



Missouri Department of Natural Resources
Total Maximum Daily Load Information Sheet

East Fork Grand River

Water Body Segment at a Glance:

Counties:	Worth/Gentry
Nearby Cities:	Albany, Denver
Length of impaired segment:	25 miles ¹
Pollutant:	Bacteria
Source:	Rural Nonpoint Source
Water Body ID:	0457



State Map Showing Location of Watershed

Scheduled for TMDL development: 2013

Description of the Problem

Beneficial uses of East Fork Grand River

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category A
- Secondary Contact Recreation
- Public Drinking Water Supply
- Irrigation

Use that is impaired

- Whole Body Contact Recreation – Category A

Standards that apply

- Missouri's Water Quality Standards at 10 CSR 20-7.031(4)(C) state that the *E. coli* bacteria count shall not exceed 126 colonies per 100 milliliters of water (126 col/100 mL) for Category A and 206 col/100 mL for Category B waters. This count is the geometric mean during the recreational season (April 1- October 31) in waters designated for whole body contact recreation.

Background information and water quality data

The East Fork Grand River is located in northwest Missouri. It originates in Iowa and flows south to join the Grand River in Gentry County. The East Fork Grand River is designated as Category A for the whole body contact recreation use, which means it has swimming areas which are open to and fully accessible by the public. The evidence for impairment is based on data collected by the U.S. Geological Survey

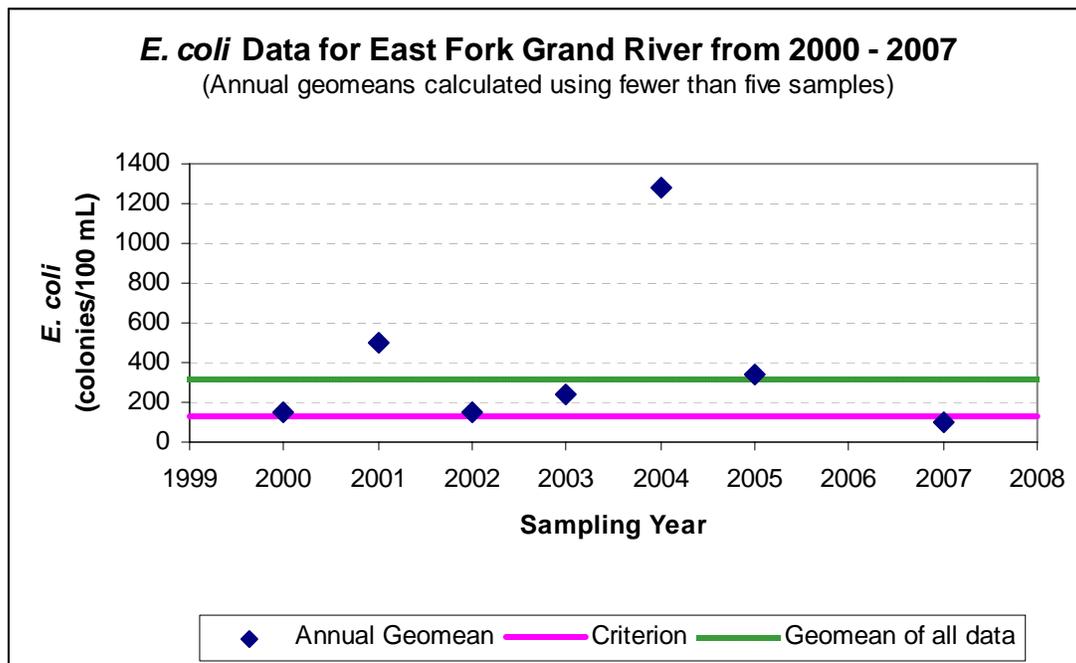
¹ In the Oct 30, 2009 revision of Missouri's WQS, this segment is now listed as 28.7 miles. The end points are the same, but the length has been measured more accurately.

from 2000-2007. The listing methodology states that, to be considered not impaired, a water body must meet the water quality criterion in each of the last three years of available data and that the geometric mean must consist of at least five data points within the recreational season. None of the years had five samples during the recreational season; therefore, the data from all years were pooled. This pooled geometric mean was 321 col/100 mL, exceeding the water quality criteria of 126 col/100 mL for Category A.

Excessive amounts of fecal bacteria in surface water used for recreation are an indication of an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat and skin diseases. *E. coli*, are bacteria found in the intestines of warm blooded animals and are used as indicators of the risk of waterborne disease from pathogenic (disease causing) bacteria or viruses. Most *E. coli* strains are harmless, but some can cause serious illness in humans and are occasionally responsible for product recalls. The harmless strains are part of the normal flora of the intestines, and can benefit their hosts by preventing the establishment of pathogenic bacteria within the intestine^{2,3}. Missouri's bacteria criteria are based on specific levels of risk of acute gastrointestinal illness. The levels of risk correlating to these criteria are no more than eight illnesses per 1,000 swimmers in fresh water.

The watershed for East Fork Grand River is rural. Sources for bacteria in rural areas would most likely be manure from livestock of all types (both roaming and confined), wildlife and poorly or nonfunctioning on-site septic systems.

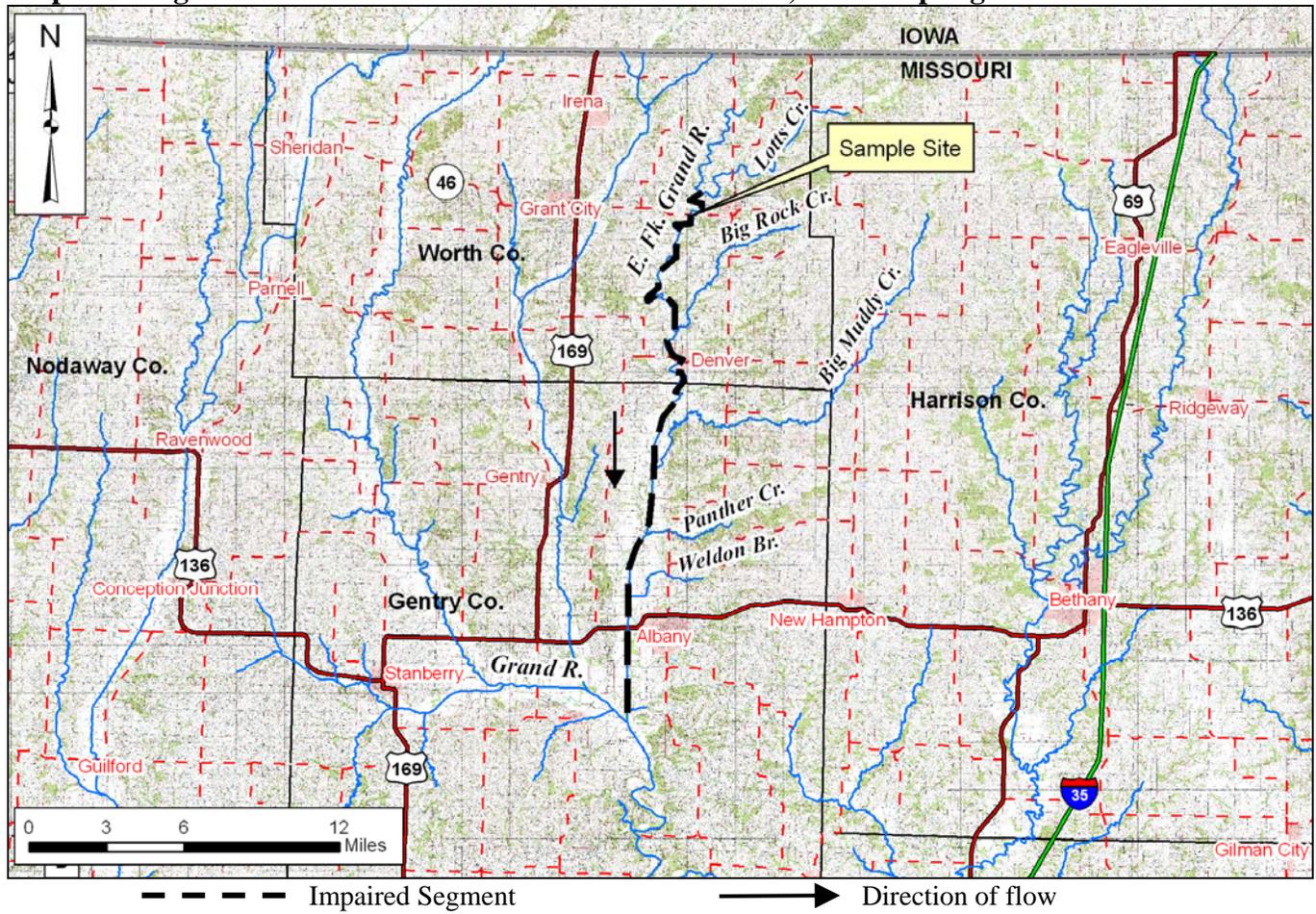
People can protect themselves from waterborne illness by avoiding contact with contaminated water. However, when swimming anywhere, it is wise to take common sense precautions. These include washing hands before eating, showering after swimming and avoiding exposure to questionable water if you have open cuts or wounds.



² Hudault S, Guignot J, Servin AL (July 2001). "[Escherichia coli strains colonising the gastrointestinal tract protect germfree mice against Salmonella typhimurium infection](#)". *Gut* **49** (1): 47-55

³ Reid G, Howard J, Gan BS (September 2001). "Can bacterial interference prevent infection?". *Trends Microbiol.* **9** (9): 424-8.

Map Showing East Fork Grand River in Northern Missouri, and Sampling Sites



Sample Sites
 1 – East Fork Grand River at State Highway 46

For more information call or write:
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