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FRANKLIN SOIL AND WATER CONSERVATION DISTRICT

The Urban Review

Sediment & Erosion Control Information Newsletter

What are Stream Setbacks and Why are they Following Me?

Stream setbacks are a key ingredient in protecting the integrity of our streams within Franklin County. A stream setback is an area along the stream where development is restricted or prohibited. Providing physical separation and protection between future development and stream ecosystems is the main function of stream setbacks. If these setbacks are sized properly they will provide sustainable stream ecosystems, act as a right-of-way for flood waters, and can provide storm water management.

According to the Chagrin River Watershed Partners the primary ecological benefits of stream setbacks include the reduction of flood size flows, filtering and settling out pollutants, limiting stream bank erosion, and protecting aquatic and terrestrial habitat.

Setbacks reduce flooding

When considering the reduction of flood size flow, implementation of stream setbacks will potentially reduce property damage and threats to public safety by allowing flood water to soak into the ground rather than running off directly into streams. Additionally, stream setbacks reduce downstream flooding by allowing streams to access their natural flood plains. For example, as water spreads out over its floodplain, water velocities and flood elevations are reduced. One study found that adjacent forest vegetation and litter lowered stream flood elevations from 32 feet to 17 feet for a 100-year flood (Bertulli, 1981 in Castelle et al., 1994). In this instance the stream setbacks helped reduce flood levels, therefore reducing the damage to downstream properties.

Setbacks reduce pollution

The vegetation contained within stream setbacks filters and traps the pollutants, preventing them from degrading the water quality of our streams. As contaminated water flows across vegetation it slows the water down and allows the pollutants to settle out. Wider stream setbacks are found to be more effective in filtering and trapping pollutants. In a recent study most degradation of the aquatic benthic community from sediment deposition is prevented by riparian setbacks 98 feet wide or greater (Newbold et al., 1980 in Divelbiss, 1994.). It may not be practical, however to install large setbacks to small intermittent streams or ditches. Therefore, implementing a stream setback policy that is dependant on drainage area will ensure that the setbacks are appropriately sized.

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NOIs and Permits Required

The Ohio EPA requires individual builders and landowners to obtain permit coverage under the NPDES by filing a Notice Of Intent with the Division of Surface Water before any earth disturbance over one acre. This applies to single, stand-alone lots as well as lots within an existing subdivision that are being individually developed. For example, if a house is being built on a one acre lot, and a lawn will be planted to cover that one acre an NOI must be filed. All persons responsible for the day to day maintenance or installation of any erosion control practices must be listed on the permit as co-permittees. Along with filing an NOI with the Ohio EPA a storm water pollution prevention plan must be developed that includes a description of measures that will be installed during construction to control pollutants in storm water discharges that occur after construction is complete.

Inside This Issue

Stream Setbacks (continued from page 1)

Setbacks reduce stream bank erosion

Stream bank erosion poses serious threats to property, the health and safety of communities, and the quality of our water resources. Vegetated stream setbacks help protect against stream bank erosion by slowing runoff and stabilizing stream banks. The Ohio EPA has found that vegetated stream banks are up to 20,000 times more resistant to erosion than bare stream banks. Conversely, stream banks without the protection of vegetation experience higher velocities that quickly erode bare soils. Stream setbacks can easily provide the "buffering" action that is needed to prevent stream bank erosion.

Mark Your Calendar!

The 4th Annual Central Ohio Stormwater and Erosion Control Expo will take place on April 25th at Tolles Career and Technical Center in Madison County. You are invited to participate as an exhibitor, sponsor or attendee. Last year's event had nearly 300 attendees for our program featuring presentations from experts in the field and installation demonstrations of new technologies and products! Please plan to attend this year, we look forward to seeing you there. Information on registering is available at www.coe-scexpo.org.

Setbacks protect habitats

Stream setbacks provide interconnected habitat areas for many wildlife species in Ohio. Removing or disturbing stream setbacks disrupts these areas that are relied upon as critical habitat. For example, the Ohio EPA found that more than 50% of the breeding bird species in Ohio use wooded riparian areas to nest. Additionally, vegetation present along the stream provides shade that helps reduce and maintain water temperatures. These steady, cooler water temperatures improve the overall diversity and health of aquatic ecosystems. The habitat and temperature "buffer" that is provided by stream setbacks are strategic in sustaining a healthy stream ecosystem.

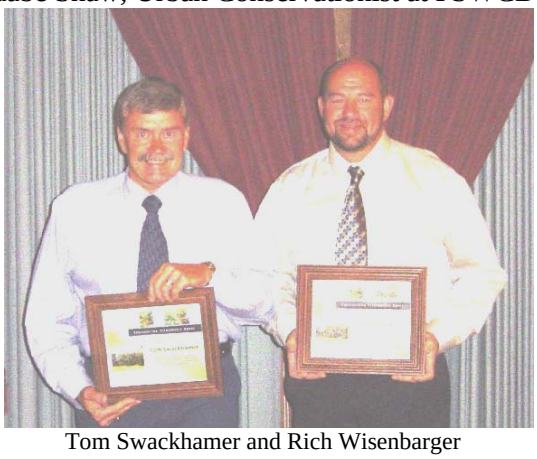
What your community can do

Communities can utilize the benefits of stream setbacks by implementing regulations on new development, increasing landowner education and outreach programs, and acquiring strategic land, which will provide the most benefit to their residents. In addition to providing flooding and water quality benefits stream setbacks will provide an economic benefit to communities by reducing or eliminating the infrastructure needed to combat flooding, repair eroding stream banks and replace damaged property.

These benefits can potentially offer an asset for a community that is economical, efficient and sustainable. Stream setbacks will improve the quality of stream ecosystems within your community and help reduce costs associated with development.

And the Winners Are...!

The winners of this year's Conservation Stewardship Award were presented with certificates at the Annual Banquet in October. Congratulations go out to Tom Swackhamer and Rich Wisenbarger of Wisenbarger & Assoc. for establishing conservation easements in their new development in Jackson Township. John Freund of National Golf and Don Patco from the Scarlet and Gray Golf Course were presented their awards for conservation stewardship by Kaabe Shaw, Urban Conservationist at FSWCD.



Tom Swackhamer and Rich Wisenbarger

John Freund, Don Patco and Kaabe Shaw

Permeable Pavements for Stormwater Management

Wherever grasslands, farms and forests are replaced by rooftops and roads, the movement of water across the landscape is radically altered. Many of these changes can have severe but unintended consequences. Channel erosion, flooding, and destruction of aquatic habitat are some of the unforeseen consequences of urbanization. Stream channels may expand to cover adjacent land that never before was affected by either flooding or erosion. Storm water facilities may be overwhelmed by frequent flows far beyond their design capabilities.

Almost all of these problems are the result of one underlying cause: loss of the infiltration function of the soil. This water retaining function can be viewed as an underground reservoir of tremendous volume that can hold water for hours, days or weeks. Without access to this system water flows rapidly across the land surface and arrives in the stream channel in short, concentrated bursts of high discharge.

The usual way to deal with this problem is to build artificial reservoirs or "detention ponds" that are designed to imitate the natural functions of the soil reservoir by accepting water at whatever rate it flows off the developed land area and releasing it at the slower, pre-development rate. Unfortunately, this strategy has been shown to be surprisingly ineffective. The storage volume in constructed detention ponds, unless they are built to extraordinary standards, cannot come close to replacing the volume of the soil reservoir.

One way of supplementing the traditional detention pond to increase infiltration and reduce runoff is by using permeable pavements. These surfaces can be driven over while permitting rapid infiltration of water into the underlying soil. Evaluations were conducted by the Center for Water and Watershed Studies in 1997 examining long term durability of the surfaces, persistence of infiltration, and the chemistry of the infiltrate being released to groundwater. Four types of permeable pavement systems were evaluated over a period of six years. The designs were: 1) a flexible system consisting of a plastic network of cells with grass infill and no impervious area;. 2) a flexible system consisting of a plastic network of cells filled with gravel; 3) a system of impervious blocks with the space between the blocks filled with grass; 4) a system of impervious blocks with the space between the blocks filled with gravel.

The study results show that the infiltration capacity, surface durability, and water-quality performance all compared well against the usual asphalt surface. All 4 systems held up with daily use for over 6 years. All of the permeable pavement systems infiltrated virtually all the precipitation, even through the most intense storm experienced during the study period of 7.4 mm per hour. The use of permeable pavement systems dramatically reduced surface runoff volume and attenuated the peak discharge. Despite significant structural differences in the systems, the hydrologic benefits were consistent. However, results may not be as successful in areas with poor underlying drainage or higher rainfall intensities.

The water quality results also show clear differences between the subsurface infiltrate and surface runoff from asphalt. The water quality of the subsurface infiltrate was significantly better. Levels of copper, zinc and motor oil were reduced to almost undetectable levels.

A major contribution of permeable pavements is their ability to reduce effective impervious area, which has a direct connection with downstream drainage systems. This strategy of hydrologic and hydraulic disconnectivity can be used to control runoff timing, reduce runoff volume, and provide water quality benefits.

Stormwater performance of permeable pavement systems. January 2004. Center for Water and Watershed Studies. Seattle, WA– Fact sheet.

Annual Tree and Fish Sale

The Franklin Soil and Water Conservation District Annual Tree and Fish Sale is under way. Now is the time to select the native bare root trees and shrubs for your farm or urban landscape. This year we are also offering a limited quantity of container trees for those wanting larger size plants. All proceeds go toward Franklin Soil and Water conservation projects. Our website has details on all plants and fish being offered this year including on-line ordering information. www.franklinswcd.org

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District programs and services are offered on a non-discriminatory basis.

BMP Review: Stream Setbacks-How Wide Should Yours Be?

Everyone agrees that water quality and stream stability are protected when development is kept away from the edges of a waterway and the forested riparian corridors are kept intact. However, there always seems to be some confusion when deciding just how large the stream setback should be.

The latest information from the Ohio Department of Natural Resources recommends using the following formula to calculate total width of the setback zone. (The drainage area is calculated in square miles.)

$$\textit{Setback Area Width} = 129\ (\textit{Drainage Area})^{0.43}$$

As tributaries enter a stream, the additional drainage areas will produce a setback area that gets appropriately larger as you go downstream. No matter how small the drainage area the setback area must never be less than a **total width of 50 feet** for any stream with a defined bed and bank in which flow occurs

Wetlands also require setback protection to maintain the integrity of their functions. Franklin SWCD prescribes the following wetland setbacks:

120 feet or more for all Category 3 wetlands
75 feet or more for all Category 2 wetlands
50 feet or more for all Category 1 wetlands

Category 1 wetlands often provide minimal habitat, hydrologic and recreational function. The degraded state of these resources is often due to the lack of an adequate setback. Establishing setbacks from these resources may, in time, promote the restoration of these wetlands.

Our Mission:

To promote responsible land use decisions for the conservation, protection and improvement of soil and water resources through effective partnering and technical guidance in Franklin County.