Riparian Management: Back to Basics

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Wayne Elmore, *Riparian Management: Back to Basics*, *in* THE PUBLIC LANDS DURING THE REMAINDER OF THE 20TH CENTURY: PLANNING, LAW, AND POLICY IN THE FEDERAL LAND AGENCIES (Natural Res. Law Ctr., Univ. of Colo. Sch. of Law 1987).

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June 8-10, 1987

I. INTRODUCTION

The condition and management of our riparian zones is the number one land conservation issue in the United States. Over 80 bills were introduced into the Oregon Legislature last year relating to riparian areas or water, and this year will be the same. Public comment letters on riparian management in the Prineville District, Bureau of Land Management ran ten to one over other issues in the Brothers Environmental Impact Statement (EIS). Management decisions affecting long accepted practices in forestry, range management, transportation, and recreation are being challenged based on past and projected impacts to riparian zones. The public is deeply and emotionally involved in the condition of our riparian zones and the primary focus is the wildlife resource. They ask "If you can't manage two percent of the total correctly, how can we trust you with the other 98 percent?" As a result, the Forest Service and BLM land use plans are addressing riparian zone management as a major resource issue.

Early explorers and residents give us a glimpse of what our riparian areas once looked like. Ogden, traveling in the Crooked River Basin in Eastern Oregon during 1825, described willows from side to side across the valley bottom and said "a greater place for beaver does not exist in this world". Most of this scene is now gone. The Indian word "Ochoco," for which our Central Oregon mountains are named, means "streams lined with willows," yet today willows are uncommon. Senior ranchers in Central Oregon tell stories about the problems with gathering cattle in the "thick willow stands" on Big Summit Prairie. The "thick willow stands" have digressed to scattered clumps. Historic evidence indicates that riparian zones were in better condition then than they are today.

II. THE RIPARIAN SYSTEM

In recent years the management of riparian areas has typically been the responsibility and interest of wildlife biologists. Improvements have been primarily judged in relation to habitat for big game, song-birds and fish. But riparian areas are more than just habitat for wildlife, they actually are functioning systems that provide physical filtering of water, bank stability, water storage, and the recharge of underground aquifers. Wildlife habitat is a product of those functions, and should not be considered as the only emphasis for managing riparian systems. In fact, many times wildlife benefits are the lowest economic value received from riparian restoration.

To fully evaluate the benefits and incorporate riparian management into our land use plans, we must go back to basic functions.

These functions include:

1. Physical filtering of water: Riparian vegetation can withstand high velocities of water and still remain intact. One of its functions is to slow the flow of water, literally "combing" out sediments and debris. This water purification process also helps to build banks; so channels typically become narrow and deep where once they were wide and shallow. Vegetation, such as grasses, sedges and rushes, lays down under high flows, and literally forms a blanket over the banks. This process reduces bank cutting and aids in deposition of sediments. Where deposition has occurred through time, extensive wet meadows or flood plains will develop.

2. Bank stability: The diversity of grasses, forbs, sedges, rushes, shrubs and trees produces a variety of fibrous roots and tap roots that bind and hold settled soils in place. The binding effect of the roots helps maintain the positive factors of the bank building processes during high flows. A combination of both woody rooted and fibrous species have a reinforcing effect. The woody rooted species provide physical protection to the hydraulic forces of eroding water and allow forbs, grasses and sedges to bind the finer particles. In combination, this diversity of plant species is much more effective in promoting bank stability than is any one by itself.

3. Water storage and recharge of underground aquifers: The aquifers in many areas of the west are going dry and one of the processes of riparian systems is to help recharge a percentage of a given aquifer. For many degraded riparian systems, all the flows are contained in the channel and cannot access the banks or floodplains where the water can spread. It is widely accepted that we can lower a water table and drain a stored underground aquifer through channelization or erosion. It is not readily accepted, however, that we can reverse that process and store water through recovery of riparian systems and deposition in formerly degraded channels. Riparian systems slow the flow of water and allow it to spread and soak into the banks like a sponge, which raises water tables. When banks rebuild through filtering of sediments, they increase the area for water absorption and improve recharge of aquifers by allowing gravity to work on the stored waters.

The upland areas must not be excluded in our discussion because they are an integral part of the riparian system. Overland and subsurface flows also influence sediment loads, water cycles, and recharge of aquifers. The first

order watersheds (those with single unbranched streams) are the uppermost area in the system and vary from small areas in our forests to rather large areas in our rangelands. Despite their size, they are critical to total system recovery. First order watersheds generally comprise the major portion of any stream system. They are also the only areas within the system with physical integrity because all other stream orders are a mixture of upstream reaches.

Other processes observed in riparian systems that have shown a substantial improvement include increases in the base flow (minimum flow period), reduction in buildup of ice, and physical filtering of sediments by ice. In Central Oregon, the Bureau of Land Management (BLM) is studying these processes to better understand their role in the total cycle of the riparian system. Results will be forthcoming over the next several years.

III. THE PRESENT

Today, livestock grazing practices are receiving most of the criticism for the long-term decline in riparian conditions in both our forests and rangelands. Members of the Oregon Cattlemen's Association recognize the potential of riparian recovery and recently adopted a resolution supporting a "flexible riparian management concept." Ranchers, such as E.J. Kropf of the Bonnieview Ranch near Prineville, Oregon, have incorporated management of riparian areas into their total ranch plans. Kropf said, "A cow has never awakened in the morning and said, 'I'm going to gain as much weight today as I possibly can.' Instead, they will lay along the creeks, eat everything that is green and stay there and lose weight. Not only can the cattle be detrimental to the riparian zone, but they can also be detrimental to

themselves, weight gain wise. It is important to stabilize our streams and improve our flows from a land management standpoint and as an economic benefit to the ranching industry, especially in difficult times such as now."

Leaders from the Oregon Cattlemen's Association and the environmental community recently formed the Oregon Watershed Improvement Coalition with the help of the Pacific NW Section, Society for Range Management. The committee is represented by 5 members from each group plus one advisor from the Bureau of Land Management, U.S. Forest Service, and Oregon State University Range Sciences Department. The main thrust of the group is working together to improve riparian conditions in Eastern Oregon and increase understanding of riparian systems management through education. Bob Skinner, Oregon Cattlemen's Association President and Coalition Member, said "The riparian controversy will not go away and we must work together to solve the problem. There are too many benefits for all of us."

THE FUTURE

We must now face the future and accept what the past has to teach us. Management of riparian systems with an eye to positive improvement will result in systems that will recharge underground aquifers by rebuilding water tables that have been depleted from misuse and erosion. Five miles of Camp Creek (in Central Oregon) was placed under management in 1966. In the 1800's the area was a wide wet meadow marsh complex. Overuse caused accelerated erosion and by 1905 it was a 20-foot deep eroded channel, flows were typically intermittent in the summer, and the meadow marsh complex was gone. Since 1966 the five mile section has filtered out sediments from the stream and raised

the channel by 6 feet in places. The green zone adjacent to the stream increased from a few feet to over 200 feet. The most dramatic recovery, however, was observed in 1977 and 1981 during drought periods. The only perennial flow in the entire Camp Creek watershed was within the recovered section.

An example of the thought process we use to evaluate our streams can be seen on Bear Creek in Central Oregon. In 1974 the stream channel pasture was licensed for 72 Animal Unit Months (AUMs) between April and September. The channel was deeply incised, stream gradient less than two percent, sediment load medium to high, soils principally willowdale loam - very deep and well drained, gravel layers common, and an elevation of 3,500 feet. The riparian system was heavily overgrazed and the stream often intermittent during the summer. In 1976, the solution to improving this riparian zone was total exclusion of livestock. In 1982 a proposal to graze the area under a three pasture short duration system in February was proposed. The idea met with some opposition but was initiated on a trial basis. In 1986 we licensed 280 AUMs in the channel pasture, the riparian area continues to improve and the rancher has cut his hay bill $10,000. This management worked in that particular riparian system because ecosystem functions and processes have been nurtured even though livestock use was four times that which was preventing recovery in 1974. Livestock numbers were not the problem, it was more a matter of timing and intensity.

There are many other examples of riparian recovery co-existing with other land uses, however, we must not forget wildlife habitat as a product of the riparian system. Vegetation, the key to a functioning riparian system,

provides habitat for 80 percent or more of the wildlife species in many areas--species that depend on these systems for all or some part of their life cycle. These areas are important because all of the factors for habitat are in one place; food, cover and water.

Riparian systems are the water collectors. They work like a funnel, with the funnel mouth functioning in the uplands and the small end of the funnel in the riparian areas. Managers must therefore include the uplands for total system recovery. If we look only at the riparian areas in management, we ignore a major portion of the system.

One of the first riparian land use philosophies came from the Chinese Emperior Yu in approximately 1600 BC. He said, "To protect the river, protect the mountains." We must begin to incorporate the basic functions of our riparian systems into our planning documents. If we continue to ignore the warning signs in our riparian zones, we will lose their benefits. We must accept the fact that many of our present forest and range management practices are no longer acceptable in the riparian zone. Now is the time to make amends and work together to devise sound practices based on the processes of each individual system. We must then make sure we adhere to those practices.

"Riparian Management: Full Stream Ahead!"