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How Scientists Can Help End the Land-Use Conflict

In the last 6 months, we have seen an increase in conflicts about how to use public lands. And scientists have the tools to assist in solving those conflicts. Recently, we saw Native Americans occupying a prairie in North Dakota to protest the construction of a pipeline through tribal land. The confrontation between tribal nations and an energy transport company escalated and led to the intervention of the federal government.

The 41-day standoff associated with the Malheur National Wildlife Refuge in Oregon had a tragic ending and captured national attention. Similarly, there is conflict about the future of a Bears Ears National Monument in Utah, as well as the management of 1 million hectares of forests in western Oregon.

All these recent conflicts share a common denominator: different stakeholders trying to influence government in the way that it manages public land. Stakeholders are quite diverse; include ranchers, energy and mineral extraction companies, environmental conservationists, tribal nations, and tourists; and all want something different from the same land.

Science provides a unique point of view that may assist in solving this type of conflict. During the last 20 years, scientists have been measuring ecosystem services, which are the benefits that society receives from nature. These ecosystem services include the food, fiber, and wood that humans extract from the land. They also include the maintenance of air quality, the pollination of crops, the regulation of climate, and the purification of water. Finally, cultural services contain the nonmaterial benefits that individuals obtain from nature, such as cultural diversity, spiritual and religious values, and recreation.

Scientists have measured the capacity of different areas to provide different ecosystem services using surveys of soils, plants, and animals in more than 1500 papers. They also have estimated the demand for ecosystem services through stakeholder interviews, questionnaires, and surveys. One of the interesting findings is that demand for ecosystem services, or what people want from land, varies with the educational level, income, and location of residence of social beneficiaries. Different stakeholders want different things from nature, and their demands are dynamic and change with time.

Measuring ecosystem services and the demands from stakeholders may assist in conflict resolution by shifting the discussion from an emotion-based conflict to an evidence-based negotiation in which many novel options are in play. Then, it would be possible to assess whether there are trade-offs among the demands of different stakeholders.

Trade-offs result when an increase in one service is associated with a decline in another. The logging of forests provides timber but reduces habitat for wild and endangered species. Burying a pipeline creates economic value but diminishes the cultural ecosystem services of the land. Knowledge of the gains and losses associated with each management action may open the door to new approaches, such as compensation from one group to the other or payment for ecosystem services.

Not only do trade-offs exist, but also win–win situations occur when an increase in one service is associated with an increase in other services. Moderate grazing of rangelands, as opposed to overgrazing, increases forage production and conservation of species while reducing soil erosion. Science can provide an unbiased estimate of the costs and benefits in terms of the ecosystem services of different management options—all with the goal of managing land to reconcile the ever-changing demand and supply of ecosystem services.

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doi:10.1093/biosci/biw145