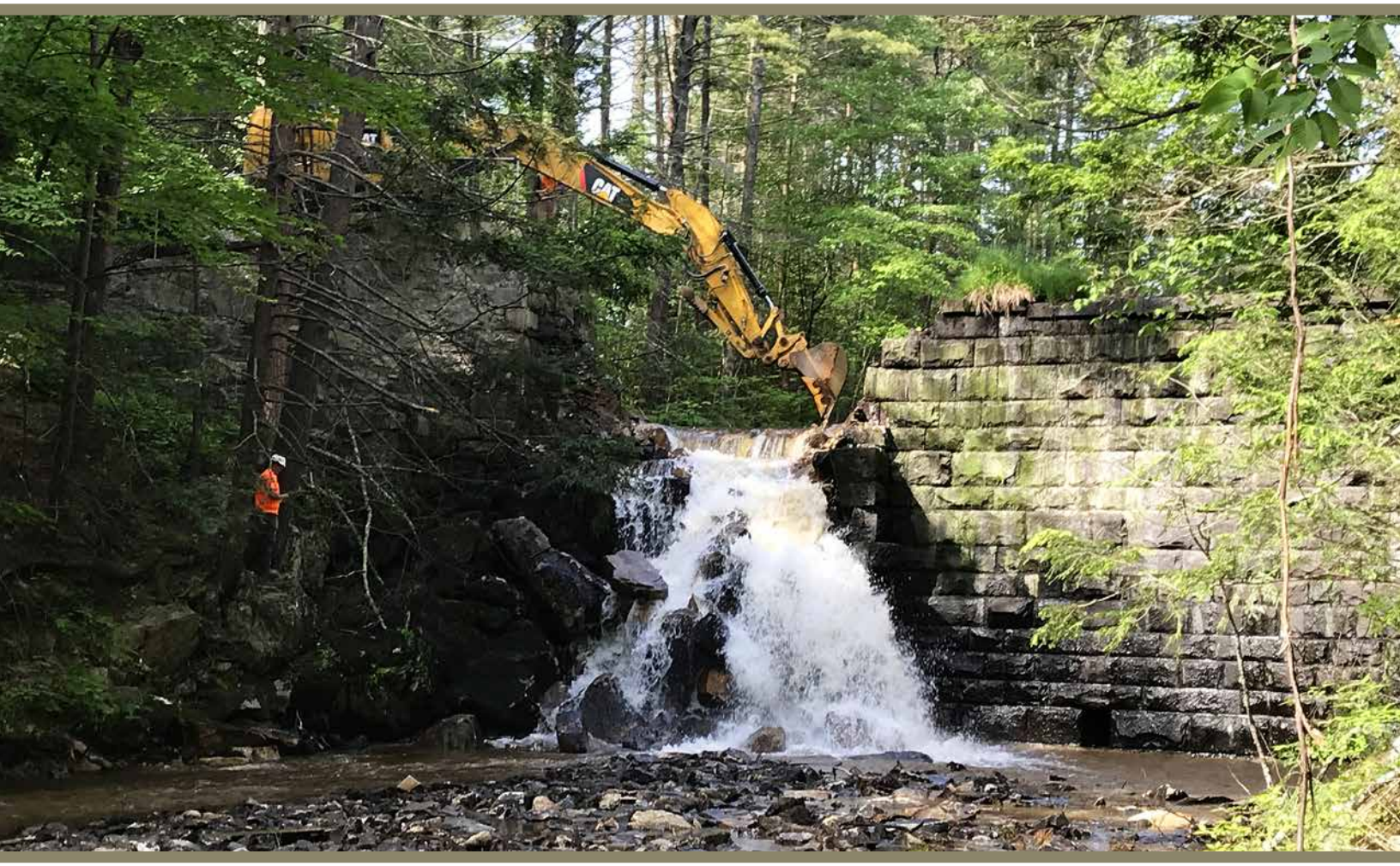
2018 Annual Report: Adaptation in Action

Helping nature and people prepare for our changing climate



COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF FISH & GAME
DIVISION OF ECOLOGICAL RESTORATION

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Matthew A. Beaton, Secretary
Ronald S. Amidon, Commissioner
Mary-Lee King, Deputy Commissioner
Beth Lambert, Director
Hunt Durey, Deputy Director

Massachusetts Department of Fish and Game
Division of Ecological Restoration
Invested in Nature and Community

Commonwealth of Massachusetts
Division of Ecological Restoration
Invested in Nature and Community

2018 Annual Report - Adaptation in Action

Helping nature and people prepare for a changing climate

Friends,

The climate of Massachusetts is changing, affecting the rivers, wetlands, and watersheds we love and the natural resources we all depend upon. The good news, however, is that we have the ability to work together to help people and nature adapt to these changes.

To help the state prepare, the Massachusetts Division of Ecological Restoration (DER) is ramping up its technical and financial assistance for river and wetland restoration projects that help nature and communities adapt to the changing climate. We're also working with other state agencies to carry out high priority actions in the State Hazard Mitigation and Climate Adaptation Plan.

As you'll see in this annual report, we invested significant time over the last year to gear up to expand our services:

- In 2018, we designated twelve new Priority Ecological Restoration Projects and launched two new programs, all of which restore habitat and increase climate resilience. The new Priority Projects include dam removals, streamflow restoration, coastal wetland restoration, and urban river revitalization efforts. Our new programs restore wetlands on former cranberry farm lands and help watershed groups and communities protect and restore water quality.
- In 2019, we'll expand our assistance to help communities remove dams, upgrade culverts, and advance other restoration and climate adaptation projects. Communities and landowners across the Commonwealth are requesting our help. They lack the capacity and know-how to get these projects done. Our technical and project management assistance bridges the gap between community desire to do this work and getting good projects designed, permitted, funded, and constructed.

We are taking action now to restore and protect nature and our communities for future generations. For more information about any of our programs or projects, contact DER Director Beth Lambert at 617-626-1542 or beth.lambert@mass.gov.

Sincerely,

Beth Lambert, *Director*

Ronald S. Amidon, *Commissioner*

Hunt Durey, *Deputy Director*

Mary-Lee King, *Deputy Commissioner*

2018 Accomplishments

- DER leveraged over $7.1 million in newly awarded external funds for community-based restoration projects. The grant funds pay for engineering, design, and construction work taking place in communities across the Commonwealth.

- DER helped municipal staff, watershed groups, landowners, and other organizations in more than 180 communities across 26 major watersheds through trainings, site visits, one-on-one assistance, grants, projects, and other types of assistance.

- Volunteers devoted more than $40,000 worth of labor towards DER river and wetland restoration projects.

- DER awarded Priority Project status to 12 new river and wetland restoration projects. Projects include dam removals, culvert upgrades, urban river revitalization efforts, floodplain restoration, and streamflow restoration.

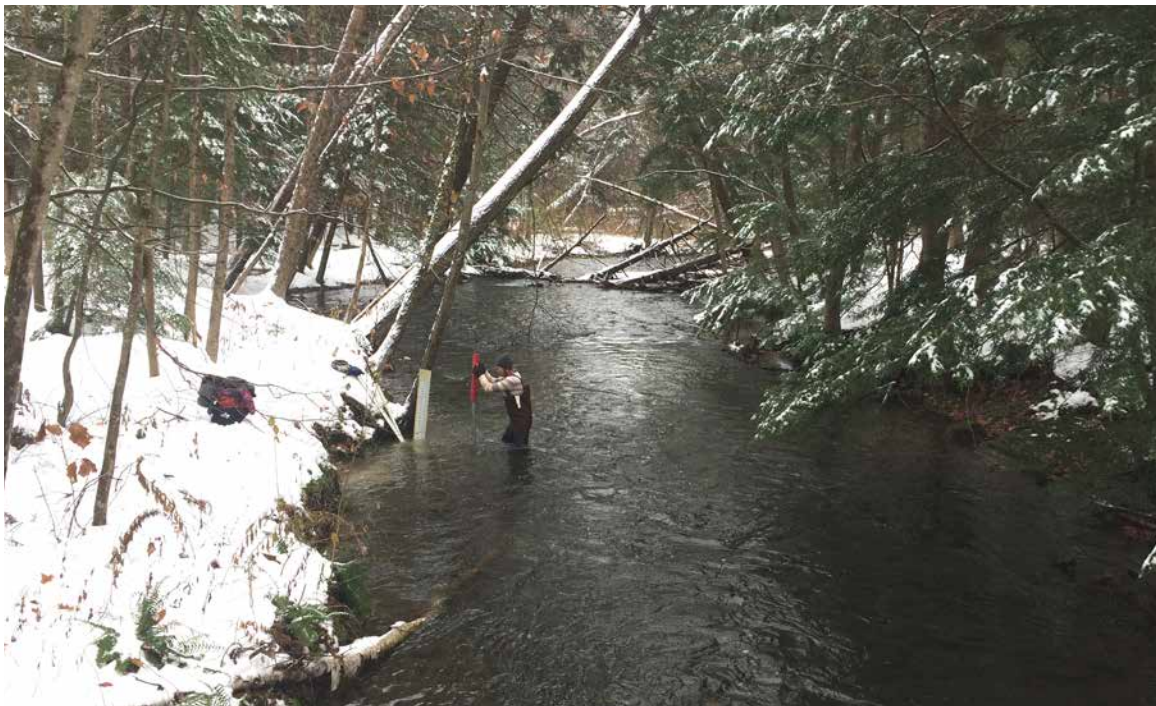
- DER launched a new program to restore wetlands on cranberry farmland that has been retired from agriculture. The new program will restore hundreds of acres of wetlands in the coming years, protect open space, and help ease financial strain on farmers.

- DER began a Water Quality Restoration Pilot Program to help communities and watershed organizations to reduce or prevent water quality impairments.

- The Culvert Replacement Municipal Assistance Program, launched in 2017, has awarded $1.65 million in grants to 24 towns in its first two years. Grant funding helps towns upgrade road-stream crossings to provide fish passage, habitat continuity, and resilience to large storms.

- DER hosted a Financing Sustainable Water Rates workshop in partnership with the MA Department of Conservation and Recreation. Effective water rates can encourage water conservation while also supporting water suppliers' needs. There were 85 attendees from over 30 public works/water departments in Massachusetts.

- DER removed 4 dams, opening up more than 55 river miles, restoring 28 acres of wetlands, and reconnecting more than 260 acres of spawning habitat. Progress continued on 45 other habitat restoration projects.



DER staff brave the cold river after the season's first snow to install a stream gage on the Southwest Branch of the Housatonic River downstream of Richmond Pond. This gage will help DER better understand how management of the dam at Richmond Pond impacts streamflow downstream.

DER Accepts 12 New Priority Projects

On December 6th, the Baker Polito Administration announced that 12 river and wetland restoration projects across the Commonwealth will be designated Priority Projects by DER. Upon receiving designation, Priority Projects are eligible for technical services, including data collection, engineering, design work, permitting, project management and grants.

The new Priority Projects include dam removals, culvert replacements, urban river revitalization, salt marsh restoration, and streamflow restoration. Each project restores healthy habitat while also helping communities prevent storm damage, address aging infrastructure, and improve outdoor recreation. Currently, more than 45 active ecological restoration projects throughout the state are designated as Priority Projects.

> Communities and land owners are on the front lines of climate change, and Priority Projects are critical to ensure habitat restoration and climate adaptation.
>
> Secretary Matthew Beaton
> Executive Office of Energy and Environmental Affairs

The Priority Projects selected in 2018 include:

- Abbey Brook Revitalization - Chicopee
- Great Marsh Restoration - Newbury, Essex, Ipswich
- Mattapoisett Bogs Restoration - Mattapoisett
- Mill Brook Bogs Restoration - Freetown
- Osgood Brook Restoration - Wendell
- Schenob Brook Restoration - Mount Washington
- Sucker Brook Restoration - Pepperell
- Stewart Bog Restoration - Rochester
- Stony Brook Flow Restoration - Littleton
- Traphole Brook Restoration - Norwood and Walpole
- Upper Child's River Restoration Project - Falmouth
- Ware River Restoration - Hardwick

Left: Removal of the Becker Pond Dam will benefit wild Eastern brook trout and other species in Schenob Brook. Right: DER's Alex Hackman discusses wetland soils with the Child's River Restoration Project Team.

Left: Restoration of retired cranberry bogs along the Coonamessett River. Right: Same site, nine months later.

New Program Restores Wetlands, Helps Farmers

Over the past decade, DER has helped to restore wetlands and streams across 277 acres of retired cranberry farmland. Another 470 acres are now in the design and permitting phase for future restoration. Without restoration, historic wetlands on most retired cranberry farms remain severely degraded from fill, ditches, and water controls. With restoration comes improved habitat for fish and wildlife, flood storage, and water filtration - all of which are important as our climate continues to change.

Now, with some cranberry growers seeking an economically beneficial way to retire from farming, DER is excited to expand this work and assist landowners and local communities with our new Cranberry Bog Program.

The Cranberry Bog Program identifies high priority sites and interested landowners, helps link farmers with land protection and conservation opportunities, completes on-the-ground restoration projects, and carefully monitors results to improve practice over time. Our staff and our partners have expertise in site assessment, restoration design, permitting, project management, and construction oversight.

DER is working with a wide range of partners: private and public landowners, municipalities (e.g. Plymouth, Falmouth, Harwich), federal agencies (Natural Resources Conservation Service, U.S. Fish and Wildlife Service, the NOAA Restoration Center), state agencies (MassWildlife, MassDEP), the Cape Cod Cranberry Growers Association, local land trusts and watershed associations, and numerous academic institutions.

In 2019, DER and partners will advance eight wetland restoration projects totaling hundreds of acres of retired cranberry farmland. We will also build tools to help prioritize sites and work with others to study the effects of restoration on water quality, coastal nitrogen pollution, hydrology, and plant communities.

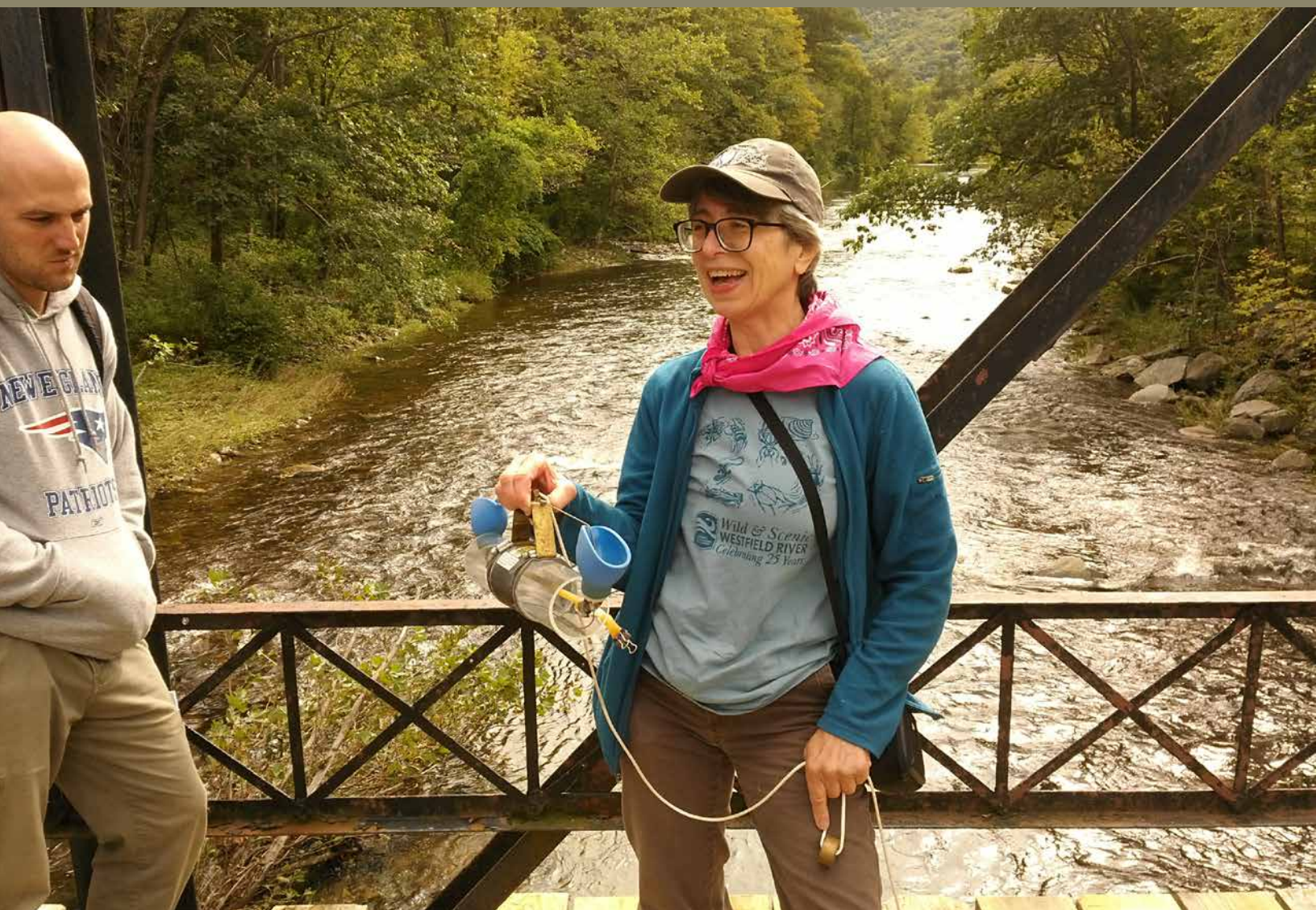
In a day and age when we see nature getting pretty beat up, when you see this resiliency, it's really a story of hope. What you see here is nature taking its course*.

Lauren Kras
Mass Audubon

* Farragher, Thomas "With new wildlife sanctuary in Plymouth, nature regains 480 acres" *Boston Globe*, 9 Mar 2018. Web. Accessed 3.9.18

Working Towards Clean Water

From coffee first thing in the morning to just one more load of laundry after dinner, clean water is critical to our way of life, economy, and health. We rely on clean water to grow our food, manufacture our goods, sweep away our wastes, and support the world's ecosystems.



Over the last fifty years, we have made significant strides in improving the Commonwealth's water quality but there is more still to do. Extreme weather patterns and warming brought on by climate change add to the challenge and the need to restore water quality for people and ecosystems.

Massachusetts has a small army of volunteers regularly monitoring local rivers, streams and lakes through local watershed groups. While this data is routinely shared with state and federal agencies, watershed groups have historically struggled to hone their goals, actions, and marketing to catalyze water quality restoration at a local and watershed level.

DER's recently launched Water Quality Restoration pilot program seeks to help watershed groups move from data collection to water quality restoration. The immediate goal is to build the capacity of NGOs and communities to work together to use the water quality data that's been collected to reduce or prevent water quality impairments. Our longer-term mission is to foster significant water quality improvements and realize the benefits clean and healthy waters provide to natural and human communities.

In the first phase of the pilot, DER is identifying water quality restoration efforts from around the country to inform a Massachusetts-relevant process that will help NGOs and communities build their capacity to improve and protect water quality. We will test and refine the process by working directly with a watershed group selected through a competitive process.

The final product will detail a new water quality restoration process, fine-tuned through real world testing, providing recommendations for making the Water Quality Restoration Program transferable and useful for a range of groups and communities.

> Communities and rivers are deeply intertwined. When our rivers are degraded, our communities are degraded.
>
> Alison Bowden
> The Nature Conservancy

Opposite page: DER's Cindy Delpapa talks water quality monitoring with local volunteers.
Below: Nutrient pollution can result in algae blooms in the summer.

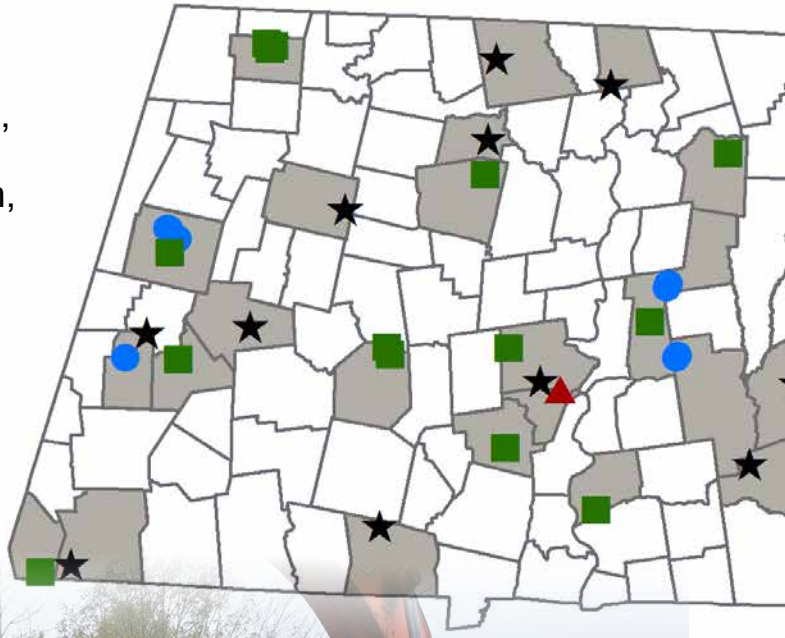
Where We Work

2019 Project Preview

Seven on-the-ground restoration projects will break ground in 2019 restoring more than 350 wetland acres and opening more than 150 miles of river:

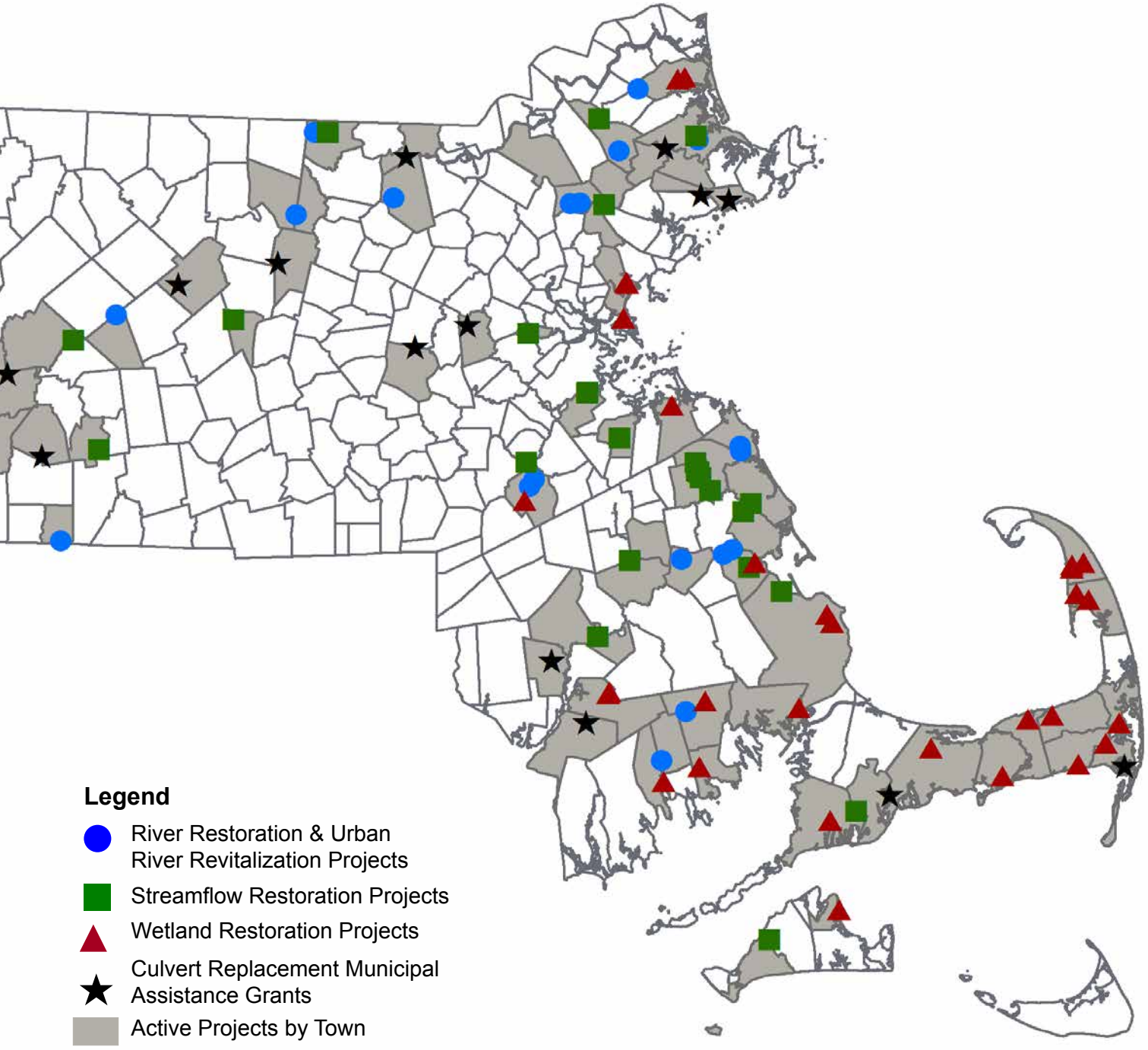
- Coonamessett River Restoration, **Falmouth**
- Foothills Preserve, **Plymouth**
- Jones River Restoration, **Kingston**
- Kent's Island Creek Restoration, **Newbury**
- Kinne Brook Restoration, **Chester**
- Parkers River and Seine Pond Restoration, **Yarmouth**
- West Branch Housatonic River Restoration, **Pittsfield**

Culverts in **Colrain** and **Northampton** will be replaced with help from DER's Culvert Replacement Municipal Assistance Grant Program.



Dam removal in process in Fall River.

DER has more than 45 active river and wetland projects across the state. Projects include dam removals, wetland restoration, culvert upgrades, urban river revitalization efforts, floodplain restoration, and streamflow restoration. All projects restore healthy habitat and help communities adapt to climate change.



Climate Change and Streamflow Restoration

Streamflow is a primary driver of healthy streams, influencing water quality, temperature, and the availability of habitat and food for aquatic species. Each river has its own natural pattern of high water, floods, and low water. Native fish and wildlife are adapted to these natural patterns. Humans also rely on predictable streamflow for drinking water. Climate change and water management can disrupt these natural streamflow patterns resulting in unusually low flows and more frequent and severe droughts.

In 2018, we focused our streamflow restoration work on dam management and water conservation. Dam management and water withdrawals can have significant impacts on streamflow. The process of refilling a lake after winter drawdowns can result in periods of unnaturally low streamflow and dry stream beds. Similarly, when water is withdrawn from reservoirs and groundwater wells, it results in less water going into streams. In some locations, dam management and water withdrawals can lead to periods of streams going dry.

DER is working with interested dam owners on dam management plans to improve streamflow and ecological condition while balancing in-lake recreation needs. In 2018, we created a GIS-based tool to prioritize dams for potential releases. This summer we monitored streamflow at five of the high-priority sites using time-lapse cameras. In 2019, we will analyze the photos and reach out to dam owners to discuss adopting alternative dam management that balances both in-lake and downstream needs.

DER is also working on several projects to encourage water conservation. For the past two years, DER has been piloting a campaign to reduce lawn watering during the summer in the flow-stressed Ipswich River watershed using a social marketing approach. The campaign compared individual household's summer water use to the average use in town and provided targeted educational information on how to reduce lawn watering. DER also worked with MassDEP to test pilot a refined campaign in three additional communities. Results are expected in early 2019.

Finally, DER continued working with the MA Department of Conservation and Recreation (DCR) to provide support to water suppliers who are trying to restructure water rates. Effective water rates can encourage water conservation while also supporting water supplier needs. Based on interviews with seven communities, we developed points of guidance in four areas – communication, financial planning, governance and data management – to aid suppliers in their rate-setting process. As a follow up, DER and DCR hosted a Financing Sustainable Rates workshop with the Alliance for Water Efficiency that provided additional information and tools to address some of the challenges in rate setting. Eighty-five people attended from more than 30 municipal water suppliers.

Opposite page: The Ipswich River provides drinking water to 350,000 people. DER is working with partners to encourage water conservation. Below: DER staff Michelle Craddock installs a time-lapse camera to monitor streamflow.

On-the-ground Restoration Benefits Habitat and Communities

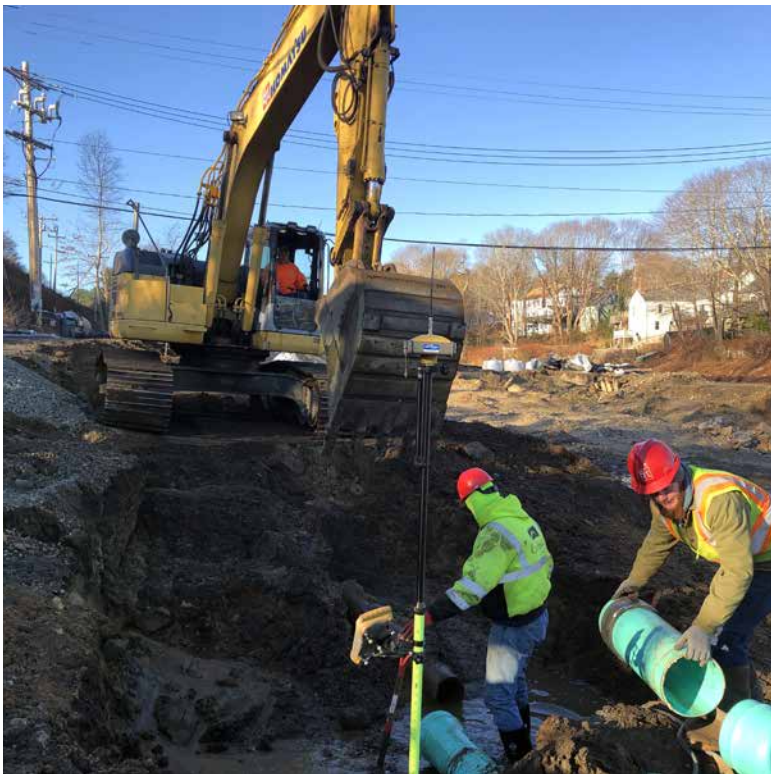
In 2018, DER advanced more than 45 ecological restoration projects towards implementation. DER also accepted 12 new Priority Projects. DER's projects restore habitat for keystone species, protect public safety, and help communities deal with aging infrastructure. All of these efforts make our natural areas and our communities stronger as we face a changing climate. Highlights from 2018:

Upper Roberts Meadow Brook Restoration
DER helped the City of Northampton remove the Upper Roberts Meadow Brook Dam, the tallest dam removed to date in Massachusetts at approximately 35 feet. The project involved controlled downstream release of impounded sediment, natural channel reformation, and re-connection of approximately 9 miles of coldwater trout habitat. The project also led to a new public access trail, display of an old mill stone, and signage. The removal was funded in large part by EEA's Dam and Seawall Repair or Removal Program.

Mill River Restoration
DER and partners completed the Mill River Restoration Project with the removal of the West Britannia Dam in Taunton. National attention was focused on the Mill River in 2005 when the Whittenton Dam came close to failing during an extreme flood. The Mill River Restoration project removed three obsolete dams, including Whittenton Dam, and built a fish ladder at a fourth. With the removal of the final dam, the project opens over 30 miles of mainstem and tributary habitat to river herring, American eel, sea lamprey, and many other species. Funding for the deconstruction of West Britannia Dam came from the U.S. Fish and Wildlife Service and the MA Natural Resources Damages Program.

> We're always hearing a litany of all the bad things we do to the environment but we can also do a lot of good. I think the [return of] herring [after dam removal] shows us how we can have positive influences on these ecosystems that can support our well-being.
>
> Jon Honea*

Cotley River, during dam removal and after.



Left: West Britannia Dam removal, Taunton. Right: Holmes Dam removal, Plymouth .

Town Brook Restoration

DER supported the Town of Plymouth with the removal of the Holmes Playground Dam in 2018. This project removes a High Hazard dam and replaces an aging bridge over Town Brook near downtown Plymouth while also improving passage for river herring, American eel and other species. Work on this project began in October and will continue well into 2019. Partners include the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service, the MA Division of Marine Fisheries and American Rivers. Additional funding was provided by EEA's Dam and Seawall Repair or Removal Program and a Parkland Acquisitions and Renovations for Communities grant.

Cotley River Restoration

Barstowe's Pond Dam in Taunton was removed in February. The dam, owned by the Mashpee Wampanoag Tribe, blocked all fish but American eel from accessing over 5 miles of habitat in the Cotley River, a tributary to the federally-designated Wild and Scenic Taunton River. The project was led by the non-profit Taunton Development Corporation, with assistance from the NOAA and Save the Bay. Additional funding came from the National Fish and Wildlife Foundation. Monitoring of the river and fish response to the restoration will continue in 2019.

Coonamessett River Restoration

On May 6, 2018, DER, NOAA, the Town of Falmouth, Coonamessett River Trust, and over 100 individuals representing project partners, family, friends and members of the community celebrated the completion of Phase 1 of the Coonamessett River Restoration Project. This phase, which kicked off in October 2017, included removal of the first dam from the ocean on the Coonamessett River, as well as restoration of wetlands and riverine habitat in an 11-acre former cranberry bog just upstream of the dam. Phase 2 is scheduled to break ground in 2019 and will restore the remaining 26 acres of the former cranberry bog.

* Lyman, Don "As Dams come down, herring return to Shawsheen River" *Boston Globe*, 23 Jun 2017. Web. Accessed 6.26.17

Making Culvert Upgrades Business As Usual

Massachusetts has more than 30,000 culverts and bridges. When well-designed and maintained, these structures provide near-seamless connections for streams and roadways, allowing traffic to pass safely and minimizing impacts on fish and wildlife populations. Unfortunately, more than half of the culverts in Massachusetts are undersized or improperly installed.

Inadequate culverts often create barriers to fish and wildlife, reduce water quality, and damage stream habitat. A high percentage of the undersized crossings are also at high risk of washouts during large storms. This risk is increasing as climate change brings more frequent severe rain storms to the area.

Culverts designed to meet the Massachusetts Stream Crossing Standards are better for wildlife, more resilient to storms, and last longer, but the number that need to be upgraded is daunting. Local governments bear a large near-term burden as most culverts in Massachusetts are municipally owned and maintained.

Since 2014, DER has been working to assist towns with their efforts to bring aging culverts up to the improved design standards. We aim to increase local capacity to undertake these projects through technical assistance, training, and grant funding.

In its first two years, our Culvert Replacement Municipal Assistance Grant Program provided over $1.5 million to support 24 culvert upgrade projects. Communities used grant funds to conduct the field data analyses, design and engineering, and permitting tasks necessary to advance projects to construction-ready status. The state-wide interest in this program highlights a significant unmet need. In 2018, 67 towns requested more than $5.7 million to upgrade undersized or poorly functioning culverts.

As more culvert replacement projects are completed and designed to the Massachusetts Streams Crossing Standards, the Commonwealth's roads will be more resilient to floods, protecting communities and allowing for healthier rivers and streams.

Culvert Upgrade Profile: the Town of Palmer

DER trains volunteers and municipalities on culvert assessments. Opposite page: DER helps a Town replace an aging culvert with a bridge.

Several years ago, Angela Panaccione, the Town of Palmer's Conservation Agent, worked with volunteers to inventory and assess Palmer's road-stream crossings. With assessment information in hand, she then worked with the Town Highway Department to identify the culverts most in need of repair and/or upgrading. In 2018, the town applied to DER's Culvert Replacement Municipal Assistance Grant Program and received funding towards the design of the proposed Route 181 culvert upgrade project. Upgrading the crossing will improve water quality, stream habitat, and Palmer's infrastructure and storm resilience. It will also reduce the threat of storm damage to the primary access between the MassPike and Bondsville Industrial Park and UMass Amherst.

> The Route 181 project helps with climate change, not only for fish and wildlife migration – especially for species who will definitely use these coldwater streams as temperatures increase – but the new crossing will also be able to handle much more stream flow. We won't have plug ups or as much flooding.
>
> Angela Panaccione
> Town of Palmer

Commonwealth of Massachusetts
Division of Ecological Restoration
Invested in Nature and Community

Website: www.mass.gov/der
Twitter: @MassEcoRestore
Instagram: @MassEcoRestore

The Division of Ecological Restoration restores and protects the Commonwealth's rivers, wetlands, and watersheds for the benefit of people and the environment. DER works with many partners across a variety of aquatic systems – from freshwater to saltwater – to restore the ecological integrity of degraded habitats.

DER is turning 10 in 2019! Be on the lookout in the coming year as we celebrate ten years of river and wetland restoration and protection in Massachusetts.

The dam removal and transformation of Upper Roberts Meadow Brook in Northampton.

DER STAFF

Beth Lambert
Director

Hunt Durey
Deputy Director

Eileen Goldberg
Assistant Director

Carrie Banks
Stream Continuity Restoration Planner

Kate Bentsen
Streamflow Restoration Specialist

Michelle Craddock
Flow Restoration Program Manager

Cindy Delpapa
Riverways Program Manager

Kristen Ferry
Habitat Restoration Program Manager

Eric Ford
Ecological Restoration Specialist

Alex Hackman
Ecological Restoration Specialist

Kris Houle
Ecological Restoration Specialist

Brian Kelder
Stream Crossing Specialist

Georgeann Keer
Ecological Restoration Specialist

Megan Sampson
Program Coordinator

Nick Wildman
Ecological Restoration Specialist

Printed by Massachusetts Correctional Industries