

## **Management of Land Use Conflicts in the United States Rocky Mountains**

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People have long been attracted to the beauty and grandeur of the Rocky Mountains. Until very recently, however, the Rocky Mountain region was sparsely populated and its use mostly extractive. Commodities removed in massive quantities included first beaver, then precious metals, timber, energy, and finally water. There has been a fundamental change in migration patterns since the 1980s. Populations are expanding not only in urban areas; many rural areas are also growing faster. In an affluent and mobile society, Americans are moving to the West for aesthetic reasons, often based on perceptions that have little to do with regional roots, family ties, or economic opportunities.

Wallace Stegner described the West into the 1980s as a colony for the rest of the nation. "It seems to be almost like a

continuous repetitive act of God that the western resources should be mined ..., that populations should rush in and have to rush out again, or trickle out again.... Get in, get rich, get out.... Every boom and bust leaves the West physically a little poorer, a little worse damaged" (Stegner 1996).

In an article about actor and director Robert Redford, writer Richard Raynor talks about unexpected side effects Redford's movies have had on American behavior. "A River Runs Through It dangerously swelled the banks of American rivers with novice fishermen. It seems likely that Redford's loving rendition of ranch life in *The Horse Whisperer* ... will have a similar effect on western Montana, filling it with even more people in a nostalgic search for American rapture and simplicity" (1998).

## The price of immigration

The Rocky Mountain West is now growing three times faster than the rest of the United States (see Figure 2). Immigration is creating a cultural clash between those who have practiced traditional western livelihoods and newcomers to previously remote valleys and resort towns. A dichotomy has sprung up between Old and New Westerners. "Long-time residents are especially disturbed at New Westerners' enthusiasm to preserve, or 'museumize' the region's natural and working landscapes—they crave wilderness and like the look of cattle country, though they demand well-marked trails in the backcountry and call for animal rights when ranchers shoot coyotes or prairie dogs," writes Bill Riebsame in his *Atlas of the New West* (1997). Riebsame describes current settlement as fundamentally different in nature than earlier shanty towns and trailer parks of the short-lived mining and energy development booms. Immigrants are buying into cookie-cutter subdivisions and mammoth houses spread across the landscape, often on 35-acre ranchettes.

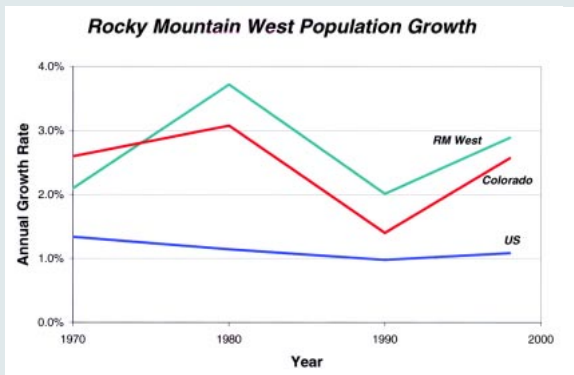
This new wave of migration to the Rockies comes with an environmental price tag, especially in direct effects to native ecosystems. Even though most of the West is publicly owned and managed, much of the ecologically productive,

riparian, and valley bottom land is privately owned. Moreover, because the private land ownership follows the dendritic patterns of the valley bottoms, the vast majority of public land is within close proximity to private land. Nearly 80% of Colorado's publicly owned forested lands are within 2 km of private land. Homebuilding in mountain valleys fragments corridors for migration, separates predators from prey, introduces predatory pets such as cats and dogs, increases sewage releases into rivers, and reduces the area of riparian and valley bottom habitat available for wildlife. Increased recreation means more exotic species are introduced, and in autumn, low-flowing rivers are further drawn down to quench thirsty snowmaking machinery.

But perhaps even more debilitating are the impacts of development on human control of ecological processes. In pre-European times, forest fires in montane zones occurred with a return frequency of 40–80 years. Today, prime development is located on the forest fringe—homes nestled at the edge of the forest, great views overlooking valleys below, and private access to public land above. The result is that let-burn policies are challenged pragmatically because of the many homes and buildings at risk from forest fires. This occurs despite current public sentiment



**FIGURE 1** Sign close to a highway near Durango, CO. A condo is a condominium, ie, a common type of resort housing that is comprised of multiple-family attached dwellings purchased outright by their owners. (Photo by David M. Theobald)



**FIGURE 2** Annual population growth rates for the Rocky Mountain West (top), the State of Colorado (middle), and the United States, 1970–1998. While the population of the United States increased by approximately 1–1.4% per year, populations in the Rocky Mountain States increased at greater rates of 1.5–3.8% over the same time. At present, population growth rates are still increasing for the Rocky Mountain States, while the overall US population growth rate is stable.

and policy that favors limited fires to maintain healthy forests. Other examples include development in avalanche paths, introduction of exotic species and weeds from home landscaping, and increased recreational use of remote lands.

### Interest groups versus land management

Development has many impacts on the social, cultural, and economic systems of the West. Changes are colorfully characterized in accounts by the popular press. Cultural and social clashes have direct effects on the ecological system and illustrate how difficult land management has become in the Rocky Mountain West. Today, land managers must spend more time with many different special interest groups rather than singular, well-established associations. In addition to natural resource skills, land managers need training in conflict resolution, collaborative processes, and facilitation.

Nowhere is this more evident than in the management of national parks. Parks act as magnets for surrounding real estate development and, as populations grow, for increasing services. Gateway communities respond, often with businesses that conflict with the values for which the park was established. These have included golf courses, amusement parks, and theaters at the park's boundary. In turn, local economies become dependent on park management decisions; pressures increase to compromise park attributes in order to maintain those economies. As surrounding landscapes are developed, managers acknowledge that external threats and

issues have become their major focus in trying to preserve the park's resources for an increasingly demanding public. However, as park managers seek to influence land use decisions outside their jurisdiction, it has become clear that they have no mandate to do so.

### Local decisions with regional impacts

In the face of these threats, management of the Rocky Mountain landscape must move beyond public lands to influence land use decisions on private land. Regional changes in land use are simply the result of many local decisions made one at a time—a ranch is converted to a subdivision, a mountainside is developed for skiing, a valley is dotted with vacation homes. These decisions are inherently local, so that the regional effects of growth on ecosystems are simply the collective outcome of many local decisions. An unstated assumption in planning is that habitat lost in one place can be compensated by undisturbed habitat elsewhere. However, this assumption cannot hold forever—many small, seemingly benign impacts accumulate to cause large, harmful effects on environmental goods like wildlife habitat—what economist A. E. Kahn calls the tyranny of small decisions.

One example of an effort to inform local land use decision making of possible ecological impacts is the System for Conservation Planning, SCoP (pronounced "scope"). The goal of SCoP is to support local community planning in Colorado by providing readily accessible information on the consequences of development for



**FIGURE 3** Vail valley, Colorado, USA. Valley bottoms are mostly privately owned, leaving them vulnerable to high-density development. Here, hotels and highways have squeezed the river and associated riparian zone up against the right side of the photograph, greatly reducing habitat for wildlife. (Photo by David M. Theobald)



**FIGURE 4** National Park ranger radiotracking a bear on golf course adjacent to Glacier National Park, Montana, USA. The bear is just out of sight of the photographer. Glacier National Park high country is in the background. (Photo by Daniel B. Fagre)

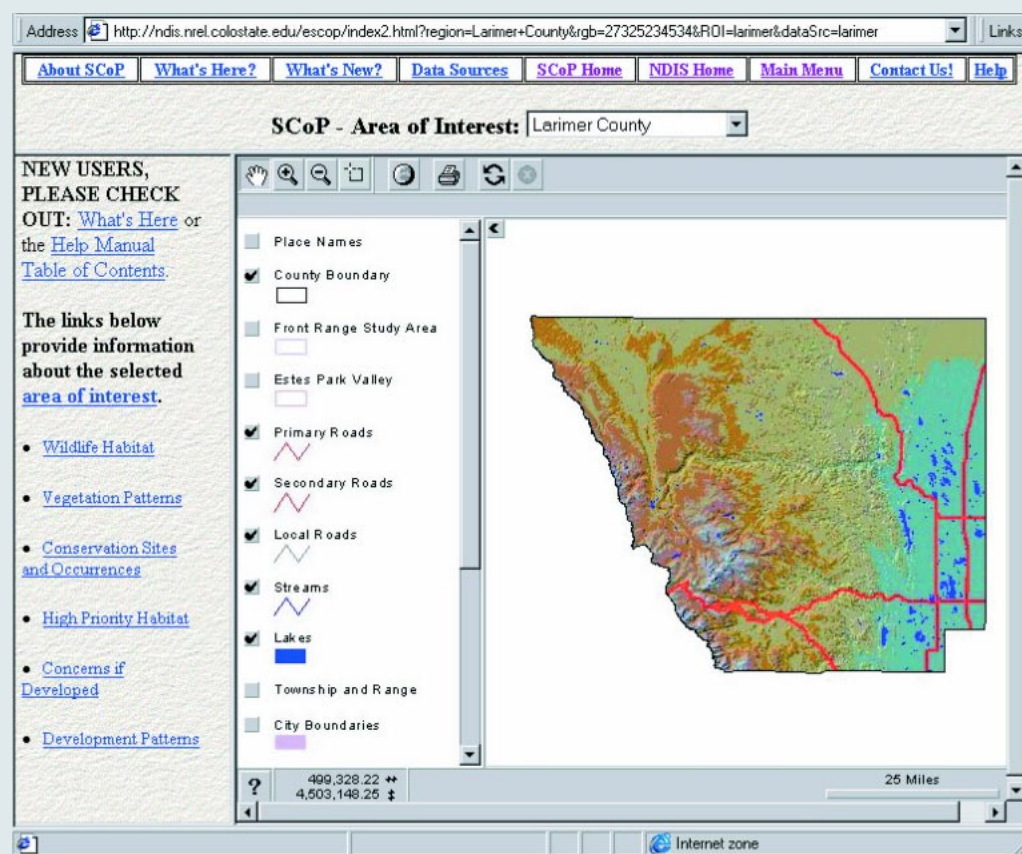
wildlife. To meet that goal, SCoP uses an interactive GIS (geographic information system) that allows planners, decisions makers, and citizens to foresee how changes in land use are likely to accumulate over time and space (Figure 5). SCoP further defines how these cumulative changes might affect the extent and distribution of habitat for wildlife. To date, federal and county planning agencies have used SCoP to assess the potential impacts of ski expansion plans and proposed mining operations, and to inform citizen growth conferences. Counties also have used SCoP during their development review process to screen proposed developments that may generate concern for important wildlife habitat.

### Tools for integrated mountain development

One important challenge is to identify, develop, and implement policies and initiatives to manage future growth. A mix-

ture of policy and legal instruments is needed, but there is a clear trend toward incentive-based tools rather than regulatory policies. A shining example encourages developers of large-lot (ranchette) subdivisions to voluntarily enter into a county planning process. In most Western states, county governments have little oversight of large-lot developments. Thus, many counties have developed rural land use processes that allow developers to earn bonus development units in return for clustering houses on a limited portion of the parcel. These so-called conservation subdivisions hold great promise for reducing or limiting site-level impacts by placing houses away from areas of important natural resources such as wetlands, critical habitat, or even prime agricultural land. Even so, vigilance is needed to also avoid placing houses near areas of intense and recurrent disturbances such as flood and forest fire, to locate conserved areas contiguous with neighboring areas and corridors of conserved land, and to

**FIGURE 5** A view of a SCoP screen showing tools that a planner could use to view a mountain area. Maps include wildlife habitat, vegetation patterns, conservation sites, and occurrences of threatened or endangered species, high priority habitat, concerns if developed, and development patterns.





**FIGURE 6** Arapaho Basin, Co. Most of the ski area lies above the timberline (3200 m asl) on state-owned land; the ski runs are privately operated under permit from the Forest Service. Natural snowfall is augmented out of season by snowmaking technology, which dewateres the streams during periods of low flow. This can be devastating to aquatic communities, creating yet another conflict among multiple users of mountain environments. (Photo by Matthis A. Zimmermann)

ensure that conserved areas are compactly shaped rather than dissected by fingers of development.

Development of land use planning tools is a step in the right direction. But wise land management requires that public and private stakeholders come to share

a similar vision of Rocky Mountain environmental health. This will call for communication skills and willingness to listen among all sectors of the West: the ranchers, the developers, the new immigrants, service providers, local governments, and public land managers.

#### AUTHORS

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Daniel Fagre is an ecologist with the U.S. Geological Survey stationed at Glacier National Park, Montana. For the past 9 years he and his collaborators have been modeling and documenting the ecosystem responses of Glacier Park's mountains to climate change. A new project is examining the impacts of regional landscape disturbance on 3 mountain protected areas.

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