



Calais Lakes and Streams COMMITTEE



SPRING
2012
Ed. 12-01

*“Just as you feel when you look on the river and sky, so I felt;
Just as any of you is one of a living crowd, I was one of a crowd;
Just as you are refresh’d by the gladness of the river and the bright flow, I was
refresh’d;”*

From “Leaves of Grass”, by Walt Whitman

Calais is blessed to have a landscape alive with a family of streams and one strong river, the Kingsbury Branch of the Winooski, running near the eastern border of town. Most of these streams, with the exception of certain areas along their banks, are healthy, clear, free-flowing waters that sustain a diverse host of wildlife-fish, mammals, amphibians and lots of tiny critters. Preserving the water quality depends on us and the activities of our daily lives. Gravel roads run near and frequently cross the streams, many houses are located near them and farm fields are cultivated along their banks. In this issue of the newsletter we look at what it takes to preserve and restore the streams including strategies that individuals can use on their own properties.



Pekin Brook in Calais

The River Bank

“He thought his happiness was complete when, as he meandered aimlessly along, suddenly he stood by the edge of a full-fed river. Never in his life had he seen a river before- this sleek, sinuous, full-bodied animal, chasing and chuckling, gripping things with a gurgle and leaving them with a laugh, to fling itself on fresh playmates that shook themselves free, and were caught and held again. All was a-shake and a-shiver-glints and gleams and sparkles, rustle and swirl, chatter and bubble. The Mole was bewitched, entranced, fascinated. By the side of the river he trotted as one trots, when very small, by the side of a man who holds one spellbound by exciting stories; and when, tired at last, he sat on the bank, while the river still chattered on to him, a babbling procession of the best stories in the world, sent from the heart of the earth to be told at last to the insatiable sea.”

From “The Wind in the Willows” by Kenneth Grahame

The river bank is a world awash with life-creatures that live here, those that stop here for



Kingsbury Branch- well vegetated river bank

refreshment, those that start their lives here and move on. In the spring every inch of the bank is coveted territory. Mallard ducks are looking for a safe nesting peninsula. Migrating birds find water and temporary habitat as they travel north. Wood turtles arise from the waters depths to lay their eggs in soils adjacent to rivers and streams where there is sufficient sunlight to assure a timely hatch. Numerous other species move in

and out of the river bank to forage and drink. White-tailed deer, moose, some amphibians, dragonflies and their fellow invertebrates are some of the visitors.

The locale bordering a creek, stream or river-- its river bank and the adjacent green vegetated area-- is known as the riparian area. Riparian comes from the Latin word *ripa* meaning river bank. This is an area that is not wholly wet or dry. It is often subject to spring floods and temporary inundations following heavy summer thunderstorms. Plants that thrive here must tolerate periods when they are partially submerged in flowing water.

River Banks Role in Protecting Flowing Waters and Wildlife

Part upland, part wetland, riparian areas frequently hold the greatest diversity of species of any habitat in our region and are considered by many scientists to be more sensitive to environmental change than any other ecosystem. For example, changes in water temperature can affect which species can live in a particular waterway. This is especially true with fish. Streams may no longer



Pekin Brook- unvegetated eroding bank

support trout populations if temperatures exceed certain thresholds. Activities on the land adjacent to streams, such as logging or clear cutting, can elevate water temperature and greatly increase the maximum summer temperature. A canopy of trees whose trunks reach out across the open space between the banks provides shade and cooling. Once removed, it can take years to reestablish this beneficial canopy of green. This is particularly critical in headwaters, where removing

streamside cover in a small area can affect much larger portions of the watershed as warm water is transported downstream.

Stability of river banks is important. The purity of the flowing water depends on minimizing soil erosion. Whenever the land is disturbed near a stream or river some soil erosion is inevitable. As a result, fine sediments are the most widely occurring pollutant in streams. These sediments can be carried quite a distance. When water contains a large amount of fine sediments in suspension it becomes more opaque, a condition known as turbidity. Streams with high turbidity have lower abundance and diversity of species. The higher the turbidity the less sunlight can reach to the depths of the stream. This limits photosynthesis and has a negative effect on bottom dwelling plants as well as phytoplankton.

Trees, shrubs and other plants living along the river bank protect the waters from soil erosion.



Recovering bank - new trees filling in

Their root structures reach deep into the soil and stabilize the river bank. In addition, they provide essential food and habitat sources for aquatic life. The leaves and twigs which they shed support many species of water-dwelling insects. These in turn become the food source for amphibians, birds and larger animals, thereby, sustaining the web of life. Large branches and even whole trees falling into streams redirect currents, slow moving water, and create structurally diverse microhabitats in the form of small pools and riffles as water flows over and around such large woody debris. These are important habitats for many fish big and small. Any angler knows that a partially submerged log is the place to cast.

Riparian zones are utilized by wildlife as a sort of "natural highway". They provide wildlife benefits far out of proportion to their extent on the landscape by offering an all-in-one package of three critical resources-cover, food and water. Forested riverbanks are connective corridors traveled by mammals and birds as they journey up and down the river during daily movements and seasonal migrations. Where wildlife and plant habitats are no longer continuous because of human settlements, farms and industrial uses, healthy riparian buffers may be an essential element in preserving genetic variability by maintaining connections amongst geographically dispersed populations within a species, thus maintaining the gene pool.

The richness of the plant community in a riparian buffer, its abundance, composition and diversity, directly affects the resident wildlife. A study of riparian buffers conducted in Quebec showed that the abundance of small mammals and reptiles increased with the complexity of the mix of riparian plants. Small mammal diversity was higher in herbaceous and wooded riparian strips, whereas amphibians and snakes were more diverse in shrubby strips.

Riparian buffer strips

Protecting riparian areas or restoring their plant diversity where it does not exist, is a relatively simple strategy for protecting aquatic environments. It can be accomplished with riparian buffer strips- vegetated setbacks from shorelines. The benefits that result include reducing the flow of sediment from neighboring land, absorbing pollutants from runoff before they reach the river, improving habitat for aquatic plants and animals and providing contiguous corridors that serve as habitat and travel routes for wildlife.

If this idea sounds interesting, then perhaps protecting or restoring riparian buffer strips is something you may wish to undertake, particularly for streams that flow through your own property. In the next issue of the newsletter we will present information on steps you can take. There are many options, such as establishing a conservation easement on riparian buffer strips, replanting a buffer strip, or letting it grow back naturally.

Rain Gardens

“Gardening to Absorb the Storms”

Springtime in Vermont is rain time. As you listen to the rain dripping from the roof and flowing from the gutters you might wonder where the rainwater is going. On the next rainy day when you are running errands, stop for a minute in a few different locations and try observing the flow of the water. Is it channeled into a fast moving stream? Is it flowing like a sheet across the road or parking lot? Where does the water go once it meets the street or the neighboring yards?

Water flowing from hard, impermeable surfaces carries with it gravel, sand left over from winter, and the detritus on the ground-oil, trash, leaves, sticks. If this water and the items it carries, is not absorbed by the landscape, it eventually makes its way into nearby streams and rivers, lakes and ponds. You may have noticed that many rivers and streams flow brown for several days after a major storm.

Keeping excess rain water and pollutants out of rivers is essential to the health of our surface waters. In a world without villages and roads the streams and rivers would be lined with trees and under-story vegetation. Most rainfall would be captured in the duff layer on the floor of the forest and only slowly trickle into the rivers. Sheets of water running off of roads and tilled earth would not exist.

A Rain garden is a planted depression that allows rainwater runoff to be collected so that it can be absorbed or evaporate and not flow into rivers or lakes nearby.

Rain gardens are an excellent way to shield streams from the deluge that comes with opening the land to fields, houses and villages. A depression landscaped with plants is created to collect the water and debris. Native plants which tolerate wet feet and occur naturally along the edges of wetlands or ponds are best. By locating them between nearby waterways and man-made hard surfaces (roofs, parking lots, roads), they can prevent pollutants and sediments from reaching nearby streams and ponds. In a residential setting a rain garden is located typically near the down spout from gutters or along the down hill edge of a driveway.

See Diagram below left.

Why native plants? They generally do not require fertilizer, a pollutant when it gets into streams, they thrive in the local climate, soil, and water conditions, and attract local wildlife such as native birds. A mixed selection of wetland edge vegetation, such as wildflowers, sedges, rushes, ferns, shrubs and small trees, will absorb excess water flowing into the rain garden and filter it before it reaches the groundwater below. Also, through the process of transpiration, rain garden plants return water vapor to the atmosphere. The size of a rain garden can vary from a small planting at the foot of a gutter to a more extensive planting that is integrated into other gardens in one’s yard.

The first rain gardens were created to mimic water retention areas which occur naturally before man-made developments are introduced. Rain gardens for residential use were developed in 1990 in Prince George’s County, Maryland when a

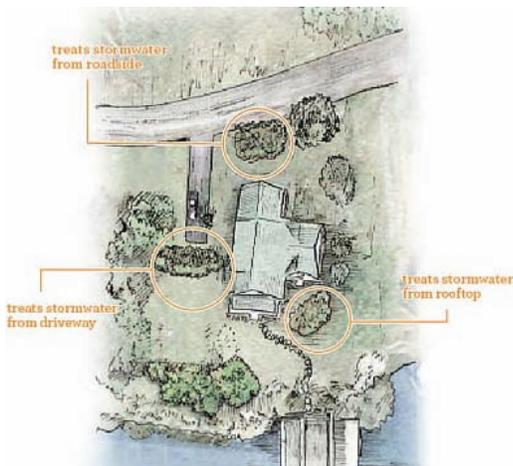


Diagram of rain gardens near a home on a lake
 Courtesy of The Lake George Waterkeeper



Installation of rain garden in Plainfield Village

developer building a new housing subdivision had the idea to replace the traditional stormwater management pond with individual rain gardens at each house. The rain gardens in this community, known as Somerset, proved to be highly cost-effective. Flow monitoring done in later years showed that the rain gardens have resulted in a 75-80% reduction in stormwater runoff during a regular rainfall event.

Rain gardens can be attractive, useful additions to towns and villages that are located beside a river. A local example is the municipal rain garden located in the center of Plainfield. This rain garden was created a few years ago to collect the runoff from road and small parking lot opposite the Country Bookshop on Mill St. Subsequently it has been modified to accommodate much more silt and gravel than was expected originally. Before the rain garden existed the excess water flowed down the hill into the Winooski River and with the water large amounts of sand and silt filled with pollutants from the road were deposited in the river. It is an evolving garden worthy of a visit when you next pass that way.

Charting the flow of rain water in your yard is a great family activity for a rainy day. Don slickers and boots and go outside to watch the water as it spills from the gutters or rolls off the driveway. Follow its path. Look closely at the lawn's surface. Often you can see a multitude of tiny rivulets flowing downhill. Can you find where the flow stops? If there is a steady current flowing into the road, where does it go from there? Does

water need to be collected to prevent a large influx into a nearby stream or pond? A rain garden might be a good solution. There are so many beautiful native plants that happily dwell where water and land meet. If your gardening fingers are itching for a new project, building a rain garden could be a new and interesting experience. Rain Gardens are a wonderful way to enhance the beauty of your yard and protect Vermont's streams and rivers!

For information on how to construct a rain garden, consult **The Vermont Rain Garden Manual** available on line

Go to:

<http://www.uvm.edu:8889/~seagrants/communications/assets/VtRainGardenManual.pdf>

Or

Lake George Do it yourself water quality

Go to:

<http://www.fundforlakegeorge.org/index.asp?lg=1&w=pages&r=72&pid=75>



**Do you value the health of your lake or pond?
Would you like to learn more about native and
invasive aquatic plants and animals?**

Join the
Vermont Invasive Patrollers

2012 VIP and Blue-Green Algae Workshops:

Friday, July 20th 9-4 (register by July 13th)
Lake Morey Resort, Fairlee

Wednesday, August 15th 10-5 (register by Aug. 8th)
Community College of Vermont, Newport

**Or host your own local workshop. For information
and/or registration contact:**

Bethany Sargent at
Bethany.Sargent@state.vt.us or (802)
338-4819

**VIPs protect Vermont's waters from harmful
invasive species through spread prevention and
early detection**

Learn more at www.vtwaterquality.org



Runoff water standing in Plainfield garden



Calais Lakes and Streams COMMITTEE

PO Box 63
Calais, VT 05648

FIRST CLASS
PRE-SORT
U.S. Postage
PAID
Montpelier, VT
Permit No. 61



This newsletter is sponsored by:
Vermont Watershed Grant Program



Calais Lakes and Streams COMMITTEE

To volunteer or for more information, contact:

Noreen Bryan noreen1945@yaho.com
Laura Brown 454-7723
Ginger Clammer vlammer@aol.com
David Ellenbogen pianomath@gmail.com
Wilson Hughes wilson.hughes@yahoo.com

Victoria King vkingvt@gmail.com
Susan McKenney siouxpooh@hotmail.com
Ram Verma rgverma@live.com
Clay Whitney cwhitney@cabotcheese.com

SPRING
2012
Ed. 12-01