

ECCD OUTLOOK

A publication of the Eastern Connecticut Conservation District, Inc.

Summer 2017 Edition

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Denitrifying Woodchip Bioreactor

Valleyside Farm, with assistance from ECCD, installed a denitrifying (removing of nitrogen or nitrogen compounds) woodchip bioreactor in Woodstock, CT. Woodchip bioreactors have been installed in the mid-west to treat agricultural runoff from tile drained fields. However, the technology has not been applied broadly in the northeast. The project is being implemented to demonstrate the viability of using the technology in Connecticut.

Tile drains are subsurface drainage systems consisting of conduit installed beneath the ground surface to collect excess water and maintain the water table at the proper level for healthy plant growth. However, contaminants such as nitrogen, phosphorous and pathogens that leach through the soil may not be filtered out before reaching the tile drainage outlets, causing them to be discharged into nearby surface waters.

Though systems can be designed to treat other contaminants, the bioreactor installed in Woodstock has been designed to treat nitrogen. The woodchip bioreactor consists of a 12 x 100 foot trench filled with woodchips. There are flow control structures installed at both ends of the bioreactor allowing Valleyside to control the amount of water entering the system. When contaminated runoff enters the bioreactor, natural denitrifying soil bacteria consumes the nitrate as part of their respiration process, thereby converting the nitrate into nitrous oxide gas, which is released into the atmosphere rather than being discharged into the water.

The woodchip bioreactor will treat agricultural runoff affecting a tributary of Roseland Lake and the Little River. Little River provides drinking water to Putnam, so this project will benefit the residents of Putnam. Additionally, however, since excess nitrogen is harming Long Island Sound and its coastal embayments, the project will benefit coastal waters and habitats as well.

This project is funded in part by CT DEEP through the US EPA Nonpoint Source grant under section 319 of the Clean Water Act.

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Metals in Urban Soils: Free Assistance to Urban Growers

As ECCD continues its projects with urban agriculture, we are excited to include additional technical assistance to urban farms and community gardens throughout eastern CT. Thanks to equipment and analysis provided by NRCS-CT, the District is reaching out to find urban farmers and community garden programs that would like their soils analyzed for the presence of trace and some heavy metals.

Metals in the soil can come from natural sources like bedrock, and these background levels are generally not toxic. This is not the case in urban areas, where soils often have higher levels of metals due to the history of manufactured materials used at or nearby a particular site. For example, lead-based paint was widely used in homes and buildings built before 1978, when lead additives were banned. Soils around those buildings – or from a site where such buildings were razed – should be tested.

Continued on page 2



Employees of NRCS, Deb Surabian and Don Parizek, locate tile drainage at Valleyside Farm for the woodchip bioreactor project.

The equipment used to analyze the soils is called an X-ray Fluorescence Analyzer, or XRF. If metals are present in the soil, the x-ray light energizes the metal atoms causing electrons to be released. The release creates a unique “fluorescence,” like a fingerprint. This means the XRF can determine instantly the types and concentrations of metals in the soil; however, it is not as accurate as lab analysis and should be used only as a screening tool for reference data. NRCS-CT provides the results in a report, along with sharing the average levels for these metals in eastern US soils and the established standards for CT, NY, and NJ.

Ultimately, the goal is to limit public exposure to metals, if present. That can be achieved by knowing a soil’s composition (analysis) and then using that information to grow produce in ways that limit exposure to people working on the farm or garden and to those eating the produce. For a good overview of growing in urban soils and the health concerns associated to specific metals, see the 2015 publication, *Metals in Urban Garden Soils*, by Cornell University and the State of New York (link: ecommons.cornell.edu/handle/1813/48147).

This outreach and technical assistance from ECCD is funded by the National Association of Conservation Districts (NACD). Last year, in partnership with GROW Windham, ECCD was one of 20 conservation districts nationally to be awarded funding through NACD’s new *Urban Agriculture Conservation Initiative*. In eastern CT, our project was designed to increase the use and awareness of conservation practices in urban agriculture, and to assist in developing a “community of practice,” a network for the exchange of information and resources for the region’s urban growers.

For more information about the soil analysis or ECCD’s other work in urban agriculture conservation, contact Michael Soares at (860) 319-8809 or michael.soares.eccd@comcast.net.



GROW Windham's new community garden, named *The Thread City Family Garden*, in Lauter Park, Willimantic.

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Partnering Helps to Get the Job Done

Since ECCD researched and prepared the *Muddy Brook, Little River Water Quality Improvement Plan* (Woodstock/Putnam) in 2009, we have prepared many other planning documents aimed at improving water quality in our 36 towns. Water quality improvement plans completed by ECCD include Mashamoquet Brook (Pomfret), lower Natchaug River (Windham/Mansfield), Mount Hope River (Ashford/Mansfield), Spaulding Pond (Norwich), Baker Cove (Groton), Ekonk Brook (Plainfield/Voluntown) and Poquetanuck Cove (Preston/Ledyard). Our staff is currently involved with drafting water quality improvement plans for Roseland Lake (Woodstock) and French River (Thompson), and we are awaiting contracts so we can begin more water quality improvement planning work in the near future. Our staff is also involved in implementing the Niantic River Watershed Protection Plan prepared by Kleinschmidt Associates in 2006.

The importance of this research is to identify pollution sources and present the information in a format that makes ECCD eligible for grant funding from the US EPA and other grantors to address the sources of pollution. Once ECCD prepares a watershed based plan, our goal is to restore water quality in eastern Connecticut by implementing recommendations in the plan. A large portion of the funding we apply for is “pass through” money, meaning the grant award goes to ECCD, but much of the funding goes to pay local businesses and contractors for their goods or services, thereby stimulating the local economy.

In many cases, ECCD works with other organizations to achieve our conservation goals. For example, ECCD is partnering with UCONN, The Last Green Valley (TLGV), USDA Natural Resources Conservation Service (NRCS) and others to refine our knowledge of fecal bacteria sources in streams known to have high concentrations of *E. coli*. *E. coli* is one type of fecal bacteria. ECCD’s traditional bacteria trackdown work has been able to determine which streams contain the highest concentrations of *E. coli*, but does not identify which species of warm blooded animal is the main source. All warm-blooded animals have *E. coli* in their gut, including people.

Continued on page 3

Partnering Helps to Get the Job Done, continued from page 2

project headed by Dr. Jack Clausen of UCONN, ECCD is providing technical assistance & coordination of water quality monitoring volunteers recruited through The Last Green Valley. The *PATH to Reduce Pathogens in Agricultural Runoff* project is one of three active NRCS Regional Conservation Partnership Programs (RCPP) in eastern Connecticut.

Using *E. coli* data collected previously by ECCD and volunteers, the *PATH* project is advancing our understanding of *E. coli* sources using a high-tech lab technique that can detect biomarkers in *E. coli* samples. These markers are unique to the animal from which the *E. coli* originates. Using this type of advanced testing has been recommended by ECCD in several water quality improvement plans. For the project, sample collection began in April at ten locations across eastern CT. If the samples test high for *E. coli* bacteria using standard testing methods, they are filtered and preserved at UCONN for further analysis at Source Molecular, a specialty lab in Florida. To date, three samples have been sent to Source Molecular for advanced *E. coli* testing. Two streams tested positive for *E. coli* originating from cow manure and human fecal contamination. In the third stream, the results were inconclusive.

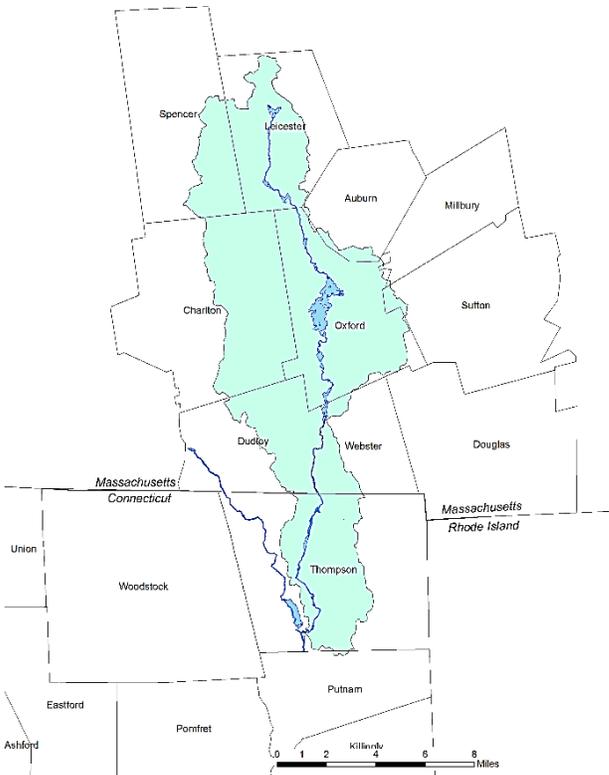
To address these sources of *E. Coli*, ECCD will provide technical assistance to homeowners about septic system maintenance and recruit farmers to participate in programs designed to reduce contaminated runoff.



A volunteer sets up a sampler for the *PATH* project.

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French River Water Quality Investigation



The Eastern Connecticut Conservation District, in partnership with CT DEEP and the Town of Thompson, is completing a two-year long water quality investigation of the French River watershed in Thompson, CT. In 2015, ECCD was awarded funding by CT DEEP through the Clean Water Act Section 319 Nonpoint Source grant program to conduct the investigation. The French River and Long Branch Brook, a tributary to the French River, have not been meeting state water quality standards for recreation due to high levels of the indicator bacteria *Escherichia coli* detected in water samples collected by CT DEEP as part of their state-wide water quality monitoring program. The presence of *E. coli* in the water indicates that other harmful pathogens may also be present.

In partnership with The Last Green Valley Volunteer Water Quality Monitoring Program, ECCD and TLGV volunteers collected water samples from the French River and multiple tributary streams in the summer of 2015. These samples were analyzed by the CT Department of Public Health for fecal bacteria content. The results were very good. All the sampled rivers and streams met water quality standards for recreation except for Quinatissett Brook, located in the southeast portion of the watershed and the section of Backwater Brook downstream of Duhamel Pond, near the Thompson Public Library. As a result of the investigation, the French River and Long Branch Brook were removed from the State's list of impaired waterbodies. Using information collected during the water quality investigation, ECCD is preparing a

Continued on page 4

French River watershed in Massachusetts and Connecticut.

watershed-based plan for the portion of the French River watershed located in Connecticut. The plan, which will be completed in September 2017, will summarize the physical characteristics of and natural resources in the watershed, the results of the water quality investigation, and potential sources of pollutants that can impact water quality. The plan will provide guidance for local and regional watershed managers to protect water quality, including recommendations for non-structural and structural measures that can be adopted or implemented to reduce or eliminate pollution sources, and technical and financial resources to assist with implementing plan recommendations.

In order to encourage Thompson residents to adopt practices that will protect the good surface water quality in the French River watershed, ECCD and the Town will install a suite of low impact development (LID) practices at the Thompson Public Library at 934 Riverside Drive in North Grosvenordale this summer. These practices, which include rain gardens, downspout planters, and storm drain filters, can be installed on private property to intercept and treat stormwater runoff by filtering pollutants out of stormwater or soaking the water into the ground. ECCD will prepare a guide of the library stormwater management practices so visitors can take a self-guided tour of the site and learn more about the practices installed there.

For more information about the French River water quality investigation, the watershed-based plan, or LID practices, contact ECCD at 860-319-8806.

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TRBP Floating Workshop 17



TRBP workshop participants learn about ongoing studies around Roseland Lake and its watershed.

Another successful Thames River Basin Partnership Floating Workshop was held on June 9, 2017. The workshop was sponsored in part by Millennium Power through The Last Green Valley and hosted by Roseland Park, in Woodstock, CT. Approximately 40 people participated in a two-part program focused on Little River, a National Water Quality Initiative watershed located primarily in Woodstock and Putnam, CT. ECCD is a core member of the TRBP and this workshop showcased many aspects of ECCD's work.

A morning tour of completed and ongoing conservation projects included a stop at Elm Farm, Valleyside Farm and Fairvue Farm, all in Woodstock, as well as a stop at a bioretention project completed at the Woodstock Arboretum.

After lunch, Ray Covino, Windham County District Conservationist for NRCS gave a demonstration on the significance of soil health using a rainfall simulator on a variety of soil samples influenced by different land covers.

The program continued in the barn at Roseland Park, where ECCD's Jean Pillo overviewed an ongoing study of water quality in and upstream of Roseland Lake, followed by ECCD's Dan Mullins, who gave a presentation entitled *Little River, Big Projects*. After the indoor presentations were completed, our workshop guests took to the water of Roseland Lake, where they learned more about local land conservation strategies to protect water quality in Little River, a main drinking water source for the neighboring town of Putnam.

A slideshow overview of the 17th annual TRPB Floating Workshop is available at <http://thelastgreenvalley.org/wp-content/uploads/2016/07/FW-XVII-Summary.pdf>

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Baker Cove Non-Migratory Canada Geese Project is Now Underway!

ECCD is excited to report that we have been awarded a Clean Water Act §319 Nonpoint Source Program grant by CT DEEP to carry out implementation strategies listed in the Baker Cove Abbreviated Watershed-Based Plan (2011), to reduce fecal coliform bacteria in Baker Cove. According to the plan, Baker Cove is a 0.31 square mile estuary of Fishers Island Sound located between the City and Town of Groton, Connecticut. It has been listed in multiple State of Connecticut Integrated Water Quality Reports as impaired for direct shellfish consumption, where permitted, due to elevated levels of fecal coliform bacteria, most recently in 2016 (the state-wide bacteria TMDL, or water pollution budget 2013 has a detailed appendix for the New London/Groton Estuary including Baker Cove). The project's goal is to reduce the level of indicator bacteria for the direct consumption of shellfish to below the standard set by the State of Connecticut Water Quality Standards, which supports a longer-term goal of re-opening the shellfish beds in Baker Cove for recreational shellfishing. The focus of this project will be to evaluate and address a large population of non-migratory Canada Geese that utilize Baker Cove and the surrounding area and may contribute to the bacteria load in Baker Cove.

An adult Canada goose can deposit 1 – 2 pounds of feces per day, which contain fecal bacteria and nutrients such as nitrogen and phosphorus, contributing to water quality degradation such as reduced oxygen levels. Canada geese feces is a type of nonpoint source pollution (along with pet wastes, faulty septic systems and stormwater runoff from developed areas) and a potential source of fecal coliform bacteria that contributes to water quality issues and shellfish bed closures at Baker Cove.

According to the Cornell Lab of Ornithology, Canada geese like to feed on the large expanses of lawn in parks, backyards, golf courses, farm fields, and airports as they are one of the few bird species that can digest grass. Resident (non-migratory) geese have interfered with the diversity of other native wetland species and inundated most native wetlands in the east, including refuges that were created to protect migratory populations. Aviation safety is a concern, too. The Federal Aviation Administration (FAA) estimates there are 240 goose-aircraft collisions each year nationwide. A number of watershed stakeholders, including local golf courses, the Groton-New London Airport, and Groton Utilities are independently addressing the issues of resident geese with a variety of flock management strategies including hazing, barrier fencing, decoys, acoustic measures, trained dogs, and others. The difficulty with these efforts is that the nuisance goose flock rotates from one location to the next, but the overall result is no decrease in flock size. This project, with a regional and coordinated management approach, should reduce the flock size and discourage repopulation of the area in the future.

ECCD will work with local stakeholders to conduct a comprehensive Canada goose public education & outreach campaign to support the reduction of the non-migratory flock size to healthy and safe levels in both the City and Town of Groton. Steps in the process include:

- Form stakeholder group comprised of local, state and federal partners to inform and support project implementation
- Provide public education and outreach workshops
- Recruit and train volunteers, if needed, for goose reduction techniques
- Identify and evaluate Canada goose use areas and create a goose management recommendation matrix
- Identify and implement at least one resident goose aversion measure, such as installing an un-mowed, vegetated riparian buffer.



<http://stlri.org/Geese.htm>

We'd love your help! If you are interested in learning more or attending a workshop and participating as a volunteer, please call Maura Robie, Conservation Technician at (860) 319-8806 or email maura.robie@comcast.net. ~ ~ ~

2017 CT Envirothon

Congratulations to all the schools that participated in the 2017 CT Envirothon high school competition at the Tolland Ag Center. The top three placing teams were 1st place: Housatonic Valley High School, Team 1; 2nd place: Academy of Aerospace & Engineering; and 3rd place: Housatonic Valley High School Team 2. A special thanks goes to the event organizers and volunteers who donate so much of their time to this outstanding day-long event!

Outreach Support to ECCD

**We send along our many thanks to the following supporters
for their generous assistance and outreach to conservation!**

- ✧ 2016-17 Water Quality Monitoring Volunteers
- ✧ 2017 Plant Sale Volunteers
- ✧ Andrew Tate Memorial Fund
- ✧ The CT Audubon Society
- ✧ CT Dept. of Energy & Environmental Protection
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- ✧ The Last Green Valley, Inc.
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- ✧ USDA Natural Resources Conservation Service
- ✧ Windham County Agricultural Society, Brooklyn

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**★★ ECCD wishes to express its respectful appreciation for donations ★★
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We would like to thank the following towns for their 2016-17 contributions to ECCD
which help to support regional conservation throughout eastern Connecticut.

**Ashford, Brooklyn, Canterbury, Columbia, East Lyme, Eastford, Franklin, Hampton, Lisbon,
Ledyard, Mansfield, Pomfret, Preston, Sprague, Sterling, Thompson, Voluntown and Waterford.**

Partnership with our area towns contributes towards cleaner flowing water and improved soil health.

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ECCD would like to acknowledge the dedicated service of **Herb Schacht**, Waterford, to natural resource conservation, serving on the Conservation District's Board of Directors for many years. Herb passed on August 10th.
Peace Herb.

*The Eastern Connecticut Conservation District wishes to extend our sincere appreciation to our 2016-17 donors listed below. Your generosity and cooperative spirit greatly support our efforts in soil & water conservation throughout eastern Connecticut. **Thank you.***

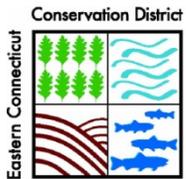
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Inside this issue:

- Page 1...Denitrifying Woodchip Bioreactor*
- Page 1...Metals in Urban Soils: Free Assistance to Urban Growers*
- Page 2...Partnering Helps to Get the Job Done*
- Page 3...French River Water Quality Investigation*
- Page 4...TRBP Floating Workshop 17*
- Page 5...Baker Cove Non-migratory Canada Geese Project is Now Underway*
- Page 5...2017 CT Envirothon*
- Page 6...Outreach Support*
- Page 6...Donations Made on Behalf of Others*
- Page 6...Supporting Towns*
- Page 6...ECCD Remembers Herb Schacht*
- Page 7...List of Donors*

**ECCD remembers
former Board member
Herb Schacht,
founder of the
Waterford Country
School.**

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