

Kentucky Division of Water
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Phone: 502-564-3410
Website: <http://water.ky.gov/waterquality/Pages/TMDLHealthReports.aspx>

Townsend Creek Watershed Health Report

Department for Environmental Protection - Division of Water

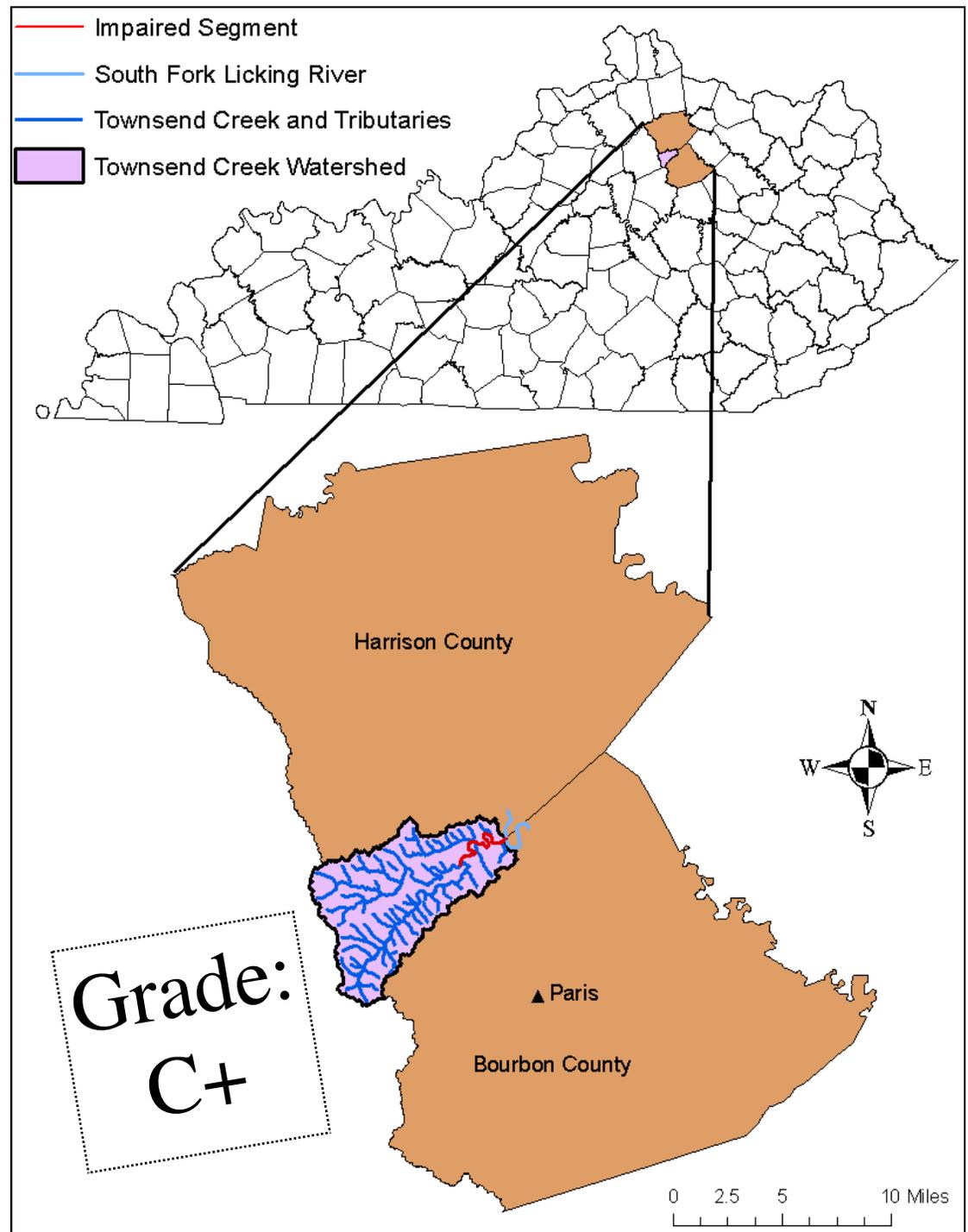
The Kentucky Division of Water (DOW) is the state agency responsible for carrying out the requirements of the Clean Water Act to reach the goal of making all waters in Kentucky safe for swimming and fishing (called **uses**).

DOW has developed this health report to inform the residents of Bourbon and Harrison counties of efforts to examine the health of Townsend Creek and the area of land that drains into Townsend Creek, which is called a **watershed**.

Upon initial evaluation, it was determined that a segment of Townsend Creek (shown in **red** on the map) does not support the swimming use required by the Clean Water Act due to high levels of bacteria. Therefore, this **red** segment of Townsend Creek is considered impaired.

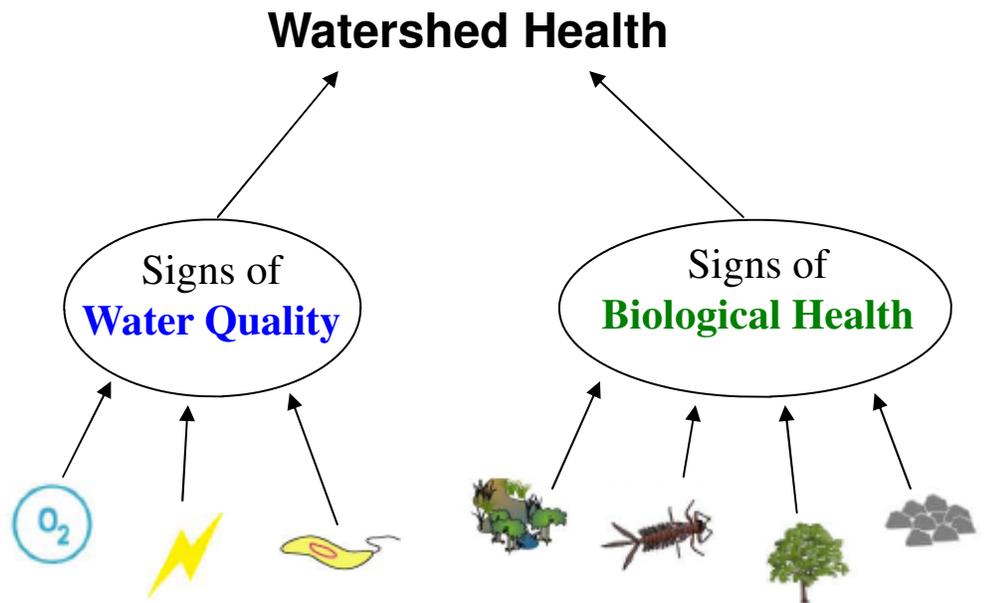
The U.S. Environmental Protection Agency (EPA) requires that states conduct watershed studies on all such impaired waters to calculate the maximum amount of contaminant(s) a creek can receive and still support a healthy watershed. This amount is known as a **Total Maximum Daily Load**, or TMDL.

Following a year-long study by DOW biologists to gather scientific information, DOW has given a "report card grade" of a **C+** to the watershed. This health report explains the signs of health that went into assigning that grade and provides information on how the grade can be improved.



Grading System

1. Data collected were divided into signs of **water quality** or signs of **biological health**.
2. Each sign received a grade, A through F, according to the results of our study, which were compared to health and science requirements and DOW scientific information.
3. The grades from each biological health sign were averaged to achieve a biological health score.
4. Similarly, each sign of water quality was averaged to achieve a water quality score.
5. These two scores were averaged to achieve a **watershed health grade**.



The grades can also be used to compare **sites** or **signs**. For example, one site within a watershed may receive a higher grade than the other sites in that watershed, demonstrating its quality. Or, one sign may receive a higher grade than the other signs, demonstrating that aspect of watershed health is doing better than others.

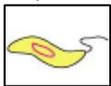
Signs of Water Quality



Dissolved Oxygen: Concentration of oxygen dissolved in water and 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 total dissolved solids content of water. Low specific conductivity is desired, and increasing specific conductivity negatively impacts fish and aquatic bugs.



Fecal Coliform: A type of bacteria that lives in the intestinal tract of man and other warm-blooded animals. For a site to receive an F, the Fecal Coliform concentration was above the level considered safe for swimming 80 to 100 percent of the time.

Signs of Biological Health



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.



Total 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: Land adjacent to a stream that has distinct soil types and plant communities, which aid in absorbing water and shading the stream. To receive an A, the riparian zone must be at least 18 yards wide on each side of the stream.



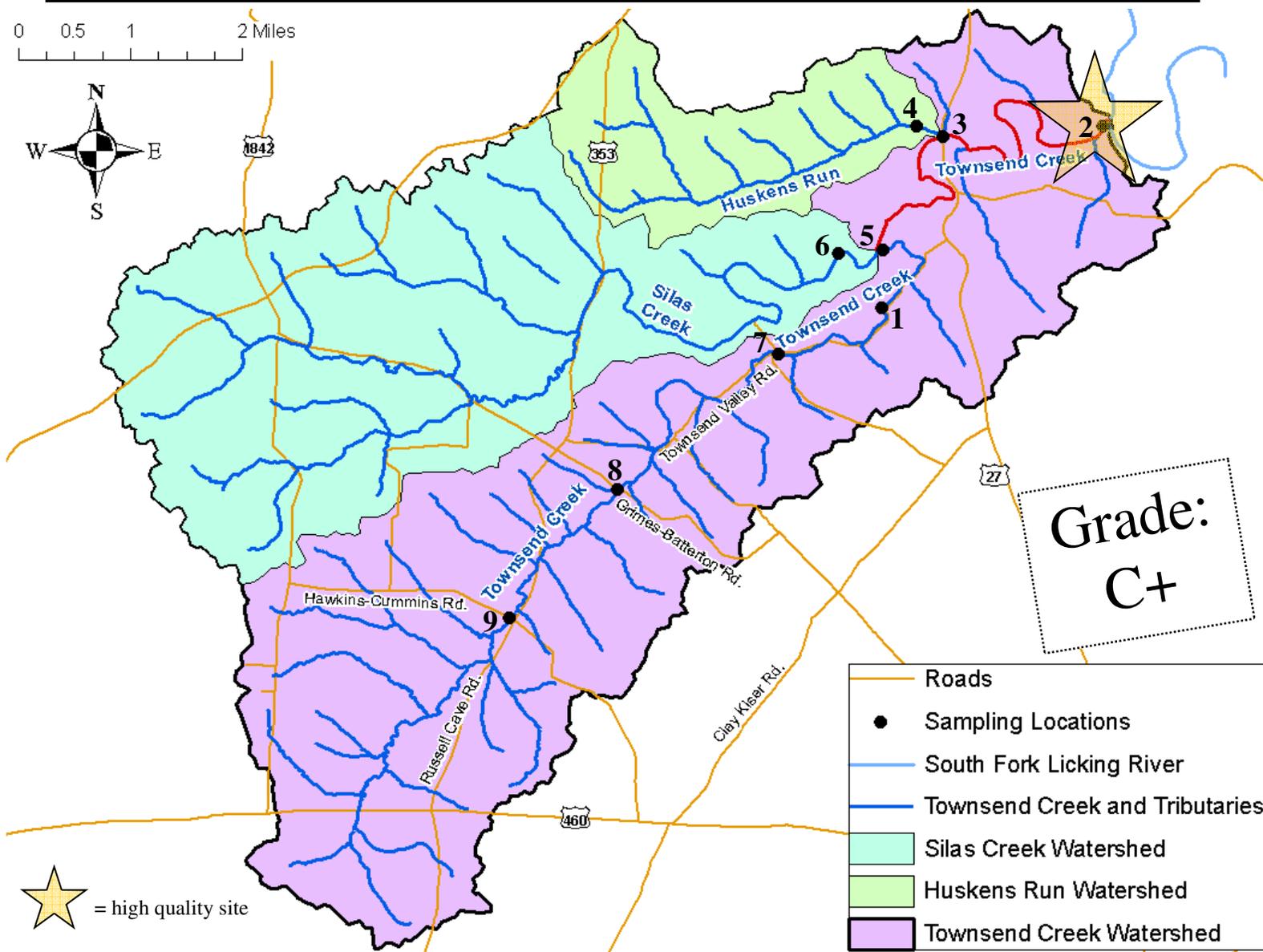
Available Cover: The quantity and variety of structures in the creek that provide a place for aquatic organisms to hide, feed, reproduce and raise young. Examples include different sizes of rocks, fallen trees, logs, branches, root mats, undercut banks and aquatic vegetation.

Farm Facts and Information

- The Agricultural Water Quality Act seeks to protect ground and surface water from pollution that results from agricultural activities.
 - ◊ To learn more about the Act visit the Division of Conservation's website at <http://conservation.ky.gov/Pages/AgricultureWaterQuality.aspx>
- All landowners with 10 or more acres of agricultural activity should have a Water Quality Plan.
 - ◊ To create your plan visit the KY Agricultural Water Quality Planning Tool at <http://warehouse.ca.uky.edu/AQQP2000/index.html>
- KY's Department of Agriculture **free** farm chemical collections are listed at <http://www.kyagr.com/consumer/envsvs/technical/FarmChemicals.htm>
- A list of Best Management Practices can be found at <http://warehouse.ca.uky.edu/AWQP2000.index.html>

Grades by Sampling Site & Sign

Site #	Creek Name								Site Grade
1	Townsend Creek				B	D	D	C	C
 2	Townsend Creek	B	B+	A		A	B	B	B+
3	Townsend Creek	B	B	B		D	F	D	C
4	Huskens Run	B+	C+	C		D	F	D	C-
5	Townsend Creek	C+	B	C					C+
6	Silas Creek	B-	B+	A					B+
7	Townsend Creek	B	B	B		B	C	C	C+
8	Townsend Creek	B	B-	A		D	F	D	D-
9	Townsend Creek	B	B-	C		D	F	F	F+
Sign Grade	Townsend Creek Watershed	B	B	B	B	C-	D	D+	C+



Summary: Not bad, but room for improvement

POSITIVES



Dissolved oxygen (DO) levels were suitable for fish and bugs at all sites throughout the Townsend Creek Watershed, except at site 5, which had DO levels below a suitable concentration 63% of the time.



Specific conductivity most often scored a B, indicating reasonable levels of total dissolved solids. The exception is site 4, which scored a C+, where elevated levels of total dissolved solids may negatively impact bug communities.



Fecal Coliform scored a B, on average, throughout the Townsend Creek Watershed. If a site received an A, it exceeded the level considered safe for swimming 0 - 20% of the time, if it received a B, it exceeded 20 - 40% of the time, and if it received a C, it exceeded 40 - 60% of the time. Fecal Coliform levels that exceed the level considered safe for swimming may cause gastrointestinal illness if the water is swallowed or an infection if contact is made with an open sore or wound.



Site 2 was deemed a high quality site based on its score of a B+, and received As or Bs in all categories, including signs of biological health. This site is located at the most downstream point of Townsend Creek before it joins the South Fork Licking River. Its quality should be maintained and considered a valuable resource of the Townsend Creek Watershed.

GRAY AREA



Aquatic macroinvertebrates (bugs) were only collected at site 1 where they received a B. It is difficult to make a conclusion based on one collection, therefore the bug community status in the Townsend Creek Watershed is undetermined.

NEGATIVES



Total habitat shifted from scoring an A at the most downstream site (site 2) to scoring a D at all upstream sites, with the exception of site 7, which scored a B. This reduced habitat can have negative impacts on the biological health because total habitat is the base of the building blocks for a healthy watershed. When it is lacking, biological health begins to degrade.



The riparian zone width is greatly reduced throughout the Townsend Creek Watershed, with the exception of site 2. When the riparian zone is wide (grade A or B), streams are well shaded, banks are more stable and runoff is filtered before entering the stream. As the riparian zone width decreases, these benefits are reduced.



Available cover is greatly reduced throughout the Townsend Creek Watershed, with the exception of site 2. Not only is available cover an important place for fish and bugs to live, feed, hide from predators and mate, it also provides habitat for beneficial bacteria, an important food source for aquatic bugs.

What can you do?

- Work with the local government and land owners to **protect the areas that are less degraded** and improve land management to minimize further degradation.
- **Trees are the best way to protect and restore water quality and biological health.**
 - ◊ Leave in place or establish vegetation alongside streams to provide natural filters that stabilize stream banks, minimize erosion, regulate water flow, provide shade, retain sediment and absorb excess nutrients.
 - ◊ Plant trees and do not mow within 18 yards of the stream bank.
- **To keep water safe for swimming**, keep animals out of the streams, which will limit the amount of animal waste entering the waterways, and report septic and sewer problems.
- **To improve habitat**, allow fallen trees, logs, leaves, and different sizes of rocks to remain in the stream to create habitat for fish and bugs to use to feed, find refuge and reproduce.
- **Good Land Management Practices**
 - ◊ Keep grass clippings, petroleum products, trash and litter out of storm drains. This material enters the stream directly without treatment.
 - ◊ Service your vehicle regularly to prevent oil and antifreeze leaks and reduce noxious emissions.
 - ◊ Properly dispose of pet waste.
 - ◊ Use chemicals and pesticides according to labels, and fertilizers based on soil test results. Limit uses and store and dispose of properly.
 - ◊ Reduce runoff by installing filter strips, rain barrels or rain gardens.
 - ◊ Properly guard waterways during construction activities.
- Become a certified citizen **volunteer** water quality monitor or establish a program in your local community or watershed.

Where to go for more information

Making changes at home and work

- Bluegrass PRIDE at www.bgpride.org/gallery1.htm

Volunteering

- Watershed Watch in Kentucky at <http://water.ky.gov/wsw/Pages/default.aspx> or contact Joann Palmer at 800-928-0045 or Joann.Palmer@ky.gov

Nearby Watersheds

- Hinkston Creek Watershed Protection Project at <http://www.hinkstoncreek.org/index.html>
- Strodes Creek Conservancy at <http://www.strodescreek.org>
- Friends of Stoner Creek at <http://www.stoner creek.us/>

Grants and Programs

- KY's Nonpoint Source (Runoff) Pollution program at <http://water.ky.gov/nsp/Pages/default.aspx>
 - KY's Natural Resource Conservation Service at <http://www.ky.nrcs.usda.gov/>
 - KY's 319 Grant program at <http://water.ky.gov/Funding/Pages/NonpointSource.aspx> or contact James Roe at 502-564-3410 or James.Roe@ky.gov
- ### Purchasing or planting native trees and plants
- Division of Forestry at <http://forestry.ky.gov/Pages/default.aspx>
 - Kentucky Native Plant Society at http://www.knps.org/plant_resources.html