WHAT CAN I DO TO HELP PREVENT SURFACE EROSION?

Help For Surface Erosion

Did you know……

- Topsoil is one of our most valuable resources.
- Cropland represents the greatest soil erosion potential.
- Urban areas have high erosion potential.
- Sediment is the number one pollutant in West Virginia rivers and streams.
- 3.6 billion tons of sediment reach the ponds, rivers and lakes of our country each year.

Erosion is a natural process by which material is worn away from the earth's surface through the action of wind and water. Human activities upon the land tend to accelerate the process. Streams and rivers carry an estimated 3.6 billion tons of sediment away each year. The result is a net loss of valuable topsoil as well as excess loads of sediment in our streams.

What are the effects ?

Excess sediment can be detrimental to aquatic life. As stream velocity slows, the suspended sediment falls to the bottom. As it accumulates on the bottom, it forms a blanket. Spawning beds for several species of game fish can be buried under this silt/sediment. With fewer places to spawn, game fish populations decline.

In addition to the loss of valuable topsoil, runoff can wash fertilizer and other pollutants along with it. Most phosphates and pesticides entering water are attached to soil particles. Nitrogen and phosphorous from fertilizers carried by runoff have been associated with many environmental problems. Streams, ponds, and rivers suffer from algae growth, depletion of the water's oxygen supply and suffocation of aquatic organisms.

Excessive quantities of sediment can also damage property adjacent to streams and rivers. Obstruction of stream channels by masses of deposited sediment reduces hydraulic capacity (the amount of water a stream can hold). This, in turn, causes an increase in flood crests which can lead to the potential for greater flood damage.

Simple things you can do to help control erosion

- Cover the bare spots of your property/yard.
- If using the land adjacent to a stream consider leaving a buffer strip.
- If you need or want access to the stream consider only mowing a path down to the stream bank instead of completely clearing it.
- Do not mow your lawn too short. Try to keep the grass height at about 2 1/2 inches.
- Do not place any structure in the stream. This could alter the dynamics of the stream and lead to serious erosion problems downstream or make existing ones worse.

Your local USDA Service Center manages various conservation programs

- The Conservation Reserve Enhancement Program (CREP) offers long term rental payments and cost share assistance to establish permanent vegetative cover on cropland that is highly erodible or contributing to serious water quality problems.
- The Emergency Conservation Program (ECP) provides emergency funding for farmers and ranchers to rehabilitate farmland damaged by natural disasters.
- The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to implement structural and land management conservation practices on eligible agricultural land.
- For more information contact your local Conservation District, USDA Natural Resource Conservation Service or County Extension Agent.

WHAT CAN I DO TO HELP TAKE CARE OF MY SEPTIC SYSTEM?

Your Septic System

The Basics

A septic system allows solids to settle within a tank and wastewater to drain to a drainfield and be absorbed by the subsurface soil. Proper treatment and disposal of sewage from a septic tank and drainfield system requires that the soil be suitable to treat and dispose of large quantities of wastewater before it reaches the groundwater. Soils must undergo a very careful physical evaluation and or testing prior to health department approval. Contact your local health department for more detailed information on your system and the soils that your system relies on for proper treatment and disposal of sewage.

Over time, the septic drainfield absorbs hundreds of thousands of gallons of sewage effluent and will last many years if properly maintained. A malfunction of a septic system may be expensive and offensive, potentially resulting in a backup of sewage in the toilets and drains of your house and sewage effluent ponding on the surface of your drainfield or both. Health risks to humans caused by direct exposure to improperly treated sewage are numerous. It is important to take care of your sewage disposal system to prevent serious diseases, save on the high costs of untimely repairs, and prevent further contamination of surface water and groundwater.

Taking Care of Your Septic System

Plantings

A good vegetative cover should be maintained over the system. It is important to protect the surface from any erosion since the drainfield lines are often within two feet of the ground surface. Herbaceous, shallow rooted plants, such as flowering perennials and annuals, turfgrass and many groundcovers are unlikely to damage the lines. In addition the vegetation will help remove excess water. It is also important to note that roots from nearby trees or shrubs may clog and damage your drain lines.

Practice Water Conservation

Household water use directly controls how quickly waste travels through the system. Too much water moving too fast through the septic system does not give the helpful bacteria time to break down the solids. This is why it is important to repair dripping faucets and leaking toilets as well as running washing machines and dishwashers only when full. You can also conserve water by installing water saving features in faucets, showerheads and toilets.

Control What Goes Down the Drain

Controlling what goes into the water that enters the septic system is just as important as reducing the quantity of water that flows into the system. A septic system is dependent on a balance of “good” bacteria and solids to work properly. Avoid using excessive amounts of chlorine bleach and other chemicals. These are helpful around the home for cleaning and disinfecting but will wipe out the helpful bacteria in your system which are vital for breaking down waste. Non-degradables such as grease, disposable diapers, plastics and chemicals such as gasoline, oil, paint thinner and antifreeze should be kept out of your septic

WHAT IS A RIPARIAN BUFFER AND WHAY IS IT IMPORTANT?

Help For Streambanks

Did you Know…

Riparian buffers provide a wide range of benefits:

- Slow surface runoff, decreasing erosion.
- Provide stability to streambanks that prevents erosion and bank failures.
- Regulate water temperatures, important for aquatic life in the stream.
- Filter pollutants such as sediment, chemicals and nutrients.
- Provide habitat and shelter necessary for wildlife and game species such as turkey, deer, rabbits, and quail.
- Provide food sources for wildlife and fish.

1990

1994

1996

Photos courtesy of Dick and Tom Schultz, Iowa State Department of Natural Resource Ecology and Management.

Riparian buffers are areas adjacent to streams that serve as protective barriers between the stream and different land uses. These buffers usually contain vegetation such as trees and shrubs, and play an important role in protecting the quality of the stream. Riparian buffers filter pollutants and sediment from surface runoff, stabilize the streambank and prevent erosion, regulate the stream temperature, provide food and habitat for wildlife, and create shelter for wildlife and game animals traveling to the water source.

By creating or maintaining buffers, landowners increase the quality of the stream. A healthy stream is the foundation necessary to support a diverse ecology that includes wildlife such as fish, game animals, and songbirds. A balanced and stable stream also improves the quality and value of the surrounding property. Vegetation prevents erosion that leads to streambank failure and a loss of land. While a riparian buffer is no longer available for livestock grazing or hay production, it is a valuable investment for improving the environment and protecting fields and farms.

If bank erosion is extreme you may contact the **West Virginia Stream Access Permitting Program**. Agency personnel will provide landowners with technical assistance including plans for stream management and restoration. Activities include erosion prevention, the removal of material creating blockages and the creation of riparian or restoration areas. For more information contact the WV Conservation Agency at (304) 422-9088.

WHAT NATIVE PLANTS GROW WILL IN RIPARIAN BUFFERS?

Native Plants For Buffers

Did you know…….

Native plants have evolved within a particular region and environment.

They are usually well suited to the growing conditions, and have developed an important place within the ecological system.

Native species will usually be healthier, require less maintenance, and provide more food and habitat for wildlife than non-native plants.

You can find examples of native plants by observing natural areas in your watershed. You can get more information on native trees in your area from your local WVU County Extension, WVDNR, NRCS, WVCA or the WV Division of Forestry.

Native Trees & Shrubs

Black Willow	River Birch
Silver Maple	Box Elder
Sweet Gum	Sycamore
Hackberry	Pin Oak
Red Maple	Hazel Alder
Northern Catalpa	Silky Dogwood
Sand Bar Willow	Button Bush
Elderberry	Black Gum
Red Maple	Swamp White Oak

Where To Buy Native Plants

West Virginia
Division of Forestry
Clements State Tree Nursery
P.O. Box 8
West Columbia, WV 25287
(304) 675-1820

Sunshine Farm & Gardens
HC 67 Box 539B
Renick, WV 24966
(304) 497-2208
www.sunfarm.com

Ernst Conservation Seeds
9006 Mercer Pike
Meadville, PA 16335
(800) 873-3321
www.ernstseed.com

Check your local growers and nurseries!

WHAT PROGRAMS ARE AVAILABLE FOR FIXING YOUR DIRT ROAD?

Help For Dirt Roads

Did you know…….

- There are hundreds of miles of unpaved roads in the Sand Fork Watershed.
- Runoff from roads is a major source of sediment.

Benefits of road stabilization…….

- Less road maintenance.
- Less wear and tear on your vehicle.
- Better access.
- Improved water quality.
- Reduced flood damage.

Before

After

Runoff from dirt roads is a major source of sediment in streams. It contributes to flooding, increases streambank erosion and decreases water quality. There are practices for new or existing roads that you can use to minimize erosion potential:

- keep the slope as low as possible
- gravel steep sections adjacent to streams
- use water bars where needed
- vegetate the road

There are assistance programs available to help you improve the quality of roads on your property.

Forestry Land Enhancement Program

The Forestry Land Enhancement Program is a federal cost-share assistance program funded by the USDA Forest Service that provides financial assistance for the long-term sustainability of non-industrial private forestlands. In West Virginia, the Division of Forestry administers the program. You must have a minimum of 10 acres and no more than 1,000 acres to qualify. This program requires a stewardship plan, which can also be cost-shared. The primary focus of this program is permanent grass cover on critical areas. Funding can not be used for annual maintenance such as grading or cutting back vegetation. The road may be retired but if it is still used, the landowner must ensure that the original stabilization practices are maintained for 10 years.

For more information contact: WV Division of Forestry,

304-558-2788 or visit www.wvforesrty.com

Agricultural Management Assistance

Agricultural Management Assistance provides cost-share assistance to agricultural producers to voluntarily address issues such as water management, water quality, and erosion control by incorporating conservation into their farming operation. This program provides financial and technical assistance in using vegetation to treat gully erosion on existing woodland harvest roads, trails and landings. This practice does not apply to roads subject to daily or frequent use, or roads that have been used for a timber harvest in the past 12 months. The landowner must have control of access to the road and be willing to limit access to ensure maintenance of vegetative cover.

For more information contact: Natural Resources Conservation Service, 304-284-7540 or visit the NRCS website at www.wv.nrcs.usda.gov

Active Oil and Gas Well Roads

Best Management Practices (BMPs) are designed to prevent sediment runoff on all active oil and gas well roads. BMPs are required during construction, reclamation and while the road is being used. BMPs can include culverts, ditches, broad based dips, water bars, proper slope, graveled crossings and revegetation. All revegetated access roads and well sites are required to be maintained throughout the life of the well. Whenever the soil is disturbed on any well or well road by a well-related activity, it should be revegetated according to the Department of Environmental Protection, Office of Oil and Gas, Erosion and Sediment Control Field Manual.

If you are aware of erosion problems from active oil and gas well roads, contact: WV Department of Environmental Protection, Office of Oil and Gas, 304-926-0450

Active Logging Sites

To help ensure your water quality is safe before, during and after a logging operation, the West Virginia Legislature passed the Logging Sediment Control Act of 1992. This law sets guidelines for logging companies to use when timbering. Part of the Act states logging operations must be registered and supervised by individuals who have completed the WV Division of Forestry certification program. The law also requires loggers to follow best management practices that prevent soil erosion or run-off that could potentially cause problems in nearby ponds, streams, rivers or other bodies of water. If you or someone you know is planning on harvesting timber, please check to make sure the logging company you use is licensed to complete timbering operations in West Virginia.

For more information contact: WV Division of Forestry, 304-558-2788 or visit the WV Division of Forestry's website at www.wvforestry.com

WHAT CAN I DO TO HELP PROTECT MY HOME FROM FLOODING?

Reduce Flood Damage

Did You Know……

- Flooding is the most frequently declared type of disaster.
- Homeowners insurance does not cover losses due to floods.
- Flood Insurance Rate Maps (FIRMs) are used to determine your flood risk. Check with your local government to determine FIRM locations.
- Flood insurance rates can go down if your community participates in the community rating system.

Nationwide flooding is the most frequently declared type of disaster. In the past it was believed that dredging a stream could effectively and sustainably reduce flood levels. Experience and a better understanding of streams and rivers has shown that **dredging is not the best solution.** Dredging leads to steam instability which causes increased bank erosion and loss of property. Dredging unnaturally increases the width of a stream which leads to increased sediment deposition and increased flood stage over time. Dredging is expensive and any positive effects usually last for only a short time.

A better solution is to **stop excessive sediment from entering a stream** by maintaining roads, streambanks and surfaces and by maintaining vegetation buffers that soak up runoff during storm events. Educating your family and preparing your home can help reduce the chance of an injury and the amount of flood and water damage.

Check your sump pump…. Clean the sump pump and the pit. Consider having a portable sump pump. Make sure the discharge hose delivers the water several feet away from the house to a well-drained area that slopes away from your home. Don't run sump pump water into a rural septic system because the water may saturate the drain field.

Plug basement floor drains with removable grids…. A flexible rubber ball about 11/4 times the inside diameter of the pipe can be wedged into the drain to create a tight seal. The pressure may be quite high so brace the ball securely with a 2x4 against the ceiling. Some hardware stores sell a plug that has a rubber center that expands to fill the pipe when the top and bottom metal plates are squeezed.

Reducing flooding from other drains…. Unbolt toilets from the floor and plug the outlet pipe using the same procedure as for floor drains. Shower drains can be plugged this way as well. Most washing machines and basement sinks have their drain connections about three feet above the floor so they may not overflow if the water doesn't get that high. If necessary, these drains can be disconnected and capped or plugged with braced rubber balls.

Move valuables to higher locations…. Get items such as irreplaceable family photo albums, high school yearbooks, personal videotapes, tax records, insurance policies and household inventories off the bottom shelves in the lower level of your home.

Keep water out of window wells…. Since windows can't withstand much pressure, build dams and contour the ground so water will naturally drain away from the house.

Get downspouts down in place so that water is carried away from the house.

Prepare appliances for flooding…. Shut off appliances at the fuse box or breaker panel. Put freezers, washers, dryers and other appliances up on wood or cement blocks to keep the motors above water level. If high water is imminent and appliances can't be moved, wrap them in polyethylene film, tying the film in place with cord or rope. The water will still get in, but most of the silt won't so cleanup will be easier.

Shut off electricity…. Even if floodwaters are not reaching electrical outlets, the risk of electrical shock to someone working in a flooded basement is high with electric motors in appliances. Shut off electrical breakers or unscrew fuses. Do not stand in water and turn off electrical switches. If floodwaters are getting close to the electrical entrance box, call the power supplier and have the electrical supply to the house disconnected.

Move hazardous materials to higher locations…. This includes paint, oil, cleaning supplies and other dangerous materials.

Anchor fuel tanks…. Unanchored fuel tanks can be easily moved by floodwaters. When an unanchored tank in your basement is moved by floodwaters, the supply line can tear free and your basement can be contaminated. Even a buried tank can be pushed to the surface by the buoyant effect of soil saturated by water. Anchor tanks to a concrete slab or run straps over the tank and attach them to ground anchors.

Keep the car fueled…. Stations may not be able to operate because of lack of electricity.

Stockpile emergency building materials…. These include plywood, plastic sheeting, lumber, nails, hammer, saw, pry bar, shovels and sandbags.

Plan an escape route if certain roads or streets are known to flood easily. Where would you go if your home flooded? Would you go to a local shelter or a family member or friend's house? Plan and practice an evacuation route.

Plan for pets…. Pets are not allowed in shelters due to health regulations. If left behind, stressed pets can damage your house, and their safety is at stake too.

Assemble supplies in case the electricity goes off…. Gather water and food that requires no refrigeration or cooking, a non-electric can opener, a battery-powered radio, a flashlight and extra batteries.

Assemble supplies for possible evacuation…. Gather water, nonperishable food, paper plates/cups and plastic utensils, extra clothing and shoes, blankets or sleeping bags, a first aid kit and prescription medications, cash and credit cards, important phone numbers, special items for babies and the elderly.

Discuss safe emergency procedures…. Teach adults and older children where electric fuse boxes, water service mains and natural gas mains are and how to turn them off if necessary.

Ask a family member or friend to be your family contact…. If family members get separated during an evacuation, each should get in touch with that contact. Make sure everyone has the contact number.

HOW DO I PLANT A RIPARIAN BUFFER?

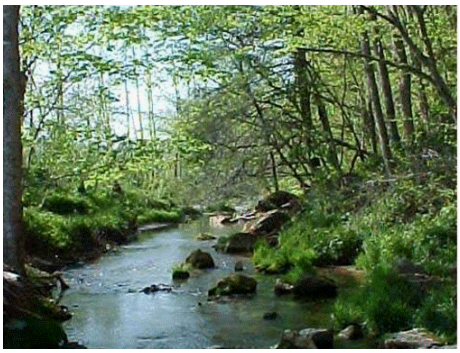
Planting Your Buffer

Did you Know…….

The easiest way to start a riparian buffer is to let it grow naturally.

If left alone, seeds from plants in the area will begin to grow along your streambank. Some "pioneer" tree species that will probably be the first to grow include willow, sycamore, silver maple, locust, and sumac.

Keep in mind that plant communities go through a natural succession when they develop (grasses, taller herbaceous plants, shrubs and finally trees), so your buffer may look "brushy" at first. Be patient! As your buffer grows from season to season, it will change to resemble a mature plant community for your area.



Planting vegetation along streambanks provides a buffer that prevents erosion, filters pollutants, and slows surface runoff. Consider these tips when planting a riparian buffer:

- Consider your options. Different types of plants provide different benefits. Grasses can slow runoff and filter some pollutants, but provide the least amount of protection to the streambank. Shrubs and tress provide food sources for the stream, shade which regulates water temperatures, and stability which prevents bank erosion.

- Go native. Native plants are already well suited to growing in your area. They will be healthier, require less maintenance, and provide food and habitat for wildlife. Native plants can be harvested from other parts of your own property, or purchased from a nursery. Check the list included in this packet for common native plants that grow well in riparian buffers, and local nurseries where you can purchase native plants.

- Beware of invasive species. Invasive species are plants that grow and spread excessively, displacing the majority of other plants. This reduces the diversity of the ecological community, which is the key to a healthy environment. Many invasive species also have shallow root systems, which provide less protection against erosion. You can get more information on invasive plants and alternative plantings from the WVDNR or the WV Native Plant Society.

- Plan the best buffer for your property. A vegetation buffer as small as 20 feet can make a difference. For larger streams, or in areas of frequent erosion, 100 feet or more will provide the most benefit to the stream. Devote as much area as you can to planting a buffer, considering the benefits of preventing erosion and improving water quality.

HOW DO I PLANT LIVE CUTTINGS?

Planting Live Cuttings

Did you know…….

Willow trees grow easily from cut branches?

Stakes
1-2 inches in diameter
1-2 feet long

Posts
3-5 inches in diameter
3-4 feet long

Logs
6+ inches in diameter
5+ feet long

Three foot centers is the recommended spacing for most types of willows.

Plants along the stream stabilize the bank, prevent erosion, provide food and shelter for wildlife, and regulate the water temperature. Planting trees can improve your property and the quality of the stream.

You don't need to purchase trees to start a riparian buffer. Several types of trees grow easily from cuttings, such as willow and hackberry. You can find trees on your property, or ask a neighbor. Live cuttings are an easy and inexpensive way to start improving your streambank.

How To Plant Live Cuttings

Cut and plant during dormancy, when trees are not growing, from late fall to early spring for the best success.

1. Begin by finding a mature, healthy tree as your harvest source. Use the list on the left to decide what size of planting you want.
2. Cut the section at a 45 degree angle. This creates a point for the widest end of the cutting to be planted.
3. Remove all side branches.
4. Cut to desired length, making sure the top is cut flat.
5. Keep the cuttings cool and moist until planting. Wrap them in wet burlap or store in a bucket of water.
6. Plant
   - To plant stakes and posts, use a rubber mallet to carefully drive the angled end into the ground. Plant approximately 2/3 the length of the stake or post underground. Be careful not to split or damage the top of the stake.
   - To plant logs, place the log on the bank parallel to the to the stream, close to the water's edge. Bury 2/3 of the length of the log in the bank, being sure that the exposed end faces downstream.

HOW DO I KNOW IF MY WELL WATER IS UNSAFE?

Monitoring Your Well

Did you know……

- *If your home is on a private well system, you are solely responsible for monitoring the quality of the water?*
- *Water that appears clean and clear may include potentially harmful materials?*
- *You should test your well annually?*
- *Different well types and their age require different levels of monitoring?*
- *You can contact your local Health Department to have your well water tested?*

Who can I contact for more information?

- Local Health Department
- Local Conservation District
- West Virginia Cooperative Extension Service
- WV Department of Environmental Protection

Contact information for these and many other agencies are located within this publication.

If your home is supplied by well water, you are solely responsible for monitoring the quality of the water. For the health of your family and the value of your property, pay attention to your water quality.

Signs of potential problems with your well water

- Members of your household have reoccurring gastrointestinal problems.
- Water has an objectionable taste or smell.
- Pipes show signs of corrosion.
- Water is cloudy or colored.
- Water supply equipment wears out rapidly, including pumps or water heaters.
- Water leaves a residue or stains plumbing fixtures or laundry.

Test your water annually for the following

- **Total Coliform Bacteria** (Presence indicates unsanitary conditions and the possibility of pathogenic microorganism)
- **Nitrates** (High levels are particularly harmful to expectant mothers and newborn infants)
- **pH** (Extremes may corrode household plumbing)
- **Total Dissolved Solids** (Concentration of dissolved materials in your water)
- **Lead** (Lead poses a variety of health risks associated with the brain and nervous system)

In addition, test for contaminants that you are likely to encounter. Based on surrounding land uses, test for fertilizer and pesticide contamination. It is important to keep records of tests and results; this will enable you to identify changes in water quality due to contamination or deterioration of the system. Routine testing is the only way to assure that your water supply is safe.

WHERE TO GET MORE INFORMATION/HELP

WV Department of Environmental Protection (DEP)
Phone: (304) 926-0495
Website: www.dep.org

WV Conservation Agency (WVCA)
Phone: (304) 558-2204
Website: www.wvca.us
Watershed Resource Center
From WV only: (800) 682-7866

WV Division of Natural Resources (DNR)
Phone: (304) 558-3370
Website: www.wvdnr.gov
Law Enforcement Section
Phone: (304) 558-2784

WV Division of Forestry (DOF)
Phone: (304) 558-2788
Website: www.wvforestry.com

U.S. Army Corps of Engineers (USACE)
Phone: (304) 399-5353 or (866) 502-2570
Website: http://www.lrh.usace.army.mil/

WV Office of Emergency Service (OES)
Phone: (304) 558-5380
Website: http://www.wvdhsem.gov

National Flood Insurance Program
Phone: (304) 965-2331 or visit
Website: www.fema.gov/nfip/

Federal Emergency Management Agency (FEMA)
Phone: (215) 931-5614
Website: www.fema.gov

Canaan Valley Institute
Phone: (800) 922-3601 or (304) 463-4739
Website: www.canaanvi.org