

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Total Maximum Daily Load Information Sheet

Strother Creek

Water Body IDs: 2751 and 3960¹

Water Body Segment at a Glance:

Counties: Reynolds and Iron
Nearby Towns: Between Bixby and Oates
Length: 6 miles (2751)
 0.9 miles (3960)
Pollutants: Arsenic, lead, nickel, zinc
 and aquatic macroinvertebrate
 bioassessments
Source: Buick Mine



State 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. Strother Creek is impaired due to exceedances of state water quality criteria that protect aquatic life designated uses.

Designated uses of Strother Creek*

- Warm Water Habitat (WWH)
- Cool Water Habitat (CLH) ←WBID 2751 only
- 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).

¹ The segment of Strother Creek that is associated with WBID 3960 was included on the 2014 303(d) List of Impaired Waters as having water body ID 3965.

Designated Uses that are Impaired

- Warm Water Habitat (WWH)
- General Criteria

Criteria that Apply

- Missouri Water Quality Standards for toxic substances at 10 CSR 20-7.031(5)(B)1 state:

Water contaminants shall not cause the criteria in Tables A and B to be exceeded.

Concentrations of these substances in bottom sediments or waters shall not harm benthic organisms and shall not accumulate through the food chain in harmful concentrations, nor shall state and federal maximum fish tissue levels for fish consumption be exceeded.

- Table A of the Water Quality Standards contains dissolved metals criteria for the protection of aquatic life designated use (WWH). These acute and chronic criteria are hardness dependent and are calculated using various formulas that are provided for in Table A.
- 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.², 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 Center Creek 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

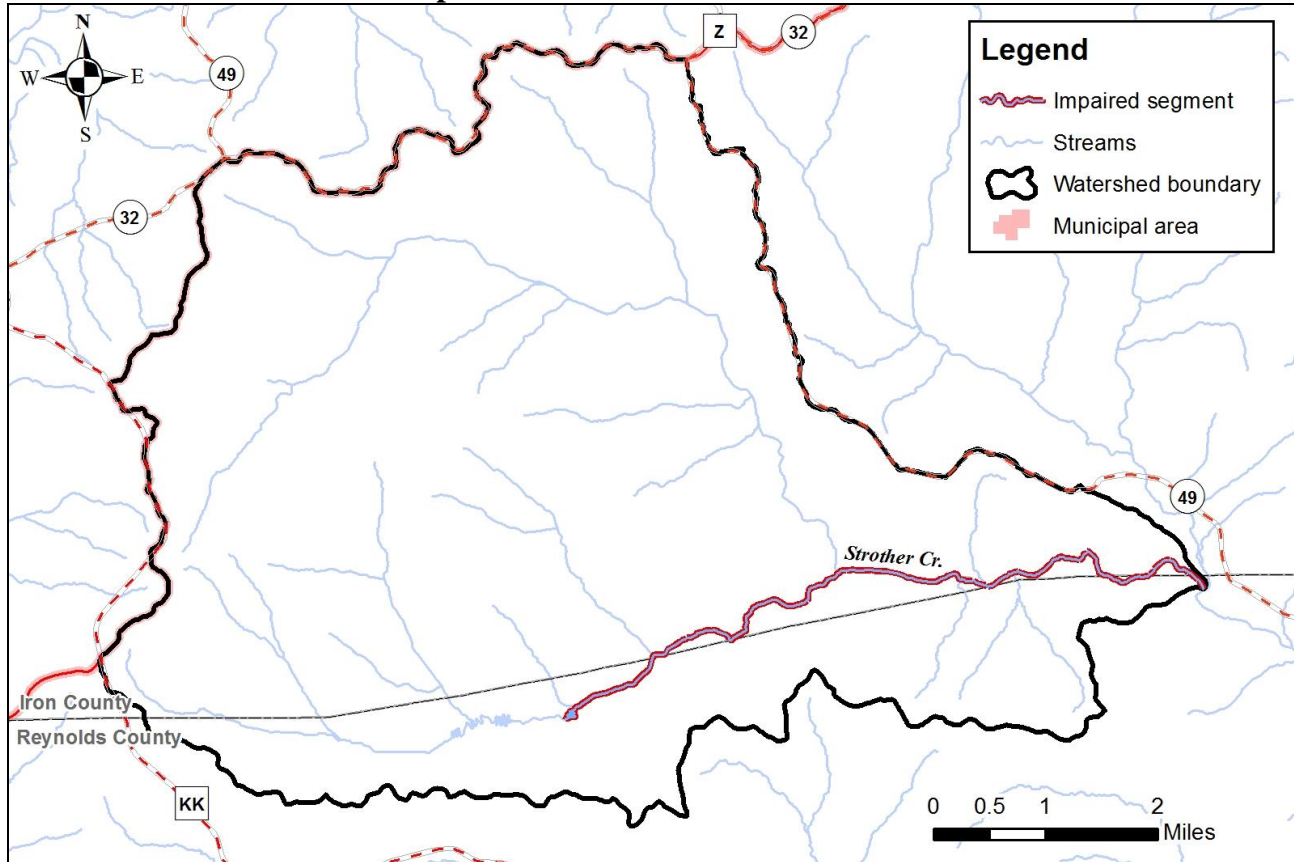
A stream is judged to be impaired due to dissolved metals when either the chronic or acute criteria are exceeded on more than one occasion during the last three years for which data is available. For Strother Creek, dissolved lead values exceeded the chronic criterion four times and the acute criterion for dissolved zinc was exceeded five times. For metals in sediment, a stream is judged to be impaired when the recommended PEC value is exceeded by more than 150 percent. In Strother Creek, PEC values were exceeded for arsenic, nickel, lead and zinc. In addition to these various metal criteria, Strother Creek was also determined to be impaired due to a measured lack of invertebrate species diversity and density when compared to reference streams. More information regarding the assessment of Strother Creek as impaired can be found on the departments website at dnr.mo.gov/env/wpp/waterquality/303d.htm.

² *Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*, D. MacDonald, et al., 2000. USGS

TMDL for Strother Creek

The Strother Creek 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 Strother Creek 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 Strother Creek Watershed



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