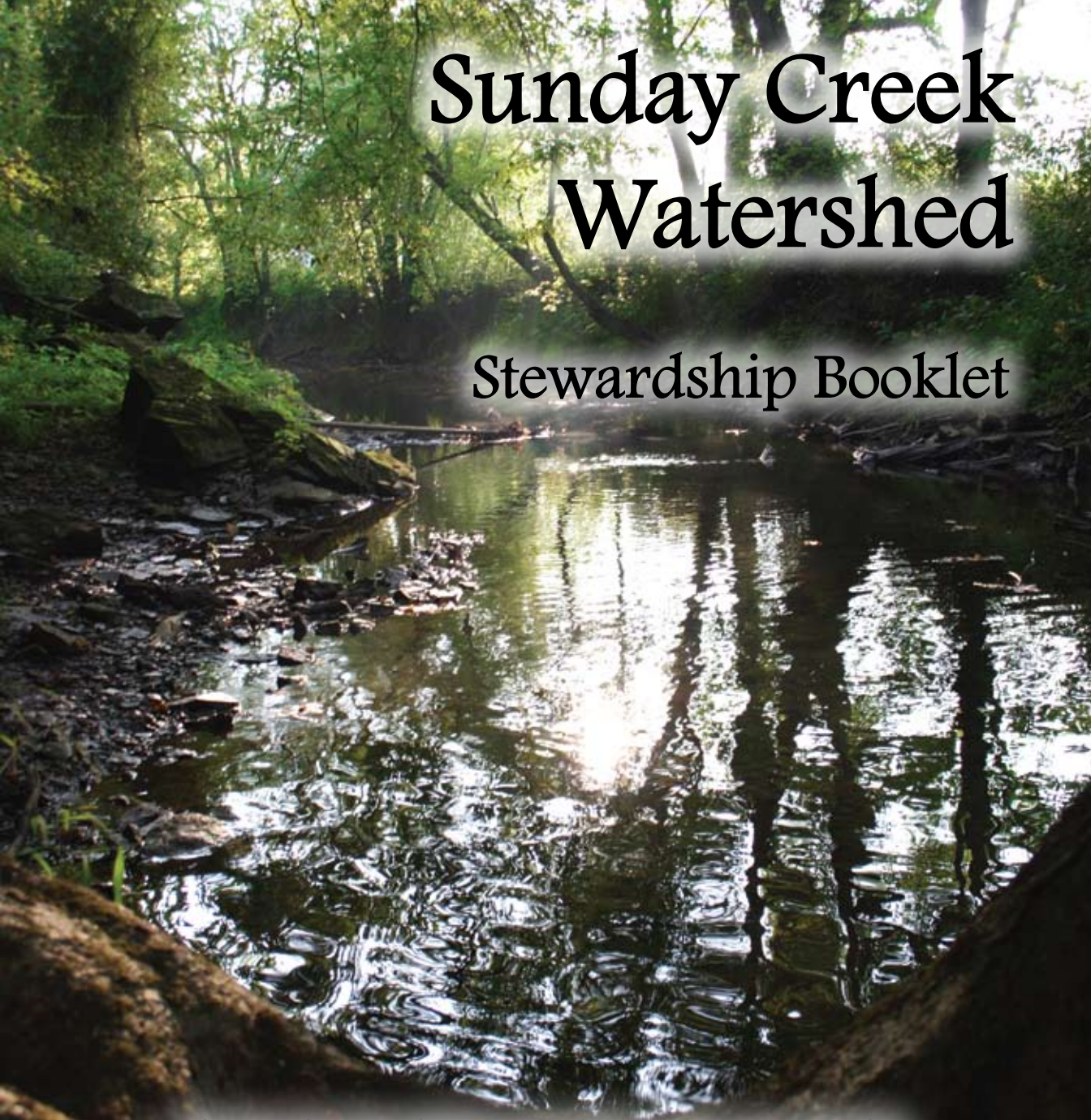
Sunday Creek Watershed

Stewardship Booklet



The Sunday Creek Watershed Group is committed to restoring and preserving water quality through community interaction, conservation, and education; in pursuit of a healthy ecosystem capable of supporting bio-diversity and recreation.

Contents

What is the Sunday Creek Watershed Group?

The Sunday Creek Watershed Group (SCWG), sponsored by Rural Action, is a non-profit organization committed to restoring and preserving water quality through community interaction, conservation, and education; in pursuit of a healthy ecosystem capable of supporting bio-diversity and recreation.

Sunday Creek Watershed Group

Fishes of Sunday Creek

The Sunday Creek Watershed Group is proud of the 45 fishes that are found in our watershed. Our pride is evident in the painted fishes on our office ceiling panels and our official motto, as seen on our T-Shirt, "Home of the Orange Throat Darter". You have an opportunity to learn about the Fishes of Sunday Creek because all 45 fishes are displayed throughout the BMP booklet. While we have our water quality and landuse problems our end goal is to improve the water quality within Sunday Creek. Providing better water and habitat are the only methods of increasing the amount and diversity of fish that inhabit our streams.

How do we know there are 45 fishes in the Sunday Creek Watershed? Well, the Ohio EPA and various volunteers took to the creek in the summers of 2000 and 2001 during the Total Maximum Daily Load (TMDL) process. A total of 45 species of fish were found in the Sunday Creek Watershed during that sampling period. Not a bad start for a watershed that has seen mining throughout 40% of its land area. Samples collected from the mainstem had some of the highest species diversity; while Pine Run, a subwateshed in the West Branch, had the lowest species diversity. The number of fish found ranged from 2,194 at East Branch to 2 at Pine Run. Some of the more unusual species found were the Orangethroat Darter and the Stonecat Madtom. The Stonecat Madtom, found upstream of the Truetown Acid Mine Drainage (AMD) discharge (our worst AMD source) in July 2000, is highly intolerant to pollution.

The 45 fish species will be shown on the far right hand column of each page.

Black Bullhead

Black Crappie

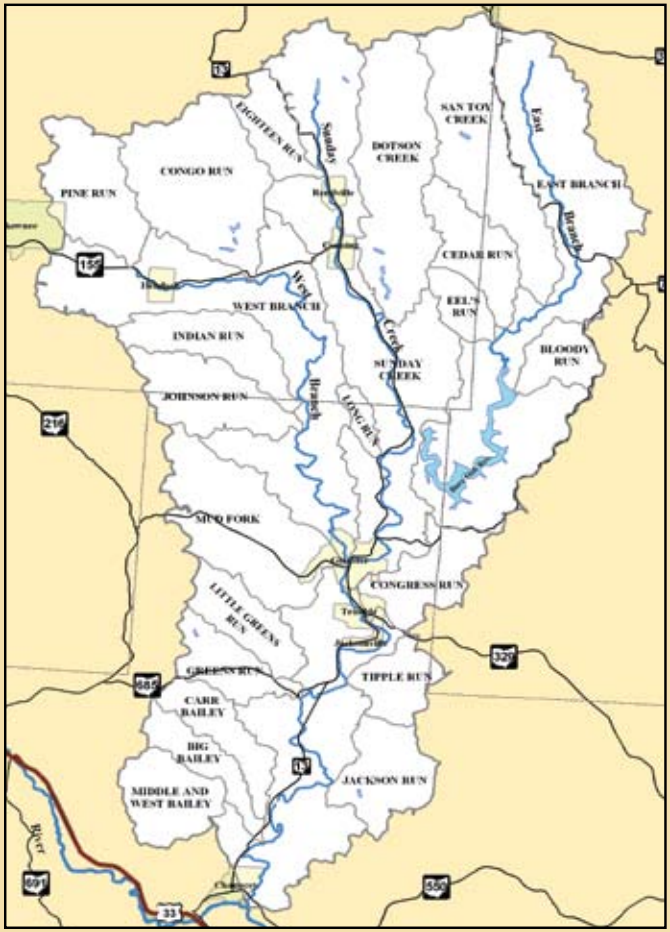
Blacknosed
Dace

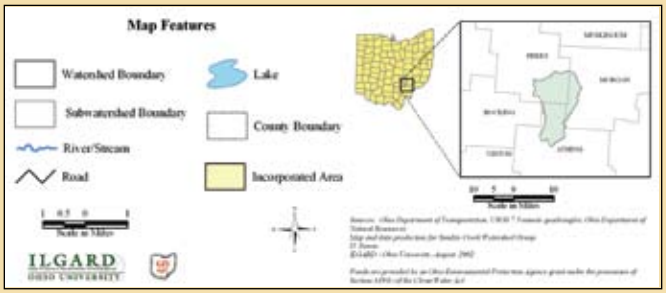
Blackstriped
Top Minnow

Bluegill
Sunfish

Bluntnose
Minnow

What is a watershed?





A watershed is an area of land that drains rain and snow into a bigger river or body of water. You are in the Sunday Creek Watershed right now. All of the land in the Sunday Creek Watershed drains rain and snow into Sunday Creek. Schools, homes, farms, forests, small towns, big cities are all in watersheds. They come in all shapes and sizes with some crossing county, state and even international borders. Some are millions of square miles; others are just a few acres. Just as creeks drain into rivers, individual watersheds are nearly always part of a larger watershed. The United States is composed of 18 major drainage basins. The Sunday Creek Watershed is one sub-watershed in the Ohio River Drainage Basin. Water from the Ohio River Drainage Basin flows into the Mississippi River and eventually travels all the way into the Gulf of Mexico.

Learn more about the Sunday Creek watershed at: www.sundaycreek.org.

Overview of Sunday Creek

The Sunday Creek watershed is 138 square miles of land that drains to Sunday Creek. A watershed is all the land that drains to a particular body of water, whether a creek, lake or river. Sunday Creek flows from the north, around Corning, to the south where it enters the Hocking River near Chauncey. Other communities in the Sunday Creek Watershed include Hemlock, Glouster, Trimble, and Jacksonville. About 10,000 people live within the watershed.

Sunday Creek is twenty-seven miles long with ninety-four miles of named streams. Some of the streams are Bailey Run, Congress Run, Dotson Creek, East Branch, Greens Run and West Branch.

About 74% of land in the watershed is covered with forest. About 19% is used for agriculture. Most of the row crop agriculture is found in the lower sections of the main Sunday Creek valley. Pasture and hayfields are found throughout the watershed.

The Tom Jenkins Dam was built on the East Branch in 1952 forming the 664 acre Burr Oak Lake. This reservoir is the source of drinking water for the Burr Oak Water District that provides drinking water to most of the homes in the area. The lake is popular for boating, swimming and fishing.

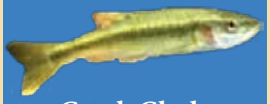
Brook Silverside

Brown Bullhead

Central Stoneroller

Common Carp

Channel Catfish



Creek Chub

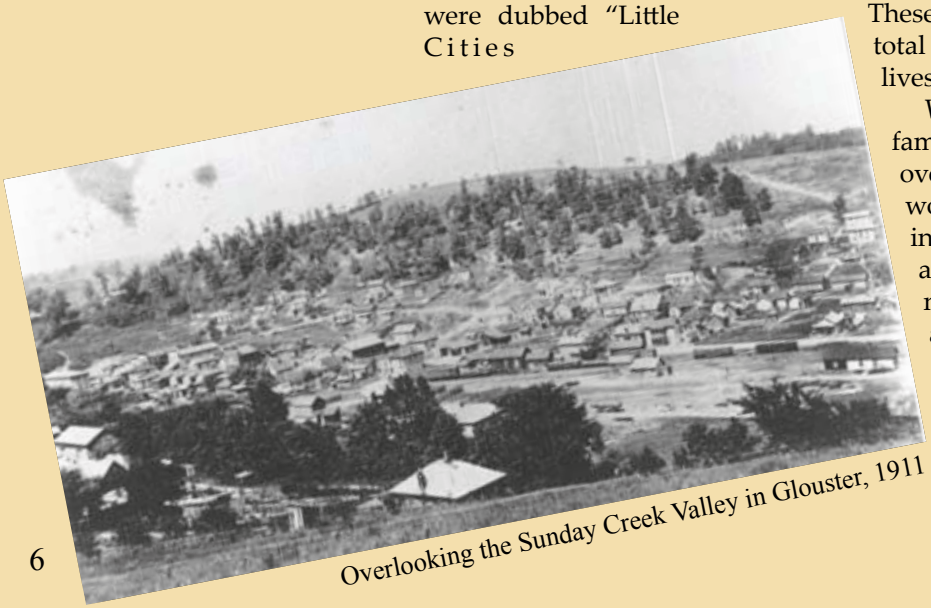
History of the Sunday Creek Valley

The Sunday Creek Valley is believed to be a pre-glacial watershed, whose land narrowly escaped the flattening glacier, though it was affected greatly by melting waters from the north. These lands have a rich history and are known to have served as home to mound building pre-historic cultures and historic Indian tribes including the Shawnee. White settlers were slow to settle in the area north of the Hocking River until well after Ohio statehood due to its rugged terrain and the limited navigability of streams. A few sleepy crossroad towns were all that existed in the area at the time of the Civil War.

That rapidly changed when the railroad arrived along the Hocking River in the 1870's and down the Sunday Creek Valley in the early 1880's at the start of the Great Hocking Valley Coal Boom (1870-1925). The Toledo & Ohio Central Railroad from the north met with Kanawha and Michigan Railroads from the south at the new town of Corning in 1880. Dozens of mines were opened along this railroad, which included many spurs to mine sites.

New towns sprang up as if by magic from 1880 through 1900. Some were incorporated villages that served various mines (Rendville, Corning, Glouster, Trimble, Jacksonville, Millfield and Chauncey) with ambitious plans for becoming new industrial centers and thus were dubbed "Little Cities of Black Diamonds" after the slang name for coal. Others were company owned towns built at the mine site such as San Toy, Congo, Red Town, Hartleyville and Hollister. These towns took nearly total control of the miners' lives.

Workers and their families came from all over the country and world seeking work in the region, creating a rich racial mix of newcomers who created a provocative and vibrant culture. Conditions for miners were difficult causing workers to organize and play nationally signifi-

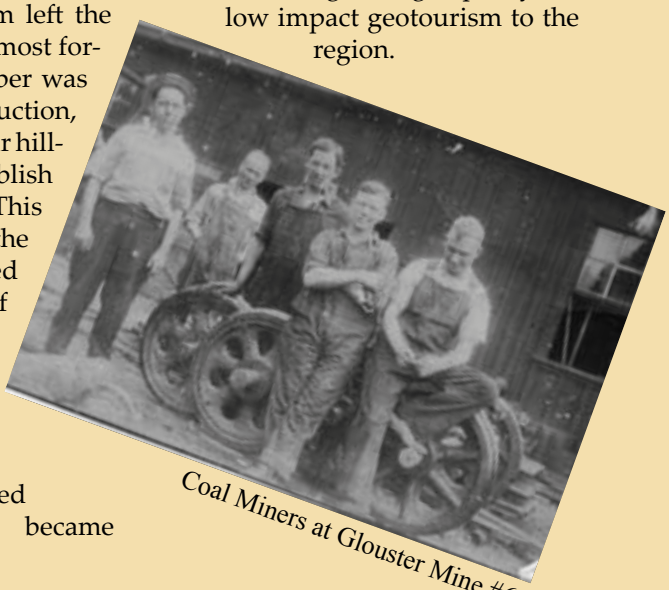


Overlooking the Sunday Creek Valley in Glouster, 1911

High Street in Glouster, 1908

cant roles in a courageous era of labor union development in America. The boom was relatively short however, having ended by the start of the Depression in the late 1920's. This industrial boom left the region void of most forests as the timber was used for construction, fuel, and to clear hillsides to establish strip mines. This removal of the forests allowed hundreds of tons of sediment to enter into the waterways ach year. Many of the abandoned deep mines became inundated with water and now drain into local streams. This water enters the mine as clean water, but after flowing through the excavated coal seams, it contains extremely high levels of dissolved metals and sulfuric acid.

Since the coal boom, the population and economy has declined in the area with little reinvestment from the out of town investors and owners who benefited greatly. This left those who remained with a legacy of a rich history, but a degraded environment and a struggling economy. This legacy lives on today, but is challenged by more positive trends of reforestation, environmental restoration and a gradually improving quality of life that includes a growing capacity for low impact geotourism to the region.



Coal Miners at Glouster Mine #6

Fantail Darter

Fathead Minnow

Gizzard Shad

Golden Redhorse

Golden Shiner

Grass Pickerel

Green Sunfish

Existing Conditions
of the Sunday Creek Watershed

Promoting and practicing responsible land stewardship results in good quality streams. Good quality streams will have good water chemistry and varied physical structure, which will provide habitat for fish and will support a diverse community of aquatic life.

While some areas have been devastated by past mining activities and currently cannot support any aquatic life, other areas of the watershed are in fair to good condition and host a variety of fish and aquatic insects. Many people are surprised to find out that the Sunday Creek Watershed is home to 45 different species of fish. Fish, like all animals, need food, shelter, breeding areas and, of course, good quality water to live. These areas together make up the fish's habitat.

Rope swing on Congo Run

Good habitat includes: deep pools and riffles, cover (such as tree roots, overhanging limbs, submersed logs and large rocks) curves and bends, as well as phytoplankton, zooplankton, insects and forage fish which are needed for the food web to be sustainable.

In order to fix some of the environmental damage caused by past-unregulated mining, the Sunday Creek Watershed Group has intensely studied the watershed. This study included taking an inventory of the creek and tributaries looking for the heaviest influence of pollution; usually acid mine drainage. With this study done, a management plan and an Acid Mine Drainage Abatement and Treatment plan have been written. These documents describe the most effective ways to help improve water quality.

Riparian Buffer Zones

The best stewardship practice which helps increase water quality, regulate stream temperature, stabilize banks, slow erosion, reduce flooding, filter runoff, protect property, and create aquatic and terrestrial wildlife habitat is the development of riparian buffers.

- Riparian buffers, sometimes called riparian zones or streamside management zones, are areas bordering the stream that are allowed to become established with native trees and vegetation naturally, or can be planted in hardwoods suitable for floodplains.
- Depending on the size of the stream, soil type and slope of the land, the riparian buffer can be anywhere from 50 to 300 feet wide on each side of the stream. In deciding what size buffer to set aside, bigger is always better due to the natural meandering of streams.

Benefits of Buffers

Lack of Riparian Buffer increases stream bank erosion

- As the trees grow their root systems help hold the soil in place thereby slowing the rates of bank erosion. As the banks do erode, the roots become exposed which slows the flow of water reducing downstream erosion and creating habitat for fish.
- Trees surrounding the creek will also shade the creek keeping the water cooler, which will also benefit the aquatic organisms living in the creek.
- During heavy rain events, the trees and other vegetation absorb water and keep it from entering the creeks which helps reduce flooding.
- The vegetation and trees naturally filter run-off entering the creek from surrounding lawns, pastures, houses, and roads.
- Another benefit to planting trees or allowing them to grow naturally is their ability to absorb and retain carbon dioxide, a greenhouse gas, from the atmosphere, which can help to reduce the greenhouse effect.

Johnny Darter

Large Mouth Bass

Least Brook Lamprey

Log Perch

Longear Sunfish

Northern Hog Sucker

Streams, Floods & Floodplains

Streams

So there's a stream on or near your property? Here's what every landowner needs to know about streams and their characteristics.

- Streams are dynamic. They move and this is their natural process. Water in streams is traveling downhill; this gives the stream energy. The constant meandering of a stream is a result of the balancing back and forth of the stream's energy between flow rate, volume, soil type, lay of the land, and anything with which the stream comes in contact.

- Plan ahead; avoid putting buildings, driveways, roads or other permanent structures right next to the creek to avoid constant "battle" with the moving/eroding stream banks that may threaten the buildings and roads.

- Streams Flood. Just like the constant meandering of streams, flooding is part of their natural process. As streams meander they erode banks sending the sediment downstream forming sandbars. When streams flood they carry these sediments, which have accumulated in the streambed, onto the floodplain. This helps to create more suitable habitat for the aquatic life in the creek and also deposits nutrient rich soil onto the surrounding floodplains.

Flooding and Floodplains

• Every stream or creek has a Natural Flood Plain, which is the flat land adjacent to a stream. The stream occasionally flows into the natural floodplain where the stream slows down in velocity and drops its sediment load.

• A 100-year flood is the flood having a 1% chance of occurring in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years.

• Flood Insurance Rate Maps (FIRM) are the official map of a community on which Federal Emergency Management Agency has delineated both the special hazard areas and the risk premium zones applicable to the community. Insurance is not mandatory within the 100-year floodplain but most lending agencies will require it if the property is within the 100-year floodplain.

• To find where the natural or 100-year floodplain is located on your land, Maps and additional information can be obtained through the following:

Athens, Perry and Morgan County Soil and Water Conservation District Office
Athens, Perry and Morgan County Tax Map Office
Athensgis.com
Federal Emergency Management Agency: www.FEMA.gov
Association of State Floodplain Managers: www.floods.org

• Suitable uses of a floodplain are: parks, football, soccer or baseball fields, wildlife habitat, riparian buffers, row crops, and pasture. Some floodplains flood annually, some every few years, some may only flood every hundred years or more. Whatever you decide to do with your floodplain remember; it will flood at sometime.

Orangethroat Darter

Pumpkinseed Sunfish

Redear Sunfish

Rock Bass

Sand Shiner

Silverjaw Minnow

How to be a Good Steward

Being a good land steward is an important part of being a Sunday Creek Watershed resident. The term 'Stewardship' is defined as the responsibility of taking care of something that one does not own. The Sunday Creek Watershed Group feels that being a good steward requires you to take care of the watershed in a sustainable manner, for future generations to enjoy and utilize. The concept involves a responsibility to learn about being a positive land steward, educating your neighbors about their responsibility and putting the following stewardship ideas into action.

Forestry Stewardship

Consult A Forester

Forest landowners can greatly influence stewardship practices within their watershed by becoming familiar with the best management practices (BMP's) for forestry operations and by creating detailed forest management plans. A forest management plan will describe the types of management activities that will be permitted on your land, including calculating the allowable cut, creating reserve sites, identifying environmentally sensitive areas, and identifying areas where management is not feasible (Lansky, 2002).

Management plans should be developed in conjunction with a certified forester who specializes in harvesting techniques that best reflect your own management goals (Lansky, 2002). Using a forester can bring the landowner a higher price for their timber, protect soil and water resources, and leave the forest in an aesthetically pleasing condition. With proper management timber harvests can benefit many aspects of the forest such as: deer, turkey, grouse, quail, songbirds, non-timber forest products, high value timber, or any other wishes the landowner has.

Low impact forestry practices such as utilizing horses, reduces soil erosion and compaction

Agricultural Stewardship

Agriculture can be one of the largest types of non-point source pollution. Unlike a factory discharging into the river through a large pipe, non-point source pollution cannot be pinpointed to one direct source. Non-point source pollution is carried across the ground or air in a wide sweep, eventually ending up in the streams. There are many other Best Management Practices that can be put in place on your land to reduce non-point source pollution. Frequently, cost share programs are available depending on your land use, location and particular situation. Landowners may benefit from a variety of conservation programs and technical assistance that are offered by organizations and agencies.

The following is a partial list of organizations and agencies that provide conservation programs for private lands and in some cases public lands:

- **Rural Action Sustainable Agriculture:** 740-767-4938
- **Soil & Water Conservation District Offices (SWCD)**

  Perry County SWCD: 740-743-1325

  Athens County SWCD: 740-797-9686

  Morgan County SWCD: 740-962-4234
- **OSU Extension (OSUE)**
- **Ohio Department of Natural Resources (ODNR)**
- **ODNR - Division of Wildlife**
- **ODNR - Division of Soil & Water Conservation**
- **ODNR – Division of Mineral Resources Management**
- **ODNR Division of Forestry**
- **Natural Resource Conservation Service (NRCS)**
- **Farm Service Agency (FSA)**

Silver Redhorse

Southern Redbelly Dace

Spotfin Shiner

Spotted Sucker

Spotted Bass

Steelcolor Shiner

Stonecat Madtom

Home Owner Stewardship

Every homeowner has a link and a responsibility towards maintaining good water quality. Each time it rains, water is flushed across houses, driveways and lawns taking everything with which the water came into contact into the stream. Often in villages, the water flows into sewers that drain directly into a nearby stream.

Fertilizer and Pesticides

If you choose to fertilize or otherwise treat your lawn, follow directions on the labeling. Using excessive concentrations or amounts wastes the product and usually ends up in run-off entering into the sewers and streams. Only applying them when there isn't a threat of rain helps keep them where you want them and helps prevent run-off. Organic methods of fertilization, which may have less negative effects, include utilizing hoof, horn, fish and bone meal; seaweed, potash and rock phosphate; and hand pulling unwanted weeds.

Reduce, Reuse and Recycle

Waste can also be an issue that impacts our watershed. One way of reducing waste, or household trash, is recycling. Recycling not only reduces the amount of trash put into our landfills, but also reduces the amount of environmental damage by reducing the need for mining or extracting raw materials.

Composting can also reduce your household trash. The benefits of composting, other than reducing trash, is the development of nutrient rich compost, which is great for gardens and plants, and is a great benefit of keeping the nutrients from your plants and vegetable waste for your use and out of the landfill.

Volunteers participate in trash sweep at Trimble Township Community Forest

Home Sewage Treatment Systems

Home septic treatment systems do a great job of treating sewage. However, when not working properly, they can add large amounts of nutrients to creeks, add dangerous levels of bacteria, and give off unpleasant odors. The addition of excessive nutrients can be detrimental to aquatic life. The excessive levels of bacteria can also cause a human safety concern in the creek, an area where children often play. By having a properly working septic, or home sewage treatment system, all these situations can be avoided. For a small fee the county health department will test to see if your system is functioning properly.

For more information concerning Home Septic Treatment Systems Contact your local Health Department.

- Athens County: http://www.health.athens.oh.us/ or (740) 592-4431
- Perry County: http://www.perryhealth.com/ or (740) 342-5179
- Morgan County: (740) 962-4572

Construction

Whenever soil is disturbed for a project, responsible measures should be taken to preserve the existing bare soil. Bare soil is bad soil. When rain and wind hit bare soil two negative affects happen. First the soil is either blown or washed away adding to siltation in waterways. Secondly the soil is lost from the site taking away its nutrient rich ability to grow cover after the project is complete.

If an area to be disturbed is larger than one acre, a permit is required from the Ohio EPA. If you see a construction situation which is resulting in pollution getting into a stream a report can be made to the county's Soil and Water Conservation District. This allows the situation to be addressed at the local level and allows the landowner the opportunity to resolve the issue before legal action is taken.

Stripe Shiner

Warmouth Sunfish

White Crapie

White Sucker

Yellow Perch

Yellow Bullhead

Natural Resource Extraction

Oil and Gas

Oil and gas extraction is common in the watershed. There are specific management practices that the owners of the wells need to follow. These practices help protect the soil, water and air, and provide for public safety while still providing oil and gas.

- If either the brine or oil storage tanks are in a floodplain, they should be safely secured.
- The storage tanks should be surrounded by an earthen berm to protect against overflow.
- Access roads should use the same best management practices as logging roads to prevent erosion.

Abondoned Mine Lands

Abandoned mine lands (AML) are scattered throughout 39% of the watershed. These areas can be old strip mines, gob piles, deep mines, mine seeps, or subsidences. Before the Surface Mining and coal Reclamation act (SMACRA) of 1977, the owners of mines weren't legally obligated to reclaim their mining sites. This has left thousands of acres of abandoned mines and coal refuse piles in the watershed. Detrimental effects of such lands are highly acid; low pH run-off laden with heavy metals from old strip mines and gob piles; the loss of good quality water as it drains into subsidences, or the highly acidic and heavy metals laden water which exits deep mines through old mine shafts or breaks out of hillsides through seeps. All of these situations add acidity, metals, and excessive sedimentation to our waterways degrading the habitat and preventing aquatic life from prospering in our watershed.

Landowners of such areas are not responsible for repairing such sites, but can be helpful in getting them fixed. By notifying SCWG, or ODNR-MRM, these sites can be added to existing maps of areas of concern. Permission by the landowner is needed for any research or reclamation to be done on their property. There are programs in effect to help remediate these issues. There is a coal tax put on every ton of coal mined that goes towards public safety and reclamation of coal mines not affected by the 1977 SMACRA laws.

For more information concerning Underground or Surface Mining contact the following agency.

- ODNR-Division of Mineral Resource Management: www.ohiodnr.com

The Trutown Discharge negatively effects seven miles downstream on Sunday Creek

Congo Stream Capture was the first of five completed restoration projects

The twenty-seven acre Corning gob pile shown here on fire has now been reclaimed

pH Scale and Effects

MORE ACIDIC

MORE BASIC

	0	
Battery Acid	1	0-3 Lethal to all species of fish.
	2	
Apples		
Vinegar	3	3-3.5 Unlikely that fish can survive although some plants & invertebates can be found.
Tomato Juice	4	4-4.5 All fish, most frogs & insects are not present.
	5	5-5.5 Decomposing bacteria & plankton begin to disappear. Dead plant & animal materials begin to accumulate. Minnows can be found.
Milk	6	
NEUTRAL Pure Water	7	6.5-8.5 Optimal for most organisms. Bass, bluegill, pike, & sunfish can be found.
Baking Soda	8	8.5 - 9.0 Not harmful to fish, but indirect effects from chemical changes in water may occur.
Limestone	9	9.0-10.5 Harmful to perch & salmonids, but minnows can be found.
	10	10.5-11.0 Prolonged exposure is lethal to carp & perch.
	11	
	12	11-14 Lethal to all species of fish.
Ammonia	13	
Lye	14	

Acknowledgments

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Photo Credits

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