



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Total Maximum Daily Load Information Sheet

Willow Branch

Water Body ID: 3280

Water Body Segment at a Glance:

County: Newton
Nearby City: Neosho
Length: 2.2 miles
Pollutant 1: Bacteria
Pollutant 2: Metals in sediment
(Cadmium, Lead and Zinc)
Source 1: Rural nonpoint sources
Source 2: Mill tailings



Statewide Map Showing Location of Watershed

Schedule for TMDL development:

TMDL development schedules are subject to change.

The most current schedule for TMDL development is available on the department's website at dnr.mo.gov/env/wpp/tmdl/wpc-tmdl-progress.htm

Description of the Problem

A water body is considered impaired when it fails to meet applicable water quality standards. Water quality standards consist of designated uses, water quality criteria, an antidegradation policy and implementation procedures. Willow Branch is impaired due to exceedances of state water quality criteria that protect aquatic life and whole body contact recreation designated uses.

Designated uses of Willow Branch*

- Warm Water Habitat (WWH)
- Whole Body Contact Recreation Category B (WBC-B)
- Secondary Contact Recreation (SCR)
- Human Health Protection (HHP)
- Irrigation (IRR)
- Livestock and Wildlife Protection (LWP)

*In addition to these specific uses, all waters of the state are protected by the general water quality criteria that are specified in the state's Water Quality Standards at 10 CSR 20-7.031(4).

Designated uses that are impaired:

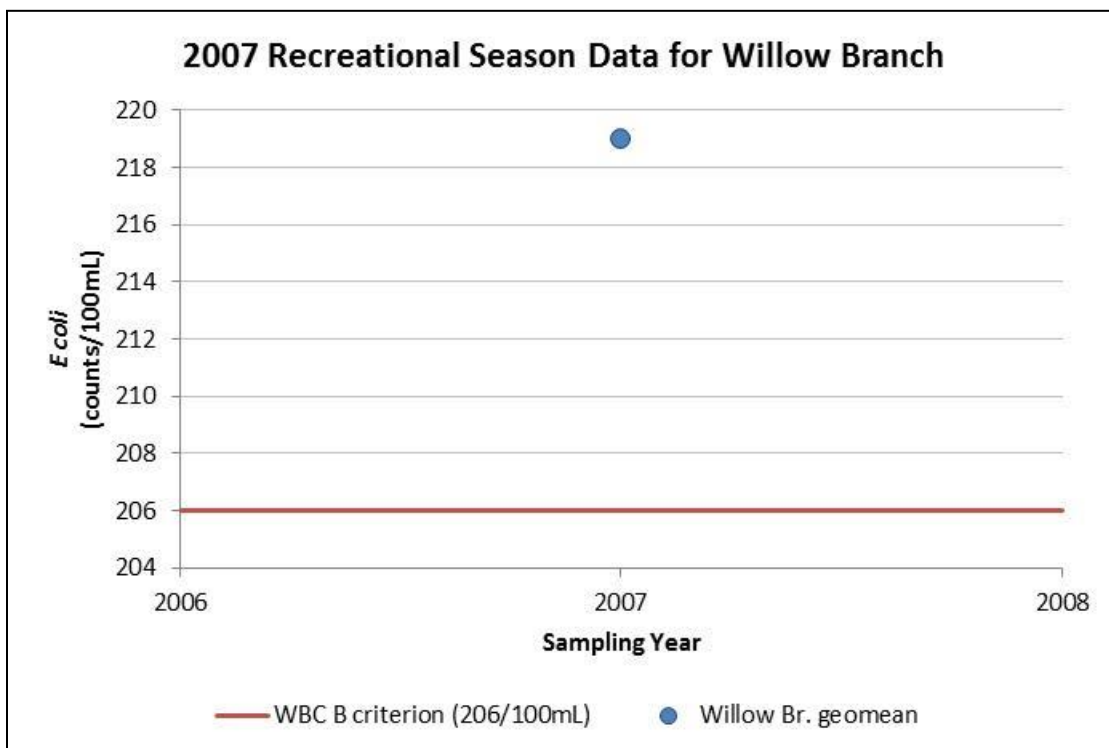
- Whole Body Contact Recreation Category B
- Warm Water Habitat (WWH)
- General Criteria

Criteria that apply

- Missouri's Water Quality Standards at 10 CSR 20-7.031(5)(C) and Table A, state that for Category B waters the *E. coli* bacteria count, measured as a geometric mean, shall not exceed 206 col/100 mL during the recreational season. The recreational season is defined as being from April 1- October 31.
- Missouri has no numeric criteria for metals in sediment. Likewise, federal guidelines have not yet been established for toxic chemicals in stream or lake sediments. In lieu of such criteria, Probable Effect Concentrations, or PECs, suggested by McDonald, et al.¹, are used to assess toxicity in stream sediments. PECs are the concentrations at which some toxic effect on aquatic life is likely.
- Missouri streams are also protected by the general criteria found at 10 CSR 20-7.031(4). The particular general criteria that apply to Willow Branch include:
 - (D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal, or aquatic life.
 - (G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

Assessment and water quality data

The department judges a stream to be impaired by bacteria if the water quality criterion for *E. coli* is exceeded in any of the last three years for which there is adequate data (minimum of five samples taken during the recreational season). The most recent adequate data available to assess water quality in Willow Branch was collected in 2007. This data shows that the whole body contact category B criterion is being exceeded.



¹ *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*, D. MacDonald, et al., 2000. USGS

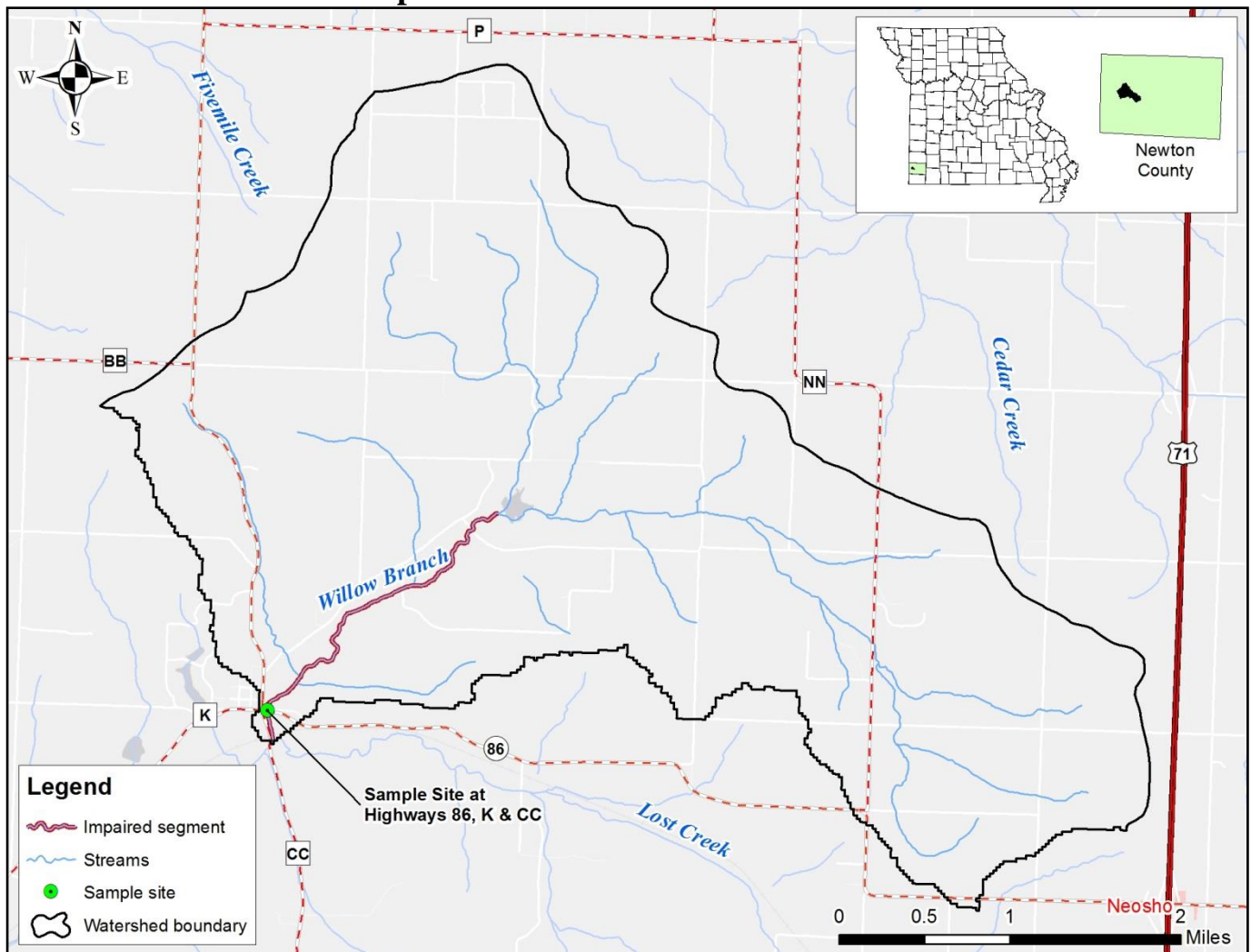
For metals in sediment, the department judges a stream to be impaired when the geometric mean of available metals data exceeds the recommended PEC value by 150 percent or more. In the upper reaches of Willow Branch (at Jute Road), the PEC values for cadmium, lead, and zinc were exceeded.

<i>Pollutant</i>	<i>PEC (mg/L)</i>	<i>Willow Branch Geometric Mean (mg/L)</i>	<i>Percentage of Exceedance</i>
Cadmium	4.98	34.5	692%
Lead	128	1,383	1,081%
Zinc	459	4,618	1,006%

TMDL for Willow Branch

The Willow Branch TMDL will calculate the maximum amount of each listed pollutant that the stream can receive and still meet water quality standards. The TMDL will also identify all potential or suspected pollutant sources in the watershed and distribute the allowable pollutant loads among those various sources. When developed, the Willow Branch TMDL will use the most current and available data. For this reason, the final TMDL may present information that differs from that contained in this information sheet.

Map of the Willow Branch Watershed



For more information call or write:

Department of Natural Resources

Water Protection Program – Watershed Protection Section

P.O. Box 176

Jefferson City, MO 65102-0176

Ph: 1-800-361-4827 or 573-751-1300

Fax: 573-526-6802

Email: TMDL@dnr.mo.gov

Program Home Page: dnr.mo.gov/env/wpp/index.html