



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

California

Water Recreation Use Restored in Alpine Waterbodies

Waterbodies Improved

Livestock grazing on high wet meadows on public lands in the Lake Tahoe Basin contributed bacteria to Big Meadow Creek and the Upper Truckee River. Water quality monitoring showed that fecal coliform (FC) bacteria levels violated water quality standards and prevented the waterbodies from supporting their beneficial use, prompting the Lahontan Regional Water Quality Control Board (Lahontan Water Board) to add both waterbodies to California's 2002 Clean Water Act (CWA) section 303(d) list of impaired waters. Despite ongoing efforts to implement various rangeland best management practices (BMPs) on the grazing allotment, violations of the FC bacteria water quality objective continued, prompting the U.S. Forest Service–Lake Tahoe Basin Management Unit (USFS-LTBMU) to eliminate cattle grazing in the Big Meadow Creek–Upper Truckee River watershed beginning in 1999. Water quality improved, allowing the Lahontan Water Board to remove 4.5 river miles of Upper Truckee River and 1.4 river miles of Big Meadow Creek from the 2010 CWA section 303(d) list of impaired waters.

Problem

Big Meadow Creek flows into California's Upper Truckee River (Figure 1), which is Lake Tahoe's largest tributary. The Big Meadow Creek–Upper Truckee River watershed is managed by the USFS-LTBMU and is primarily open space with recreation trails, including the Pacific Crest Trail. The alpine streams provide habitat for the Lahontan cutthroat trout, a federally threatened species. As early as 1849, people grazed their cattle in this watershed. Cattle and other livestock can contribute FC bacteria to surface waters. Pathogenic bacteria, found in conjunction with FC bacteria, can cause waterborne disease in humans.

The Lahontan Water Board water quality objective for pathogenic bacteria requires that the FC concentration during any 30-day period not exceed a log mean of 20 FC units per 100 milliliters (mL), and that no more than 10 percent of all samples collected during any 30-day period exceed 40 FC units/100 mL.

Since at least 1990, water quality violations for FC bacteria have occurred. Analysis of surface water samples taken from Big Meadow Creek and the Upper Truckee River during and immediately after cattle grazing demonstrated that cattle were the major source of FC bacteria. Because FC levels exceeded the water quality objective, the Lahontan Water Board issued the USFS-LTBMU a Notice of Violation and added 4.5 river miles of the Upper Truckee River (above Christmas Valley) and 1.4 river miles of Big Meadow Creek to the 2002 CWA section 303(d) list of impaired waters.



USFS Meiss/ Dardanelles Backcountry photos on Flickr

Figure 1. The Upper Truckee River, after restoration.

Project Highlights

Under the state's Porter-Cologne Act, the USFS manages grazing allotments in accordance with a State Water Resources Control Board-certified water quality management plan. The plan sets forth an iterative process that governs the implementation, monitoring and revision (as appropriate) of BMPs used to control nonpoint source pollution. If BMPs are not effective—even after revision—the USFS can choose to mitigate the water quality impact, refine water quality standards and/or cease the activity. All resource activities are managed under the limitations provided in a USFS site-specific environmental assessment developed by an

interdisciplinary team of experts. The USFS-LTBMU develops allotment-specific management plans in cooperation with its grazing permittees.

In the decade prior to the grazing ban (1999), USFS-LTBMU tried to mitigate the impacts on water quality from cattle grazing by installing BMPs such as cattle stream crossings and cattle exclusion fencing upstream of the crossings. Within the protected stream areas, the USFS-LTBMU planted vegetation and stabilized streambanks using cobbles and erosion control cloth. The USFS-LTBMU conducted its own water quality monitoring to assess the effectiveness of the various BMPs.

In the areas where cattle weren't excluded, the USFS implemented the following BMPs: off-stream water sources, rest rotation, reduced herd size and shortened grazing season. Despite these efforts, water quality continued to violate the FC bacteria objective. In 1999, the USFS-LTBMU informed the permittees who grazed the Meiss Meadows area that "a viable grazing strategy cannot be developed that would likely meet the state-mandated water quality standards..." As a result, the USFS permanently ceased all grazing on the Meiss Meadows area, which includes the Big Meadow Creek and Upper Truckee River basins.

Results

Removing livestock from the area allowed the waterbodies to recover. The USFS collected and analyzed approximately 43 samples at three separate locations in Big Meadow Creek during 2000, 2001, 2002 and 2008. FC levels have declined and now meet the water quality objective of less than a log mean of 20 units/100 mL (Figure 2). Similarly, the USFS collected and analyzed approximately 103 surface water samples from the Upper Truckee River (above Christmas Valley) during the years 2000, 2001, 2002, 2003, 2004 and 2008. Like Big Meadow Creek, FC levels in the Upper Truckee River have declined steadily since 1999 and now meet the water quality objective (Figure 3).

These significant reductions in FC bacteria counts restored the water contact recreation use, prompting the Lahontan Water Board to remove 4.5 river miles of Upper Truckee River and 1.4 river miles of Big Meadow Creek from California's CWA section 303(d) list of impaired waters in 2010.

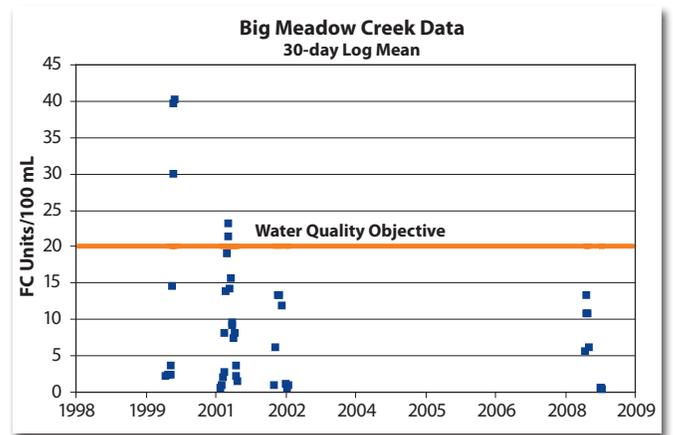


Figure 2. Data from three sites on Big Meadow Creek show that FC levels have declined.

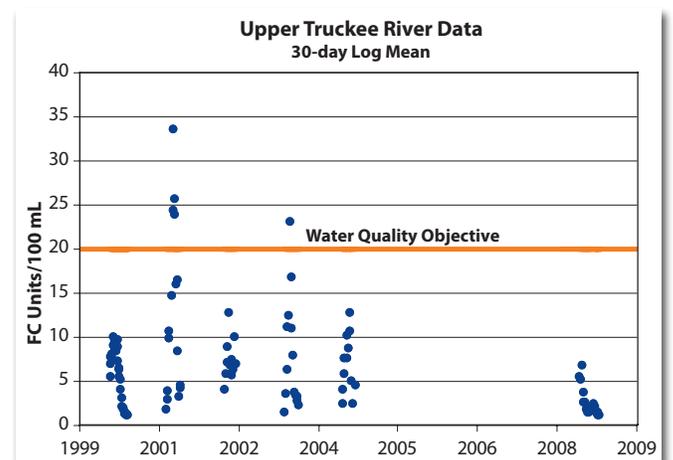


Figure 3. Upper Truckee River data show that FC levels have declined. Data were normalized prior to analysis.

Partners and Funding

An agreement with the State Water Resources Control Board requires that the USFS accept responsibility as the water quality management agency for USFS lands and be financially responsible for mitigating impacts on water quality that are a result of resource management actions such as grazing. As a result of its own monitoring, and with the support from the Lahontan Water Board in a Notice of Violation and comments on the environmental assessment, the USFS-LTBMU chose to terminate all grazing leases in the Meiss Meadows area. Approximately \$50,000 in CWA section 319(h) funds supported the Lahontan Water Board staff's involvement in this case.



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