



WATERSHED PROGRESS: Hot Creek Watershed Mimbres River Basin

"Whether our interest in the watershed is healing our souls by the tranquil sound of a mountain stream or watering livestock, the need for reliable clean water is the same...without it we all perish."

- Sally Smith, Resident of Hot Springs Ranch

Photo: Royal John After Restoration - Constructed Wetland for Treatment

Since 1991, the U.S. EPA has been promoting the watershed approach as a mechanism to achieve the next generation of water protection. The focus on watersheds, or drainage areas, provides people living there a meaningful context in which to identify problems and solutions. Below is a description of the Hot Creek Watershed where the watershed approach is making a difference.

The system:

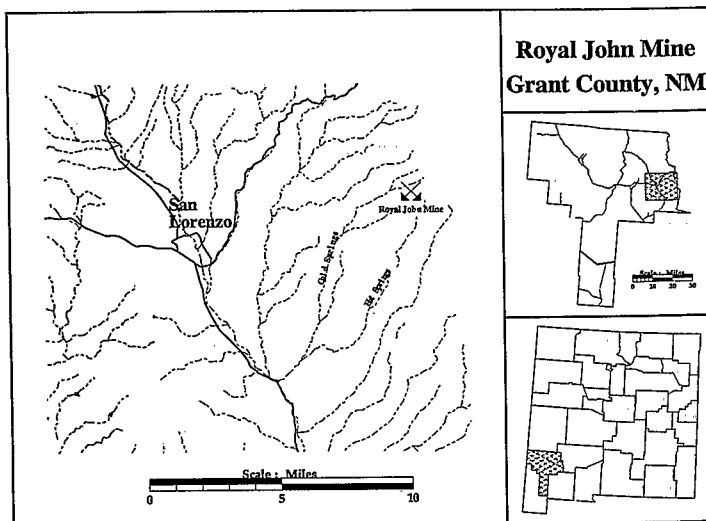
The Hot Creek watershed covers an area of approximately 26 square miles on the west flank of the Mimbres Mountains in southwest New Mexico. The watershed is a subwatershed of the Mimbres River basin and is part of the Greater Gila Ecosystem. The Greater Gila Ecosystem covers an area of approximately twenty thousand square miles in New Mexico and Arizona and constitutes the largest tract of wild country in the southwestern United States. Three federal wilderness areas, the Gila, the Aldo

Leopold, and the Blue as well as a dozen wilderness study areas are contained in this region. The land in the upper reaches of the Hot Creek watershed are federally owned and administered by the Gila National Forest; the lower half is primarily privately owned land. The vast areas of public land around the Hot Creek watershed attract a wide variety of outdoor recreationalists. Most outdoor recreation involves water in one way or another, and the scarcity of this resource makes its continued presence and high quality all the more important.

In addition to the habitat and recreational uses of these scarce waters, resident ranchers and small farmers rely on the resource for irrigation and livestock watering. Competing interests over water resources are a part of this watershed's history that continue to this day.

The stresses and sources:

Under the New Mexico water quality standards program, the State has designated uses for the Hot Creek Watershed, including cold water fishery, irrigation, livestock watering, wildlife habitat, and secondary contact. The standards for most of these uses are frequently not attained due to nonpoint sources of pollution and the poor overall condition of the watershed. Non-support of water quality standards within the Hot Creek watershed is often due to sediment loading, metals (lead, zinc and cadmium) and nutrients. The most severe water quality problems appear during and after intense storm events. Point source and urban nonpoint source problems within the watershed are minimal. The turbidity and nutrient problems are primarily a result of grazing, the dominant land use practice in the watershed.



For the past 150 years, the established practice throughout the Gila Ecosystem has been to allow cattle to graze year round on marginal rangelands without active management. The result has been the gradual demise of native grasses in the watershed, which accelerates storm water runoff and results in the loss of vast quantities of the soil resource. The increasingly violent runoff events have scoured much of the riparian vegetation, leaving raw banks and sediment-choked channels. The cattle that continue to roam the watershed are reduced to eating any palatable greenery they can find including remnant riparian vegetation that may sprout from root stock or seed dispersion. This further increases the problem of bank failure, stream channel incisement and sediment clogging. Pooled water in these damaged reaches often becomes very warm, allowing for excessive algal growth which robs oxygen from the system as it decomposes.

Metal loading problems in the upper reaches of the watershed originated primarily from concentrated sources in mine wastes. (The region was heavily mined for zinc and lead from the 1880s through the 1960s.) In fact, concern about the transport of metals from the inactive Royal John Mine originally motivated watershed residents to organize and seek the help of the New Mexico Environment Department (NMED) Nonpoint Source Program ("the State").



Photo: Royal John Before Restoration

The Strategy and Successes

The State has conducted an extensive watershed investigation with the help of interested citizens, identifying several sources of nonpoint pollution. The group confirmed that the most concentrated sources of metal loading to Hot Creek were associated with the inactive Royal John Mine. Sparse vegetative cover in the rugged upland range was also identified as a wide spread problem leading to increased turbidity (cloudiness of water). Concentrated cattle waste was also a problem, particularly in shallow pools, and resulted in algae blooms and reduced dissolved oxygen. Further, the dirt road system in the watershed was found to be a conduit and concentrator of storm runoff, as well as a source of sediment.

With encouragement from the State, private citizens in the Hot Creek watershed formed an advisory group to increase their influence over decisions affecting their water resources. The advisory group succeeded in having the Gila National Forest take the lead on the first project in the overall watershed restoration effort - the reclamation of the Royal John Mine in the headwaters of the Hot Creek watershed. This pilot was highly successful through the cooperative effort of both public and private lands and the entire range of interests in the watershed.

The goal of stabilizing the principle source of metals in the watershed has been accomplished. To restore the stream channel below the Royal John, the Gila National Forest identified several design alternatives through the National Environmental Policy Act process. A wide range of interested parties, including the citizen watershed association, participated in the design selection process. The final design included restoration of the stream channel, site seeding and mulching to encourage re-



Photo: Royal John Reclaimed

growth of riparian vegetation. After this was completed, members of the watershed group constructed a wetland treatment area to address remaining dissolved metals concerns from the mine tailings. The private Hot Springs Ranch community provided all woody riparian and wetland plants as well as labor for the restoration effort. In addition, the area was fenced to protect the newly planted materials from cattle grazing. The continued effectiveness of this effort will be monitored through regular water quality sampling and by visual measures from fixed photo points of the recovery of the riparian and wetland resource at the Royal John Mine.

Further efforts to restore the integrity to the Hot Creek watershed will require the continued cooperation and active participation of all the interested parties that live and work in the watershed. Future cooperative efforts may involve building cattle enclosures along key stream segments, active riparian restoration, road improvements, and necessary changes in livestock management on both private and public lands.

For more information, contact Brian Wirtz, New Mexico Environment Department, Nonpoint Source Program at 505-827-2470.

EPA's Role

The U.S. EPA Region 6 has provided seed money for this effort through a Clean Water Act Section 319(h) Grant to the NMED. In addition, EPA offers technical advice and assistance to this and other citizen watershed restoration efforts. For more information, contact Susan Branning at 214-665-8022.

Nationally, EPA has been reorienting its programs and developing tools to facilitate the watershed approach since 1991. For more information on the watershed approach, please contact the EPA at Office of Wetlands, Oceans and Watersheds, 401 M Street, S.W. 4501F, Washington, DC 20460 (Attention: Watershed Outreach coordinator) or visit us on the world-wide web at URL:<http://www.epa.gov/OW/OWOW>.