



### Spring Thaw

by Ruth F. Guillard

Night, early April  
White rivers of rain, snowmelt  
Roar over the rocks  
Scouring the steep slopes  
Tripping over grey boulders  
Hillsides echoing

Every spring I wait  
For this sweet sound of release  
The earth rejoicing.

*Printed with permission of the poet.*

### Stormwater~How You Can Help Protect Ponds and Streams



Stormwater is rain or snow melt that does not soak into the ground. Even from small rain events, stormwater is a danger to our streams and lakes, often leading to localized flooding and erosion as well as water quality degradation from added pollutants. Harmful debris sitting along the edge of water bodies is carried into streams and ponds by fast moving stormwater. In fact, it is the first half inch of runoff that carries the vast majority of pollutants. In this issue of the newsletter, we focus on:

1. **A new approach for minimizing the impact and devastation that stormwater brings to properties and rivers and**
2. **How property owners can help reduce the consequences of stormwater.**

In a natural environment with trees, shrubs and tall grasses, most stormwater does soak in and is used by vegetation or slowly enters streams as groundwater. This natural process filters the water and removes pollutants. Even in these undisturbed areas, a certain amount of overland flow occurs. However, by changing the natural landscape from forest and meadow to lawn and driveway, we create impervious surfaces that increase the amount of overland flow. This increase in stormwater is a problem for two reasons. First, rapid runoff causes localized flooding and erodes and destabilizes stream channels. Second, it carries pollutants to the streams such as phosphorus, bacteria, hydrocarbons and more. The best way to address these problems is to reduce runoff as much as possible at the source.



**The goal today with stormwater is to: Slow it down, spread it out, soak it in. Every landowner can help do this.**

For decades, the goal of stormwater management was to collect runoff as quickly as possible, route it into a drainage system (ditches or pipes) and route it to a stream, lake or pond. We also regarded stormwater runoff as an urban problem. However, stormwater management is just as important in village centers, suburban and rural areas where cumulative changes to the natural hydrology can lead to localized flooding, poor water quality, and impacts to downstream properties.

Large lawn areas on top of compacted soil, long gravel driveways, sizeable rooftops, development on steep slopes, and networks of backroads all generate stormwater runoff. This runoff is often connected and collected by roadside ditches that transport water, sediments, and pollutants directly to nearby

headwater streams. In addition to negative impacts on streams, this runoff contributes to road maintenance costs by eroding road surfaces and damaging culverts. During extreme storm events, these small streams can quickly overflow their banks and drastically change course. In some cases, the impact isn't felt until far downstream.

Village, suburban and rural landowners have many opportunities to control stormwater runoff from their properties. In the article which follows, we will introduce you to tools for assessing and managing your property to reduce stormwater runoff. This will benefit you and your neighbors. It can save the town and its residents money, since reduced runoff from private property to roadways means less road maintenance and lower costs. It will help protect the natural waters, keeping them clean and healthy environments for wildlife and recreation.

As you may recall, the spring 2013 edition of this newsletter focused on the impact of roads and driveways. You can find that issue (and others) through the Town of Calais website: [www.calaisvermont.gov](http://www.calaisvermont.gov).

## **Do It Yourself Site Assessment**

**A**s noted previously, the best way to manage stormwater is to slow it down, spread it out and soak it in. There are actions that you can take on your property to do just that. You don't need to be an engineer to understand stormwater and to take steps to reduce flow. The main thing that you want to understand is where stormwater comes from on your property and where it flows. All you need to do that is some rain gear and your power of observation!

**Take a walk around your property during a rain storm. Here are some of the things to take note of:**

**If you have gutters and downspouts, where does the water discharge? Is it onto a vegetated area where it has the opportunity to spread out and soak in? Or is it directed onto a hard surface such as a sidewalk or driveway? If the water is directed onto lawn, will it be conducted downhill because of a steep slope?**

**Where does the water from your roof fall if not collected and directed by gutters? Does the water soak in where it falls or does it runoff across a lawn or driveway? The roof valleys often shed large amounts of water.**

**What about your driveway, sidewalks and paths? These features not only generate stormwater (even a dirt footpath, if hard packed, does not absorb water) but often concentrate water flows turning them into small rivers thereby increasing erosion and pollutants.**

**Where does water enter your property? Is water coming onto your property from a road? From a neighbor's property? Is it a concentrated (identifiable channel) flow or does it sheet across a broader expanse, such as down a hill.**

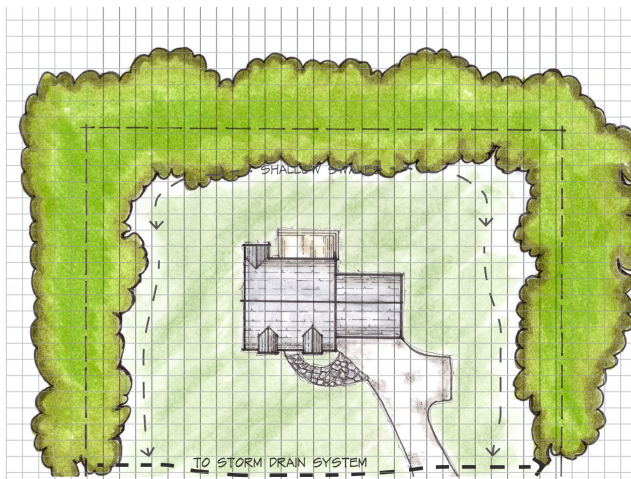
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**Where does water leave your property? Do you have ditches or channels that conduct the water offsite? Does it run down your driveway? Where does it end up? Does it run onto a the road or roadside ditch? Does it run onto a neighbor's property?**

**If your property is along a stream or pond, how does water from your property reach that stream or pond?**

You may find it useful to sketch a map of your property (house, yard, driveway etc) and note where water flows or accumulates. Grid paper can help you keep things to scale. Or you can go online, find an aerial photo of your property (using Google Earth) and make notations directly on that. Photographing of the flow and its evidence, such as channels, matted grass, or washed out gravel will help you recall locations once the storm is over.



Courtesy of NH Dept. of Environmental Science

**Map of Property on Grid Paper**



Courtesy of Lancaster County Conservation District

**Aerial Photo of Property**

After making these rain storm observations, you will have a good idea of where the water comes from and where it goes. What can you do? Here are some solutions as well as links to documents that provide more details.

One of the best things you can do is simply plant trees and shrubs on your property. Deep rooted, woody vegetation increase the amount of water that infiltrates into the ground. The water that soaks in is used by vegetation or becomes groundwater that will make its way slowly to the stream. This infiltration process helps maintain stream flow during periods of drought and filter out pollutants. Native trees and shrubs are particularly important as buffers along the edges of streams and ponds. In addition, the vegetation will also help reduce erosion, slow overland flow to the waterbody and filter out pollutants before the flow reaches the stream.

**If you have gutters and downspouts that are discharging on to hard surfaces or running in a channel across your lawn, there are a number of simple solutions:**

**Redirect the downspout onto an area where the water can spread out and soak in.**

**Connect a rain barrel to the downspout and use it to water your trees, shrubs and flowers**

**If you have large amounts of water and no suitable area for discharge, consider building a dry well (a stone filled**

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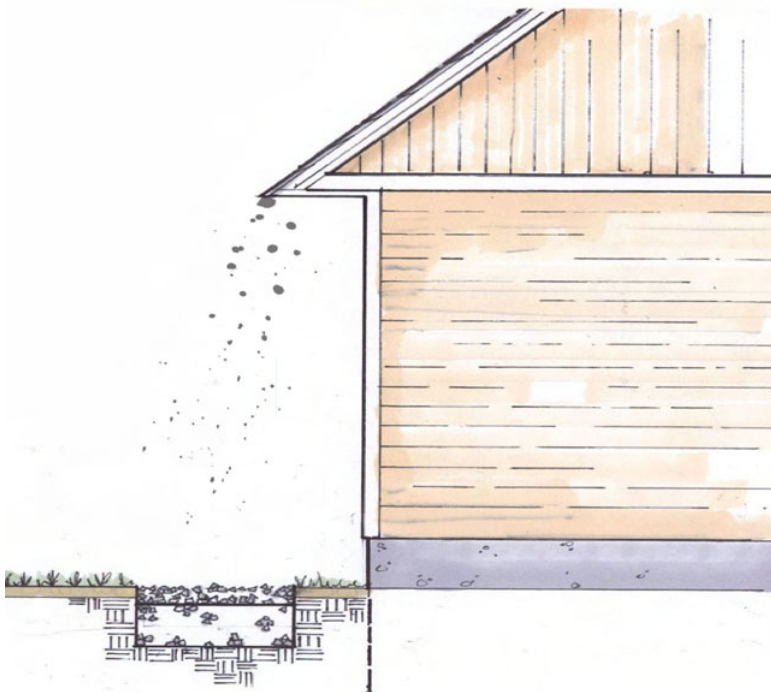


pit) or rain garden (a slightly depressed vegetated area) at the end of the downspout.

**If you don't have gutters and downspouts but have concentrated flows that don't soak in, there are several options.**

Create a dripline infiltration trench, which is a shallow stone-lined trench that runs the length of the roof line. In poorly drained soils, a perforated PVC pipe may be needed to conduct the water away from the foundation.

You may consider installing gutter and downspouts at key spots and then use the solutions listed above.



Courtesy of NH Dept. of Environmental Services

#### **Dripline Infiltration Trench**



Courtesy of Lancaster County Conservation District

**Example of Damage that can occur when runoff becomes concentrated flow causing erosion**

**There are a number of things you can do to reduce runoff from driveways, sidewalks and paths.**

If you have a gravel driveway, proper construction and maintenance will not only protect waterways but also save money in the long run. Last spring's CLSC newsletter was focused on driveway maintenance. CLSC Newsletters can be found at The Town Website [www.calaisvermont.gov](http://www.calaisvermont.gov)

You can improve infiltration along the edge of your driveway, sidewalk or path by creating a vegetated swale, which is simply a shallow channel that slows water and directs it to a place where it can be absorbed.

A driveway infiltration trench is similar to the dripline trench described earlier but is simply placed along the edge of a driveway or sidewalk.

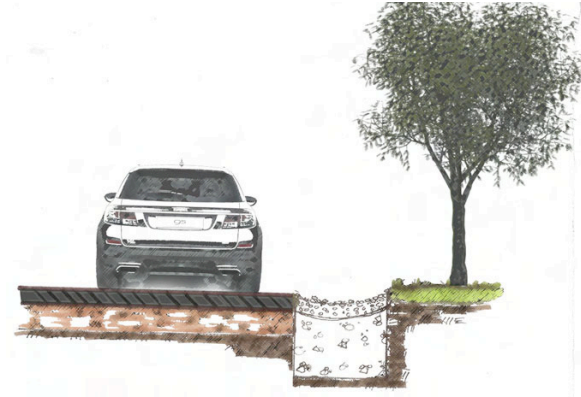
If you have steep paths which concentrate water flow, you could install infiltration steps to slow it down and let it soak in or create water bars to direct water off the path into a vegetated area.

If you have paved or concrete surfaces, consider replacing them with a more permeable surface. Pervious pavers have a reservoir underneath them that collect and infiltrate water.

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As mentioned earlier, you should take note of where stormwater enters and exits your property. If you have stormwater coming onto your property from public property such as a roadway or private property, work with your town or neighbors to consider the best options for managing it. Using what you have learned here, you may be able to help your town or neighbor reduce or eliminate the flow. Even though it is not 'your' stormwater, it may best be managed on your property by dispersing it into a vegetated area or into an infiltration practice such as a rain garden. At the same time, take responsibility for runoff that is generated by your property. Water doesn't obey property and a collaborative approach may be beneficial to you, your town and your neighbor.



Courtesy of NH Dept. of Environmental Services

### **Driveway Infiltration Trench**

**If you would like to learn more about techniques for managing stormwater on your property, the following resources are useful.**

Vermont Riparian Buffer Guide

[www.vtwaterquality.org/stormwater/docs/sw\\_gi\\_1.5\\_protect\\_riparian\\_buffers.pdf](http://www.vtwaterquality.org/stormwater/docs/sw_gi_1.5_protect_riparian_buffers.pdf)

Vermont Lakewise Series

[www.vtwaterquality.org/lakes/htm/lp\\_lakewise\\_standards\\_bmps.htm](http://www.vtwaterquality.org/lakes/htm/lp_lakewise_standards_bmps.htm)

Vermont Rain Garden Manual

[www.winooskinrcd.org/wp-content/uploads/VTRainGardenManual.pdf](http://www.winooskinrcd.org/wp-content/uploads/VTRainGardenManual.pdf)

New Hampshire Homeowners Guide to Stormwater Management

[www.des.nh.gov/organization/divisions/water/stormwater/stormwater-mgmt-homeowners.htm](http://www.des.nh.gov/organization/divisions/water/stormwater/stormwater-mgmt-homeowners.htm)

The Homeowner's Guide to Stormwater (Lancaster County PA)

[www.lancasterwatersheds.org/documents/HomeownersGuideFINALweb\\_000.pdf](http://www.lancasterwatersheds.org/documents/HomeownersGuideFINALweb_000.pdf)

**This edition of Calais Lakes and Streams Newsletter was created in conjunction with Friends of the Winooski.**

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