

**Final Report
November 2013
Coldwater Heritage Partnership
Riparian Buffer Installation & Education Project
Bushkill Stream Conservancy**

Project Photos

Please see attached photos.

Project Background

The project included the purchase and planting of some 1,700 live stakes of willows and dogwoods along 1,200-linear feet of three recently cleared PPL power line stream crossings in the upper Bushkill Creek watershed in Bushkill Township, Northampton County. Once mature, these streamside plantings will help filter stormwater runoff, reduce streambank erosion, reduce water temperatures and enhance in-stream habitat for trout and other aquatic organisms in these High Quality, Cold Water Fisheries. The project also included the design, fabrication and installation of “No Spraying/No Cutting” signs at these three project sites.

The project further included the design and printing of a two-page fact sheet about the project and about the values and benefits of riparian buffers, which was included as an insert in the Spring 2013 issue of Bushkill Township’s municipal newsletter, which was mailed to nearly 3,500 homes and businesses in the township (please see attached publication titled *Riparian Buffers for the Bushkill Creek Watershed*). Four other municipalities in the Bushkill Creek watershed were provided with PDF files of the fact sheet, some of which have posted the file on their websites and/or plan to include it in future municipal newsletter mailings. Additionally, the Bushkill Stream Conservancy posted a PDF file of this publication on its website as well.

Project Partners

- PPL Electric Utilities Corporation – granted permission to access and plant live stakes on three cleared stream crossings in their power line easements and to post these newly planted riparian buffers with “No Spraying/No Cutting” signs on these sites in their right of ways.
- PA DCNR, Bureau of State Parks, Jacobsburg Environmental Education Center; Bushkill Township; Private Landowner – each of these three landowners granted permission to access and plant live stakes on their properties. Additionally, Bushkill Township agreed to include the *Riparian Buffers for the Bushkill Creek Watershed* fact sheet as an insert in its Spring 2013 municipal newsletter mailing to nearly 3,500 homes and businesses and Jacobsburg Environmental Education Staff assisted with planting the live stakes.
- Bushkill Stream Conservancy – coordinated the overall project and provided volunteers to assist with planting the live stakes and installing the “No Spraying/No Cutting” signs on both sides of the streams at each of the three project sites.
- PA DCNR, Bureau of Forestry, William Penn Forest District – Assisted with GIS mapping of power line rights of ways for PPL approval to install the live stakes and assisted with planting the live stakes.
- Forks of the Delaware Chapter of Trout Unlimited – provided volunteers to assist with planting the live stakes.

- Northampton County Conservation District – developed project planting plans for PPL approval, researched & developed copy for the *Riparian Buffers for the Bushkill Creek Watershed* fact sheet and assisted with planting the live stakes.

Total Project Cost

The total project cost, including local in-kind contributions, was \$10,657. Please see the Final Expense Record for itemized budget breakdown.

Project Deliverables

- The purchase and planting of 1,700 live stakes along 1,200-linear feet of three recently cleared PPL power line stream crossings.
- The design and development of a PDF file and printing of paper copies of *Riparian Buffers for the Bushkill Creek Watershed*, a two-sided fact sheet about the values and benefits of streamside vegetation, which was included as an educational insert in Bushkill Township’s Spring 2013 municipal newsletter, which was mailed to 3,500 homes and businesses in the township. Please see the attached PDF file of this publication.
- The design, fabrication, purchase and installation of 32 “No Spraying/No Cutting” signs on both sides of the three project sites to ensure the sustainability of the live stake plantings in the PPL power line easements.

Next Steps

The Bushkill Stream Conservancy has identified additional utility line stream crossings in the Bushkill Creek Watershed that would benefit from similar riparian plantings to protect local water quality, and has made contact with a gas utility company in hopes of doing so. The Watershed Coalition of the Lehigh Valley, through PPL Electric Utilities Corporation, has donated funding to the Conservancy to implement such projects in the right of ways of utility companies willing to work with the Conservancy to that end.

Project Sustainability

Since the live stake plantings were completed last winter, field surveys over the past growing season have revealed that most of the live stake plantings have survived and flourished at all three project sites. To ensure their continued success and to avoid future risk of either herbicidal or mechanical removal of the live stakes by PPL vegetation management contractors, thirty-two 12”x12” metal fluorescent orange “No Spraying/No Cutting” signs, with PPL’s name and logo on them, were mounted on metal posts that were installed at 30’-50’ intervals and within 50’ of the streams and on both sides of the streams at all three project sites.

Riparian Buffers

for the Bushkill Creek Watershed

Riparian buffers link our land and water together and protect our streams from land-based pollution. These corridors of grasses, shrubs and trees along the banks of Bushkill Creek and its tributaries filter stormwater runoff and provide a transition zone between water and human land use. Riparian buffers are the single most effective and least expensive protection for our water resources in the Bushkill Creek Watershed. They are also complex ecosystems that provide habitat and improve the stream communities they shelter.

Riparian buffers have been lost in many places in the Bushkill Creek Watershed over the years. Preserving existing buffers and restoring lost ones are important steps forward for water quality, stream bank stability, flood protection, and fish and wildlife habitat. Landowners, farmers, governments, businesses and conservation organizations can all work together to help restore and protect riparian buffers, which in turn restore and protect the quality of our streams and drinking water.



Bushkill Stream Conservancy volunteers prepare to plant shrubs along Sober's Run.

In 2012, the Bushkill Stream Conservancy secured a grant from the Coldwater Heritage Partnership to restore riparian buffers along streams in the upper Bushkill Creek Watershed. With additional funding from PPL Electric Utilities Corporation and support for the project from landowners, Bushkill Township, the PA Bureau of Forestry and the Northampton County Conservation District, the

Conservancy purchased and planted more than 1,500 shrubs along the banks of Bushkill Creek and Sober's Run. These plantings will help stabilize stream banks, prevent erosion and sediment pollution, and shade and cool these streams for temperature sensitive fish like trout, for which Bushkill Creek and Sober's Run are locally famous. As part of this project, Bushkill Township and the Bushkill Stream Conservancy created web pages on their websites at www.bushkilltownship.com/riparian_buffer.html and <http://bushkill.org/riparianbuffers.html>, which are dedicated to educating the public about riparian buffers, how to establish and maintain buffers, and regulations related to their protection.

Buffer Benefits:

Hundreds of studies have been conducted over the past 30 years on riparian buffers and their effectiveness in filtering out chemicals and sediment, mitigating flood damage, and protecting and improving water quality. An Internet search will reveal scores of these studies and their findings. Click on www.bushkilltownship.com/riparian_buffer.htm or <http://bushkill.org/riparianbuffers.html> for a look at some of the research and facts behind buffers. In their natural state, riparian buffers provide environmental and public health and safety services for us, completely free of charge. The science is in and it's indisputable. *Consider this:*

- **Buffers reduce flood damage.** The vegetation and soils in riparian buffers reduce flooding impacts by increasing storage and infiltration of floodwaters and slowing floodwater velocities, protecting riverfront and streamside properties from maximum flood damage.
- **Buffers decrease costs of stormwater management.** The use of riparian buffers, especially in new land development designs, can reduce or eliminate the need for large and expensive stormwater infrastructure, such as storm sewers and detention basins.
- **Buffers filter pollutants.** The vegetation and soils in riparian buffers filter incredible amounts of pollutants, including sediment (the #1 pollutant in Lehigh Valley waterways), nutrients from agricultural and lawn practices, and toxics and other contaminants from stormwater runoff from roadways, sidewalks and parking lots.
- **Buffers protect drinking water.** The vegetation and soils in riparian buffers filter out pollution, as mentioned above, and battle drought by retaining vast amounts of water, protecting both water quality and quantity—a fact that should prove crucial in water management planning.
- **Buffers improve in-stream pollution removal.** Streams protected by forested riparian buffers break down and remove an astounding 200-800% more nitrogen pollution than streams without buffer protection—a finding that should prove vital to regional water quality improvement programs.
- **Buffers reduce stream bank erosion.** The root systems of trees, shrubs and other vegetation in riparian buffers stabilize stream bank soils and slow down stormwater runoff to prevent erosion, reducing sediment pollution.
- **Buffers cool waters.** The shade of forested buffers can cool streams by 4-9°F. Shaded and cooler water means healthier streams, particularly for temperature-sensitive fish like trout, for which Bushkill Creek is a locally famous fishery.
- **Buffers enhance stream habitat for fish and other aquatic life.** Leaves, sticks and other natural debris that end up in streams from riparian buffers provide food, shelter and habitat, increasing biological productivity from the bottom of the food chain on up.



BUSHKILL STREAM
CONSERVANCY



Bushkill Township
Northampton Co., PA



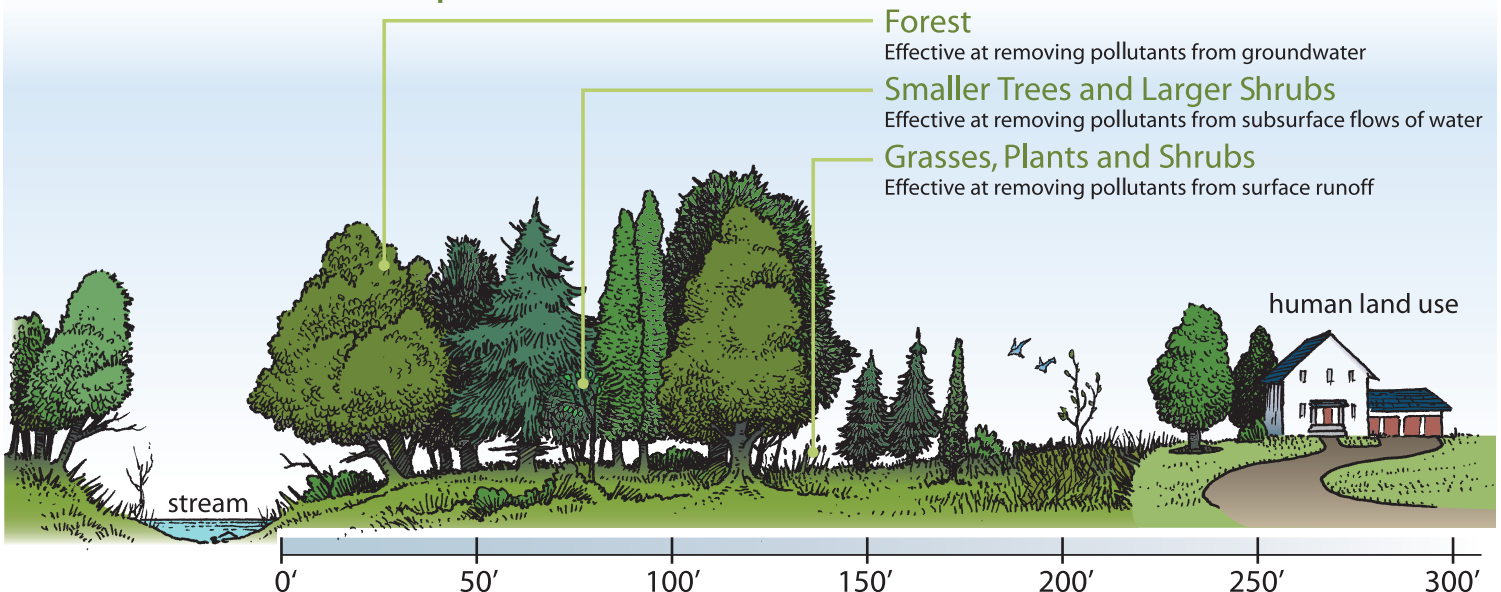
Northampton County
Conservation District

The Challenges

Whether you own a waterfront slice of the 80-square-mile Bushkill Creek Watershed or live a mile away from the nearest stream, local creeks are affected by what happens on your home turf. We all live in a watershed—the land under our feet and all around us that drains into the nearest stream, lake or river. Even that storm drain at the bottom of your driveway or street eventually leads to a waterway. Water flowing off driveways, sidewalks, parking lots, roads, farms and lawns picks up sediment, fertilizers, pesticides, herbicides, heavy metals, petroleum products and other pollutants and carries them to the nearest water body. The loss of riparian buffers and their streamside vegetation has reduced the ability of streams to naturally “buffer” or cleanse themselves of these pollutants. Without a living filter to intercept and trap these pollutants, they enter our streams directly as polluted runoff.

Another challenge: We tend to like our outdoor spaces—whether it’s our private backyards or public parks—to be neat, tidy, manicured and wide open. We often clear as much vegetation as possible along streams for our viewing pleasure, and mow the grass or pasture right down to the water’s edge. And we’re pretty particular about pulling weeds, raking leaves, trimming trees and cleaning up the brush in what few natural patches we leave out back or in our urban parks. Unfortunately, nature doesn’t conform well to these manmade rules of landscape aesthetics. Streams need thick, carefree buffers of a variety of trees and shrubs along their banks to best filter sediment, nutrients, chemicals and other pollutants out of surface runoff before they enter and poison our waterways.

Cross-section of a Forested Riparian Buffer



The Solution

Make a buffer! Even if you don’t own streamside property, add buffers between your house and the street to filter runoff before it enters a storm drain or ditch on its way to a stream. Another good place for buffers to filter runoff is alongside your driveway, where they can be disguised as perennial flower beds, shrub borders or fern gardens. The cleaner runoff is leaving your property, the cleaner it will be when it finally enters the nearest waterway. We are all responsible for whether water is better or worse off when it leaves our land.

If you do own streamside property, the first goal is to avoid mowing right down to the water’s edge. Simply ignore your stream bank by establishing a no-mow zone and let wild plants naturally colonize and protect it for you. This is the easiest and cheapest way to encourage a riparian buffer. If you want a more active hand in the process, develop a planting plan, test your soils, map out your buffer, prepare the site by removing invasive plant species and plant appropriate native trees and shrubs. The best care is the least care when it comes to a stream buffer, which reduces time-consuming lawn care and associated costs. Resist the urge to tidy up. A natural strip or corridor of vegetation along your stream, with its “litter” of fallen leaves and twigs, helps the buffer break down pollutants and soaks up water.

You don’t have to convert your entire lawn to a buffer, but bigger is better. The longer runoff is detained in the buffer before entering the stream, the cleaner the water will be. Wider, forested buffers are even more effective than narrow, grassy buffers. But even a narrow buffer is better than no buffer at all. While there is no generic one-size-fits-all buffer, specific buffer widths are prescribed for specific functions, like stream bank stabilization, sediment removal or flood protection. Realistically, decisions about buffer widths will be a compromise between ideal widths based on environmental goals, and landowner concerns and economic constraints. For additional information on riparian buffers and guidance on establishing, maintaining & protecting them, log onto www.bushkilltownship.com/riparian_buffer.html or <http://bushkill.org/riparianbuffers.html> or call the watershed specialist at the Northampton County Conservation District at 610/746-1971.

Before:



After:

