

The Gunpowder and the Chesapeake Bay

The Chesapeake Bay is a body of water and, like a human body, its health depends on what goes into it. The Chesapeake is fed by 10 major rivers and numerous smaller streams that flow out of Virginia, Maryland, Pennsylvania, and Delaware. These rivers bring the nutrients and fresh water that, when mixed with the ocean's salt water, make Chesapeake Bay the most productive estuary in the United States.

But, as everyone knows, the Chesapeake is not as healthy as it once was. The problems stem, in part, from the declining quality of the rivers that feed the Bay. This fact sheet explains how the Gunpowder River contributes to the Bay and outlines some ways to help you keep the river clean.

More than most, Maryland's Gunpowder is a people's river; about 60 percent of the river corridor is publicly owned. In its 53-mile run from the Pennsylvania border southeast to the Chesapeake Bay, the Gunpowder flows through northern Baltimore County and passes through 12,000-acre Gunpowder State Park and 8,000 acres of wetlands, extensive forests, and many areas of historic and archeological importance.

People enjoy the Gunpowder in many ways. Hikers can visit areas of exceptional natural beauty where slender blue flag and nodding trillium bloom along the boulder-strewn river and marsh hawks and green heron live near its banks. In the winter, bird watchers may see whistling swans, Canada geese, black ducks, and other waterfowl that spend the cold days on the lower Gunpowder.

The Gunpowder serves people in other ways as well. At two points on its journey to the Bay, the river is slowed and held in reservoirs. Prettyboy Reservoir to the north, and the more southerly Loch Raven Reservoir provide Baltimore City and Baltimore County residents with most of their drinking water.

The middle Gunpowder stretches between Prettyboy and Loch Raven. Here anglers can find some of the best trout fishing in Maryland. The reservoirs themselves provide boaters, fishermen and birdwatchers with recreation.

THE BASIN

A 1986 Maryland Water Quality Report said the water quality of the Gunpowder varied from good to fair, with many segments described as good. The forested state park that lines much of the Gunpowder's course helps to shield the river from some of pollution's worst ravages. But the barrier between the river and its enemies is a fragile one, vulnerable to the effects of ever expanding human activities in the Gunpowder's 500-square-mile basin.

Between 1973 and 1985, the amount of land in the Gunpowder River basin taken up by residences and commercial buildings increased rapidly. Although 31 percent of the land is still agricultural, the rapid increase in the percentage of developed land indicates how the river basin is changing. For most rivers change spells trouble, and the Gunpowder is no exception.

Farming, which predominates in the upper basin, and development, which is increasing primarily in the middle and lower basins, are the sources of the

Gunpowder's biggest threats: sediment and excess nutrients.

PROBLEMS

Silt is the Gunpowder's greatest enemy. Over the years, timbering, mining, and particularly farming within the river basin have uncovered, loosened, and crushed vast amounts of soil. Rains wash soil and other solids into streams and rivers where heavier particles fall to the bottom, while lighter bits remain suspended in the water and settle out miles downstream.

When the river becomes cloudy with silt, light cannot reach the underwater plants. If the plants die, a valuable source of wildlife food and shelter as well as fish habitat is lost.

Sediments that fall to the river bottom may smother the eggs of trout. In large amounts, sediment can change the pattern of stream flows, fill shipping channels, and raise the level of the river bed, making the surrounding area more prone to flooding.

In addition, sediment accumulation lowers the storage capacity of reservoirs. In the two decades between 1943 and 1961, Loch Raven reservoir lost 10 percent of its storage capacity because of silt accumulation.

Historically, sediment in the upper reaches of the Gunpowder came from surrounding farms. Both farmers and the river suffered as unchecked erosion lowered the productivity of the land. No-till and other soil conservation techniques now are used routinely by farmers in the basin and run off from farms, while still a problem, has declined.

Another source of sediment continues to plague the Gunpowder and may be growing worse. Communities are burgeoning through the Gunpowder basin, especially in the southern basin in the White Marsh and Perry Hall area. Over the last decade, forest and farmland in the basin have given way to rooftops, pavements, and parking lots -- between 1973 and 1981 the amount of developed land in the basin increased by 19 percent. Soil loss from urbanizing areas is large, as high as 100 tons per acre per year at some construction sites.

Construction sites can also send other pollutants including pesticides, oil, metal, construction chemicals, and cement into the river.

Some sediment, particularly that from farms, may also bring with it another of the Gunpowder's enemies -- nutrients. Phosphorus (from animal and human waste), along with nitrogen (from fertilizers), over enrich the water causing serious overgrowth of algae in the reservoirs and lower river. The algal blooms in the Loch Raven reservoir are an example of over enrichment or "eutrophication." While algal blooms do not pose a threat to human health, they do increase the cost of treating raw water and sometimes give treated water an unpleasant odor.

The rampant growth of algae leads to another serious water quality problem. As large masses of algae die, sink to the bottom, and decay, oxygen dissolved in the water is used up. Animals, such as fish, that need large amounts of oxygen may die if oxygen levels in the water drop too low.

Sewage overflow from urban and suburban communities in the basin is another source of trouble for the Gunpowder. If not properly treated, sewage brings phosphorus and harmful bacteria to the water. As the human population grows, the problems could become worse. The population in the basin below Loch Raven reservoir was 19,000 in 1978. By 1998, there may be as many as 41,000 people living in the area. There are nine pumping stations on the Gunpowder. Two of the nine stations, both located on the lower river, have malfunctioned frequently and pumped raw sewage into the river. These plants should be improved in order to safeguard the Gunpowder.

Both point sources, such as sewage treatment plants, and non-point sources, such as farm and urban run off, contribute to the problem of excess nutrients. Nonpoint sources, though, contribute the bulk of the polluting phosphorus to the Gunpowder. Up to 70 percent of the phosphorus in the Loch Raven reservoir is thought to come from nonpoint sources particularly farm run off. Failing septic systems and over board dumping from pleasure boats are prime culprits for both phosphorous and bacterial pollution particularly in the lower segments of the Gunpowder.

REMEDIES

In comparison with some rivers, the Gunpowder is well off. Its water quality is generally good. But nonpoint pollution is a persistent problem and one that requires some ingenuity and foresight to solve. Fortunately, there are things we can all do to battle the Gunpowder's enemies.

A reservoir management agreement signed by Baltimore City, Baltimore County, Maryland's Departments of Health and Agriculture and other state and local groups, may help to maintain and improve the water quality in the Loch Raven and Prettyboy reservoirs. This long-term agreement incorporates controls on farm and construction pollution, and must be enforced in years to come if reservoir quality is to be improved.

Erosion from construction sites, homes, and urban areas can be reduced. Harford and Baltimore Counties began enforcing their own sediment control programs in 1985. These programs, in addition to stormwater run off management programs, will help reduce sediment flow from urbanizing areas. You can assist with enforcement by learning how the sediment and erosion control structures should be built, and by checking during construction that they are properly constructed and maintained.

To keep sediment from leaving the construction site, the Soil Conservation Service suggests the following practices:

- *Expose the smallest possible area of land for the shortest possible time.*
- *Stabilize critical and disturbed areas with temporary or permanent plantings or mulch.*
- *Retain natural vegetation where possible and avoid disturbing vegetation in swales or that is adjacent to streams.*
- *Physically retard runoff, wherever possible, on the site.*
- *Some of these practices can be applied on your farm or in your backyard as well.*

On a farm, you can reduce erosion, phosphorus and nitrogen run off by using no-till farming techniques where possible and maintaining an unploughed "buffer strip"

around all tilled crop fields. Consult your local Soil Conservation Service office about loan programs that help pay for soil conservation projects and about developing and implementing farm conservation plans.

Keep your eyes open as you travel around the basin. Report construction site sediment violations to 1-800-DNR-SOIL, dispose of trash properly and encourage others to do the same, and clean up after your pet.

Spread the word about the importance of the Gunpowder River. It provides drinking water for those in the Baltimore metropolitan area and gives us all many hours of recreation. It's up to all of us to make sure future generations will know the pleasures of fishing, swimming, or just strolling along the banks of the beautiful Gunpowder River.

WHAT YOU CAN DO

- *Fertilize sparingly and according to manufacturer's instructions.*
- *Plant trees and grass along stream banks to establish buffer zones.*
- *Wash cars on grass or gravel driveways so water will soak into the ground and be filtered rather than running off into storm sewers.*
- *Make frequent checks for septic tank failures (every three to five years).*