State of Ohio Environmental Protection Agency

Fact Sheet

February 2010

# White Oak Creek Watershed TMDL Report

***What are the essential facts?***

- *Ohio EPA studied the White Oak Creek watershed and found water quality problems at some of the locations measured.*
- *The watershed can make progress towards restoration with practical, economical actions.*
- *Improving the streams depends on the participation of the watershed's residents.*

***What is the significance of this report?*** *The White Oak Creek Watershed TMDL Report is a tool to help improve and maintain water quality in the watershed.*

***What is a watershed?*** *A watershed is the land area from which surface runoff drains into a specific body of water.*

**Where is the White Oak Creek watershed?**

The White Oak Creek watershed is located in southwest Ohio in Brown and Highland counties. It is a direct tributary of the Ohio River, flowing south to join with the Ohio River near Higginsport. The watershed drains 234 square miles.

An estimated 43,000 citizens reside in the White Oak Creek watershed. The larger communities in the watershed include Mount Orab, Georgetown, Sardinia and Mowrystown.

Overall, the land use in the White Oak Creek watershed is 67 percent row crop and pasture land, 26 percent forest and 7 percent developed land. Most of the soils in the watershed are highly erodible when disturbed and easily compacted by heavy equipment. Soils in the lower portion of the watershed drain more easily.

The Village of Mt. Orab draws its drinking water from Sterling Run, which was identified by Ohio EPA in 2008 as being impaired by atrazine.

White Oak Creek is home to one of Ohio's few populations of the bigeye shiner, a state threatened fish species. Based on 2006 sampling, the population appears to be stable in the watershed.

To focus its work, Ohio EPA divided the watershed into two areas: the headwaters of White Oak Creek and Sterling Run – White Oak Creek (see map).

*White Oak Creek at Miller Ring Road*

**How does Ohio EPA measure water quality?**

Ohio is one of the few states that measures the health of its streams by examining the number and types of fish and aquatic insects in the water. An abundance of fish and insects that tolerate pollution is an indicator of an unhealthy stream. A large number of insects and fish that are sensitive to pollution indicate a healthy stream.

In 2006, comprehensive biological, chemical, and physical data were collected by Ohio EPA scientists in the White Oak Creek watershed.

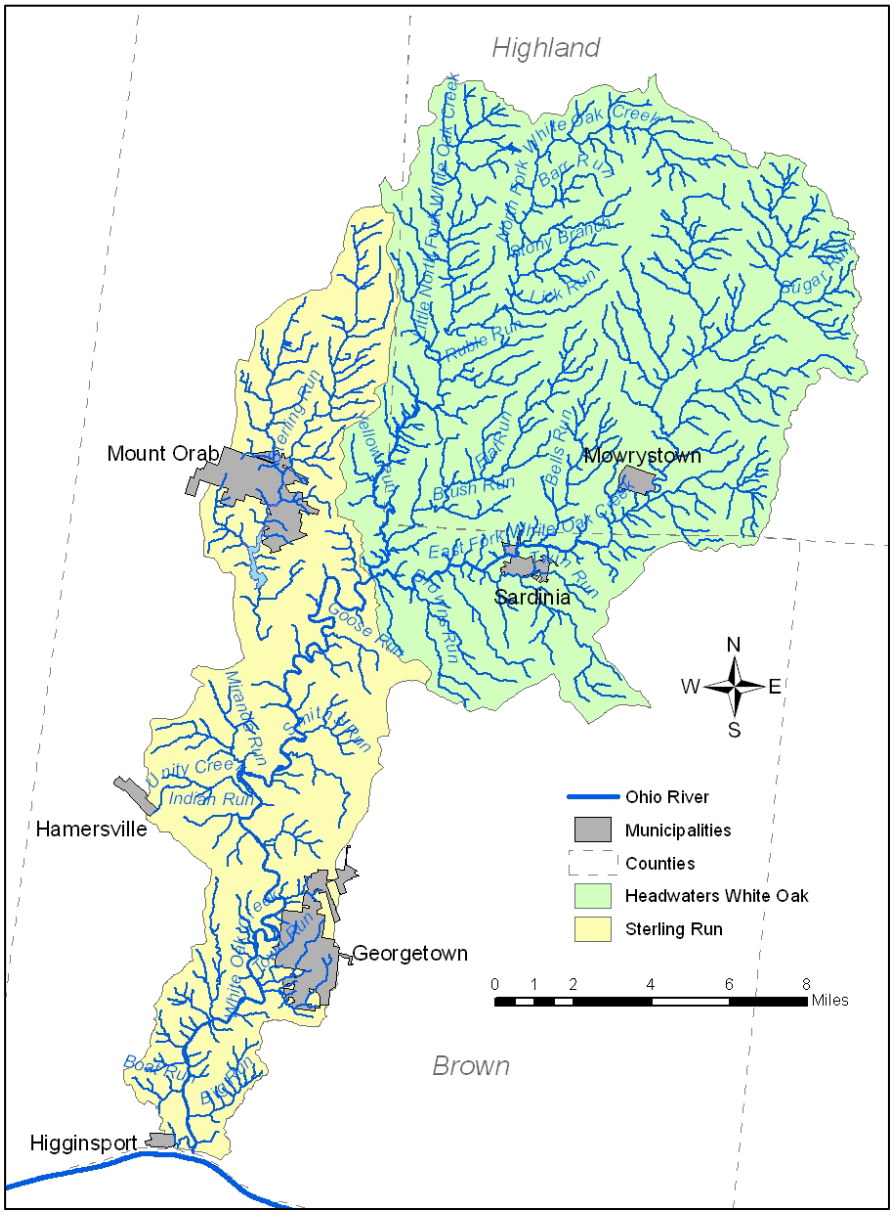
The watershed's conditions were compared with state water quality goals to determine which stream segments are impaired, and how much needs to be done to restore good stream habitat and water quality.

**What is the condition of the White Oak Creek watershed?**

Ohio EPA's study of 47 sites on 18 streams in the watershed showed that although biological problems are found throughout the watershed, many unproblematic areas remain. About 59 percent of the sites fully meet the goals associated with healthy warmwater habitat streams; 18 percent of sites partially meet the goals; and 23 percent of sites do not meet goals.

Most sites on the White Oak Creek and its tributaries that did not meet or partially met water quality goals were impaired because of physical changes to the land and nutrient additions.

Physical changes such as stream channelization and loss of floodplains and streamside vegetation have degraded the creeks. When streams are widened and deepened for agricultural drainage, they contribute excess soil to the stream, which destroys habitat for fish and other aquatic life.




When trees along the stream banks are removed, the lack of shade allows the water temperature to increase, which decreases the amount of dissolved oxygen available for aquatic organisms. This is worsened by agricultural runoff and untreated sewage flowing from failing home septic systems and small communities without any wastewater collection or treatment.

Lack of water in small headwater streams, especially in the summer, makes it hard for pollutants to be assimilated by the natural stream ecology. Agricultural drainage practices such as routine ditch clean-outs change both quantity and quality of water flowing to downstream reaches, making it difficult to support good aquatic life communities.

Excessive nutrients entering streams from agricultural and urban runoff contribute to the growth of algae in streams, particularly where streamside vegetation is sparse. When the algae die, they break down and use up dissolved oxygen that insects and fish need to live.

**How will water quality get better?**

The White Oak Creek watershed is included on Ohio's list of impaired waters. Under the Clean Water Act, a cleanup plan is required for each impaired watershed. This cleanup plan, known as a total maximum daily load (TMDL) report, calculates the maximum amount of pollutants a water body can receive and still meet water quality standards (goals). A TMDL report specifies how much pollution must be reduced from various sources and recommends specific actions to achieve these reductions.

The White Oak Creek watershed TMDL report provides specific numeric goals for reducing pollutants, including pathogens, ammonia, total phosphorus, total suspended sediments, nitrate + nitrite and atrazine.

Ohio EPA can address some of the White Oak Creek problems through regulatory actions, such as permits for wastewater and storm water dischargers. Other actions, such as committing to proper nutrient management and reduced home sewage system failures, will depend on local residents.

**What actions are needed to improve water quality?**

Because there are many reasons why streams in the White Oak Creek watershed fail to meet water quality goals, several actions are required to improve the current condition and protect the watershed in the future. The recommendations focus on reducing pollutant loads and/or increasing the capacity of the streams to handle the remaining pollutant loads.

***What are the three most important "fixes" in the watershed?***

- ***Restore a more natural flow to the streams***
  - *Plant trees along stream banks that have no vegetation*
  - *Limit stream channel straightening and allow streams to return to more natural function to better assimilate pollution*
- ***Reduce nutrient contributions to streams***
  - *Develop and apply nutrient management plans*
  - *Plant conservation buffers to reduce agricultural runoff*
  - *Plant winter cover crops to provide manure application sites*
  - *Fence cattle out of streams*
- ***Reduce atrazine contributions to streams***
  - *Apply atrazine only according to label instructions*
  - *Apply atrazine well back from any streams or wetlands*
  - *Install riparian buffers to filter runoff before it enters streams*
  - *Develop and implement an education plan to ensure label instructions are understood*

Re-establishing a more natural flow regime is important for protecting water quality and aquatic biological communities. The basic principles of providing floodplain connectivity, stable stream morphology and watershed hydrology that approximates natural conditions are applicable to all areas of the watershed. Likewise, stream buffers are appropriate for all land use types in the watershed. Other actions include:

- Home sewage treatment system (HSTS) failures should be corrected in rural, urban and developing areas by the county health departments.
- Drinking water sources should be protected by reducing atrazine loading from row crop agriculture. Ensuring on-label application of atrazine is essential. In addition, atrazine should not be applied in the fall, near streams, or before expected rain. A collaborative educational program may assist in ensuring on-label instructions are followed.
- Residential, commercial and other urban areas can reduce overland loading of nutrients by practicing better timing and rate of fertilizer application.
- Nutrient and sediment loading can be reduced by fencing cattle out of streams and managing manure according to Natural Resource Conservation Service recommended practices.

**Who is responsible for taking action?**

Implementation of this report's recommendations will be accomplished by state and local

partners, including the voluntary efforts of landowners.

The White Oak Creek Watershed Partners group was formed in September 2000 and is led by a watershed coordinator out of the Brown County Soil and Water Conservation District.

The group has already executed two 319 grants awarded for the watershed. The first one paid for watershed action plan develop-ment (which has been endorsed), a school water quality monitoring program, septic system repairs/ upgrades, riparian buffers, filter strips and grassed waterways.

The second grant addressed livestock issues with winter feeding pads, structures, and lanes. It also paid for septic system repairs (causing development of county-wide HSTS plans) and continued the education program. The coordinator remains involved in restoration and preservation activities in the watershed.

**Are any actions already underway?**

In addition to the watershed action plan and grants discussed above, several activities indicate a high interest in restoring and protecting the watershed:

- The Brown County Department of Economic Development prepares the county for growth through planning, infrastructure and program development.
- Watershed activities have included installing storm drain markers; annual stream clean-ups; a high school water monitoring program; a junior high school macroinvertebrate monitoring program; conservation field days; various educational school days; and teachers' workshops.
- A new 319 grant (2009) focuses on reducing atrazine levels in Sterling Run in order to protect the Mt. Orab water supply and improve aquatic life.
- In 2005, the Brown Soil and Water Conservation District performed research about the Clermont soil series, a predominant soil type in the watershed. The project determined that the characteristic most affected by disturbance in Clermont soils was infiltration, the rate at which soil is able to absorb rainfall or irrigation. Logical next steps include additional focus on implementation of agricultural best management practices (BMPs) to improve soil infiltration and providing outreach to watershed land owners and managers for more widespread adoption of appropriate BMPs.

*Tributary to East Fork White Oak Creek at New Market Road*

***Where can I learn more?*** *The Ohio EPA report containing the findings of the watershed survey, as well as general information on TMDLs, water quality standards, 208 planning, permitting and other Ohio EPA programs, is available at http://www.epa.ohio.gov/dsw/Home.aspx.*

*The final TMDL report was approved by U.S. EPA on February 25, 2010. The final report is available at http://www.epa.ohio.gov/dsw/tmdl/index.aspx.*

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