

Northwest
Conservation
District

NCD works to conserve local natural resources by delivering technical services and educational programs.

We focus on sustainable resource and energy use, promote ecosystem planning, watershed and open space protection and lower impact development techniques. We serve 34 communities in northwest Connecticut.

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2015 NCD Annual Meeting South Farms, Morris

A crisp, clear late-October day in Morris saw our annual meeting step off with a walking tour of the first subsurface gravel wetland in Connecticut, installed with design assistance from NCD, at Harvest Moon Timber Frames, East Street. NCD Executive Director Sean Hayden addressed how the constructed wetland filters polluted stormwater runoff from the manufacturing operation before being released to the pristine East Morris Brook on the back of the property.

Upon everyone's return to the South Farms "White Barn," host Ben Paletsky welcomed everyone to his iconic family-run farm, which is committed to highlighting the uniqueness of Connecticut's historic farmland roots and bright agricultural future.

Following an energetic presentation of Low Impact Development (LID) techniques by NCD friend, Earthtone's Liza Turoczi, three 2015 Conservation Award winners were honored. NRCS retired conservationist Kathleen "Kathy" Johnson was presented with a Lifetime Conservation Award given in recognition of her dedication to environmental stewardship and unwavering commitment and advocacy for healthy communities and sustainable agriculture. The 2015 Conservation Volunteer Award was presented to Bantam Lake Protective Association President Constance "Connie" Trolle in recognition of her extraordinary dedication and hours of volunteer service for the protection of Bantam Lake and Morris' valuable wetlands and natural water resources. The 2015 Conservation Award was presented to Dennis McMorro, principal of Berkshire Engineering, in recognition of his longtime partnership with NCD to design and advocate for stormwater designs that provide long-term environmental benefits to Northwest Connecticut. A fun evening of good company, conversation and celebration was had by all!



L to R: Kathy, Dennis and Connie
2015 NCD Award Winners

INSIDE

Why the Change to Low Impact Development?	2
Conventional Stormwater Management.....	2
LID - Permeable Paver Systems - An Urban Success.....	3
LID - A Natural Fit for Recreational Sites.....	4
CT Envirothon: 1991-2016.....	6
NRCS Financial Assistance Opportunities in Connecticut.....	6
An Award Winning Partnership.....	7
Fracking Waste-At What Cost?.....	8



Why the Change to Low Impact Development?

The Northwest Conservation District, in partnership with the Northwest Hills Council of Governments (NHCOG), recently obtained grant funding from the Connecticut Institute for Resilience and Climate Adaptation (CIRCA) for Low Impact Development (LID) initiatives in northwestern towns served by NCD and the NHCOG. The mission of CIRCA, a partnership of the University of Connecticut and CT DEEP, is to increase the resilience and sustainability of vulnerable communities along Connecticut's coast and inland waterways to the growing impacts of climate change on the natural, built, and human environment. The grant will allow NCD, working with the Town of Morris, to create a Low Impact Development Design Manual for the town. The manual will be used by design engineers, property owners, developers, homeowners, municipal officials and others who are involved with the design of development and redevelopment projects in Morris. The NHCOG and NCD envision this design manual to serve as a regional model for stormwater management in other small towns in our region. The following is the first part of a three part series written by Steven Trinkaus, PE, CPESC, and CPSWQ, a design professional and long-time LID advocate who is working with NCD as part of this initiative. This series, starting with Conventional Stormwater Management, will end with Low Impact Sustainable Development. Our joint mission is to increase awareness of why the change to LID from traditional stormwater management is needed, and how to accomplish it. LID will be essential to make northwest hills towns more resilient and sustainable in the face of the growing impacts of climate change on the part of Connecticut we treasure and call home.

Conventional Stormwater Management

The Clean Water Act (CWA) was adopted by the United States in 1972 to address point source discharges of pollutants into the many rivers and lakes in the United States. Over the past 43 years, the CWA had the desired result of restoring the water quality in these water bodies, which were often so polluted that they were unsuitable for use by the public.

However, another problem soon became very apparent. While the CWA virtually eliminated the discharge of pollutants from point sources into surface water systems, many waterbodies were still being impacted by various types of pollutants. Based upon monitoring data, it was determined that the source of these other pollutants was diffuse and was not due to a point discharge. Ultimately, these discharges became known as non-point source

discharges and were the result of rainfall washing accumulated pollutants off the many different types of impervious surfaces, such as building roofs, road networks, driveways, parking lots and even landscaped areas. The non-point source discharges were proving to be very difficult to identify, quantify and correct.

These pollutants were being discharged to streams, rivers and lakes, and over time, these water bodies were experiencing undesirable aquatic vegetation as a result of increased nutrient discharges, particularly phosphorous and to a lesser degree nitrogen. Populations of different aquatic species were being adversely impacted by the presence of metals and hydrocarbons in the water, which can be toxic even at very low concentrations. Additionally coarse and fine sediments were

being deposited on the bottom of cold water streams, preventing benthic organisms from reproducing and thus adversely affecting the entire aquatic food chain.

In addition to the water quality impacts, the approach to dealing with stormwater from developed sites caused a significant unintended consequence on small receiving streams. Starting in the late 1970s, the concept of peak rate reduction of post-development stormwater became the rule in many areas of the United States. It was simple enough in theory: reduce the peak rate of runoff for post-development conditions to the peak rate of runoff for pre-development conditions for a certain size rainfall event by using a detention basin to hold back and meter out the accumulated runoff over a longer period of time.

Continued on page 3.

“This is easy to do and will protect the environment,” was the prevailing thought of regulators and developers of this approach.

What no one considered at the time was the fact that the small streams were now seeing increased durations of flow at the bankfull flow condition. This was the result of the large detained volume of runoff being discharged over an extended time period, well past the end of the actual rainfall event. The impact of the increased volume of runoff was erosion of the stream

channel banks with the resultant discharge of sediment farther down the stream channel or into a larger water body. The discharge of sediment created turbid water, which



reduced the ability of sunlight to penetrate the water column, resulting in other adverse aquatic impacts to plants and fish.

Pictured to the left is a conventional stormwater basin doing little to remove pollutants from stormwater.

Our next 2 articles in this series will detail how LID represents a paradigm shift in how land is developed and stormwater can be managed to yield significant environmental and economic benefits.

CLEAN WATER

using a Permeable Paver System

HOW DO THESE SYSTEMS WORK?

Permeable Paver Systems protect our environment. These systems absorb and cleanse polluted stormwater and then slowly release cleaner water. They are part of a smarter way to design and build, called Low Impact Development or LID.

In Connecticut, our worst storms can bring up to 6 inches of rain per hour. Permeable Paver Systems, like this one, can absorb 500 to 900 inches of rain per hour.

The paver blocks used are strong and sustainable. When properly installed (as in this herringbone pattern) and maintained, they can last over 30 years. These systems can also be used for sidewalks, driveways and roads.

Benefits of Permeable Pavers

- Remove pollutants
- Control runoff
- Reduce flooding
- Return clean water to groundwater

Pollutants In Stormwater

- Oil & Grease
- Pesticides
- Fertilizer
- Bacteria
- Litter
- Metals
- Chemicals
- Sediment

Traditional System

In a traditional system, polluted stormwater runoff flows untreated into storm drains and pipes that discharge directly into our streams and rivers.

East Branch of the Naugatuck River
A project of the Northwest Conservation District. Partners: City of Torrington, 4Evergreen LLC, Write Way Signs Design Inc. Funded in part by the CT DEEP through a US EPA Clean Water Act Section 319 Nonpoint Source grant and the Friends of the Naugatuck River Fund.



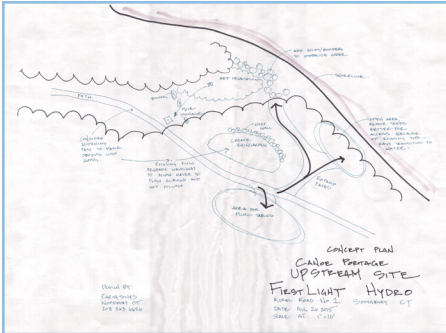
We at NCD have talked to many people about the parking lot at the corner of Main and North Elm Streets in Torrington (as shown above) and they all say the same thing -

LID - Permeable Paver Systems - An Urban Success

“That is the best looking parking lot in the City.” But its true beauty cannot be seen as the filtering layers of gravel and sand are hidden beneath the pavers, the parking meters and the dotted lines. This local business lot, complete with a rain garden and landscaping, really showcases all the major goals of LID. How you ask? It was less expensive to build, will

be easier to be maintained by the Public Works department, protects the east branch of the Naugatuck River hidden beyond the trees, prevents flooding from stormwater runoff from the high-traffic streets that surround it and of course, it is more attractive as compared to the conventional parking lots around the corner. Check it out!

The Shepaug Hydroelectric Station, the largest hydroelectric station in Connecticut, with its dam located in Southbury and Newtown, was constructed in 1955 as part of a hydroelectric project for the generation of green power. The environment around this station and dam also offers unique habitat for wildlife and is an important winter feeding site for bald eagles. The movement of water below the dam prevents ice from forming, so there's always access to an abundance of fish upon which the eagles may feed. The station and the surrounding land are owned by FirstLight Power Resources, a subsidiary of GDF SUEZ Energy North America, generating hydroelectricity under a FERC license known as Housatonic River Project P2576. FirstLight also operates the Shepaug eagle viewing area, located at 2150 River Road, Southbury, Connecticut. Two recreational sites abutting the access road to the viewing area have recently been improved to address environmental concerns. These two sites, developed in compliance with FirstLight's licence, were designed and constructed by Earthtones, LLC, Woodbury. The following article, written by Liza Turoczki, co-owner of Earthtones with husband Kyle, is an illustrated walking tour of those two sites. Liza and Kyle have been speakers at many NCD educational events including FirstLight shoreline management seminars and our recent annual meeting.



LID - A Natural Fit for Recreational Sites

Located along the access road to the Shepaug Eagle Viewing site, the two canoe portages at the Shepaug Dam site in Southbury, CT are more than just access points to the water. They are also great opportunities to educate the public about the varied approaches toward healthy shoreline management, including many elements of Low Impact Development (LID). To make it even more exciting, each site has its own feel of place. The lower site, on Lake Zoar, is sunny and open. The upper site, on Lake Lillinonah, is wooded and sheltered.

At the lower site on Lake Zoar, the access road has been redirected and graded to capture the majority of runoff into a great LID structure, a rain garden. The road now has a permeable surface of stone cobbles. An existing pipe that drains the entrance and parking area empties into this site. The small existing splash pad had become silted in, eroding and causing the shore to



disappear. This was remedied by adding boulders to the shore and building another LID structure, a vegetated swale, to capture silt coming from the parking pavement and slow the initial force of the runoff. Since the slope of the existing site was fairly steep, there were opportunities to use examples of different retaining features. The most prominent feature is seen upon entrance to the portage. Gabions were constructed to show off feasibility and the varied sizes available. Gabions are simply described, rectangular wire baskets built in place, then filled with stone to act as a retaining wall. They are stacked upon one another to reach the desired height of the hillside which they hold. They are very versatile, come in many different sizes and can also be used to reinforce

the shoreline edge. The location of the gabions in this instance, offered a fun opportunity to create an artistic flair for the entrance to the

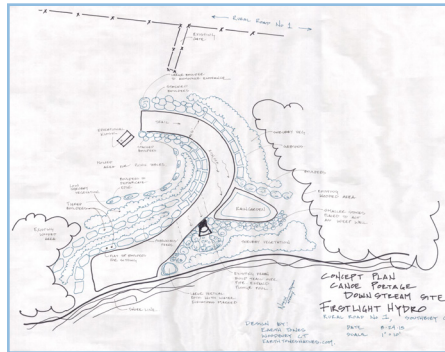


portage. Walking further into the portage area, boulders were used to retain the soil. Boulders offer a more natural look as a landscape feature, and their lifespan is much, much longer than that of a wooden retaining wall. And many of the flatter ones were placed in such a way that allows sitting or somewhere to rest your picnic, fishing and canoeing gear.

The plantings in the canoe portage are all taken from a native plant palette, including Asters, Sedges, Swamp Milkweed, Lobelia, Joe-Pye Weed, Mimulus (Monkey flower), Boneset and Rudbeckia.

The soil was inspected, the solar aspect of the site was noted and appropriate plants were selected. The immediate shoreline itself was protected in three different ways. In one area, boulders were placed to remedy the erosion. In another area, a large tree that was cut from the site was set into the shore and anchored with cable. And then on both sides, plant material was installed. Behind the log, the plant material consists of wetland shrubs that will eventually mass and will ultimately end up maintaining the integrity of the shore long after the log has rotted away. On the other side, the side with the boulders, the plant material was kept as low grasses and sedges. These will hold the soils in place but also allow easy access to the water's edge. All the plants, being native, will provide a seed source for the birds and flowers for our many important pollinators. In some situations, they will be a necessary host plant, as in the case of the milkweeds feeding our beloved monarch butterfly caterpillars.

shrubs, including Bayberry, New Jersey Tea, Highbush Blueberry and Smooth Sumac, all great berry and seed producers, have been planted as a barrier and visually leads the eye toward the new entrance to the shoreline through the wooded area. On the righthand side of the new path, a section of trees was removed to allow for picnic benches. On the lefthand side, a rain garden with a "weep" wall has been constructed to capture the runoff from the road before it dumps into the lake. The rain garden is an important checkpoint in reducing and eliminating erosion. It captures the runoff, slows the velocity and allows the water to percolate into the ground.



a filtering system. All plants introduced into these gardens are taken from an appropriate native plant palette.

Many of the original Red Cedar trees were kept. And some of the larger, six-foot-to-eight-foot-tall native Alder shrubs were saved and transplanted, creating an instant mature and natural look. The access to the water is wide and gentle. The surface of this path is permeable one-inch-wide stone cobble. This main access has a smaller path that meanders towards the original shoreline access point. The access point now has boulders placed to amend the erosion conditions. It also has large flat boulders strategically positioned to fashion steps that lead to the water's edge and create a wide platform for sitting or fishing.



This project turned out to be a terrific way to remedy existing erosion problem areas, educate the public on a diverse amount of shoreline management techniques, including LID, all while enhancing the ecological connections and integrity of the sites.

*Earth Tones LLC, is located at 212 Grassy Hill Rd, Woodbury, CT 06798
Phone:(203) 263-6626.
website earthtonesnatives.com*



The upper site, at Shepaug Dam, on the Lake Lillinonah side, (shown above in progress) is more nestled into the woods. The main trail originally went straight down a steep section of shoreline, causing a big erosion and safety issue. This path has now been cut off and redirected. Topsoil, rocks and native trees and

In large storms, the water will also be allowed to "weep" through the dry laid stone wall that is backfilled with a layer of landscape fabric, sand and pea gravel. This backfill material filters the water and allows the water to weep out onto the planted area below. The planting below is yet another checkpoint and

CT Envirothon 1991 - 2016

The Envirothon concept began in Pennsylvania in 1979 as an outgrowth of a vocational/agricultural land judging contest. The state's Conservation Districts felt there was a need for a statewide environmental program highlighting different disciplines within the natural resource field. Following Pennsylvania's lead, six more states had their own Envirothon programs by the mid-'80s and in 1988, the first National Envirothon was held in Pennsylvania with five states participating. In 1991, Connecticut sent a team by special invitation to the national competition in Maine and in 1992 held its own first statewide competition with 15 schools participating. Twenty-five years later, 43 schools, public and private and homeschooled, urban and rural, from all corners of the state are expected to participate in the May 19th statewide field day

competition at Indian Rock Preserve in Bristol. All teams will compete in the four fields of study: aquatics, forestry, soils and wildlife, as well as a current topic. This year's topic, "Invasives, a Challenge to the Environment, Economy and Society," is based on a 1999 Presidential Executive Order that defined an invasive species as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Connecticut's winning team will go to the Nationals in Peterborough, Ontario this July.

In those first 25 years, from that fledgling 1991 team to 2016, thousands more students statewide have benefited from the time and energy of dedicated teachers, environmental partners and sponsors who take part in both the planning

and execution of CT Envirothon. Teams from northwestern Connecticut schools, including Housatonic Valley Regional High (HVRHS), Litchfield High, Wamogo, Nonnewaug, Northwestern Regional 7 and Marvelwood, continue to set high standards for other schools to pursue. And, many of those students are environmental stewards whom we see and read about. To name just one, Emma Okell, an HVRHS 2012 grad and 2009-2012 Envirothon member, is currently pursuing a B.A. in environmental studies at Gettysburg College. Emma, interning last summer with HVA's Land Protection Director, Elaine LaBella, researched and provided valuable but difficult to obtain information to towns' leaders besieged by citizens concerned over the environmental impact of pesticide spraying by the Housatonic Railroad on and around the railroad tracks from Falls Village to New Milford. To learn more about and support CT Envirothon, visit ctenvirothon.org.

NRCS Financial Assistance Opportunities in Connecticut

The Natural Resource Conservation Service (NRCS) provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat.

NRCS's most popular program authorized through the Agricultural Act of 2014 is EQIP (Environmental Quality Incentives Program). Through EQIP, agricultural producers and non-industrial private forest landowners receive financial and

technical assistance to implement structural and management conservation practices that optimize environmental benefits. Connecticut has identified water quality, soil health, soil erosion, forestry, and livestock production limitations as priorities.

EQIP applications are accepted on a continuous basis; however, NRCS establishes application "cut-off" or submission deadline dates for evaluation, ranking and approval of eligible applications. Applications are considered eligible once an NRCS employee has completed a site assessment and developed a conservation plan for their property AND once all needed forms and docu-

mentation has been submitted and approved. EQIP is open to all eligible agricultural producers. Submitted applications may be considered or evaluated in multiple funding pool opportunities.

Applicants are responsible for completing and filing all application and eligibility paperwork as required. If funded, participants are required to sign a contract and agree to implement the planned conservation practices to NRCS standards and specifications as scheduled.

For more information contact your local USDA-NRCS service center. In Litchfield County: 860-626-8258.

An Award-Winning Partnership

Rivers Alliance and CT Conservation Districts

Rivers Alliance of Connecticut (RA) named the state's five Conservation Districts and the Connecticut Association of Conservation Districts as winners of its 2015 Environmental Hero Awards at its December 2nd annual meeting held in Hartford. NCD Executive Director Sean Hayden and NCD Board Chairman Curtis Read accepted the award from RA President Eileen Fielding and Executive Director Margaret Miner.

The award was particularly timely as 2015 was International Year of the Soil. Conservation districts were founded nationwide in the 1940s in response to the catastrophe of the Dust Bowl drought in the 1930s. At the time of the meeting, District state funding was at risk during heated state budget negotiations. District funding remains an important requirement to enable the state to participate in a \$10 million federal program for the protection of Long Island Sound and the rivers that flow into it. Thanks in part to support from partners like Rivers Alliance, funding for the five state Districts was kept in the 2016-2017 state budget. We thank Rivers Alliance for its continued support and environmental partnership.



Fracking - At What Cost?

(continued from back page)

In 2014, State Senator Roberta Willis, in a written statement supporting the proposed legislation prohibiting fracking waste in Connecticut, wrote, "Despite risk to lakes and rivers, some New York towns are using the briny (fracking) wastewater for de-icing roads." Senator Willis serves many towns in the northwest corner, as NCD does. Our towns drain into the Housatonic River Watershed (HRW). The HRW goes well beyond western Connecticut into Massachusetts and New York.

On March 5, 2015, the town of Washington, CT, approved an ordinance banning the storage, treatment or sale of fracking waste in their town and authorizing the board of selectmen to enforce the ban. Since then several other Connecticut towns have adopted similar bans. Litchfield, another HRW town, is considering a similar ordinance. Many towns and counties in Vermont, Massachusetts and New York have also instituted bans, but many New York towns in

the HRW have not. Some New York towns have regulations that allow fracking waste to be used in de-icing mixtures, which likely impacts downstream water resources.

NCD, in its mission to provide technical and educational assistance to its 34 towns, encourages you to communicate with your state legislators as the process to regulate fracking waste moves forward. We also need to support our legislators in their efforts to consider both regional and cross-state-border planning in regard to water quality protection.

In recent years, NCD provided technical and educational assistance to help its 34 towns to improve water quality by treating stormwater runoff, including road surface runoff, using Low Impact Development (LID) practices. Adding a mysterious stew of chemicals and elements contained in fracking waste to stormwater runoff would create a whole new challenge that would be difficult to manage. For example, while LID practices can

remove many pollutants from stormwater runoff, their ability to remove radioactivity is unproven.

Stay tuned while the CT DEEP grapples with creating regulations to deal with fracking waste.

When making energy source choices, it's also important to consider environmental cost. Many homes and businesses in Connecticut use fracked gas. There are now proposals to expand gas line networks and increase the diameter of some existing gas transmission lines. This will increase the demand for fracked gas here as well as the amount of fracking waste. It is important for all of us to practice environmental stewardship and better understand threats to environmental quality that can be lessened by making the right choices. Also, we should not underestimate the power of conserving energy. NCD will continue to provide technical and educational assistance to our towns to address issues that affect water quality, as clean water remains a basic right for all.

Northwest Conservation District
1185 New Litchfield Street
Torrington, CT 06790

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Conservation Calendar

www.conservect.org 860-626-7222

March 5 - Mad Gardeners Symposium - Housatonic Valley Regional High School, Falls Village
Visit www.madgardeners.com for more info.

March 12 - Connecticut Federation of Lakes Spring Conference/Annual meeting -
Woodridge Lake, Goshen. Visit www.ctlakes.org for more info.



SAVE THE DATE:

April 22 - 24. NCD's 34th Annual Earth Day Plant Sale at the Goshen Fairgrounds. For order forms, available March 1, 2016, call 860-626-7222, email us at ncd@conservect.org. or order online at nwcd.org.

Fracking Waste - At What Cost?

To Regulate or to Ban? That is STILL the Question

Thoughts from Sean Hayden, Executive Director, Northwest Conservation District

On August 18, 2014, Governor Malloy signed Connecticut Public Act 14-200, An Act Prohibiting the Storage or Disposal of Fracking Waste in Connecticut and establishing a three-year moratorium on the importation of fracking waste. Fracking waste, both solid and liquid, contains environmentally harmful contaminants including salts; chemical additives such as ethylene glycol, naphthalene and sulfuric acid; arsenic; metals; and organic compounds. Fracking waste from extraction activities in Marcellus Shale, found in upper New York state, also contains naturally occurring radioactive materials such as radium-226. Although Connecticut offers little opportunity for fracking, the Act was passed to prevent fracking waste coming from other states, including Pennsylvania and New York. The Act also prohibits the sale, manufacture and distribution of de-icing and dust suppression products derived from or containing fracking waste until CT DEEP adopts regulations controlling these products.

Continued on page 7