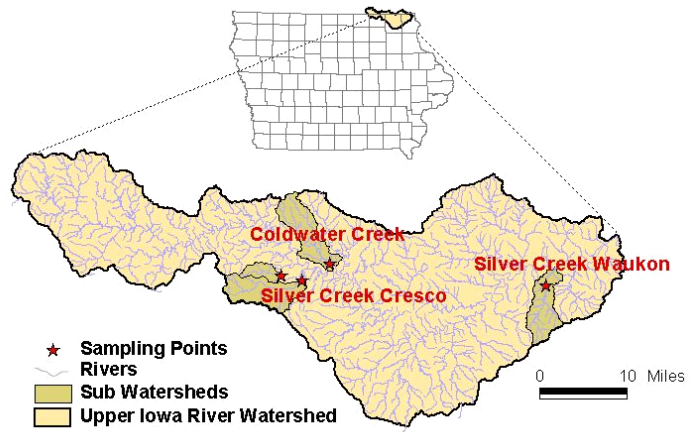


## Fecal Source Tracking Projects

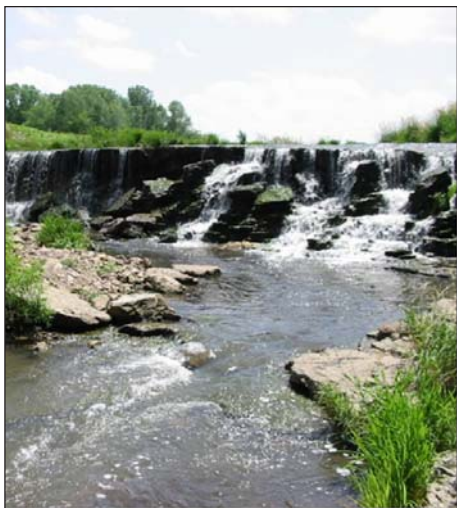
### Upper Iowa Watershed Bacteria Source Tracking Project

The Upper Iowa River and its watershed are valuable natural and economic resources located in extreme northeast Iowa and southeast Minnesota. The Upper Iowa River watershed is a 1,005 square mile watershed recognized by the U.S. Environmental Protection Agency and the State of Iowa as a priority watershed for water quality protection. This river system is heavily utilized for swimming, tubing, and canoeing. The Upper Iowa River Watershed Alliance has monitored 39 stream sites throughout the Upper Iowa River Watershed since 1999 in an effort to identify sub-watersheds that are contributing elevated levels of fecal indicator bacteria to the Upper Iowa River. The water quality monitoring identified six sub-watershed tributaries that had elevated bacteria levels. Three of the six tributaries were selected for a bacteria source tracking project; Coldwater Creek, Silver Creek near Cresco, and Silver Creek near Waukon. Potential bacteria sources in these sub-watersheds include runoff from feedlot and manure-amended agricultural lands, inadequate septic systems, and wildlife.



**Figure 1 insert.** Water sampling sites for the Upper Iowa Watershed Bacteria Source Tracking Project.

The Upper Iowa Bacteria Source Tracking Project, begun in 2002, used DNA ribotyping to identify sources in the Upper Iowa River Watershed and initiated the establishment of a statewide *E. coli* bacteria DNA database. A total of 259 *E. coli* strains from known manure sources (e.g., hog, cattle, sheep, goose, raccoon, deer, and human) were collected and analyzed to build a statewide ribotyping library with patterns from known Iowa strains. After obvious outliers were removed, the following *E. coli* strains were used in the identification of sources in the three Upper Iowa sub-watersheds: cattle (88), deer (35), human (27), geese (26), and swine (24). DNA ribotyping was performed on 50 *E. coli* strains from water samples taken from the three sub-watersheds in Coldwater Creek, Silver Creek near Cresco and Silver Creek near Waukon (Figure 1 insert). DNA ribotyping successfully discriminated between human and cattle bacterial sources. However, the number of *E. coli* strains was insufficient to distinguish between the other animal sources.



Upper Iowa River. Photo by Lora Friest.