Seventy-Five Years of Vegetation Treatments on Public Rangelands in the Great Basin of North America

By David S. Pilliod, Justin L. Welty, and Gordon R. Toevs

On the Ground

- Land treatments occurring over millions of hectares of public rangelands in the Great Basin over the last 75 years represent one of the largest vegetation manipulation and restoration efforts in the world.
- The ability to use legacy data from land treatments in adaptive management and ecological research has improved with the creation of the Land Treatment Digital Library (LTDL), a spatially explicit database of land treatments conducted by the U.S. Bureau of Land Management.
- The LTDL contains information on over 9,000 confirmed land treatments in the Great Basin, composed of seedings (58%), vegetation control treatments (24%), and other types of vegetation or soil manipulations (18%).
- The potential application of land treatment legacy data for adaptive management or for retrospective analyses of effects of land management actions on physical, hydrological, and ecological patterns and processes is considerable and just beginning to be realized.

Keywords: adaptive management, Bureau of Land Management, land treatment, restoration, rehabilitation, soil.

Rangelands 39(1):1–9
doi: 10.1016/j.rala.2016.12.001
Published by Elsevier Inc. on behalf of The Society for Range Management.

The U.S. Department of the Interior has a long history of conducting land treatments on millions of hectares of public rangelands. Established under the Taylor Grazing Act of 1934, the Grazing Service aimed to increase forage quality and quantity for livestock production on public rangelands by removing native shrubs and sowing grasses. The Grazing Service merged with the General Land Office to form the Bureau of Land Management (BLM) in 1946, about the time the BLM began keeping records on land treatments, or those areas where vegetation or soil was manipulated intentionally. These treatments were generally planned and implemented to address local needs and concerns, but collectively began to influence vegetation across vast ecoregional landscapes. The Federal Land Policy and Management Act of 1976 mandated multiple-use management of public lands, including preserving their various natural resource values. To meet these federal mandates, treatments have become progressively more complex as resource managers attempted to accomplish multiple objectives, such as post-wildfire rehabilitation of vegetation, stabilization of soils, control of invasive plant species, reduction of hazardous fuels, and production of livestock forage. In the last 25 years, a greater emphasis has been placed on ecological restoration or “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.”

The sagebrush steppe ecosystem in the Great Basin has become a focal area for landscape conservation and ecological restoration. The Great Basin is the largest desert in North America, spanning over 50 million ha, with nearly 60% managed by the BLM. This cold desert was once dominated by native perennial grasslands, salt desert scrublands, sagebrush–steppe shrublands, pinyon–juniper woodlands, and, at higher elevations, mixed conifer forests. Sagebrush steppe is the dominant vegetation type in the region, but it is also considered one of the most endangered ecosystems on the continent. Vast areas of the Great Basin now also contain nonnative, seeded perennial grasslands planted as forage for livestock; nonnative, invasive annual grasslands perpetuated by frequent fires; and irrigated croplands. Wildfire size and frequency have increased at lower elevations in the Great Basin,