

Range Management

Informative flier: no.2- Range management

Rangelands are areas where the vegetation is dominated by native grasses, forbs, and shrubs and managed as a natural ecosystem. Rangelands occupy 40% of terrestrial ecosystems in the world.

For millennia, the means by which rangelands have been managed and modified are fire, grazing, rest, and the plow. Only recently has a new tool been introduced and that is the use of chemicals to modify rangelands.

A natural and important process, fire has occurred in sagebrush-steppe rangelands at 50-100 year intervals. Over the past century, however, effective fire suppression efforts have developed regions of artificially high fuel loads (essentially fuel stockpiles) that today burn extremely large extents of rangeland. Under natural ignition conditions (i.e., lightning) fire is not a management tool but rather a natural process that can rejuvenate decadent rangelands. Anthropogenic ignition (i.e., fires started by man) is typically a deliberate modification of rangelands used to satisfy a management goal (e.g., reduce fuel loads under controlled conditions, etc.).

Grazing is the consumption of rangeland vegetation and deposition of metabolic by-products by an herbivore. While both grazing and fire "consume" vegetation, grazing differs from fire in that 1) grazers are selective about the plants they consume, 2) consumption and nutrient re-deposition are spatially disparate, and 3) grazers trample some plants and cultivate the earth with their "hoof-action".

Grazing (by both grazers and browsers) is as ancient as grass itself and the two have co-evolved into a complimentary system. Under management, livestock can be grazed to achieve rangeland modification goals (cf. *Informative flier: no.1- Grazing Systems*). The effect of grazing is governed by the number and kind of grazer (species, sex, age, and breed), the frequency and duration of grazing, and the grazing animal's spatial distribution. Absolute control by the grazer is muddled by interactions with fire, weather, and the activity of individual animals.

Rest can be one of the most destructive forces of our rangelands. Grasses, as noted above, have a symbiotic relationship with the grazing animal. Not only can the grazing animal invigorate the plant by removing older vegetation, but the hoof action breaks the soil's crust and allows for much improved hydrologic cycling. Over-rested rangelands become weed infested, experience high levels of woody plant invasion, transition from animal-dependent grasses to rest tolerant grasses, and experience reduced biodiversity.

The use of the plow actually converts rangelands into cultivated agriculture or sub-urban development. Such modifications effectively destroy rangelands forever.

Chemicals have been used only recently to modify rangelands. These are typically herbicides used to control undesirable plants or reduce fuel loads. Their effect can be similar to fire or grazing in that vegetation is "consumed". However, chemical applications can have residual effects unlike fire or grazing.

An old business axiom states "one cannot manage what is not measured". This holds true for rangelands as well. Indeed this is the niche for the Geotechnologies. The Geotechnologies (geographic information system (GIS), global positioning system (GPS), and remote sensing (RS)) offer the unprecedented ability to monitor vegetation and the location of grazing animals, detect invasive plants, and model fuel loads and post-wildfire effects.