

Restoring O'Brien Creek, Missoula, MT

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Abstract

O'Brien Creek, near Missoula, Montana, has been altered by tree harvest, road building, grazing and dewatering. These actions led to loss of streamside vegetation, increased streambank erosion and scouring, and decreased native fish and wildlife recruitment. The US Forest Service has recontoured roads in the upper watershed while Montana Fish, Wildlife and Parks has regraded and revegetated the lower creek to return it to a more natural state. The survival rate of restoration plantings after one year was only 25%. Larger plants of more drought-tolerant species, deeper planting and weed control should improve survival in future plantings. Despite poor survival of riparian plantings, there is already some evidence of increasing fish populations in the creek. Greater coordination and cooperation between the two agencies will likely result in more efficient and successful restoration efforts.

Introduction

The restoration and protection of stream and river corridors cannot be isolated from the management of adjacent uplands and headwaters areas (USDA 1998). Holistic watershed management involves all interested stakeholders in the management of all landscapes within a watershed and in attempts to mitigate "cumulative watershed effects" or the effects of all activities within a watershed (Brooks et al. 1997). Without the holistic management of the entire watershed, restoration efforts in one area might be decreased by conflicting efforts elsewhere, or objectives narrowly focused on site-specific problems might just transfer problems to other portions of the watershed.

O'Brien Creek near Missoula, Montana is an example of holistic watershed management that was achieved with surprisingly little coordination. The United States Forest Service (USFS) and Montana Fish, Wildlife and Parks (MFWP) are working to restore O'Brien Creek. Each had some knowledge of the other agency's efforts but began their respective projects independently, without setting common goals for the watershed. The history of this restoration effort will be outlined and briefly critiqued.

O'Brien Creek Watershed History

The O'Brien Creek Watershed has been heavily impacted by human uses since the turn of the century (Sandoval and Hegman 1998). Only in the last 10 years have local agencies and citizens made restoring the health of O'Brien Creek a priority. The USFS and MFWP began restoration efforts in the upper and lower watershed, respectively, and by chance at about the same time. The goals of USFS and MFWP were not identical, but, since both were ecologically guided, their goals were similar enough to complement one another's work.

At the turn of the century the McClay ranch began operations along lower O'Brien Creek. The ranch stretched from Big Flat Road to one mile upstream. The ranch owners installed a culvert and created a ditch as an irrigation channel about one mile up from the intersection of Big Flat Road and O'Brien Creek Road. From this point they diverted all of O'Brien Creek's water for the irrigation of hay fields. The only time water actually flowed in the stream channel was during high water, particularly in the spring. The creek was dry for roughly 11 months of the year. Although ranching ceased in the 1950's, and the area

was subdivided in the early 1970's, the irrigation diversion remained until the early 1990's (Zyskind pers. comm. 1997; Stephens pers. comm. 2000).

Portions of the McClay Ranch were bought by John Dydel in 1991. Dydel redirected the creek from the irrigation ditches and diversion, returning flow to the channel. The residents of lower O'Brien Creek now obtain water from wells.

The headwaters of O'Brien Creek were also modified by human use. The upper watershed was used as pasture from the turn of the century until 1992. From 1992 until 1995, logging in the headwaters was extensive, leaving very little cover on most slopes. The roads built and used by Owens & Hurst, (a Montana-based logging company) were built to very low standards (Sandoval and Hegman pers. comm. 2000). These roads, as well as the large areas of deforested slopes, created a sediment problem within the watershed, degrading the water quality of O'Brien Creek (Sandoval and Hegman 1998; Silte pers. comm. 2000).

Historically, O'Brien Creek was an important spawning tributary to the Bitterroot River and the nearby Clark Fork River. Land use practices in the O'Brien Creek watershed degraded O'Brien Creek and its spawning habitat (Sandoval and Hegman, pers. comm. 2000). In the headwaters, increased sediment inputs to the stream from historic logging, road building, and grazing resulted in a stream that was well below its potential for both fisheries and habitat quality (Sandoval and Hegman 1998). Wildlife recruitment in the upper O'Brien Creek Watershed had decreased due to loss of cover from clearcutting, and increased traffic on logging roads. In the lower sections of O'Brien Creek, there were instances of structures blocking fish passage, degraded riparian habitat, bank sloughing, mass sediment movement and the loss of in-stream large woody debris which provides fish habitat (Schmetterling and Pierce 1996).

Upper O'Brien Creek restoration work (USFS Lolo National Forest)

In 1995, roughly 2900 acres of land in the upper O'Brien Creek Watershed (all but a small private parcel in the valley bottom) were acquired by the Lolo National Forest from Owens & Hurst in a land trade. The restoration efforts of the Forest Service focused on the decommissioning of logging roads within the watershed. This would restrict vehicles from entering portions of the watershed, decrease the cost and impact of the maintenance of poorly designed roads, restrict vehicles from entering sensitive areas, and ultimately decrease the amount of sediment inputs to the stream (Sandoval and Hegman pers comm. 2000).

The road decommissioning (begun in 1997 and concluding in 2000) includes recontouring 15 miles of road to the land's original slope. The decommissioned road will then be seeded with a native seed mix and formed into a single-track trail for mountain bikes. The concentration of roads within the upper watershed will decrease from 5.8 km/km² to just over 1.6 km/km². The goals of the Forest Service for the land in upper O'Brien Creek include: increased security for wildlife, the improvement of water quality within O'Brien Creek, and the elimination of road maintenance problems. The cost to the USFS for the upper O'Brien Creek restoration through the year 2000 will total \$115,000 (Sandoval & Hegman 1998).

To assess the watershed benefits of road decommissioning in the O'Brien Creek watershed, a Forest Service study compared the sediment yield from undisturbed sites, existing Forest Service roads, newly

recontoured roads, and roads one year after recontouring and revegetating. Preliminary results indicate that undisturbed sites have lower sediment yields than existing roads, and that after one year, recontoured roads generated only slightly more sediment than undisturbed sites (Hickenbottom 2000).

Lower O'Brien Creek restoration work (Montana Fish, Wildlife and Parks)

In 1998, Montana Fish, Wildlife and Parks began restoring lower O'Brien Creek. Restoration work included restructuring the streambed and banks (from Blue Mountain road downstream to the confluence with the Bitterroot River) to resemble less impacted streams in the area. The restoration also included fencing (to control grazing), the removal of an irrigation diversion, the replacement of a culvert with a bridge (to allow more natural flow and to eliminate a fish passage barrier), and revegetation of streambanks with native vegetation. All restoration work on the lower creek through 2000 totaled \$45,600 and included monitoring costs. The goals of the restoration work done by MFWP included: improvement of trout spawning habitat, increased trout recruitment, and the return of O'Brien Creek to a more natural state.

Evaluation of the success of these efforts is ongoing, but after a year and a half, only 18% of the shrubs planted along the creek survived. Most mortality appeared to be due to desiccation or competition with weeds. Survival would likely be improved by controlling weeds, using more drought-tolerant species (like choke cherry), and placing less drought-tolerant plants where their roots can reach the low flow water table (Glaser, 2000).

Amazingly, MFWP has already seen positive effects from the restoration work on Lower O'Brien Creek. Fish density in O'Brien Creek has increased in restored reaches compared to control reaches (Schmetterling pers comm. 2000).

Evaluation of Restoration Efforts on O'Brien Creek

What level of cooperation is required for successful restoration of watersheds? The level of coordination between USFS and MFWP in the O'Brien Creek Watershed was not as great as in some other watershed restoration efforts, such as those in Big Spring Creek, MT (USDA 1998). At Big Spring Creek, drinking water was threatened by the actions of many private landowners, so a very high level of coordination and planning was needed. Many interested individuals and groups spent considerable time developing common goals and coordinating actions.

In O'Brien Creek, both the USFS and MFWP knew of the others' actions and shared materials (USFS donated 100 mature trees to MFWP for in-bank stabilization) and financial resources (MFWP donated \$7,000 to the USFS project in the form of a Sikes grant). They did not develop common goals nor carefully coordinate their actions. Such uncoordinated efforts sometimes have serious conflicts (one group is building bank stabilization structures while another is pulling them out). However, because both agencies were guided by ecological principles, their goals and approaches were similar enough to be complementary. However, several individuals in both agencies felt that more could have been done and more resources obtained with better communication and data sharing.

Coordination efforts like those in the Big Spring Creek watershed require money and time and are appropriate when coordination is essential to maintain interest and avoid conflicts. Because O'Brien

Creek has fewer stakeholders and less potential conflict, it did not need as much coordination and cooperation. Perhaps USFS and MFWP coordinated as much as was needed in this case.

However, in most watersheds, stakeholders interested in restoration would be well advised to attempt to develop common goals early on and to keep one another well advised of their efforts to restore and protect the watershed. At the same time, they should avoid allowing an overemphasis on coordination to stall their efforts or use up all their available resources. Watershed restoration continues to be as much art as science.

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