# Is a shack at the edge of a stream a watershed? Can you eat at a water table? Find out by reading. . . An Essay on Rangeland Watershed Management

John C. Buckhouse

Range watershed management involves the coordination of land management objectives within a given basin or watershed in such a manner that the clarity, quantity, and timing of the water yield is optimized while at the same time providing maximum productivity of other products of the land.

Interest in management at the basin or watershed level is growing. The public agencies all recognize the importance of water as a natural resource, and in many cases they are managing the lands under their jurisdiction from a regional watershed, rather than an arbitrary political boundary point of view.

Definitions of watershed management vary in exact wording, but they generally focus on the importance of *management* in order to optimize sustained production and control of water yields in conjunction with the other usable resources produced on the land.

Watershed management is the foundation of soil and water resources. Land and water resources are interdependent and must be used in a complementary manner. There seems to be little point in trying to prevent floods, erosion, siltation, and droughts in the valley if the headwater regions are abused and neglected. To paraphrase an ancient Chinese proverb: "To rule the mountain is to rule the river."

The objectives of watershed management which can be used toward practical application are:

**I. Control of Quantity of Water Yield**

Increased amounts of *usable* water may be possible. I emphasize *usable,* for the resource will lose its practical value if there is no consideration as to its management once it becomes available.

Increased usable water can be very important for onsite vegetation productivity, downstream irrigation, increased aesthetic values, and native and domestic animal maintenance.

Water yields can be partially controlled through vegetative manipulation and small, on-site engineering structures. Vegetation type conversions may be considered where "wasteful" vegetation is using most, or all, of the available water. This might involve the removal of riparian (streamside) or phreatophyte (water-loving) vegetation such as willows, cottonwoods, or salt cedar and subsequent replacement with grasses. It could also be done by removing long-term, low producing perennials such as scrub oak, chaparral, big sagebrush or juniper and then revegetating with more productive grass or browse species. Some small, on-site engineering structures may also be employed to increase usable water. Small catchment ponds may trap water which might otherwise be lost to the site. Gully plugs, soil pitting, contour trenches and furrows, and water spreaders all serve to catch and delay runoff. By doing so, they allow additonal time for the soil to absorb the moisture and may increase on-site productivity.

The author is with the Department of Rangeland Resources, Oregon State University, Corvallis 97331.

*An eroding meadow before a water control structure was constructed.*

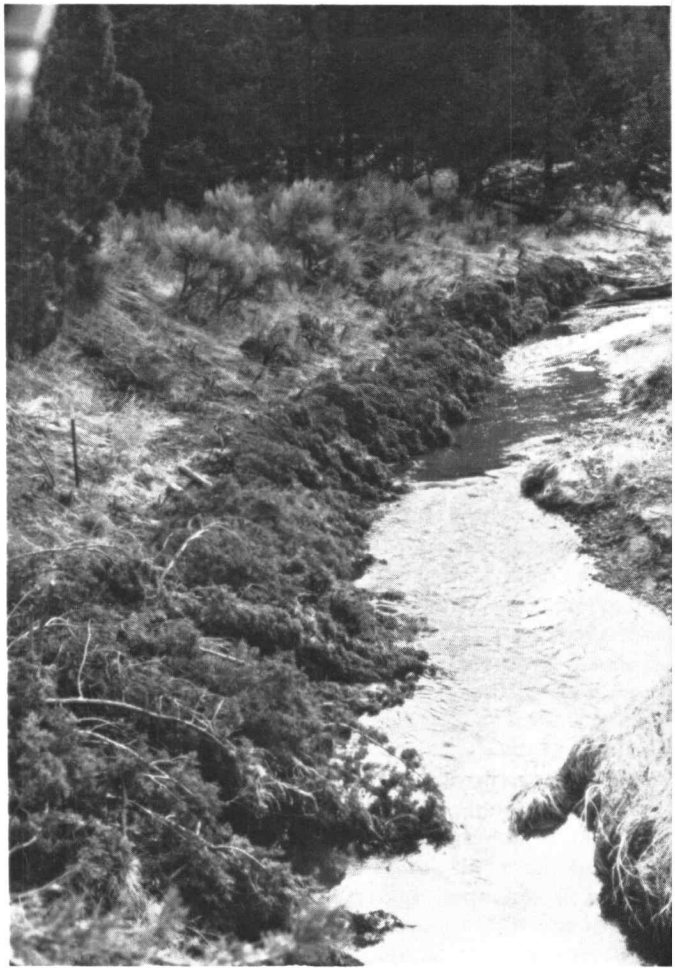
**II. Control of Quality of Water Yield**

a. Ensure clarity. (Sediment is our number one water pollutant.)

b. Guard against other pollutants entering the stream.

All of us are interested in high quality water. It is not only important to the recreationist and municipal user, but it affects local interests as well. Sediment-choked spawning grounds destroy the "redd" or egg-laying and fry-nurturing habitat of salmonoid fishes and represent an economic as well as an aesthetic loss. Clogged irrigation canals and ditches are not only nuisances, but can be damaging to crops, pumping machinery, and flow capacities. Other pollutants may relate to eutrophication and algae clogged reservoirs, decreased production due to toxic concentrations of heavy elements, and gastrointestinal outbreaks.

Headwaters watershed management can be very important in the quality of the flowing streams. It is imperative that



*Vegetative riprap made by suspending and securing cut junipe against an eroding streambank.*

road construction, logging practices, grazing schemes, anc cultivation techniques employ the foresight and manage ment principles which minimize the negative impact whicl they could potentially have on the watershed resources.

*Lush meadow after construction of a water control dam.*

**III. Control of Time and Duration (Regimen) of Water Yield**

If we had absolute control of this, we would be able to avoid the extremes of floods and droughts and could provide steady, uniform flows all season long. This is not completely possible, but steps can be taken to move toward this end. Soil and vegetative mantels can be managed to maximize water-holding effectiveness. Snowpacks at higher elevations can be controlled by snow fences and vegetative cutting patterns which help regulate accumulation and melt rates. Small engineering structures can be employed to slow runoff, encourage soil/water infiltration and promote sub-surface flow.

In range watershed management we frequently deal with low precipitation regions and high intensity storms with flashy runoff periods. Frequently the watersheds we work with are ephemeral—carrying water in the stream courses only during rainy or spring seasons. It may well be possible only to redistribute this water on-site leading toward increased on-site vegetation production, rather than to increase downstream, off-site streamflow from many of these regions. However, in addition to providing increased on-site productivity, one can justifiably hope for decreased erosional losses and increases in soil productivity through a conscious program of range watershed management.

# Attention 1984 Annual Meeting Exhibitors:

Commercial firms and organizations seeking exhibit space at the 1984 Annual Meeting of the Society for Range Management are requested to contact:

**Connee Quinn**
**Elanco Products Company**
**Route 1, Box 45**
**Whitney, NE 69367**
**(308-667-2712)**

**or**

**John Kitchell**
**Range Specialist**
**DOW Chemical USA**
**P.O. Box 455**
**Spearfish, SD 57783**
**(605-642-7513)**

The Annual Meeting and associated activities will be held at the Civic Center in Rapid City, South Dakota, February 7-12, 1984. Adequate space for both booths and equipment displays is available.