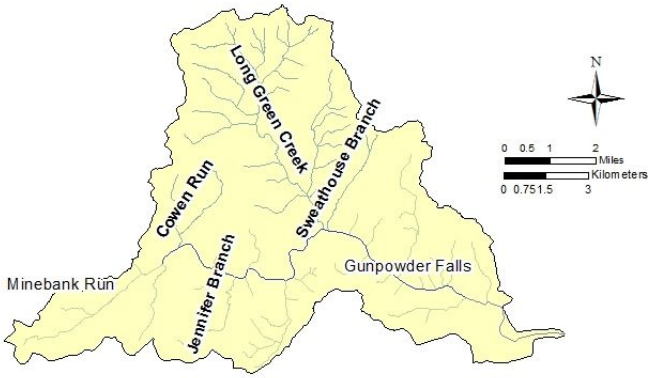
Maryland Department of the Environment

TMDL of Sediment in the Lower Gunpowder Falls Watershed

What You Need to Know

Background

A watershed is defined as the land area that drains to a stream. The Lower Gunpowder Falls watershed is located entirely within the central eastern portion of Baltimore County, Maryland. The watershed begins at the Loch Raven Reservoir dam and flows generally towards the east. Where it meets the tidal portions of Gunpowder River, it becomes the Gunpowder River watershed. Major tributaries in the watershed include Minebank Run, Long Green Creek, Sweathouse Run, Haystack Branch, Jennifer Branch, and Bean Run. The watershed is within the Gunpowder River Basin, which also includes the Prettyboy Reservoir, Loch Raven Reservoir, Little Gunpowder Falls, Bird River, Middle River – Browns, and the mainstem Gunpowder River as subwatersheds. The Loch Raven Dam divides the Loch Raven watershed from the Lower Gunpowder Falls.



The land-use distribution of the Lower Gunpowder Falls watershed consists primarily of forest (42%) and urban land (40%), with smaller amounts of crop (14%) and pasture (4%).

Point sources are sources where pollution can enter the stream. In this watershed, there are several point sources including stormwater conveyance systems.

The Maryland Biological Stream Survey (MBSS) is a randomized survey of stream health using fish and benthic (bottom-dwelling) communities as indicators. Streams are scored against reference watersheds where habitat and aquatic diversity is high. There are two indices used in the analysis, Benthic Index of Biotic Integrity (BIBI) and Fish Index of Biotic Integrity (FIBI). The Lower Gunpowder Falls watershed was originally identified as not meeting water quality standards for impacts to biological communities in 2002.

TMDL Details

Population 2010 Census	61,400
Watershed size	29,239 acres plus 80 acres of water/wetlands
Waterbody type	River
Reason for impairment	Biological Stressor Identification Report cited sediment affection biological communities
Baseline year	2009
Overall Reduction percent	46%
Related Chesapeake Bay Segment	Gunpowder River Oligohaline (GUNOH)

A biological stressor identification report was conducted to determine possible stressors/sources of the degraded streams. The report showed sediment indicators, inorganic pollutants (such as chlorides and sulfates) and manmade stream channel straightening as potential sources. Based on this assessment, the identification of sediment as well as inorganics was added to the list of impaired waters. The USEPA approved TMDL addresses the sediment impairment.

TMDL

Total Maximum Daily Loads are planning tools that create pollution budgets for specific substances typically using a model. These budgets need to include any point sources such as wastewater treatment plants and nonpoint sources such as farmland. The sediment TMDL was developed using a reference watershed approach. Watersheds with good FIBI and BIBI scores were analyzed for their sediment loads, with current land use scenario and an all forested land use scenario. These two scenarios were compared to each other and sediment yield of how much additional sediment could be added to the river and the BIBI/FIBI scores be acceptable. This is 3.6 times the all forest load for the watershed. The TMDL for the Lower Gunpowder Falls watershed is:

	Source Categories		Baseline Load (ton/yr)	TMDL Components	TMDL (ton/yr)	Reduction (%)
Lower Gunpowder Falls Watershed Contribution	Nonpoint Source	Forest (including harvested forest)	455	LA	446	2
		Agriculture	2,094		1,376	34
	Point Source	Urban Stormwater	4,319	WLA	1,856	57
		Process Water	8		8	0
	Total		6,916		3,696	46

Next Steps

It is anticipated that the Lower Gunpowder Falls Sediment TMDL is expected to be implemented as part of a staged process in conjunction with the Chesapeake Bay TMDL. This staged process is designed to achieve both the sediment reductions needed within the Lower Gunpowder Falls watershed and to meet sediment target loads consistent with the Chesapeake Bay TMDL, established by USEPA in 2010 and scheduled for full implementation by 2025.

As part of implementation of the Bay TMDL, Maryland developed a Phase I and Phase II watershed implementation plan. The strategies in the plans encompass a host of best management practices (BMPs), pollution controls and other actions for all source sectors that cumulatively will result in meeting the State's 2017 interim nutrient and sediment reduction targets, as verified by the Chesapeake Bay Water Quality Model.

Stormwater

In addition, urban stormwater sediment loads are regulated under National Pollutant Discharge Elimination System (NPDES) as municipal storm sewer system (MS4). A condition of these permits is to develop an implementation plan for each TMDL developed within the jurisdiction.

Agriculture

In agricultural areas comprehensive soil conservation plans can be developed that meet criteria of the USDA-NRCS Field Office Technical Guide (USDA 1983). Soil conservation plans help control erosion by modifying cultural practices or structural practices. In addition, livestock can be controlled via stream fencing and rotational grazing. Lastly, riparian buffers can reduce the effect of agricultural sediment sources through trapping and filtering, and reforestation, whether adjacent to part of the watershed stream system or in a watershed's interior, can decrease agricultural sediment sources as well.

Funding

In response to the WIP and the increased responsibility for local governments to achieve nutrient and sediment reduction goals, Maryland has continued to increase funding in the Chesapeake and Atlantic Coastal Bays Trust Fund.

Some other examples of programs that can provide funding for local governments and agricultural sources include the Federal Nonpoint Source Management Program (§ 319 of the Clean Water Act), Buffer Incentive Program (BIP), State Water Quality Revolving Loan Fund, Bay Restoration Fund, Chesapeake Bay Trust Fund and the Maryland Agricultural Water Quality Cost-Share Program. Details of these programs and additional funding sources can be found at http://www.dnr.state.md.us/bay/services/summaries.html.