

Technical Report for DCR Minigrant  
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**Sponsor:** Rappahannock Friends and Lovers of Our Watershed (RappFLOW):  
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**Project Title:** Residential and Commercial Best Management Practices for Nutrient  
Reduction in the Thornton River Subwatersheds: The Thornton River Re-Leaf  
Project

## **Attachment H: Guidelines for helping non-agricultural landowners**

**Guidelines for Assisting Non-Agricultural Riparian Land Owners  
To Plan and Construct Effective Runoff and Buffer Areas  
May, 2007**

By Tim Bondelid, RappFLOW Volunteer

Most of these guidelines have been gleaned from literature review and from working with Greg Wichelns (CSWCD), Mark Malick (retired landscaper from the National Park Service), and Jack and Sally Price (Master Gardeners).

The goal is to prevent, as much as possible, the entry of nonpoint source (NPS) pollution from residential and business properties into our streams . The primary pollutants of concern for RappFLOW are: Nitrogen, Phosphorous, sediment, and bacteria (fecal coliform, e-coli).

It is important that RappFLOW's consistent message be: “There is always something that can be done to help reduce pollution coming from a landowner's property”.

In this effort, small streams are as important as larger streams. If pollution gets into, say, Keyser Run, it will flow into the Thornton River and some of it (especially the Nitrogen!) will eventually travel downstream into the Rappahannock River and from there into the Chesapeake Bay. The Bay is in serious trouble and some of our funding comes from various programs set up to improve the Bay water quality.

In areas such as the town of Sperryville, landowners whose properties drain into the Sperryville storm sewer system are analogous to owners who live directly on the Thornton; that's where the stormwater goes in either case.

Riparian Buffers are vitally important: they are “the last line of defense” in keeping pollution out of a stream. Additionally, an effective buffer will stabilize the adjacent stream bank. Trees help keep the stream water cooler and provide beneficial “leaf litter” which performs a filtering action within the stream. These actions of the buffer greatly improve water quality, helping macro invertbrates thrive and making better “homes” for fish. Proper buffers can transform a stream that has no fish or only the less-desirable bottom dwellers like Carp into an environment that “cold water” fish like Trout can thrive in.

Buffers can be established in many ways. They can be created as simply as setting aside a 35 to 50 foot strip along the stream, not mowing, and permitting any naturally occurring tree seedlings to develop. Other techniques can be used, such as developing an attractive landscaping plan and then planting additional trees, shrubs, etc.. Our project at the Old Schoolhouse is a perfect example of this. Note that the landowner, Cliff Miller, stopped mowing along that stretch of the Thornton River two years ago. The taller grass buffer had already helped a great deal and our site design retained a number of very desirable “volunteer” trees already growing within the grassy area. Nature finds a way!

Some businesses and homeowners will want to retain a nice waterfront view. This can be done with “clever” landscaping which could use more low-growing plants, nice walkways and seating areas. The message, as always, is: something can be done that can help and also meet the landowner’s desires.

It is important in designing or helping with a buffer that there is not a “back door” for pollution, such as a drainage ditch or drain pipe, that circumvents the buffer. In such a case, many, if not most, of the benefits of the buffer will be lost!

A “holistic” view should be taken when looking at a property. The overall drainage, lawns, swales, and ponding areas must all be considered. One of the best ways to get this holistic viewpoint is to observe what happens in terms of runoff during a heavy rain. The landowner could do this and/or a RappFLOW team member could go out and observe during a ‘weather event’. Ponchos are really nice.

There are many things that can be done on a property BEFORE runoff reaches a stream or drainage ditch. The “mantra” is to SLOW the water down, giving it a chance to seep into the ground. As at our pilot site, a landowner could select an area to stop mowing and allow it to grow up into a forested area, ultimately providing a haven for many interesting forms of wildlife, birds, and butterflies. Undesirable trees or other plants can be cut down and the stumps carefully treated with herbicides. Alanthys (“tree of heaven”) is one such common “invasive” tree that landowners may want to control in this way. RappFLOW can assist owners in seeking out advice on the least toxic yet effective herbicide(s) to use, and how and when to apply them.

Lawn care practices alone can make an incredible difference and many of these don’t cost anything. Some practices can actually save money! Five important techniques to consider are:

1. To mow higher
2. To fertilize **only** as needed
3. To leave grass clippings in place rather than raking them – clippings are actually a source of “free” fertilizer and they return nutrients to the soil.
4. To be very selective about using herbicides, and ensure that they biodegrade quickly. Advice on proper herbicide use can be obtained by RappFLOW for the landowner.
5. To clean up after pets as much as possible – this is a source of pollution just like cow manure

Mowing higher, say at a height of four inches instead of two inches, is better for the grass and the higher vegetation will really help runoff infiltrate into the soil – it SLOWS the water down. Also, the taller the grass is allowed to grow, the deeper the roots of the grass will go. This can help the grass survive dry weather conditions because the roots are reaching farther down to get moisture. Did you know that grass roots are deeper than tree roots? Amazing but true. The grass absorbs the nutrients in runoff, withholding them

from the shallow groundwater. This also helps keep pollution from going into the deeper groundwater, benefitting the quality of our water supply wells.

Instructions on “weed and feed” bags from commercial lawn care companies almost always (always?) recommend fertilizing much more than is necessary, often as frequently as four times a year. The excess nitrogen and phosphorous from over-fertilizing will become a source of nutrients that can only contribute to pollution problems. Note that few farmers fertilize their crops that often. They tend to fertilize once a year, usually in the Fall. RappFLOW can and will help landowners to develop an effective fertilization schedule. Soil test kits can be obtained free of charge from the local Agricultural Extension Office. In Rappahannock County, the office is in Little Washington, the contact is Kenner Love at 540-675-3619. Soil samples are then sent to Virginia Tech University along with a check for seven dollars. What is returned is a complete soil analysis and recommendations for a Nutrient Management Plan. This is a great deal! RappFLOW will assist the landowner throughout the entire process. We’ll even pay the seven bucks.

Driveways can be a major source of pollution, particularly sediment. This is a challenge for everyone, and RappFLOW will do what it can to help find solutions. One possibility is to determine the current path of driveway runoff and to determine whether some of the solutions described above can be used along shoulders or ditches to slow the water down.

Some areas with a large quantity of runoff from impervious surfaces, for instance parking lots or rooftops, can be helped by other measures such as raingardens. A raingarden is a “structural” improvement that provides control for much more runoff in a smaller space. Much of the runoff from the Old Schoolhouse, for example, flows to one side of the building. A raingarden close to this edge of the parking lot would help significantly in “capturing” the runoff, slowing it and allowing it to seep into the ground. Such a raingarden is a part of our ultimate plan for the Old Schoolhouse site.

The primary objective is to control at least the first ½ inch of runoff because studies have shown that most of the pollution from parking lots comes in this first ½ inch.

There can and will be other situations or variants on these situations. Creative solutions developed in cooperation with our “partner organizations” such as CSWCD will be considered as needed.