

Big Elk Creek Watershed Plan for Clean Intact Streams (BECCI)

Preliminary Report Outline Produced by: Kyle Zentkovich, Rob Watchilla, and Terra Eby

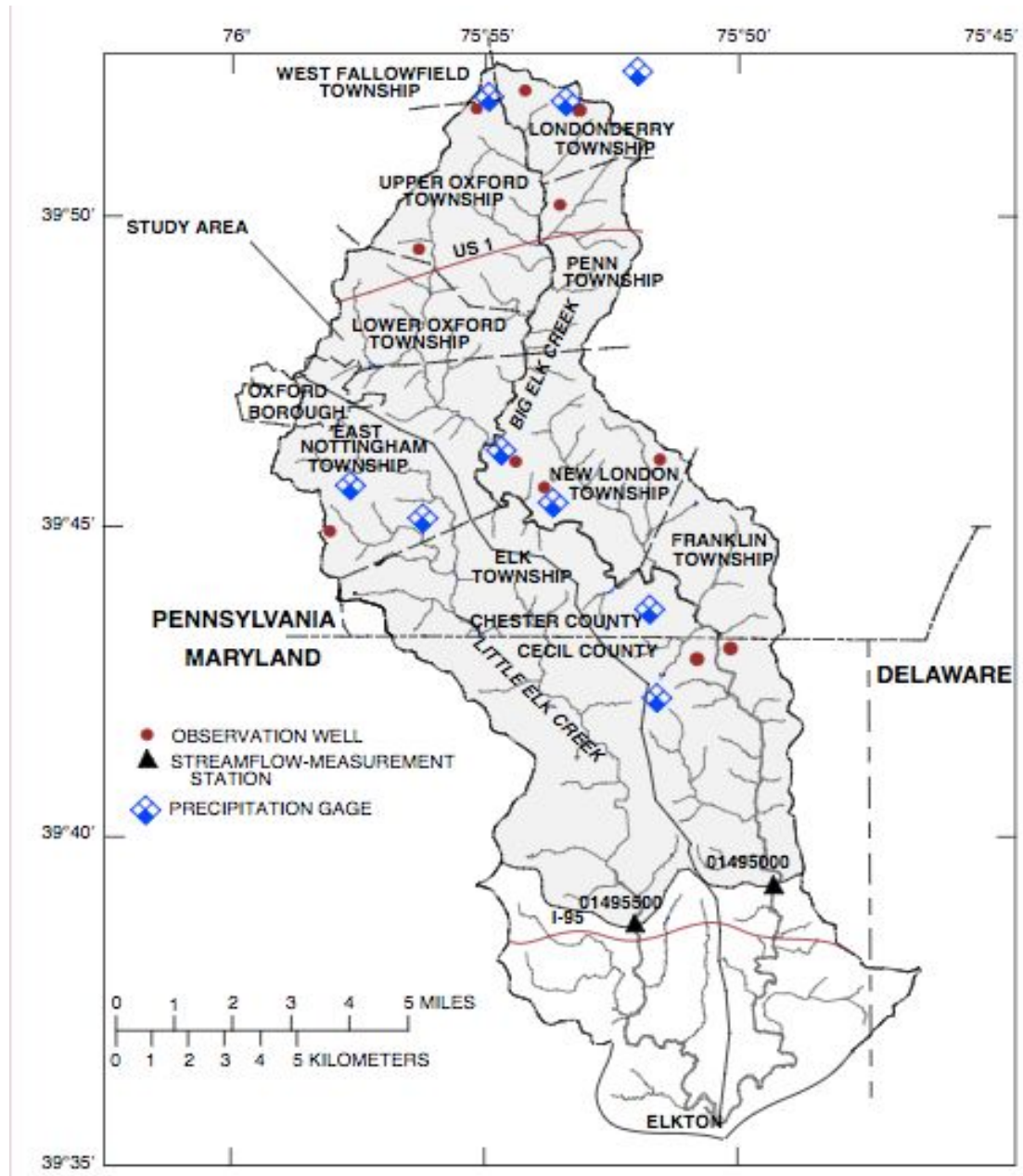


Figure 1. Data-collection sites in the Big Elk Creek Basin, Pennsylvania and Maryland. Source: U.S. Department of the Interior. USGS Fact Sheet 019-02. U.S. Geological Survey, May 2002

Table of Contents

History and Background

Mission Statement

Policies and Mandates in Place

Problem 1: Potential loss of ground water recharge

Goal

Problem 2: High nitrogen and phosphorus levels due to the high density of farms and major roads within the watershed.

Goal

Problem 3: Pathogens and Bacteria

Goal

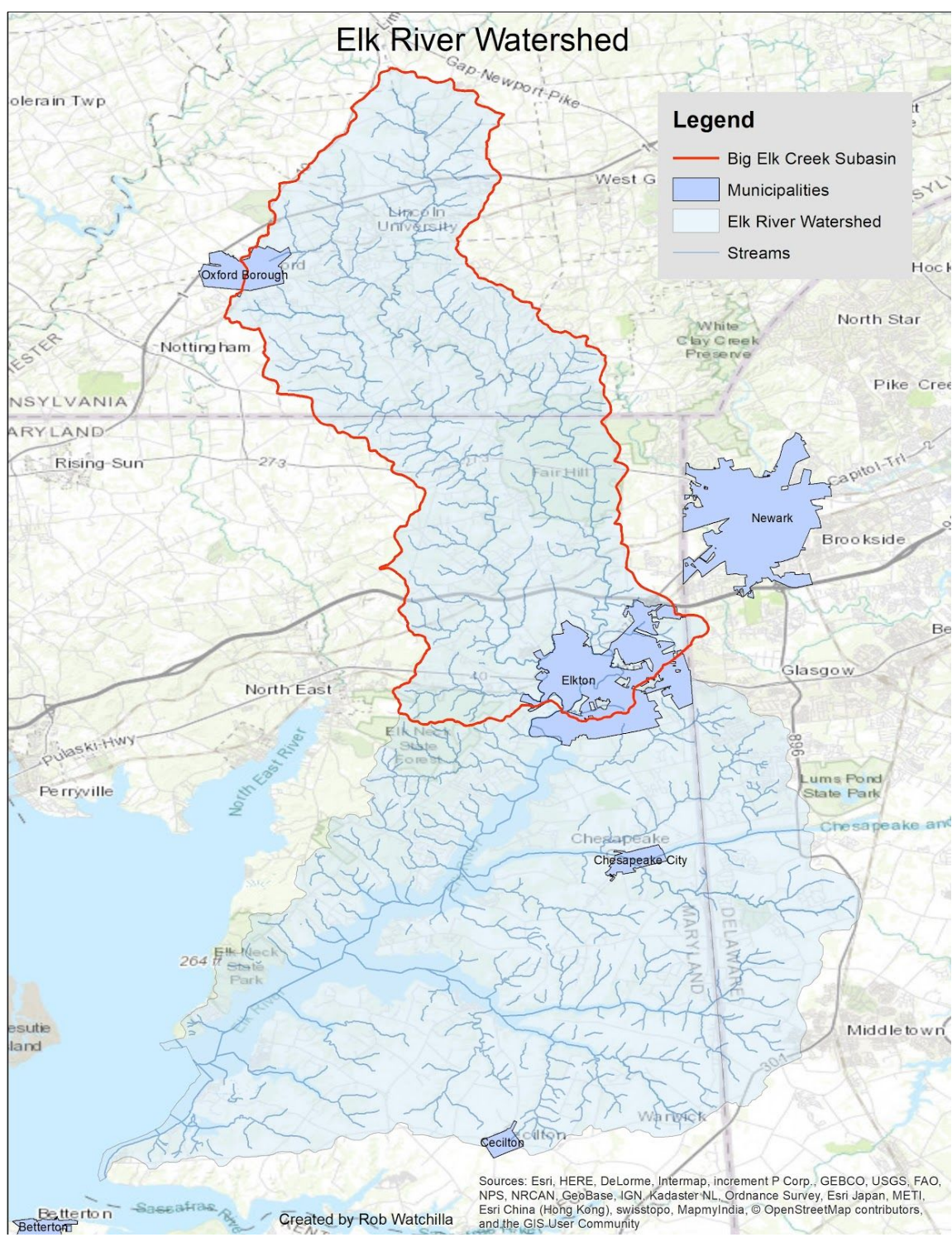
References

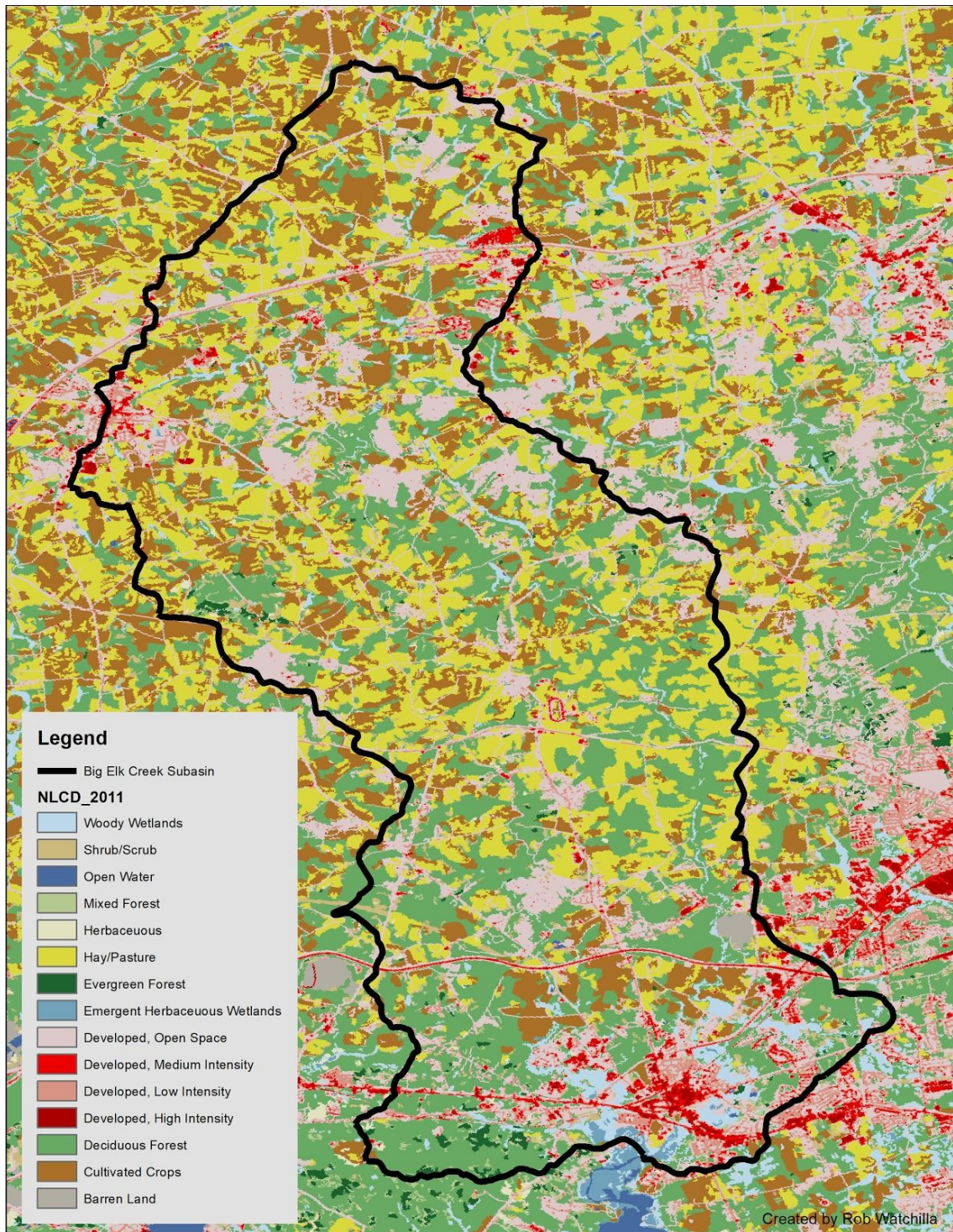
Section 1: Background/History

The Elk River is a tidal tributary of the Chesapeake Bay. It extends over 15 miles throughout the northern portion of the Delmarva Peninsula, through Cecil County, Maryland and into Chester County, PA. The Elk River has been an entrance to the Chesapeake Bay since the 19th century. It now also serves as the boundaries of the Elk Neck Peninsula. It travels through PA and MD piedmont before it reaches sea level at Elkton. The main nonpoint sources of pollution stem from contamination from non-regulated watershed areas upstream that exchange into the Elk River. Point sources include eleven wastewater treatment plants and regulated storm water run off. The population surrounding the Elk River is expanding. The need for assessment and regulation on withdrawal of water. The majority of land surrounding the elk river in Delaware and Maryland is Agriculture.

In 2014 the Elk & North East Rivers Watershed Association was established. They are putting forth great efforts to protect the Elk River. They have organized clean up days and have shown their dedication to encouraging responsible and environmental friendly recreation around the Elk River.

The Big Elk Creek Watershed also includes Fair Hill Natural Resources Management Area in Cecil County, Maryland. This encompasses over 5,500 acres of mostly undeveloped land. This property was once owned by the Dupont family until the State of Maryland purchased the property.





Land Use Land Cover of the Big Elk Creek Subbasin

Section 2: Mission Statement and Goals

Mission Statement

The goal of Becci is to reduce the risks of flooding, improve water quality from the effects of human development and agricultural runoff, and to promote a healthier habitat for all living creatures within the Elk Creek Watershed by 2028.

Section 3: Current Regulation

Code of Maryland Regulations 26.08.02.08

- Designated use of the Big Elk Creek Watershed are Use IP, recreation contact, protection of aquatic life, and potable water supply

Chester County PA Initiative Programs

- Pennsylvania Growing Greener Grants: \$80,000 was awarded to the Elks Creeks Watershed Association to develop an outdoor classroom on Oxford Area School District property on an unnamed tributary to Little Elk Creek. Included implementation of BMPs for erosion control and streambank stabilization, curriculum development, and field days.
- Chesapeake Bay Small Watershed Grants Program: \$6,760 was awarded to Brandywine Conservancy to assist the Elks Creek Watershed Association to educate landowners about conservation practices, restore riparian buffers, and encourage adoption of ordinances supportive of sustainable development.

Problem 1: Potential loss of ground water recharge

The Big Elk Creek Watershed is set to increase in population by 20% between now and 2020. More rural development with subdivisions being built is slowly changing the landscape of the watershed. The groundwater recharge is being impacted by human activities such as developments or paving that contribute to topsoil loss. The area is also surrounded by agriculture which uses groundwater for irrigation and can cause a potential problems to this watershed.

Goals for Problem 1: Balance of water budget for water entering and leaving the Big Elk Creek.

Regulations on upstream watersheds that flow into the Big Elk Creek.

Problem 2: High nitrogen and phosphorus levels due to the high density of farms and major roads within the watershed.

The Big Elk Creek Watershed contains many farms in both Chester County (PA) and Cecil County (MD). Animal waste and chemical fertilizer runoff from these farms is a major problem within the watershed since they cause high nitrogen and phosphorus levels in the water. The Big Elk Creek Watershed is a sub watershed of the much larger Chesapeake Bay watershed and according to the Chesapeake Bay Foundation “The largest source of pollution to the Bay comes from agricultural runoff, which contributes roughly 40 percent of nitrogen and 50 percent of phosphorus entering the Chesapeake Bay” (Chesapeake Bay Foundation). Being a sub watershed, the Big Elk Creek region must follow the regulations made by the Environmental Protection Agency (EPA) for the Chesapeake Bay. The EPA has very stringent regulations for the Chesapeake Bay since health of the Chesapeake Bay has serious economic impacts to the Mid-Atlantic. With potential economic impacts the EPA has implemented Total Maximum Daily Load (TMDL) requirements which limits the amount of Nitrogen and Phosphorus that can be discharged to in the water. Also, TMDL “is designed to ensure that by 2025 all practices necessary to fully restore the Bay and its tidal waters are in place, with at least 60 percent of the actions taken by 2017” (Chesapeake Bay TMDL Executive Summary). The Big Elk Creek Watershed contains high levels of nitrogen as shown in Figure E-S-2 (Chesapeake Bay TMDL Executive Summary).

High nitrogen and phosphorus levels can also be found in stormwater runoff from roads and any impervious surfaces within the watershed. Within the Big Elk Creek watershed there are major roads such as I-95, U.S. Route 40 and U.S. Route 1 that have major impacts on the watershed. These roads create significant runoff that runs across farms where the high levels of nitrogen exist and then the water continues into the streams and rivers.



Source: <https://www.usda.gov/media/blog/2013/04/25/water-quality-index-agricultural-runoff-streamlined-and-accessible>

Goals for Problem 2:

Eliminate the excessive amounts of nitrogen and phosphorus from entering the watershed by creating land buffers between the farmland and drainage ditches next to roads. Plant grasses and plants that absorb contaminants in the drainage areas to prevent contaminants from reaching major waterways. In areas with major roads create bioswales in the median of the road or next to the road.

Problem 3: Fecal Matter and Bacteria contaminants in waterways

With the numerous farms within the Big Elk Creek Watershed the risk of bacteria's reaching the waterways is high due to many farm animals within the region. Runoff from rain washes manure from these animals into the streams which causes bacteria, pathogens and parasites to travel far distances. Several pathogens such as E. coli, listeria, salmonella and giardia come from animal manure and contaminant our streams. Also, the high density of deer and other wild animals in the Big Elk Creek watershed contributes even further to the water contaminations with the animals producing even more fecal matter. These pathogens in the water can make humans and other animals sick if the water is not treated.

Other sources of bacteria and pathogens in the waterways can be from leaking septic tanks from houses or leaking municipal sewer lines. The material contained within these tanks and pipelines can seep into the groundwater and eventually to streams and increase the bacteria levels. The population within the Big Elk Creek Watershed is increasing and the number of septic tanks is also increasing which is causing issues.



Source:

https://www.google.com/search?biw=1366&bih=654&tbm=isch&sa=1&ei=w7bEWpOEO4SD5wK7wIXIBA&q=cows+farm&oq=cows+farm&gs_l=psy-ab.3..0l6j0i30k1j0i5i30k1l3.15216.15884.0.16214.4.4.0.0.0.128.266.2j1.3.0....0...1c.1.64.psy-ab..1.3.266....0.JhEZOORgdhQ#imgdii=LqPsNeHOegpYUM:&imgcr=K9gHzvoNsCpnMM

Goals for Problem 3:

Use TMDL requirements to reduce the amount of bacteria and pathogens that enter the waterways from fecal matter. Most of the bacteria and pathogens are from cow farms and therefore these farms should be watched closely for excessive amounts of bacteria. Septic tank leaks should be monitored for their effects on the watershed health. Limiting the overall bacteria and pathogens that enter the waterways will improve the health of animals, humans and the environment.

References

- N.A. *Prioritizing Sites for Wetland Restoration, Mitigation, and Preservation in Maryland*. Maryland Department of the Environment. 2006.
- Chester County Water Resources Authority. Chester County Planning Commission. Camp Dresser and Mckee. Gaadt Perspectives, LLC. *Elk Creek Watershed Action Plan*. Chester County, Pennsylvania Water Resources Compendium. 2002
- http://www.mde.maryland.gov/programs/Water/TMDL/ApprovedFinalTMDLs/Documents/Elk_CanadD_Canal_PCB_TMDL_fa.pdf
- <https://www.elkandnortheastrivers.org/north-east-isles-living-shoreline-project>
- "Nitrogen & Phosphorus." *Chesapeake Bay Foundation*, 10 July 2013, www.cbf.org/issues/agriculture/nitrogen-phosphorus.html.