

Socioecological network finds space for cattle, fish, and people in the big mountain west

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Cattle are moved seasonally between private and federal rangeland in mountain communities. Social-ecological approaches to rangeland management have been developed by the Blue Mountains working group and the Community-Based

Observing Network working group of the Mountain Social Ecological Observatory Network (MtnSEON). Credit: Baker County Tourism/CC BY-ND 2.0

Tension between the needs of cattle and fish is a source decades of controversy in northeast Oregon's Blue Mountains. Endangered bull trout, steelhead trout, Chinook salmon, and sockeye salmon require cold, clear water in mountain streams to thrive and reproduce. Cattle need these same streams for water, heat relief, and valuable streamside browse. But grazing cattle can muddy the water and trample eggs. Divisive, sometimes acrimonious, contention over livestock grazing on public lands has smoldered since the listing of salmon and trout species under the Endangered Species Act in the 1990s.

To tackle complex problems like improving the compatibility of cattle and fish, the social and ecological systems of mountains and their [river basins](#) must be approached holistically, say ecologists working with the Mountain Social Ecological Observatory Network (MtnSEON), a National Science Foundation funded initiative designed to build knowledge networks and foster resiliency in vulnerable [mountain](#) communities. Even defining problems to be solved, they argue, requires perspectives from ranching, community, and tribal groups, as well as insight from ecological research.

The Blue Mountains case study is part of an open access special issue on "Social-ecological systems in mountain landscapes" published online in the Ecological Society of America's journal *Frontiers in Ecology and the Environment*.

"Socioecological Systems Science is the understanding and perspective of people on the landscape. Traditional ecology is focused on everything

in the environment except for people—but that's changing. Landscape ecology is one sub-discipline that has seen the need to change. We need to look at relationships and the dynamic interplay between people, the environment, and ecosystems," said Andrew Kliskey, a professor at the University of Idaho.

Kliskey co-edited the special issue with his co-director at the University of Idaho's Center for Resilient Communities, Lilian Alessa, and Jim Gosz, emeritus professor at the University of Idaho.

"When you talk about people and the environment, it gets contentious. You have polarized views. We try to bring together different perspectives. Sometimes that leads you to having to do conflict resolution," Kliskey said. MtnSEON responded to the need to cope with discord by developing a curriculum for conflict management, which has grown into a popular course for middle managers within federal land management agencies.

The [mountain landscapes](#) of the American West are rich in fossil fuels, timber, fish, wildlife, and natural beauty, and host some the largest and most famous national parks, monuments, and protected wilderness. They are home to sizeable communities of Native Americans. Federal agencies govern large tracts of land in a part of the country where human inhabitants have long been few and far apart.

But change is coming with rapidly growing populations and increasing conversions of agricultural land to residential areas. In recent years, popularity with wealthy home buyers from outside these communities has shaken local economies. Booming energy sector speculation, combined with rising demands from growing urban centers and diversions to the Southwest, has put pressure on water sources. Wildfires are larger and more frequent, and warm winters have brought dramatic outbreaks of bark beetles.

Current strategies to protect fish habitat are imposed top-down by the government and present some serious disadvantages for ranchers, while benefits for fish are unclear. To break the deadlock, the MntSEON Blue Mountains working group talked in depth with stakeholders to develop new approaches, outlining potential benefits and barriers. They held meetings and interviews with with permit holders for the Umatilla, Wallowa-Whitman, and Malheur National Forests, where 70 percent of the land is allocated to grazing allotments, and with the US Forest Service personnel who manage the land, as well as community representatives and university extension agents. From these conversations, ideas like the use of range riders, flexible on and off dates for livestock, and redrawing or sharing across allotment boundaries emerged.

Upland watershed management decisions and economic activity can have outsized consequences for communities and ecosystems downstream. The Blue Mountains are part of the extensive Columbia River Basin, and the survival of salmon and trout is of great concern to the people who make their living from recreation centered on popular fish.

The Columbia is one of the most heavily managed river basins in the world. Its 668,000 square kilometers sprawl over state and international borders between British Columbia, Washington, Oregon, Idaho, Montana, and Nevada. Fifty-six hydroelectric dams span the Columbia, Snake, and other major tributaries in the basin. These barriers, combined with fishing, logging, and the effects of development have pushed several formerly abundant salmon and steelhead stocks to severe decline or disappearance. The US spends more than \$1 billion annually on habitat restoration, primarily concentrated on fish.

Though grazing has been a focus for decades, habitat may not be the critical factor currently limiting recovery of these commercially valuable species. Release of hatchery fish, overfishing, and natural migrations

stymied by dams may be undermining restoration efforts. The authors discuss the social and economic factors that complicate changes to management practices in the river basin. They revisit past successes, such as a controversial end to trout stocking in Montana in 1974 that succeeded in boosting trout abundance by 213 percent within four years.

"You really can bring together people with polarized views if you do it carefully," Kliskey said. "But it takes time. You have to listen."

More information: Susan Charnley et al. Cattle grazing and fish recovery on US federal lands: can social-ecological systems science help?, *Frontiers in Ecology and the Environment* (2018). [DOI: 10.1002/fee.1751](https://doi.org/10.1002/fee.1751)

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