

Water-borne Bacteria in the North Fork Coeur d'Alene River Subbasin

Background

The North Fork Coeur d'Alene River Subbasin contains some of the most popular streams in north Idaho for recreation. Rivers and streams can contain microscopic pathogens, bacteria and other organisms that cause illness. To protect human health during swimming and other recreation, the State of Idaho tests water for the presence of pathogens and applies water quality criteria to limit exposure to human pathogens. A bacterium called *Escherichia coli* (*E. coli*) is used as an “indicator” organism. Its presence in water samples is used to indicate the presence of other harmful human pathogens. *E. coli* naturally occurs in the digestive system of warmblooded animals, and *E. coli* can enter streams from animals or human sources. It can also be present without causing illness.



A hot summer day of floating on the North Fork
(Photo: DEQ).



A cluster of *E. coli* bacteria magnified 10,000
times (Photo: USDA-ARS).

Criteria

Geometric Mean Criterion. Waters designated for primary or secondary contact recreation are not to contain *E. coli* bacteria in concentrations exceeding a geometric mean of 126 *E. coli* organisms per 100 ml water based on a minimum of five samples taken every three to seven days over a 30-day period.

Single Samples. Single water samples can indicate the presence of harmful pathogens. Single sample maximum values have been established for secondary contact recreation, primary contact recreation and designated public swimming beaches. These include:

Secondary Contact Recreation:	576 <i>E. coli</i> per 100 ml
Primary Contact Recreation:	406 <i>E. coli</i> per 100 ml

A water sample exceeding these *E. coli* single sample maximum values indicates the geometric mean criterion is probably exceeded; however, a single sample is not enough to prove a violation of water quality standards. If a single sample contains high numbers of *E. coli*, then additional sampling must be conducted to determine if the water body complies with the 5-sample geometric mean standard described above (126 *E. coli* per 100 ml).

Bacteria Sampling and Results

Water samples are often collected for bacterial analysis during the IDEQ Beneficial Use Reconnaissance Program (BURP) monitoring events. In the North Fork Coeur d'Alene River Subbasin, there were 32 samples collected for *E. coli* analysis through the BURP program during 2000 to 2006. Sample results ranged from 0 to 30 *E. coli* per 100 ml water. An additional sampling effort took place during 4th of July weekend in 2000 on the lower mainstem North Fork Coeur d'Alene River. Five samples were collected and all samples contained less than 5 *E. coli* per 100 ml.

Altogether, 37 water samples have been collected in the North Fork Coeur d'Alene River Subbasin during 2000 to 2006. Results have ranged from 0 to 30 *E. coli* per 100 ml water, and are well below levels that would threaten human health during recreational exposure.

