Improving Utah's Water Quality

Little Bear River Watershed

UtahStateUniversity
WATER QUALITY EXTENSION

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Major Waterbodies

Little Bear River
Porcupine Reservoir
Hyrum Reservoir

Major Cities

Hyrum
Mendon
Wellsville
Paradise

Major Land Uses

Agriculture
Rangelands
Recreation

Local Water Quality Issues

Phosphorus
Sediment

Local Contact:

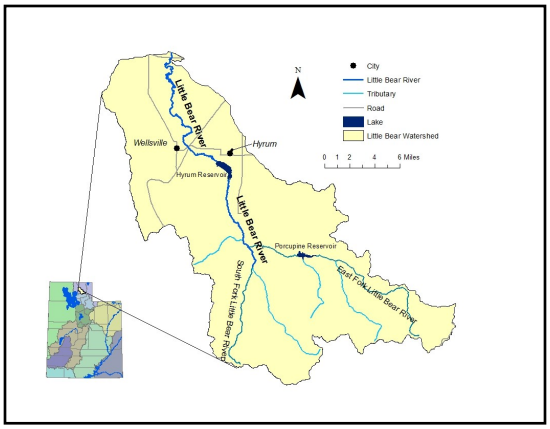
Justin Elsner
Lower Bear River Watershed Coordinator
(435) 753-5616 (X130)

Watershed Description:

The Little Bear River drains 185,000 acres at the southern end of Cache Valley in northern Utah. The river has two main forks that travel through relatively narrow and steep valleys, meeting at the approximate midpoint of the watershed near the town of Paradise. From that point the Little Bear drains to Hyrum Reservoir, and then continues north, meandering through the much flatter landscapes left behind by ancient Lake Bonneville. The river eventually drains to the south end of Cutler Reservoir.

Hyrum Reservoir holds water for irrigation uses, but is also a popular recreational area, with a state park on its shores. Porcupine Reservoir, on the East Fork of the river, is also managed for irrigation and is home to a healthy Kokanee Salmon population. These fish have established a spawning run up the East Fork River in the fall, where they create "redds" in the river's gravel and lay their eggs.

During the 1990s, the Little Bear River was the target of a major water quality improvement effort to reduce nutrients and sediments in the river. Between 1990 and 2000, more than 100 farmers in the watershed voluntarily implemented a wide range of conservation practices, with the goal of reducing nutrient and sediment runoff from dairies, rangeland, and pastures. Thirty-six animal waste management systems were installed, more than 5 miles of stream banks were re-vegetated, more than 7,500 acres of rangeland were improved, and many flood irrigation systems were replaced by sprinkler systems.



Little Bear River Water Quality Improvement Project

Project Description:

In 2005, USU began a USDA funded project to evaluate the impacts of these conservation practices. The project asked three basic questions:

1. Did the conservation practices improve water quality?
2. Were the conservation practices maintained over time?
3. Are there more effective ways of tracking impacts of these projects?

The project researchers analyzed existing data, collected new data, developed computer models of the watershed, and interviewed landowners and residents.
The following are some of their findings.

Water quality in the Little Bear River has improved compared to 20 years ago. The actual impact of the conservation practices has been difficult to determine, however, since other changes in the watershed also likely affected water quality. These include increased population in the watershed, conversion of some agricultural lands to new housing developments, and drought and flood cycles. In addition, the traditional monitoring approaches that had been used were inadequate for measuring water quality changes in dynamic rivers that are common in these watersheds.

The majority of the original conservation projects are still in place and effectively keeping nutrients and sediments from entering the river. These projects include fences, manure bunkers, irrigation systems, land leveling and revegetation of uplands and pastures. In contrast, conservation practices that involved changes in management, such as nutrient or grazing management plans, were far more likely to have been discontinued. These plans were either impractical or poorly explained to landowners. This feedback is important for conservation planners since these management plans are a critical part of protecting water quality.

The researchers also explored new ways to monitor watersheds. They evaluated historic aerial photographs to show that the fencing and in-stream structures implemented during the original project had contributed to improved vegetation near the river. They installed automatic monitoring stations that measure water quality every 30 minutes (rather than every 2-4 weeks) to better understand the dynamic changes in a river. These results reinforced the need to develop monitoring plans that focus on the actual target pollutants and the project objectives. Using these improved approaches to monitoring will assure that future projects are located in the most effective locations.

Partners

- Utah State University Extension
- Utah Association of Conservation Districts
- U.S. Natural Resources Conservation Service
- Utah Division of Water Quality
- Utah Division of Water Resources
- Utah Division of Water Rights
- Utah Department of Natural Resources
- County and City governments

Related Projects

Review of Utah's 319 Nonpoint Source Program for UDWQ Jackson-Smith et al. 2013.
www.extension.usu.edu/waterquality

References

Bear River Watershed Information System
bearriverinfo.org.

Lower Bear River & Tributaries, TMDL(2002)
http://www.waterquality.utah.gov/T

Funding

Throughout the 10 year project, over $3.5 million in USDA, EPA and other funds were invested in these projects. In addition, landowners matched approximately $1.5 million in labor, equipment or cash.
A USDA Conservation Effectiveness Assessment Project grant to USU funded the evaluation.

To learn how you can participate or lend your support to Utah community water quality projects, please contact your local conservation district or county agent.

Produced by USU Water Quality Extension, Utah Watershed Coordinating Council, Utah Association of Conservation Districts, and Utah Division of Water Quality.

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