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A HISTORICAL LOOK AT WATERSHED IMPROVEMENT ON THE NATIONAL FORESTS IN NEW MEXICO

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Thank you for this opportunity to describe one aspect of the USDA Forest Service's role—that of water manager. This is not a "high-tech" paper—it is a chance to celebrate the Forest Service's history by enjoying some pictures of watershed improvement structural measures used over the years. Many people do not recognize the Forest Service's mission as a partner in water management. Our role as watershed managers goes back to the earliest debates in Congress concerning government's duty in managing forests.

Early conservationists, such as George Perkins Marsh, recognized the relationship between healthy forests and watersheds that responded orderly, that is, they yield the best quality water possible from wildlands in flows most useful for human and habitat needs.

This year we celebrate the centennial of the Forest Reserve Act. This act resulted after many years of debate in a Congress that was previously not inclined to favor legislation that imposed controls on land use. This was landmark legislation in our country's conservation history. Prior to the Forest Reserve Act, the country favored policies based on expectations of unlimited natural resources in a vast wilderness. With the debate and subsequent conservation legislation, we recognized the need to use wisely our resources and conserve their productive potential. Government had a role in this new attitude—land stewardship for this and future generations.

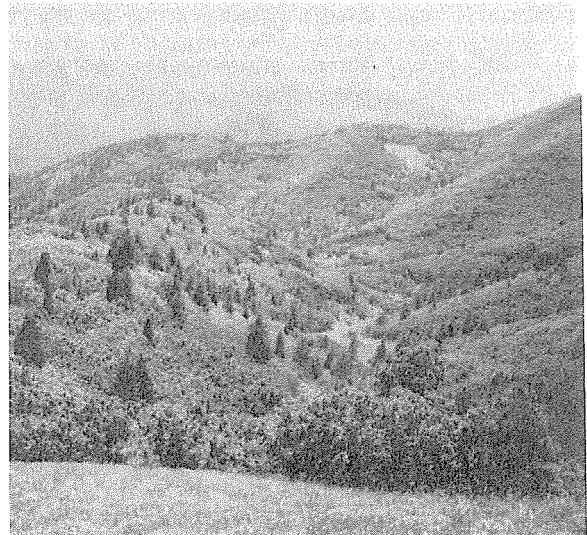


Figure 1. A watershed with good vegetative cover on a New Mexico National Forest.

Congress did not define the purposes of the forest reserves until the Organic Administration Act of 1897. Maintaining favorable conditions of water flow is one of three primary purposes for the lands that became national forests. The other primary purposes are the protection and improvement of the forests and the production of continuous supplies of timber. Thus, our role as watershed managers is clearly part of the enabling legislation and history.

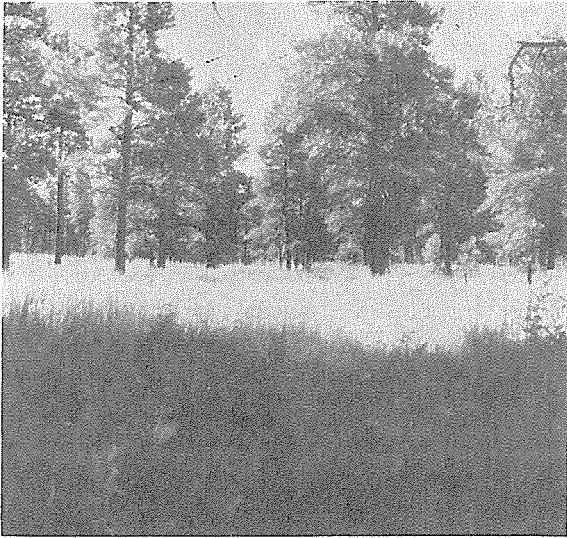


Figure 2. Good cover for watershed protection and multiple uses.

The Forest Service started taking an active part in southwestern resource conservation about 1908. By that time, many of the vegetation resources were heavily used. Watersheds were not in good condition. Vegetative use was uncontrolled, sheet erosion was common in the uplands, gully erosion was serious in the valley bottoms, and riparian vegetation was frequently abused. Flooding was a problem, perennial flows were reduced, and water quality was not up to its potential.

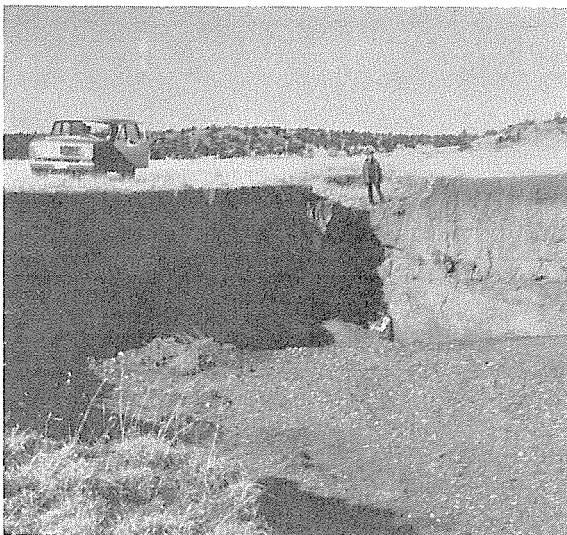


Figure 3. Gully erosion due to past land overuse.

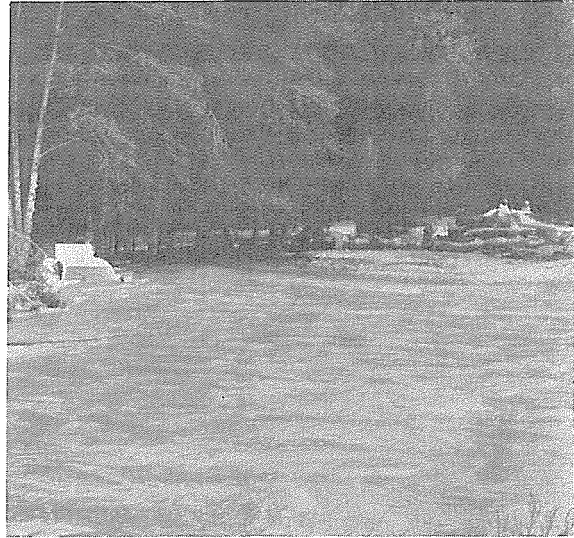


Figure 4. Flooding aggravated by unsatisfactory watershed condition.

World War I again placed heavy demands on these lands to provide timber and beef. However, the Great Depression brought renewed emphasis on the restoration of the national forest watershed in the form of the Civilian Conservation Corps. This program provided major restoration efforts, including structural measures that still stand and function today.

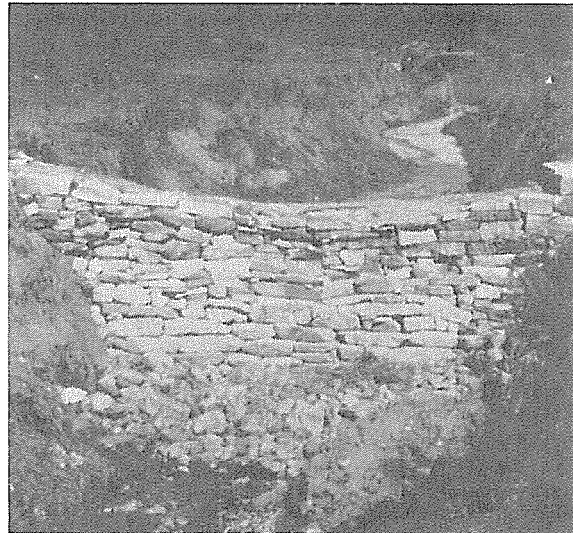


Figure 5. Watershed structure constructed by the Civilian Conservation Corps. Structure continues to function.

A Historical Look at Watershed Improvement on the National Forests in New Mexico

Several other laws, such as PL 534, the Flood Control Act, and PL 566, the Small Watershed Act, provided initiatives that helped our efforts to restore watersheds to function more orderly.

Through the years, there has been a trend from labor-intensive to mechanical methods for watershed treatment. Early in our history there was a heavy emphasis on channel treatments, subsequently on land treatments, then to a combination of channel and land treatments, and finally into ecosystem management. We started by trying to control flows and moved toward efforts designed to work with flows.

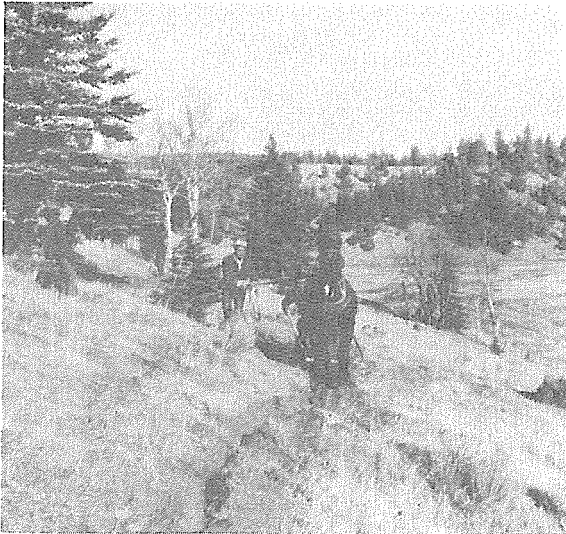


Figure 6. Land treatments such as this early terracing project enhanced watershed functioning.

Through experience we have learned quite a bit. We know that treating symptoms without curing the cause will lead to failure. On the other hand, projects that include treating symptoms after or in conjunction with solving the problems seems frequently to be successful. Working against the stream energy seems to result in long-term maintenance and frequent failure. Trying to save money on initial design is usually a fatal mistake. Not understanding risks or not developing understandable design criteria based on acceptable risk often results in constant maintenance. Finally, not considering all components of the ecosystem or not having an understanding of potential and desired future condition for the ecosystem leads to failure.

It is often through our failures that we learn best how to proceed in the future.



Figure 7. Working with the stream energy to stabilize bank cutting.