

Missouri Department of Natural Resources
Total Maximum Daily Load Information Sheet

Main Ditch

Waterbody Segment at a Glance:

County: Butler
Nearby Cities: Poplar Bluff
Length of impairment: 5 miles
Pollutants: Biochemical Oxygen Demand (BOD), low Dissolved Oxygen (DO) and Volatile Suspended Solids (VSS)
Source: Poplar Bluff Wastewater Treatment Plant (WWTP)



State map showing location of watershed

TMDL Priority Ranking: EPA approved 2005

Description of the Problem

Beneficial uses of Main Ditch

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption
- Irrigation

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standard (WQS), found in 10 CSR 20-7.031 Table A, for dissolved oxygen (related to BOD) in streams is 5.0 mg/L.
- The standards for volatile suspended solids (VSS) may be found in the general criteria section of the WQS at 10 CSR 20-7.031(3)(A) and (C). Here it states:
 - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background Information and Water Quality Data

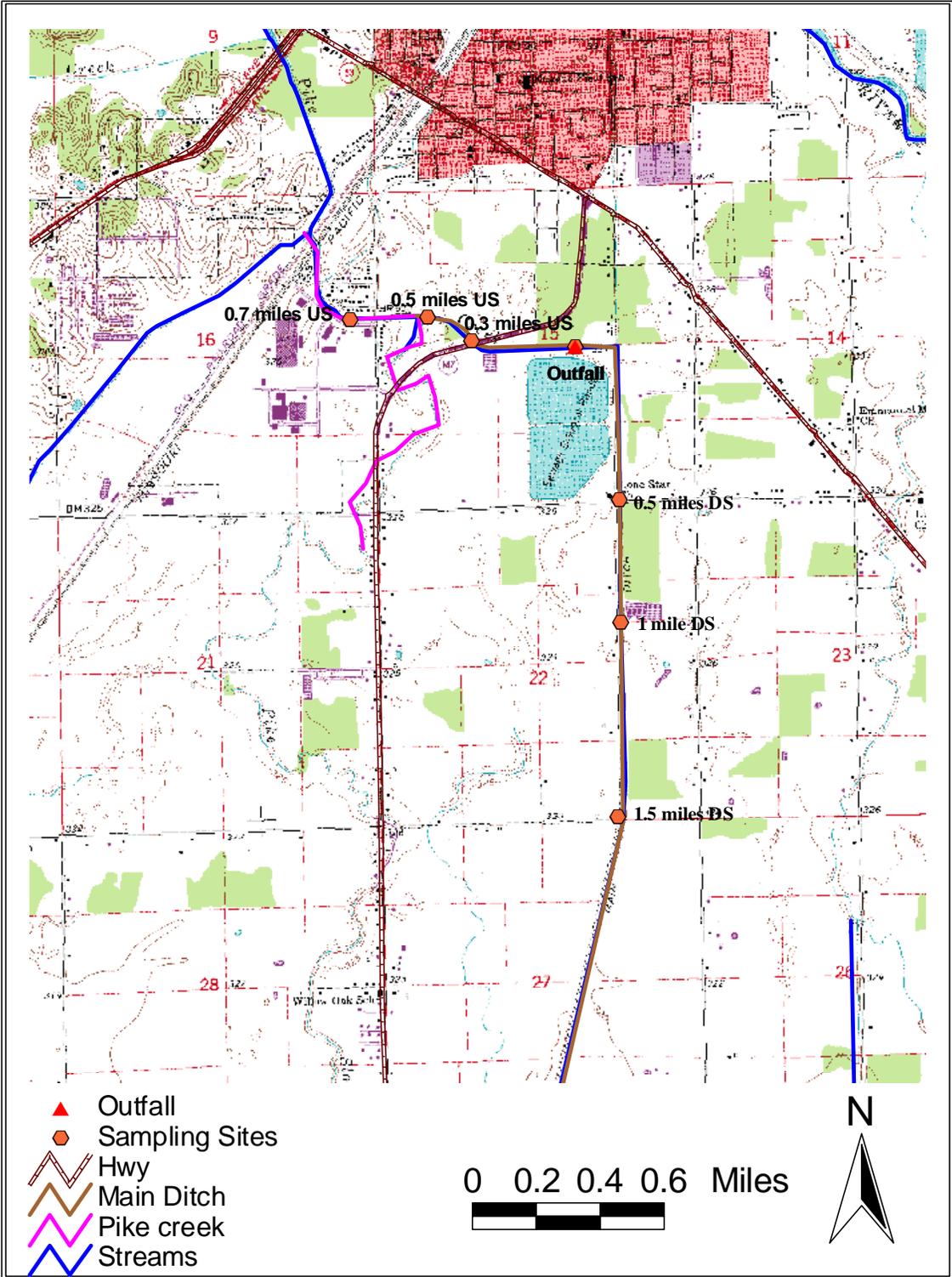
Main Ditch begins where Pike Creek drops off the Ozark Plateau and becomes a “bootheel” ditch. In 1988, three wastewater treatment lagoons serving Poplar Bluff were combined into one, which currently receives all of the city’s wastewater and discharges it to Main Ditch. As a result of this wastewater discharge, Biochemical Oxygen Demand (BOD) is causing dissolved oxygen levels in Main Ditch to be much lower than state water quality standards allow. Many aquatic organisms require high levels of oxygen to survive and the WQS are designed to protect them. Volatile Suspended Solids (VSS) are the particles that are suspended in water, like the algae in Main Ditch, or those that settle out, like sewage sludge. Suspended algae block sunlight and also reduce dissolved oxygen in the water. The Department of Natural Resources performed water quality studies in Main Ditch in 1992, 2000 and 2002. Information from these studies is summarized below. These studies will be used to set new treatment limits that will protect water quality in Main Ditch. The TMDL was approved by the Environmental Protection Agency December 19, 2005.

| Mean Early Morning Water Quality in Main Ditch in the Vicinity of the Poplar Bluff Wastewater Lagoon, 1992, 2000 and 2002 | | | | | | |
|--|----------------|----------------|----------------|----------------------------|---------------|-----------------|
| Location | D.O. (mg/L) | NH3N (mg/L) | NO3N (mg/L) | Total Phosphorus (mg/L) | VSS (mg/L) | CBOD* (mg/L) |
| Pike Creek 0.7 mile above Lagoon | 4.8 | <0.05 | <0.05 | 0.04 | 26 | 1.2 |
| Poplar Bluff Lagoon effluent | 7.5 | 2.00 | 1.63 | 0.98 | 30 | 8.5 |
| Main Ditch 0.5 mile below Lagoon | 1.1 | 1.14 | 1.74 | 1.32 | 30 | 7.2 |
| Main Ditch 1.5 miles below Lagoon | 2.7 | 1.32 | 1.47 | 0.89 | 32 | 4.7 |
| Main Ditch 3.8 miles below Lagoon | 3.3 | 1.05 | 0.79 | 0.63 | 41 | 5.0 |
| Main Ditch 5.8 miles below Lagoon | 4.0 | 0.48 | 0.82 | 0.44 | 36 | 3.8 |

Source: Missouri Department of Natural Resources

A TMDL has been written that identifies the sources contributing to the impairment. The TMDL characterizes the impairment to be primarily attributed to the discharge from the Poplar Bluff Wastewater Treatment Facility. The department is currently discussing permit limits and wastewater treatment plant upgrades with the City of Poplar Bluff.

Map showing monitoring sites in relation to the outfall on Main Ditch in Butler County, MO



For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

P.O. Box 176, Jefferson City, MO 65102-0176

1-800-361-4827 or (573) 751-1300 office

(573) 522-9920 fax

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