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# Damon Creek Watershed

Department for Environmental Protection - Division of Water

In the 1960s, government officials started to realize how polluted streams, rivers and lakes of the United States had become. In 1972, Congress passed laws, known as **The Clean Water Act (CWA)**, to protect surface water. The goal of the CWA is for all waters in the U.S. to be safe for swimming, fishing and drinking (called **designated uses**).

Everyone relies on local water sources for water to drink. People pay water treatment plants to withdraw and treat water with chemicals or other processes to make it safe for drinking. The dirtier the water, the more expensive it is to clean the water, which makes drinking water more expensive. The cleanliness of water is also referred to as **water quality**.

Everyone affects water quality because everyone lives in a watershed. A **watershed** is an area of land where runoff flows to a common stream. When streams come together, the **two streams' watersheds combine to make a larger watershed**. The **Damon Creek Watershed** (see map on right, top) is a small watershed within a much larger watershed called the Tennessee River Basin.

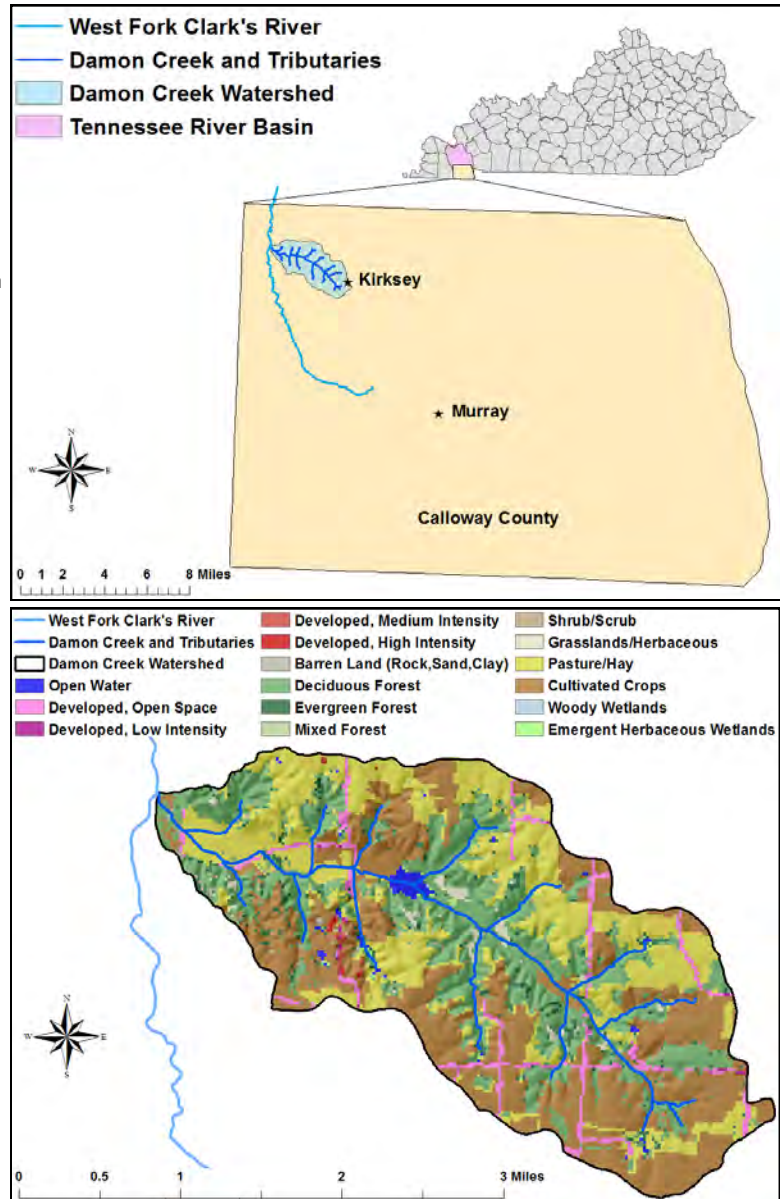
There are two types of pollution that can affect a watershed: **point sources** and **non-point sources**. Point sources are any distinct points from which pollutants are or may be discharged. Examples include any pipe, ditch, channel, tunnel, well or concentrated animal feeding operation. Nonpoint sources are pollutants originating from the land surface that have no well-defined source. The pollutants are generally carried off the land by storm water.

**Land cover** is the best way to understand how humans may potentially pollute the watershed in which they live. Cities and towns tend to have more point sources due to the number of facilities required to clean the water used in households and businesses, and may also have an increase in nonpoint sources due to impervious surfaces such as roads, parking lots and sidewalks. Rural areas tend to have more nonpoint source pollution associated with agriculture. Animal waste, fertilizers, pesticides and loose soil, which is exposed when trees are cut down, may enter the stream during rain events.

The map on the bottom of this page shows the land cover for the **Damon Creek Water-**

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shed. Much of the watershed is brown, demonstrating that the major land cover is cultivated crops. However, green and yellow also dominate the land cover map, demonstrating that deciduous forest and pasture/hay are also major features of the landscape.



## The Clean Water Act, Impaired Waters and TMDLs

The Clean Water Act (CWA) requires states to submit a report to congress, called the **305 (b) list**, which reports the water quality of streams, rivers and lakes within the state that have been assessed. To prepare this report, the Kentucky Division of Water (DOW) identifies the **designated uses** of a waterbody and then assesses the waterbody to see if the water is clean enough to meet these uses. If the stream is not clean enough to meet its uses, the stream is found to be impaired.

Examples of designated uses include:

- **Aquatic Habitat** - water quality promotes a healthy population of plants and animals that live in the water.
- **Primary Contact Recreation** - water is safe for human swimming.

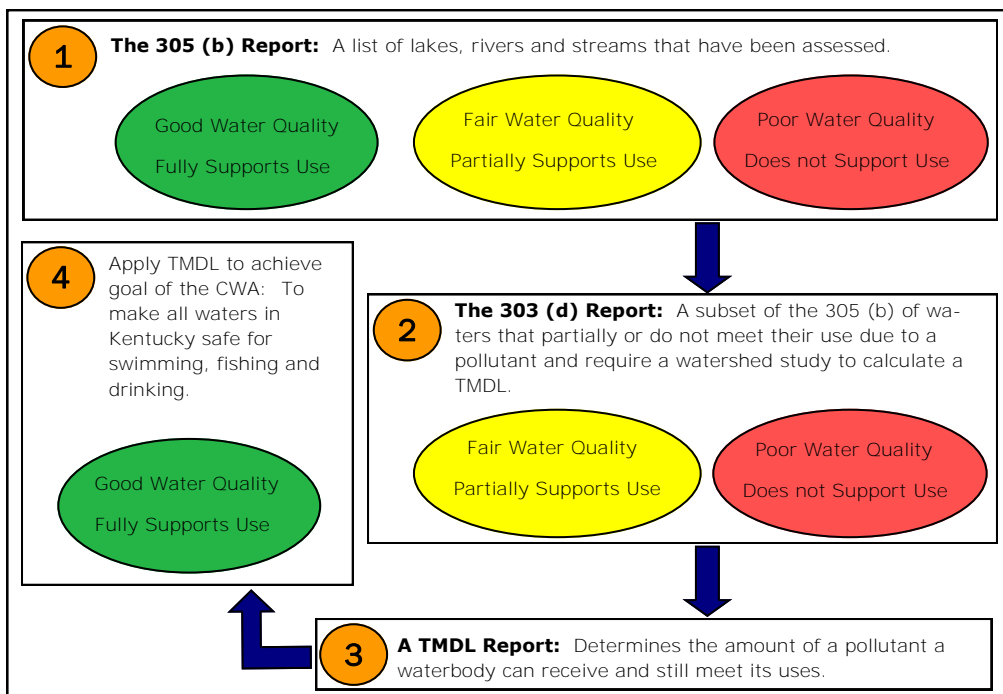
Another requirement of the CWA is the **303 (d) list of impaired waters**. This report lists all of the assessed waters from the 305 (b) list that partially support or do not support their uses and identifies the impairment as being caused by a **pollutant**, even though impairments can result from pollution or pollutants. **Pollution** is a general term that refers to something that causes instability, disorder, harm or discomfort to an ecosystem and can include removing habitat from a streambank to litter-

ing. **Pollutants** are measureable substances that contribute to pollution that makes the water harmful or unsuitable for a specific purpose; examples include chemicals or waste products.

Only impairments caused by a pollutant can be placed on the 303 (d) list since waters on the 303 (d) list require a pollutant load reduction plan, usually in the form of a **Total Maximum Daily Load (TMDL)**. A TMDL calculation is the total amount of pollutant(s) a waterbody can receive and still meet its designated use(s). A TMDL can be **thought of as a watershed diet; the watershed's intake of a pollutant must be reduced by a certain percentage in order for the watershed to be healthy once again.**

Upon assessment, it was determined that river miles 0 to 1.8 of Damon Creek do **not support** the Primary Contact Recreation Use and are therefore highlighted **red** (see map on Page 3).

For a stream to be listed as impaired for Primary Contact Recreation, *E. coli* concentrations exceeded the level considered safe for swimming at least 20 percent of the time when the assessment was completed. Elevated *E. coli* concentrations indicate an increased risk of gastrointestinal illness if the water is swallowed or infection if contact is made with an open sore or wound.



Since **Damon Creek** and its tributaries do not support some of their designated uses, and the cause of the impairment was identified as a pollutant, it is on the 303(d) list of impaired waters. A TMDL for *E. coli* has been developed for this segment. Since its development, five failing septic systems have been re-paired/replaced and a community waste treatment lagoon that can accept water from 40 households has been constructed.

## Damon Creek Watershed Study

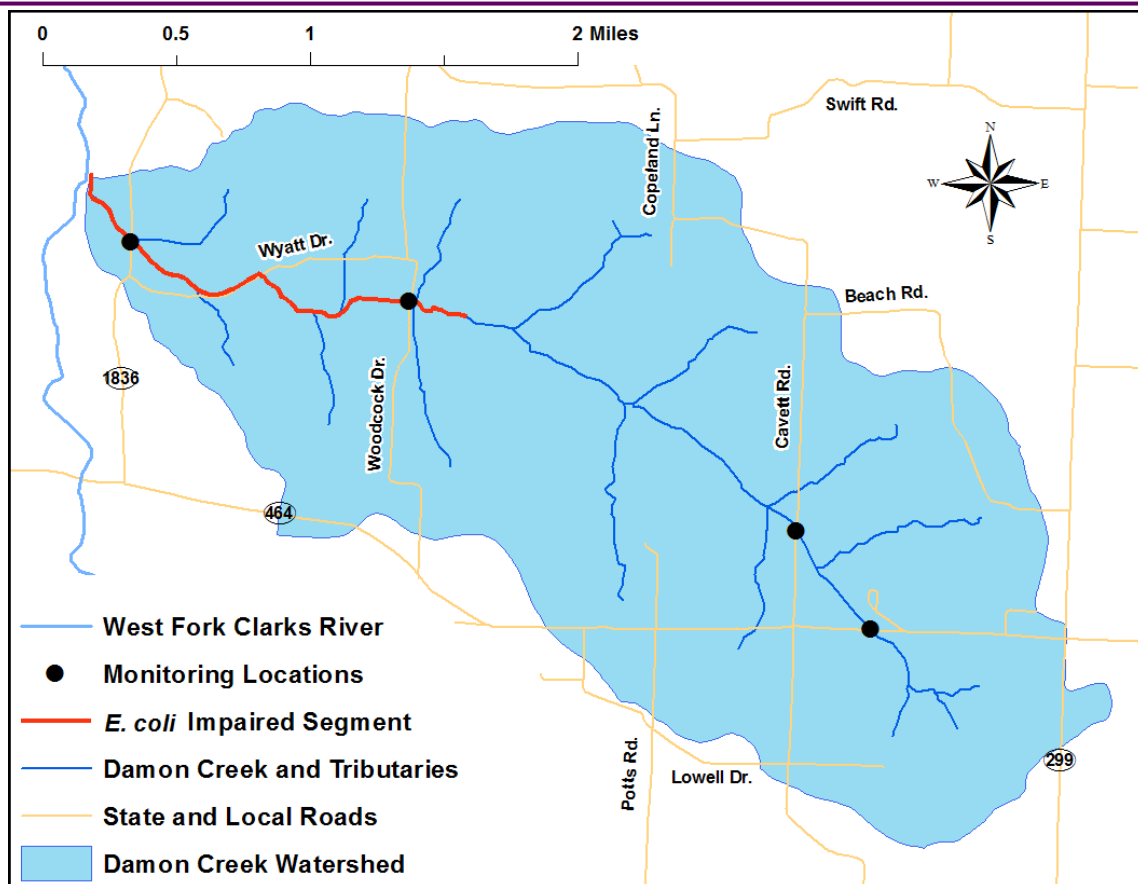
In addition, a large scale animal feeding operation that was suspected of contributing to the pathogen impairment has been shut down. These types of improvements to the landscape and infrastructure that aim to improve water quality are referred to as **Best Management Practices (BMPs)**. More work is needed to better define the main contributors of nonpoint source pollution so that additional BMPs can be implemented to improve water quality. Therefore, Damon Creek will be studied during May and June of 2015 by the Kentucky DOW, TMDL Section.

DOW biologists will sample four sites throughout the Damon Creek watershed five times during May and June at the locations shown in the map below. At each site the following will be measured or collected:

- Dissolved Oxygen
- Specific Conductivity
- *E. coli*

These terms are defined on the next page.

Beginning in March of 2015, the Calloway County Conservation District will be employing a watershed coordinator that will be working on this project. This employee will be assisting with sample collection and watershed plan development, and coordinating the outreach activities associated with this project. This will include the formation of a local watershed team to provide local advice on the project. This watershed team will likely meet every other month and will be kept up to date with the project. This watershed team will be responsible for helping to select strategies to improve water quality in Damon Creek. If you are interested in becoming a member of this team, please contact the Calloway County Conservation District at 270-767-0491. The watershed coordinator will also be directing all educational activities associated with this project. If there is a particular group you would like the watershed coordinator to speak with, please contact the Calloway County Conservation District at 270-767-0491.



Each measurement made or sample collected is considered an indicator of **Water Quality**. These indicators demonstrate how pollution entering the stream impacts the overall health of the **Damon Creek Watershed**. Below, indicators of watershed health that DOW biologists will measure or collect are defined.

## **Indicators of Water Quality**



***E. coli***: A type of bacteria that lives in the intestinal tract of humans and other warm-blooded animals. The higher the amount of bacteria in the water, the higher the chance of getting sick when recreating in that water.



**Dissolved Oxygen**: The concentration of oxygen dissolved in water that is readily available to fish and other aquatic organisms.



**Specific Conductivity**: A measure of the ability of water to conduct an electrical current, which is used for approximating the amount of dissolved substances in water. When specific conductivity is elevated above natural levels, it may negatively impact fish and aquatic bugs.

## **What can you expect?**

- Once monitoring is complete in 2015, **DOW will distribute an informal "health report" of the Damon Creek watershed** to share results of the study.
- For the next four years (2015—2018), the watershed coordinator will partner with the Four Rivers Basin coordinator and the Kentucky DOW to develop a watershed plan for Damon Creek. This watershed plan will identify water quality issues with bacteria contamination, i.e. locations of the worst areas of bacterial contamination and the potential sources of bacteria. This plan will also identify strategies that could be taken to reduce bacteria concentrations in Damon Creek.
- Implementation of these strategies will likely begin in 2019, and may extend for several years. Implementation of these strategies will be voluntary, and the watershed coordinator will be actively looking for volunteers starting in 2017-2018 so grant funds for implementation can be identified and requested. Public participation and input is requested throughout the project and can be accomplished by participating in the watershed team or contacting the watershed coordinator directly at 270-753-5151.
- The goal of this project is to collect enough water quality data to accurately identify the sources of bacteria in Damon Creek and then implement strategies that will reduce bacterial contamination from those sources. By conducting this project, the hope is to implement enough strategies to protect Damon Creek so that it fully supports primary contact recreation and is a safe, healthy stream for generations to come.
- To stay informed, **LIKE 'Kentucky Watershed Health Reports' on Facebook.**

