

Erie Streams and Rivers

Owner's Manual

**Operating and Maintaining
Beaver Creek and Its Tributaries**



Photo courtesy of Charles Hambly

SAVE THIS MANUAL FOR REFERENCE

Erie Brand Streams and Rivers

Products of the Glacial Lakes Division, Mother Nature, LLP

Getting Started

Dear Valued Consumer:

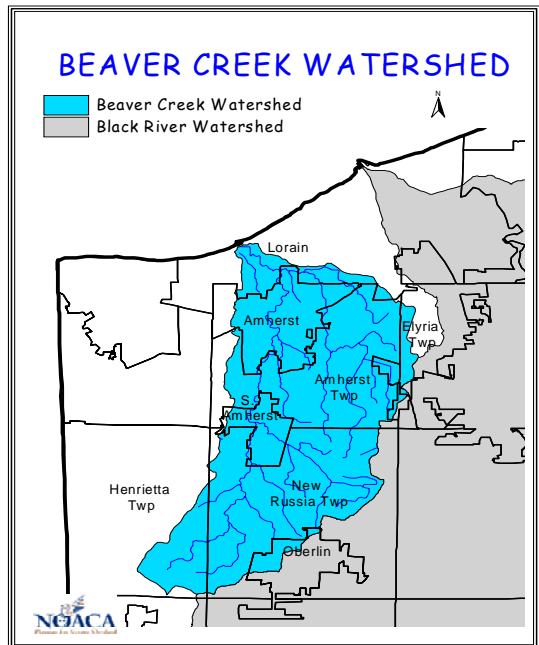
Congratulations on selecting one of our finest creek models. You live in a watershed that supports a complex ecosystem and provides drinking water for you and your family. Beaver Creek watershed is the largest watershed located entirely within Lorain County, with its mainstem flowing directly into Lake Erie. Please take a few minutes to familiarize yourself with the proper operation and care of Beaver Creek. With proper care and regular service, Beaver Creek can deliver thousands of years of reliable, high quality service.

*Mother Nature
Chief Operating Officer*

How Beaver Creek Works

Beaver Creek is part of a watershed. Watersheds are Mother Nature's way of managing precipitation (rain and snow).

Beaver Creek has three parts: Smaller creeks that connect to it like the branches of a tree; the landscape which drains the water into the creek and land around it; and groundwater which keeps sending water to Beaver Creek during dry weather. Little brooks receive the extra water flowing off the land and send it to the bigger creeks. Bigger creeks merge together to form Beaver Creek which flows into Lake Erie. Water drains off your property and eventually ends up in Lake Erie, the source of the drinking water that comes out of your faucet.



From time to time, Beaver Creek gets so much water that it can't hold it, causing it to flow over the banks. This is commonly called a "flood". Do NOT be alarmed. This may be normal, if Beaver Creek is operated in accordance with this manual. In response to floods, Beaver Creek has made flood plains that absorb and store the extra water. You may notice flood plains that store water for long periods of time and have lots of plants and animals. These are called **wetlands**.



Photo courtesy of Matt Nahorn

Important!

Wetlands are a very important part of Beaver Creek and need extra care and attention! Wetlands teem with life; clean out poisons from our water; and store extra water in case of drought.

Basic Features

The Beaver Creek Model that you have chosen has a series of features that keep it teeming with plants and animals. Please take a moment to familiarize yourself with these important features. If you need service or repair, knowing these terms will help.

Biochemical Oxygen Demand (BOD): The amount of oxygen in the water that tiny creatures in the creek need to breathe. Large amounts of BOD mean lots of oil from vehicles and sewage is in the creek. This is called organic pollution; when it increases, BOD increases because the tiny creatures use more oxygen to break down the pollutants. When they use up the oxygen, the fish suffocate and die.

Dissolved Oxygen (DO): The oxygen dissolved in the water. Fish and other animals breathe the dissolved oxygen in the water. Without it, they suffocate.

Erosion: The stripping of the soil off the land by wind or rapidly flowing water. A small amount of erosion is natural. Erosion speeds up on bare soils at construction sites, on tilled farm fields and along creek banks that are mowed right to the edge. The force of erosion washes away topsoil and ruins the shape of the creek channel by straightening out the meanders.



Photo courtesy of Matt Nahorn

Flood Plain: A flat area along the creek bank that stores extra water after a flood. Don't build on it or plant lawns or fill it in.

Groundwater: The water that flows under ground. It comes to the surface in natural springs and artesian wells. People dig wells to pump out groundwater for drinking and watering crops.

Impervious Surfaces: Land that has concrete, asphalt or buildings on top of it. Water can't soak into impervious surfaces.

Meander: The windings of a creek. Meanders are very common in Beaver Creek and its tributaries. They extend the creek's length so it can hold more floodwater without overflowing.

Native vegetation: Plant species that were growing here before European settlers arrived.

Nutrients: Food for plants and animals from fertilizer, animal waste and rotting plants.

Organic Pollution: The carbon-rich residue that flows into creeks from rotting plants, grass clippings, pet waste, sewage and oil dripping from vehicles.

Pools: Deep, slow moving parts of a creek that make the best home for the biggest fish.

Precipitation: Rain and snow.

Riffles: Shallow parts of the creek where it tumbles over sand bars and rocks. Riffles look like miniature rapids and bubble oxygen into the water. They are the nursery for fish eggs and juvenile insects.

Riparian Buffer: A strip of living plants on both sides of a creek. It should be protected. Riparian buffers shade the creek, keep the banks from falling into the creek, provide a home for animals, hold dirt back and keep it out of the creek, and filter out pollutants and poisons.

Runs: Deep, fast-flowing sections where crayfish and lively fish like to live.

Sedimentation: The natural process of laying soil down in a creek bed. Soil settles in creek beds or flood plains as the flowing water slows down. Dirt from our streets and yards can clog the creek and make it flood nearby property. Too much sediment smothers plants and animals in the water and on the creek bottom.

Vegetation: Living plants.

Wetland: An area that floods quite often. It has mushy soils and water-loving plants. Wetlands provide homes for plants and animals, filter poisons out of the water, keep the creek from eating away its banks, and refill underground creeks.

Woody Debris: Dead trees that slow creek flow, stop erosion, and make a good home for creek animals that like to hide in the shadows.



Photo courtesy of Charles Hambly

Safety

Watersheds funnel runoff and concentrate all the chemicals, nutrients, dust, litter, and debris that are washed off the landscape into the creek. Follow these maintenance rules to keep your creek clean and assure long service.

Maintenance

Protect Creekside Vegetation

Do not remove creekside vegetation. Plants growing along the creek filter the water, add shade, keep the bank from caving in and washing away, and make a place for animals to live.

Protect the Wetlands

Wetlands collect storm water, reduce flooding, and clean the water. They store water so that the creek can still get water when it doesn't rain. Wetlands are the home for lots of native plants and animals.

Develop Ways to Increase Infiltration on Your Own Property

Allow gutters and driveway runoff to soak in. Use paving brick and stone, gravel or woodchips instead of concrete for driveways, paths and sidewalks.



Maintain your septic tank (if you have one)

Keep your septic tank working right so it doesn't send your sewage into the groundwater that feeds the creek. Don't believe the myths that say you can maintain it yourself. Putting baking soda, yeast or other do-it-yourself stuff down your drain doesn't keep your septic tank working right. Only a visit every three to five paths and sidewalks.

Adopt and Enforce Creek Protection Ordinances

Get your city, village or township to adopt and enforce creek protection ordinances. Preserve your creek's banks and vegetated edges to keep it working right.



Support Efforts to Repair Damaged Creek Sections

Eroded banks and channeled sections can be fixed so that the creek can again reduce flooding and provide a healthy place for fish to live.

Develop New Storm Water Detention Basins as New Wetlands

To ensure long creek life, precipitation must soak in, rather than run off. Making new places where run-off can be held back to soak in and act like a mini-wetland will clean up the water and even out the creek flow. This means less flash flooding for our community.

Operate a Compost Bin for Recycling Yard Waste

Too much rotting yard waste can overwhelm the creek. Composting in your backyard copies Mother Nature's way to reduce organic debris and return nutrients to the soil in your own yard.

Organize and Support a Watershed Stewardship Organization

Volunteer to help organize and support a Watershed Stewardship Organization for your creek. A local group can help educate, increase awareness and support remediation efforts.

Precautions

Do **not** encroach and remove vegetation on creek banks: Building along the creek or mowing your lawn right to its edge removes critical vegetation. Creeks need stable, shaded edges to work right. Creekside shrubs and trees filter out pollutants, keep the banks from collapsing and make a home for native Ohio plants and animals.

Do **not** over fertilize your lawn and garden: Excess nutrients are not absorbed by your lawn and garden plants. They are flushed off your property right into the creek. Extra nutrients flowing into the water cause algae growth explosions that suffocate the fish.

Do **not** dump oil or other wastes into storm drains: Oil and other chemicals that you dump down storm drains empty directly into Beaver Creek. These pollutants build up on the creek bottom, and poison and suffocate the fish and insects that feed there. Your creek is not designed as a disposal site.

Do **not** add excessive pavement and other impervious surfaces to your property and community: Pavement, roofs, drives, and parking lots all block the water



from soaking into the soil. Instead, the water just gushes down to the creek causing a flash flood.

Do **not** plant non-native plants and shrubs near the creek: Non-native plants and shrubs can squeeze out local plants and destroy the homes of native Ohio birds, animals and plants.

Do **not** fill in the flood plain: Do not try to re-route or control the creek by putting in fill dirt. The creek will eventually just wash

away all the dirt you add. Any buildings may be damaged from a flood. Don't mess with Mother Nature.

Do **not** dump yard waste into creeks and ditches: Grass clippings, leaves and other yard wastes putrefy and poison the creek.

Warning! Exceeding 25% impervious land cover in your watershed automatically voids any warranty.

Service and Repair

For assistance in protecting and restoring Beaver Creek and its tributaries call the: Western Reserve Land Conservancy at 440-774-4226.

Warranty

Your presence in the Beaver Creek watershed requires you to take personal responsibility for its care and maintenance. Your creek has been carefully designed and engineered to perform faithfully. It will respond exactly to the conditions you create. Building impervious surfaces, adding pollutants, and failing to protect the creek bank, its wetlands and flood plain will drastically reduce the designed functionality of your creek, *guaranteed*.



Photo Courtesy of Matt Nahorn

Beaver Creek by the Numbers	
8.4 million gallons	Average volume discharged to Lake Erie each day
19.1 feet per mile	Average gradient as it flows north to Lake Erie
43.92 square miles	Land area drained (size of watershed)
25.70 linear miles	Length of its tributaries
12.2 linear miles	Length of the Beaver Creek mainstem
1260	Number of septic systems draining directly into Beaver Creek

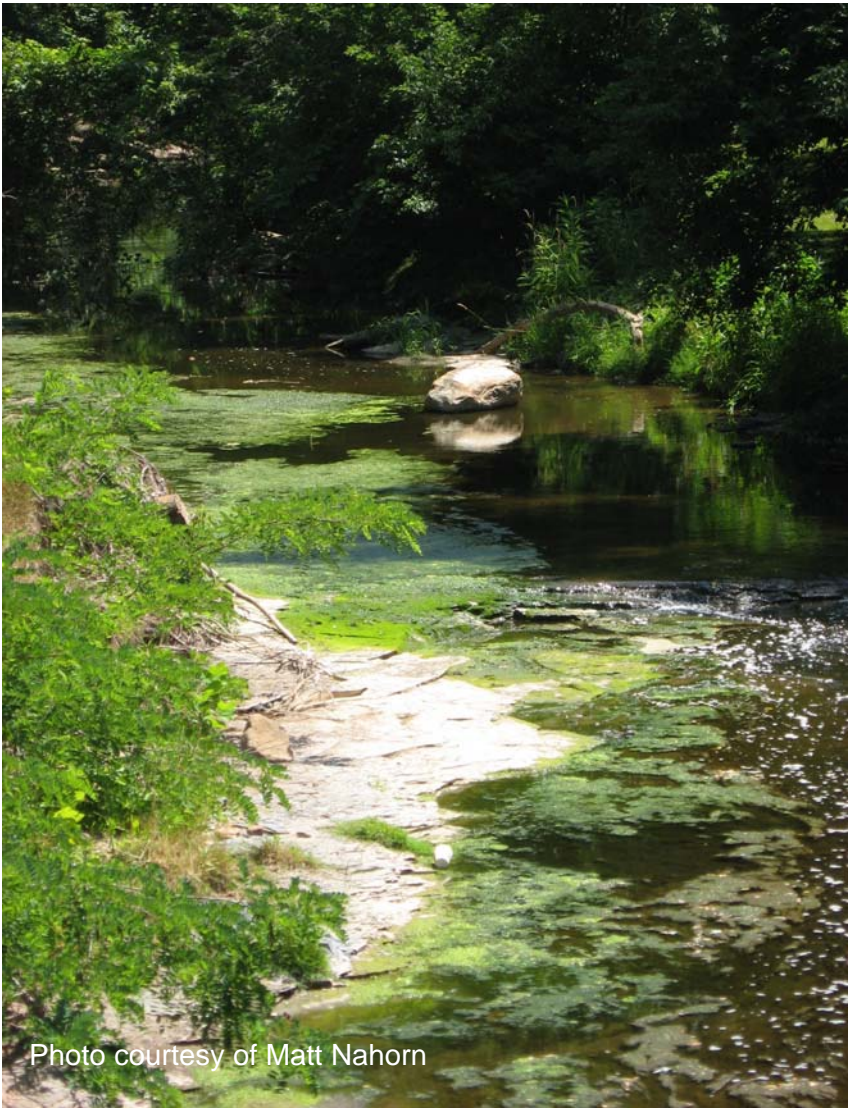


Photo courtesy of Matt Nahorn

Troubleshooting Guide

Your creek is designed to provide centuries of reliable service. However, certain human activities are known to cause damage. If problems develop, you and your neighbors can help repair the creek. Follow the troubleshooting chart on the facing page to review how to handle your problem.

Symptom	Possible Cause	Corrective Action
Strange smells, oddly colored water, dead fish or other creek creatures	Under treated sewage or chemical pollution being discharged into the creek.	Support modernizing the sewage plant and eliminating Combined Sewer Overflows (when storm and sanitary sewage flow together). Report suspected discharges from failing septic tanks to the Lorain County General Health District, 440.244.2209. Report chemical spills to the Ohio EPA hotline, 800.282.9378 .
Slimy rock or green surface scum.	Excess nutrients causing too much algae growth.	Reduce lawn fertilizer.
Expanding bank erosion and channelization.	Excess flow due to urbanization.	Write laws to keep green space and reduce run-off.
Lower dry weather flow.	Too much land surface with uncontrolled run-off. Not enough plants to hold the water back.	Increase green space to help infiltration.
Increased flooding.	Too much paved or built-upon land with uncontrolled run-off.	Add more places for water to soak back into the ground, restore wetlands, prohibit development in flood plains.
Suspended mud in water. Excess sediment on the creek bottom.	Erosion from unprotected exposed bare soil, often during construction or from bare farm fields.	Report bare construction sites that have stood for more than 21 days without grass to the Amherst Building Department at 988-3734 or the Ohio EPA at (330) 963-1200
No riffles, runs or pools.	Missing Riparian Buffer; too much stormwater has scoured the bottom clean of critters and the rocks to shelter them.	Restore Riparian Buffer; increase infiltration.
Reduced functionality of the creek.	No local Watershed Council to educate the community and protect the stream.	Call your local city council representative at 440.988.2420.

About the Beaver Creek Watershed

The Beaver Creek watershed drains Amherst, Amherst Township, South Amherst, New Russia Township, Lorain, Henrietta Township, Oberlin, Elyria Township. Land use in each of these communities influences the health of Beaver Creek and your quality of life. For more information about ways to support Beaver Creek and help with watershed remediation, call the Firelands Chapter of the Western Reserve Land Conservancy (P.O. Box 174, Oberlin, Ohio 44074, phone 440.774.4226); the Ohio Environmental Protection Agency Storm Water Program Manager at 330.963.1200; Beaver Creek Keeper, Matt Nahorn, indianridge89@centurytel.net; or the Superintendent, Amherst, Utilities at 440.988.4224.



Photo courtesy of Charles Hambly.

Some statistical information courtesy of the Northeast Ohio Areawide Coordinating Agency. Other technical information provided by the Cuyahoga and Black River Remedial Action Plan committees. We are most grateful to the Cuyahoga River Community Planning Organization (CRCPO) who developed the original Operating Manual theme for Erie Streams and Rivers.

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