



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Montana

## Successful Collaboration and Agricultural BMPs Improved 80 Miles of Sun River

### Waterbody Improved

The mainstem of the Sun River is split into upper and lower segments for management purposes. The Upper Sun River was listed as impaired on Montana's 2000 and 2002 303(d) list of impaired waterbodies because of excess nutrients. Landowners; local watershed organizations; and many federal, state, and local government agencies collaborated to implement agricultural best management practices (BMPs) in the Upper Sun River and its tributaries. Water quality improved as a result, allowing the Montana Department of Environmental Quality to remove the Upper Sun River from the 303(d) list for nutrients in 2006. The Sun River watershed project is a classic example of using the watershed approach to address nonpoint source pollution.

### Problem

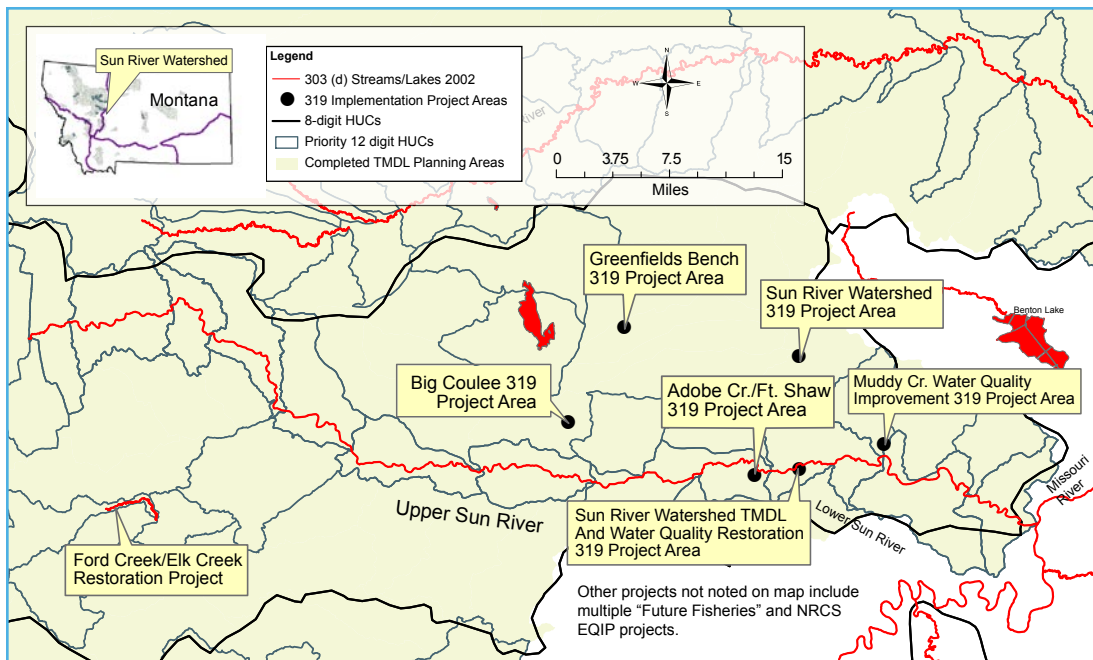
The Upper Sun River is in central Montana on the Rocky Mountain Front. The previously impaired segment is approximately 80 miles long and runs from Gibson Dam to Muddy Creek. The Montana Department of Environmental Quality (MDEQ) added the Upper Sun River to the 2000 and 2002 303(d) impaired waters list because high levels of nutrients caused the river to not meet state water quality standards for aquatic life and cold water fishery uses. Montana's nutrient standard prohibits "conditions [that] produce undesirable aquatic life," which, in this case, refers to excess growth of benthic algae that interferes with aquatic life uses. Agricultural practices were largely to blame for the Upper Sun River's elevated nutrient levels. Irrigation and stormwater runoff carried excess nutrients from over-fertilized fields and poorly managed livestock production areas into the river.

### Project Highlights

Early community-planning efforts produced initial watershed plans that identified key action items for restoration. This led to the development of the *TMDL/Watershed Restoration Plan*, coordinated by MDEQ in partnership with the Sun River Watershed Group. As part of this plan, Montana set nutrient targets (39 micrograms per liter [ $\mu\text{g/L}$ ] total phosphorus

and 350  $\mu\text{g/L}$  total nitrogen) for the Upper Sun River. If nutrient concentrations could be reduced to below the stated targets, excess growth of benthic algae would not occur under typical conditions. The plan also included restoration strategies for the impaired segments in the watershed.

Responding to the plan, partners have helped implement numerous water quality improvement projects in the Upper Sun River watershed. Farmers implemented nutrient management BMPs in the Ford/Elk Creek and Adobe Creek watersheds to minimize fertilizer applications and thus reduce the amount of nutrients transported to streams via runoff. Farmers improved irrigation water management practices by (1) lining irrigation canals to minimize and stabilize irrigation return flows and (2) using AgriMet—a U.S. Bureau of Reclamation satellite-based network of automated agricultural weather stations that provides weather, crop-water use, and other information to help support irrigation and agriculture management (for more information, see [www.usbr.gov/pn/agrimet](http://www.usbr.gov/pn/agrimet)). In addition, landowners implemented riparian area grazing management BMPs such as fencing, stream bank stabilization techniques, and fishery improvement projects in the Ford/Elk Creek and Adobe Creek watersheds and along Willow Creek, Big Coulee, and the mainstem



Map of Sun River Watershed Restoration and Water Quality Improvements.

of the Sun River. Streambank stabilization included using non-riprap techniques such as sloping banks; planting vegetation; and installing erosion matting, root wads, and rock barbs.

## Results

The cumulative effects of these on-the-ground efforts, combined with outreach and education activities that have led to better land-use practices by landowners, resulted in 20 miles of stabilized streambank, four miles of restored primary fishery and spawning habitat, 800 feet of lined irrigation canal, and the implementation of grazing management practices on 50,000 acres of rangeland. In 2005 and 2006, MDEQ collected water quality samples from the Upper Sun River. They indicated that phosphorus and nitrogen concentrations had dropped and were consistently below target levels of  $39 \mu\text{g/L}$  and  $350 \mu\text{g/L}$ , respectively, as identified in the *TMDL/ Water Quality Restoration Plan*. As a result, MDEQ removed the 80-mile long impaired segment of the Upper Sun River from the 303(d) list for nutrients in 2006.

## Partners and Funding

Many partners were involved with this project, including seven federal agencies, eight state agencies, ten local governments, four community groups, and many landowners. From 1994 to 2006, MDEQ administered \$623,430 of Clean Water Act section 319 grant funding for implementing the variety of BMPs previously mentioned. In addition, \$2,484,926 of nonfederal and another \$1,988,793 in federal funds were used to restore the Sun River watershed through programs such as Montana's Future Fisheries program, and the Natural Resources Conservation Service's (NRCS's) EQIP program. The Fort Shaw Irrigation District, Greenfields Irrigation District, Nilan, and Sun River Ditch Company worked together to improve irrigation efficiencies in the watershed by 10 percent. The NRCS Conservation Reserve Program helped to reduce salinity by converting dry cropping lands to rangeland. The U.S. Fish and Wildlife Service; the Lewis & Clark Conservation District; and the Montana Department of Fish, Wildlife, and Parks are working on the Hogan irrigation diversion to improve fish passage.



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