

## Keeping the Cows Off: Conserving Riparian Areas in the American West

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Western riparian zones are one of the most productive habitats in North America (Johnson, Haight, and Simpson 1977), providing essential wildlife habitat for breeding, wintering, and migration (Brode and Bury 1984; Gaines 1977; Laymon 1984; Lowe 1985; Stevens et al. 1977). Riparian habitats in the Southwest are home to the North American continent's highest breeding bird density (Carothers, Johnson, and Aitchison 1974; Carothers and Johnson 1975), one of the rarest forest types, and more than one hundred state and federally listed threatened and endangered species (Johnson 1989). Approximately three quarters of the vertebrate species in Arizona and New Mexico depend on riparian habitat for at least a portion of their life cycles (Johnson, Haight, and Simpson 1977; Johnson 1989). Even xeroriparian habitats—normally dry corridors that intermittently carry floodwaters through low deserts—support five to ten times the bird density and species diversity of surrounding desert uplands (Johnson and Haight 1985).

Riparian habitats are widely distributed throughout the West, but they are in extreme danger, a fact that cannot be gleaned from the conservation status map, which generalizes threats across entire ecoregions (see figure 4.1). The primary threat to riparian habitats is livestock grazing. The threat is so serious that it has led the American Fisheries Society, the Society for Conservation Biology, and The Wildlife Society to issue position statements calling for a drastic overhaul of riparian zone and rangeland management (Armour, Duff, and Elmore 1991; Fleischner et al. 1994; The Wildlife Society 1996).

Livestock grazing (primarily by beef cattle) is the most pervasive influence on native ecosystems of western North America (Wagner 1978; Crumpacker 1984). Approximately 70 percent of eleven western states (Montana, Wyoming, Colorado, New Mexico, and westward) is grazed by livestock (Council for Agricultural Science and Technology 1974; Crumpacker 1984; Longhurst, Hafenfeld, and Connolly 1982). Grazing occurs on the majority of federal lands in the West, including most of the domains of the U.S. Bureau of Land Management and the U.S. Forest Service, as well as many national wildlife refuges, federal wilderness areas, and even in some national parks. In the sixteen western states, approximately 165 million acres of BLM land and 103 million acres of Forest Service land are grazed by 7 million head of livestock, primarily cattle (U.S. General Accounting Office 1988). Ninety-four percent of the BLM lands in these states is grazed. Thirty-five percent of federal wilderness areas in the United States has active livestock grazing allotments (Reed et al. 1989—this figure is from a nationwide survey; the percentage for the West is probably higher).

Cattle are not considered terribly intelligent, but they are not as dumb as we sometimes think—they prefer riparian areas for the same reasons we humans do: shade, cooler temperatures, and water, not to mention more abundant food. While public lands grazing allotments may stretch over thousands of acres, livestock spend a disproportionate amount of their time in riparian zones (Ames 1977; Gillen, Krueger, and Miller 1984; Kennedy 1977; Roath and Krueger 1982; Thomas, Maser, and Rodick 1979; Van Vuren 1982).

Riparian habitats are not only biologically rich, but also easily damaged. The U.S. Environmental Protection Agency concluded that riparian conditions throughout the West are now the worst in American history (Chaney, Elmore, and Plaits 1990). Over 90 percent of Arizona's original riparian habitat is gone (Johnson 1989). Less than 5 percent of the riparian habitat in California's Central Valley Grasslands [54] remains, and 85 percent of that is in disturbed or degraded condition (Franzreb 1987). The Oregon-Washington Interagency Wildlife Committee (1979), composed of biologists from several government agencies, concluded that grazing is the most important factor in degrading wildlife and fisheries habitat throughout the eleven western states.

A great deal of research concurs (Carothers 1977; Mosconi and Hutto 1982; Szaro 1989; and Chaney, Elmore, and Platts 1990).

Livestock alter riparian vegetation in several ways: (1) they compact soil, which increases runoff and decreases water availability to plants; (2) they remove herbage, which causes soil temperatures to rise, thereby increasing evaporation; (3) they physically damage vegetation by rubbing, trampling, and browsing; and (4) they alter the growth form of plants by removing terminal buds and stimulating lateral branching (Kauffman and Krueger 1984; Szaro 1989). Livestock grazing is one of the principal factors contributing to the decline of native trout in the West; cattle activities especially deleterious to fishes are the removal of vegetative cover and the trampling of overhanging streambanks (Behnke and Zarn 1976). Livestock have been shown to decrease water quality of streams (Buckhouse and Gifford 1976; Diesch 1970). Changes in water chemistry (Jeffries and Klopatek 1987) and temperature (Van Velson 1979), in effect, create an entirely new aquatic ecosystem (Kauffman and Krueger 1984; Kennedy 1977). Livestock disturb: (1) streamside vegetation, (2) stream channel morphology, (3) shape and quality of the water column, and (4) structure of streambank soil (Kauffman and Krueger 1984; Ohmart 1996; Platts 1979, 1981, 1983; Platts and Nelson 1989).

Are we willing to trade rich riparian communities, bursting with birdsong, for trampled mud and befouled water? Public policy has yet to catch up with science. If the lacy network of green that harbors so much of western biodiversity is to be saved, government action must be bold and change must be immediate.

What must be done:

1. Reverse the long-standing U.S. government policy that assumes that livestock grazing is appropriate on federal lands in the West. Instead, evaluate the ecological costs and appropriateness of livestock grazing on a site-by-site basis. A site should be considered appropriate for grazing only if grazing contributes to long-term productivity and maintenance of native biodiversity.
2. Remove livestock immediately from all damaged riparian areas, except in the rare cases where grazing can be shown to provide a specific tool for ecological restoration.
3. Establish a network of significant livestock exclosures to provide landscape-scale benchmark areas for scientific monitoring of human impacts (see Fleischner 1994).
4. Eliminate grazing on U.S. public lands, especially wilderness areas and wildlife refuges, where it leads to eradication of native predators and native vascular plants.

## Conservation Snapshot Criteria

The snapshot conservation status assessment includes four criteria: habitat loss, size and number of habitat blocks, habitat fragmentation, and habitat protection. We summarize the broad trends illuminated by analysis of each of these criteria below. Detailed methods and discussion can be found in appendix B.

### Habitat Loss

We estimate the percentage of remaining intact habitat using mapped habitat information, satellite data, and expert opinion as guides (figure 4.2). This map mirrors the snapshot conservation status (figure 4.1) to a certain extent but also underscores the amount of intact habitat that remains.

Sixteen ecoregions (14 percent) have dangerously high levels of habitat loss, and five of these are globally outstanding: the Hawaiian Dry Forests [4], Central Pacific Coastal Forests [34], Northern