



# The Conservation Strip

CONSERVING NATURAL RESOURCES FOR A BETTER ENVIRONMENT

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## The Impacts of Sedimentation on Freshwater Environments By Heather Ambrose, E&S Control Specialist

Did you ever wonder why erosion control is such a big deal? Preventing erosion control issues before they begin is important to saving the earth's water resources. Erosion is a natural process that occurs when material becomes detached from the earth's surface by forces such as water and wind. These tiny particles are referred to as sediment and consist of fine inorganic or organic material that can move into water systems and either become suspended in the water column or settle on the stream bed. Although erosion is natural, it typically increases in high-flow events. Therefore, erosion tends to occur at a higher rate in the spring and summer in Virginia.

The input of fine sediments into freshwater systems is also increased substantially by human disturbance. Agricultural, forestry and mining operations increase sediment input into streams and lakes as well as urban development and construction. Agricultural practices such as livestock grazing and till farming can create excess sedimentation, as well as the construction and use of logging roads in forestry operations. Erosion issues caused by construction and urban development are closely monitored by the JMSWCD to ensure that freshwater systems are not adversely affected.

Freshwater ecosystems cover 0.8% of the earth's surface. There are three main types of freshwater ecosystems:

- 1) lentic systems – include slow moving waters such as ponds and lakes
- 2) lotic systems – include fast moving waters such as rivers and streams
- 3) wetlands in which soil is saturated at least part of the time

These aquatic systems play a vital role in environmental processes. They recycle nutrients, purify water, provide habitat for wildlife, recharge ground water and are im-

portant for recreational use. Freshwater macroinvertebrates are useful indicators of aquatic stress due to their abundance and ease of capture. Common freshwater macroinvertebrates found in this area are insects, worms, snails and crustaceans. The species of insect larva which include stoneflies, mayflies and caddisflies are often the primary macroinvertebrates used as stress indicators because they are highly sensitive to pollution and disturbance.

Excessive sedimentation can negatively affect freshwater ecosystems in many ways. Sediment particles that are suspended in the water current cause turbidity. Sus-



The water in the clear jar on the left has about 10 mg/l of suspended sediment, whereas the jar on the right contains about 500 mg/l of sediment

pended sediment concentrations are often measured in milligrams/liter (mg/l). The suspended sediment decreases the amount of light entering a stream which can lead to a decrease in photosynthesis. Fewer plants results in less food for stream macroinvertebrates and fish.

Suspended sediment also causes a visual obstruction to movement and feeding in aquatic organisms. Often, specific life stages of a species are affected.

Sediment that settles on the streambed can also pose many problems for freshwater environments. This form

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# Environmental Literacy

Chances are, most people reading this newsletter spent quite a bit of time outdoors in their youth. It didn't matter whether you were climbing a tree, skipping rocks on a pond, or exploring the local woods and fields, you were outside and learning about life from your experience in nature.

But, a lot has changed in the last few decades. Many parents today don't allow their children to explore their own neighborhood for overblown fears they will be abducted. Too many children are 'busy' sitting in front of TVs and computer screens. Other children may be very busy in the outdoors, but every minute is structured, and usually on a ball field of some type. Kids may know there's a woodlot in their neighborhood, but they don't know what's on the other side of it. They know there's a stream that flows through the subdivision, but they don't know where it starts or where it goes and they have never been wading in it.

Many books have been written about children and nature. A recent book that has tackled this subject is Richard Louv's *Last Child in the Woods*. He has coined the term 'nature-deficit disorder' to describe this distancing of today's youth from the natural world. In researching for the book, Louv interviewed many people of all ages. One fourth grade student was quoted as saying, 'I like playing indoors, 'cause that's where all the electrical outlets are.'

It's not just American kids who are losing touch with nature. A survey in England found that 8 year olds could identify more Pokeman characters than they could common plant and animal species found in their own neighborhoods.

Some readers probably remember the first Earth Day in 1970. That single event brought many environmental issues into the mainstream. Enrollment in natural resource and environmental curricula exploded at colleges and universities all over the country. Environmental education was incorporated into many public schools and there was hope of creating a generation of environmentally knowledgeable and responsible citizens. While there have been many successes, the 2005 report of the National Environmental Education & Training Foundation (NEETF) has some interesting findings.

It was assumed that people who graduated from high

school after 1990 would score higher in environmental knowledge than those who graduated before 1970. In fact, there was no difference. After three decades of environmental education programs, only one-third of American adults can pass a simple test of environmental knowledge.

Over 45 million Americans think the ocean is the source of fresh water while 120 million think spray cans still have CFC's even though they were banned in 1978. Also, 120 million people think disposable diapers are the leading problem with landfills, when in fact they make up about 1% of the volume.

The NEETF surveys and other research suggest that many Americans of all ages receive much of their environmental information from the media. They tend to remember high profile news stories that may or may not be backed by factual information. Most Americans receive a lot of environmental information, but little education that ties it all together.

Even though many school systems teach environmental classes, they tend to be electives rather than incorporated into the mainstream curriculum. Students may learn more about the Amazon rainforest than the tree species in their local woodlot.



Many children today receive little hands-on experience in nature, unlike these students who are examining stream life in the field as an extension of the classroom.

Despite these findings, many professional Environmental Educators remain optimistic. They realize environmental education is still in its infancy, and needs to be moved from elective status to core status in school curriculums. They also

need to work closer with the media to insure accuracy and depth of reporting rather than sensationalized sound bites. And finally, everyone needs to work across the board to get kids outdoors and enjoying nature. Of course, none of this will be easy, but at least they have a direction on which to focus.

# Placement of Fill on Agricultural Lands

By Rex Rexrode, District Conservationist

With new sub-divisions being constructed and transportation projects underway, contractors often have excess fill material that needs to be disposed offsite. Often they approach local agricultural producers to use their lands as a disposal site. While this may be beneficial in certain cases, it can also lead local farmers into trouble.

Most farmers have low lying wet areas that are prime candidates for fill material. Herein lies the problem. These areas may be defined as wetlands. If fill material is placed in wetland areas, a farmer may create numerous problems. If a farmer places fill in wetlands, that farmer becomes ineligible for benefits from the United States Department of Agriculture. In addition the farmer may face civil penalties from the United States Army Corps of Engineers, the Environmental Protection Agency and the State of Virginia's Department of Environmental Protection. Penalties can involve fines and restoration of the area to its original condition.

Placement of fill on well drained sites may also present problems. While this is not illegal, the fill material is often subsoil which has very limited fertility and no natural soil structure or organic matter. If this material is placed in a deep layer over natural soil, production will be limited on these areas, for an extended period of time until the unconsolidated material has a chance to develop soil structure and build up organic matter. In addition it will require additional amounts of lime and fertilizer to produce a crop.

If you decide to accept fill material from an outside site, these guidelines may help.

You will need a land disturbing permit from the Fauquier County Community Development office. In addition you may only accept material from another permitted site. You will need to submit an Erosion and Sediment control plan for the area you wish to place fill on. This plan will be reviewed by the county and by the John Marshall Soil and Water Conservation District. E&S inspectors will visit the site while the project is ongoing to check Erosion and Sediment Controls.

In addition you may need permits from the US Army Corps of Engineers, the Environmental Protection Agency, and the Virginia Department of Environmental Quality, if you plan to place fill on poorly drained soils.

If you are thinking about placing fill, please contact the John Marshall Soil and Water Conservation District, or the Natural Resources Conservation Service. Both agencies can be reached at 540-347-3120. Either agency is willing to do a site visit to provide technical assistance on placement of fill on agricultural lands. In this instance pre-planning can prevent problems from developing, after the project is well underway.



Filling wetland areas may cause legal as well as environmental problems. Landowners are encouraged to contact the John Marshall SWCD before accepting any fill materials.

## New Poultry Litter Hotline

## TMDL Program Update

The Virginia Poultry Federation and the Shenandoah Resource Conservation and Development Council have announced a new poultry litter hot line and marketing program.

Poultry growers, litter brokers and haulers, and farmers seeking litter may call 800-418-0768 and speak with Becky Barlow, the new “market maker”. Barlow will help connect buyers, sellers, and haulers.

Barlow’s position was created through a National Fish and Wildlife Foundation grant awarded to Virginia Tech and designed to address the concentration of nutrients from animal agriculture in the Shenandoah Valley.

The program will spread the word that poultry litter is a valuable organic source of nutrients that can improve soil quality and productivity. Litter will be marketed to farmers with soils containing low to moderate levels of phosphorus.

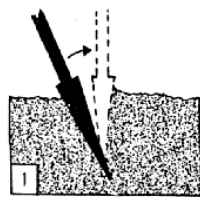
The John Marshall SWCD has started the implementation phase of the Total Maximum Daily Load (TMDL) plan for Thumb, Carter, Great, and Deep Runs in Fauquier County. These streams are all listed as ‘impaired’ by the Department of Environmental Quality due to high levels of bacteria.

The District is promoting the use of Best Management Practices (BMPs) in these watersheds, which include restricting livestock access to streams, reducing erosion, trapping sediment, and other practices. Landowners in the Great Run and Carter Run watersheds have already received a mailing from the District advertising the program. Landowners in the Deep Run and Thumb Run watersheds will receive information in the near future.

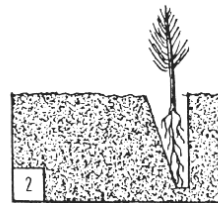
The John Marshall SWCD is the lead agency in the implementation of BMPs on agricultural land, while the Fauquier County Health Department has the lead in working with failing septic systems.

## Seedling planting guidelines

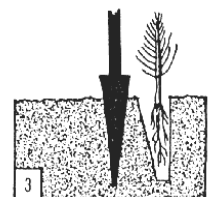
Many landowners will be planting bare root seedlings over the next few weeks. Once they are received from the nursery, they can be stored up to two weeks if kept cool and well ventilated. Small bundles can be kept in a refrigerator, just make sure roots are not exposed to freezing temperatures. Roots must be kept moist during planting, exposure to sun and wind can quickly dry them. The most common causes of planting failure include planting too shallow or too deep, leaving air pockets, and cramming tangled roots into a small hole.



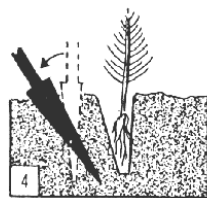
1 Insert bar or shovel at 45 degree angle, push forward to upright position.



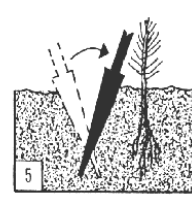
2 Remove bar and place seedling at correct depth.



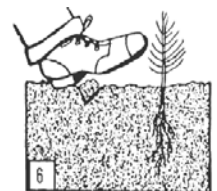
3 Hold seedling at correct depth and insert bar 3 inches from seedling.



4 Pull bar handle toward planter to close hole at bottom of roots.



5 Push handle forward to close hole at top of roots.



6 Stomp with heel to fill in last hole.

(Continued from page 1)

of sedimentation can smother benthic (bottom-dwelling) organisms such as mussels, macroinvertebrates and some fish . Excessive sediment on the stream bottom can also



Stoneflies are benthic organisms and, along with other stream macroinvertebrates, are important indicators of stream health.

destroy spawning grounds for some fish and kill eggs. It can destroy microhabitats around the streambed and make it harder for organisms to locate food. Chemicals such as plant-growth nutrients and pesticides often adhere to sediment particles, leading to even greater

stresses on the environment. Sedimentation of aquatic systems threatens the earth's drinking water supply causing an increase in filtration costs and a decrease in quality.

The best way to prevent erosion in streams, rivers and lakes is to stop it before it starts. The Virginia Erosion and Sediment Control Handbook contains several different preventative measures to install on land-disturbance sites, including silt fence, rock check dams and sediment traps. Sediment controls should always be installed before any construction begins. Agricultural producers are encouraged to participate in Virginia's Best Management Practices cost-share program, which includes terrace and strip-crop farming and maintaining streamside vegetation to avoid stream sedimentation.

## New Employees

Lloyd Goode and Melissa Hooper are new Conservation Specialists for Virginia's Agricultural Best Management Practices Cost-Share Program.

Lloyd is a graduate of Virginia Tech and is currently working towards his Masters in Natural Resources. Lloyd and his wife Caroline live in Culpeper with their dog Ranger. He enjoys participating in outdoor activities such as canoeing, hunting, and fishing.



Melissa hails from Martinsville, Virginia. She is a recent graduate of Virginia Tech completing her Masters in Wildlife Science. In her free time, she enjoys working on craft projects and refinishing antique furniture.

***The Conservation Strip*** is a quarterly publication of the **JOHN MARSHALL SOIL AND WATER CONSERVATION DISTRICT**, 98 Alexandria Pike, Suite 31, Warrenton, VA 20186

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# Looking For Host Farms

For many years, the John Marshall SWCD has been conducting Farm Field Days for local students. We are very fortunate that there are farms in the County that are willing to allow students to visit and see a real working farm. The District would like to add a few more farms to the list so we can increase the on farm opportunities for our local students. The District is most appreciative to Messick's Dairy Farm and Elk Mount Farm who have been hosting groups for over a decade each, and to Blue Ridge Farm and Inglewood Farm who have hosted in recent years.

Field Days are usually conducted for elementary and middle school students in the Spring or Fall. Groups of students rotate through a series of agriculture and natural resource stations staffed by volunteers and professionals. A typical Field Day runs from about 9am to 1pm, and involves between 100-200 students.

Almost any type of farm can be used for a Field Day. The host farm usually sets up one or two of the stations, the District lines up all the others. Typical stations include farm animals, water quality, nutrient management, insects, soils, forestry, and other related topics. A normal field day will feature 8 or 9 stations. Students spend about 15 min-

utes at each station.

If your farm might be interested in hosting a Field Day in the future, please contact the District at 540-347-3120 x 3.

Most farms on our list are only used once or twice every year or two.



Elementary students visit the soils station at a field day.

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