EPA
United States
Environmental Protection
Agency

CASE STUDY

The Fort Peck Tribes Use Biological Criteria Their Water Quality Standards*

The Fort Peck Tribes used biological assessments to identify degraded waterbodies on the reservation. Damage to streambanks (such as erosion and loss of vegetation) resulting from heavy livestock grazing is a common cause of degradation to reservation waters. The Tribes have obtained federal grants to restore the streams. Integrating biological criteria into their water quality standards program helps the Tribes detect problems in reservation waters that other regulatory approaches cannot always find. For example, a type of fish may disappear because erosion has destroyed its spawning sites. Chemical criteria would not identify this, but an assessment of the plants and animals living in the stream could reveal these impacts.

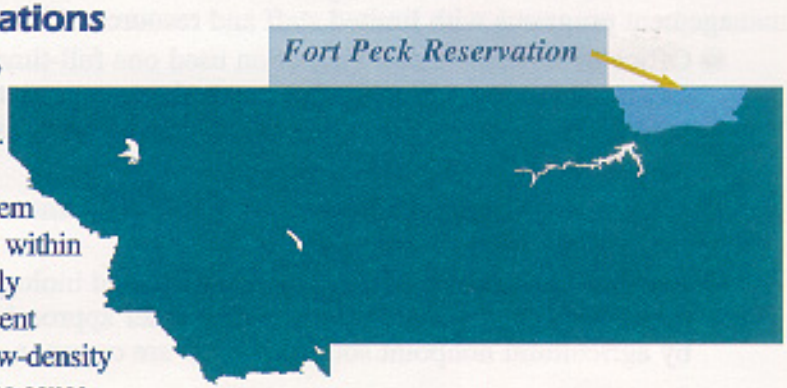
Why use biological information and biological criteria?

More than 25 years after it was passed, the Clean Water Act still challenges us to answer critical questions about the physical, chemical, and biological state of our waters. One of the most meaningful ways of answering these questions is to observe the plants and animals that live in bodies of water. The number and types of aquatic plants and animals are affected by both pollution and loss of habitat. They can reveal problems that might otherwise be missed or underestimated using chemical water quality criteria. Biological criteria are narrative or numeric standards that describe the biological community that should live in a waterbody. Biological data are the core for setting protection or restoration goals, for determining what to watch and how to understand what is found, for ranking which problem areas get worked on first, and for judging the effectiveness of management actions.

Biological criteria allow a tribe to set goals for waterbodies based on the types and numbers of aquatic species that should be present in the waterbodies. Establishing biological criteria as part of their water quality standards will allow the Fort Peck Tribes to use federal programs, both regulatory and non-regulatory, to meet their water quality goals.

Tribal Background and Operations

The Fort Peck Reservation and trust lands, located in northeastern Montana, are home to the Assiniboine and Sioux Tribes. Within the 2-million-acre reservation lie seven major watershed drainages, all of them tributaries to the Missouri River. Land use within the Fort Peck Tribes reservation is primarily agricultural: 55 percent rangeland, 43 percent cropland, and 2 percent forestland, plus low-density urban area and roads. Agricultural practices cause 98 percent of the problems in the Tribes' streams. The U.S. Environmental Protection Agency approved the Tribes' water quality standards in 2000.



The Tribes' Office of Environmental Protection introduced the concept of including biological criteria in the Tribes' water quality management strategy. Incorporating biological criteria into their water quality standards complemented the chemical and physical criteria the Tribes had been using.

* Environmental terms used in this case study are defined in the enclosed glossary.

In 1991, the Tribes began collecting data on macroinvertebrates (e.g., crayfish, clams, insects) and fish communities at 16 sites on streams across the reservation. They used this biological community data to develop numeric biological criteria for the tribal streams based on the type of organisms living there and their habits. Using the macroinvertebrate data, the Office of Environmental Protection developed a scoring system (the Biological Condition Rating) to assess a stream.

Successful Application

By using biological information, the Fort Peck Tribes Office of Environmental Protection identified and addressed specific environmental problems within the reservation. By using the Biological Condition Rating system, they have been able to determine what stream segments on the reservation are most degraded and therefore, require immediate attention. They can use information collected through the Biological Condition Rating system in funding requests to federal agencies to document specific problems.

The Tribes have used a $350,000 grant from the U.S. Department of Agriculture through the Environmental Quality Incentives Program, and a $168,000 grant from the U.S. Environmental Protection Agency through the Nonpoint Source Program to build sources of water away from streambanks, install a pipeline, and establish cross-fencing to improve riparian habitat along the stream. The biological assessment program is sampling and analyzing aquatic organisms at the sites where the improvements were made to see if the Biological Condition Rating is detecting a change in the environment.

Monitoring chemical and physical parameters alone may not be enough to document water quality problems. For example, one station downstream from an area where grazing cattle were eroding streambanks recorded chemical data within normal ranges. However, the Biological Condition Rating system showed impacts to aquatic organisms, indicating damage to stream habitat. In this type of situation, measuring the biological community is a much better tool for identifying problems.

Insights to Share with Other Tribes

Fort Peck Tribes believe that biological assessment tools are especially useful for environmental management programs with limited staff and resources. For example:

- Office of Environmental Protection used one full-time staff person, plus 10 percent of a nearby college biologist's time, and a summer intern.
- Start-up and maintenance costs for equipment for biological assessment were relatively low.
- They did all sampling and analysis in-house, eliminating the cost of sending samples out for analysis.
- Because biological techniques detect degraded biological conditions regardless of the cause, they can be more effective than other approaches at identifying problems caused by agricultural nonpoint sources, which are common on many Indian reservations.

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