










What are we studying in your watershed?

Indicators of Water Quality

-  **Dissolved Oxygen:** The concentration of oxygen dissolved in water that is readily available to fish and other aquatic organisms.
-  **Sedimentation:** Soil, sand, and minerals washed from land or stream banks into water, usually after rain. Sediment can be suspended in the water column, making the water turbid, or it can deposit on the stream bottom when water flow slows and loses energy.
-  **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.
-  **Nutrient Enrichment:** Although natural levels of nutrients are part of a healthy watershed, excess nutrients can cause water quality problems. Human activities that can contribute nutrients include: municipal sewage treatment plants, industrial outflows, failing septic systems, commercial fertilizers, and animal waste.

Indicators of Biological Health

-  **Habitat:** Stream habitat is assessed by scoring 10 habitat signs, which are both living and nonliving parts of the surroundings that support an organism, population, or community.
-  **Riparian Zone:** A component of total habitat defined by the land adjacent to a stream with distinct soil types and plant communities, which aid in absorbing water, shading the stream, and adding sources of food and cover.
-  **Available Cover:** A component of total habitat, which looks at the quantity and variety of structures in the creek that provide fish and aquatic bugs a place to hide, feed, reproduce and raise young. Examples include cobble and boulders, fallen trees, logs, branches, root mats, undercut banks and aquatic vegetation.
-  **Aquatic Macroinvertebrates (bugs):** An animal without a backbone, large enough to be seen with the naked eye. They are often the immature forms of insects that live on land as adults and are an important food source for fish. Different species prefer different habitats, and some are more tolerant of pollution than others.
-  **Algae:** A simple, rootless plant that is an important source of food and produces oxygen via photosynthesis. However, when excess nutrients enter the stream and there is enough sunlight, algae can bloom. During a bloom, algae can lower the dissolved oxygen as they die and decay, which negatively affects fish and aquatic bugs.

What can you expect?

- Over the next **year**, DOW biologists will collect monthly water quality samples at each sampling location in the watershed. Biological samples will be collected once at each location between March of 2023 and February of 2024.
- Within the next **three years**, DOW will distribute an informal “health report” of the Upper Salt River watershed to share results of the study and explain ways the community can help improve water quality.
- Within the next **five years**, a Watershed Plan will be written for the Upper Salt River watershed. It will outline where non-point source is an issue in the watershed, and what changes to land management would reduce those sources of pollution.
- Once a Watershed Plan is complete, the Upper Salt River watershed becomes eligible for grant funding to implement the actions identified in the plan.

Visit us at <https://eec.ky.gov/Environmental-Protection/Water/Pages/default.aspx>

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Upper Salt River

Water Quality Monitoring Informational Guide

Kentucky Division of Water

Published on 5/1/2023

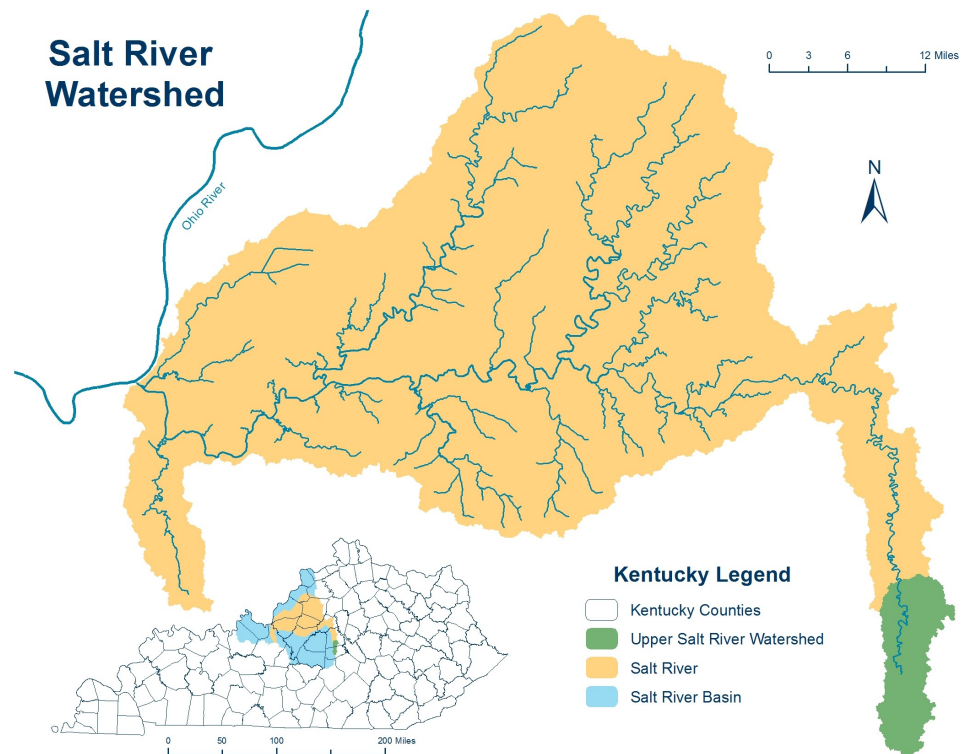
How does the Clean Water Act protect me?

Kentucky's streams, wetlands, and lakes are vital to the health and welfare of our communities and our natural ecosystems. They provide habitat for aquatic animals and plants, are a critical part of our local water cycle, and are an important part of Kentucky's economy, providing recreational activities, hydroelectric power, and commercial opportunities.

In addition, we all rely on our local water sources for clean drinking water. We pay our water treatment plants to withdraw and treat local water to make it safe. The dirtier the water, the more expensive it is to clean, which makes our drinking water more expensive. The cleanliness of water is also referred to as **water quality**.

There are two types of pollution that affect water quality: **point sources** and **nonpoint 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.

In 1972, Congress passed laws known as **The Clean Water Act** to protect our streams and lakes from pollution and make



them safe for swimming, fishing, and drinking.

Section 319(h) of the Clean Water Act provides money for communities that would like to reduce the nonpoint sources of pollution in their watershed. The Kentucky Division of Water provides this funding to communities throughout Kentucky through their 319 program. In 2022, the City of Harrodsburg approached the Kentucky Division of Water about interest in developing a Watershed Plan for the local Salt River watershed. The Division of Water's Nonpoint Source Monitoring Program has begun to collect updated water quality data throughout the Upper Salt River in support of this watershed planning effort.

What do we know about the Upper Salt River watershed?

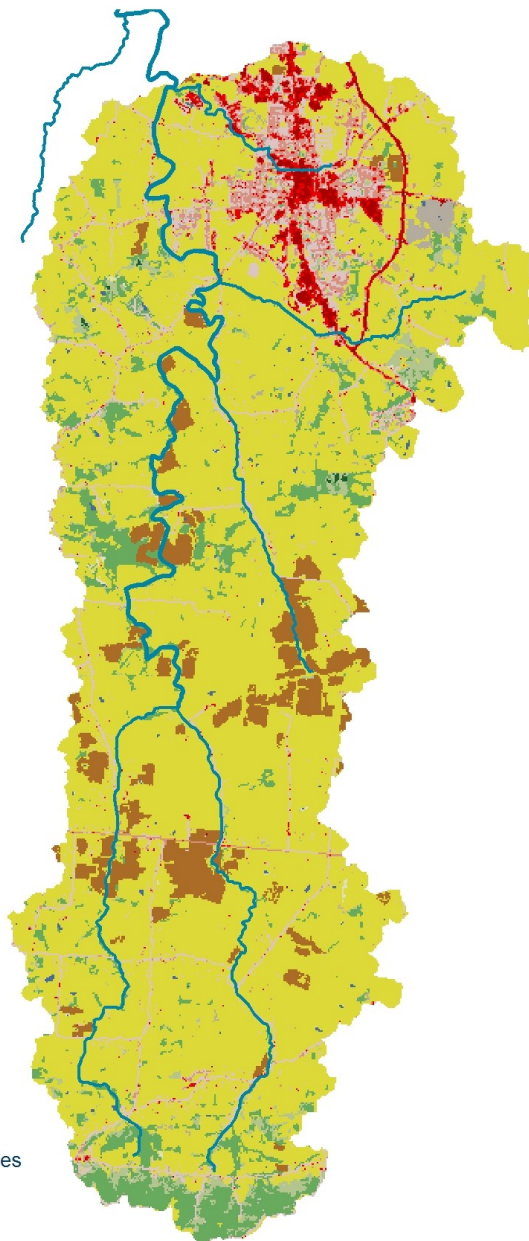
A **watershed** is an area of land where water runoff flows to a common stream. When streams come together, the two streams' watersheds combine to make a larger watershed. We all affect our water quality because everyone lives in a watershed. The Salt River is a tributary to the Ohio River and a major river basin within Kentucky (see map on page 1).

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 businesses and industries 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 or land is cleared, may enter the stream during rain events.

The Upper Salt River headwaters within the scope of this project span an area of 57.54 mi² and is dominated by agricultural land use with urban development from the City of Harrodsburg as well as a significant groundwater presence. Dry Branch, Quirks Run, and Town Creek are tributaries to the Salt River mainstem within this study area.

Two segments of the Salt River mainstem within the study area have been assessed for warm water aquatic habitat (WAH) (see map on page 3). Salt River 111.75 to 135.3 was assessed as non-support of WAH due to nutrient enrichment in 2011. Salt River 135.3 to 142.65 was assessed as full support of WAH in 2005.

Land Use in the Upper Salt River Watershed



How do we study your watershed?

The Kentucky Division of Water manages federal grant funding in an effort to reduce nonpoint source pollution through the 319 Grant Program. The 319 Grant Program provides funding for watershed planning projects with the goals of restoring streams impacted by nonpoint source pollution and lessening nonpoint source pollution through the installation of best management practices (BMPs) for land use. Examples of BMPs include rain gardens, constructed wetlands, detention pond retrofits, infiltration devices, and permeable pavement.

The first step for any community that participates in the 319 program is to create a **Watershed Plan**, which is a plan that will outline the sources of pollution in a watershed and the best ways to reduce that pollution. Studying water quality in the local streams and how land in the watershed is being used are two of the most important parts of writing a Watershed Plan. Before writing begins, streams are sampled to identify the location of nonpoint sources of pollution. Sampling locations are spread throughout the watershed. Typically, sites will be at the mouth of a tributary in order to capture the water quality in that small piece of the watershed. The map on this page shows the locations of sampling sites of this study.

Fourteen sampling sites in the Upper Salt River watershed are being sampled at least once a month from March 2023 through February 2024 for indicators of water quality (described on back page). In addition, a single evaluation at each sites for indicators of biological health will be performed (described on back page).

Based on the findings of this study, a Watershed Plan will be developed to guide decisions about how to best improve watershed health. When the Watershed Plan is complete, anyone may apply for funding to help implement the recommendations of the Watershed Plan. After a period when BMPs are implemented, a follow-up study may be conducted in order to assess the effectiveness of the Watershed Plan and identify areas in need of further improvement.

Learn more about the 319 Grant Program by visiting our webpage or contacting the Nonpoint Source & Basin Team at BasinCoordination@ky.gov



The Division of Water may also use the results of this study to evaluate if streams in this area are meeting recreational water quality standards (based on *E. coli* levels) and provide adequate aquatic habitat (based on indicators of water quality and biological health). If parts of the watershed do not meet Kentucky's water quality standards, they may require a pollutant load reduction plan. In some cases, the Watershed Plan may be able to serve as a pollutant load reduction plan.

