

National Resources Inventory Rangeland Resource Assessment

Regional Interpretation

Southwest

October 2010

About the Data

Estimates presented here are based upon rangeland data collected on-site as part of the National Resources Inventory (NRI). Rangeland is defined by the NRI as a *Land cover/use* category on which the climax or potential plant cover is composed principally of native grasses, grass-like plants, forbs, or shrubs suitable for grazing and browsing, and introduced forage species that are managed like rangeland. This includes areas where introduced hardy and persistent grasses, such as crested wheat-grass, are planted and such practices as deferred grazing, burning, chaining, and rotational grazing are used, with little or no chemicals or fertilizer being applied.

Overview: The Southwest region includes the Sonoran Desert of Arizona, the Mojave Desert of southern California and Nevada, and the Chihuahuan Desert of southern New Mexico and west Texas. It also includes the southern Rocky Mountains of south-central Colorado and north-central New Mexico. This region includes the most arid areas of the United States. Strong precipitation and temperature gradients associated with latitude, longitude and elevation largely determine general patterns of potential vegetation and plant production in the region, with local differences associated with differences in soils and landscape position. Water redistribution by runoff is an important factor in determining landscape patterns, which are reinforced by land degradation that increases runoff. Potential plant communities in most ecosystems include a significant shrub component. For those that do not, such as the Chihuahuan Desert grasslands, shrubs are often invasive. The Sonoran Desert is characterized by a high proportion of succulent species, where survival depends on the infrequency of sub-freezing temperatures. Like the Intermountain West region, the Southwest includes large areas of non-surveyed public lands interspersed with non-Federal lands. The Mojave Desert, in particular, has very small proportions of non-Federal land. There are also significant areas of forest in the higher elevations, particularly in west-central New Mexico and east-central Arizona.

Soil and Site Stability: Soil and site stability shows moderate departure from reference condition on at least 10 percent of the non-Federal land in most of this region, and on over 25 percent in parts of southern Arizona (Figure 1). As in the southern Intermountain region, aridity contributes to lower resistance and resilience of these areas. Invasion of grasslands by persistent shrubs, resulting in increased bare ground and, more significantly,

Grasslands, savannas, many wetlands, some deserts, and tundra are considered to be rangeland. Certain communities of low forbs and shrubs, such as mesquite, chaparral, mountain shrub, and pinyon-juniper, are also included as rangeland.

These results are based upon NRI rangeland data collected in the field on rangeland during the period 2003-2006. Current estimates cover non-Federal rangeland in 17 western states (extending from North Dakota south to Texas and west) and to a limited extent in Florida and Louisiana.

Quality assurance and statistical procedures are designed/developed to ensure data are scientifically legitimate. Irrespective of the scale of analysis, margins of error must be considered. Margins of error (at the 95 percent confidence level) are presented for all NRI estimates.

increased proportion of the soil surface exposed in intercanopy gaps, explains much of the increased departure from reference conditions for soil stability in southern New Mexico and West Texas. High levels of bare ground occur naturally, however, particularly in the extremely arid parts of southwestern Arizona. This helps explain why bare ground is higher in southwestern than in southeastern Arizona (Figure 2), but soil and site stability shows greater departure from reference conditions in southeastern Arizona.

Figure 1. Non-Federal rangeland where soil and site stability shows at least moderate departure from reference conditions

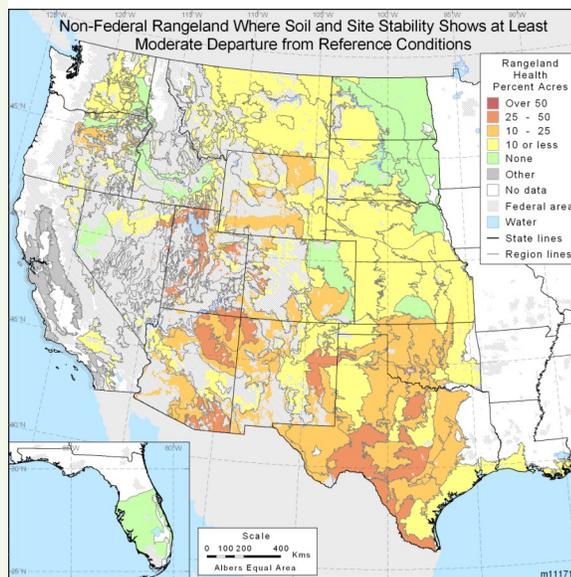


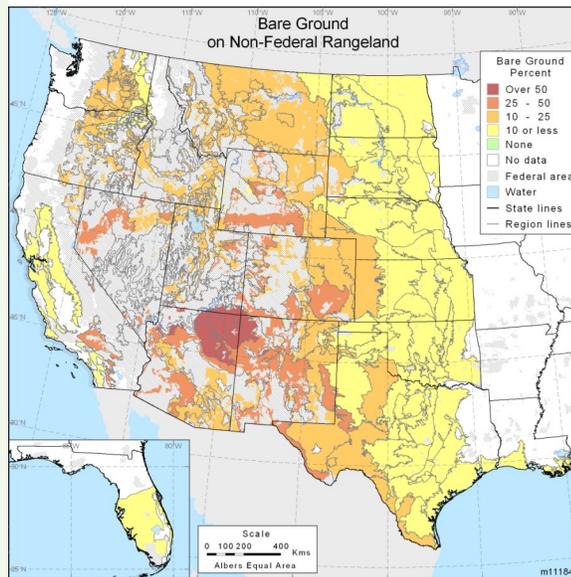
Figure 2. Bare ground on non-Federal rangeland

About the Protocols

The findings presented here are derived using data collected for two field protocols:

Rangeland health data are used to assess three broad attributes (soil and site stability, hydrologic function, and biotic integrity). Data collectors compare biological and physical characteristics of the sample site and record degrees of departures from reference conditions based on comprehensive materials describing the ecological site.

Line point intercept data are utilized in summaries of non-native plant species, non-native invasive herbaceous species, native invasive woody species, and bare ground. Line point intercept data are collected along two intersecting 150-foot transects centered on each sample location. Data collectors record plant species, litter, lichen,



Hydrologic Function: The pattern of hydrologic function (Figure 3) is similar to that for soil and site stability, and for virtually identical reasons. A loss of herbaceous cover associated with replacement of grasses by shrubs leads to increased bare ground, and a higher proportion of the bare ground in large intercanopy gaps. Accelerated runoff and soil loss in the intercanopy gaps is common.

moss, rock fragment, bedrock, and/or bare soil present at each 3-foot interval.

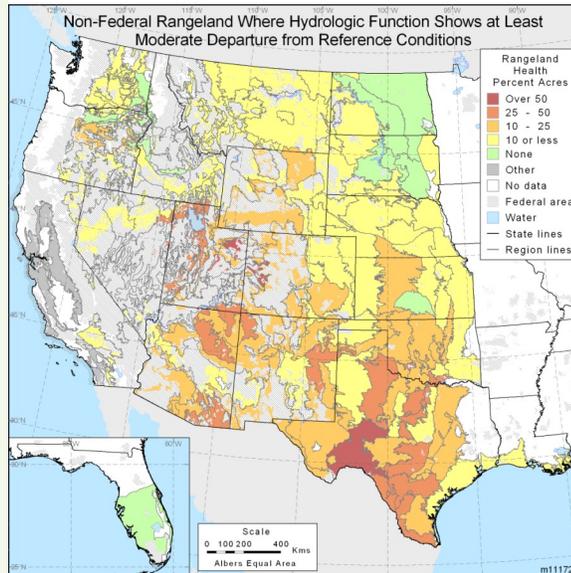
About the Maps

The maps are constructed with NRI rangeland data collected in the field on rangeland during the period 2003-2006. The mapping regions are based on Common Resource Area (CRA) boundaries; in some cases CRAs were combined to include more sample sites. Regions without non-Federal rangeland are described as “No data”. Areas of Federal land are depicted with cross-hatching. Legend categories differ by map theme (e.g., rangeland health, invasive plant species, etc.)

Rangeland Health Maps

The rangeland health maps present the percent by classes (none, <10%, 10-25%,

Figure 3. Non-Federal rangeland where hydrologic function shows at least moderate departure from reference conditions



Biotic integrity: The reduction in biotic integrity in much of this region (Figure 4) is due to the invasion of native, rather than non-native species. Mesquite (Figure 5) and creosote bush (*Larrea* spp.) are both highly invasive on many soils in the Chihuahuan and Sonoran Deserts. Juniper species (Figure 6) are also highly invasive throughout this region. In addition, there are significant effects of non-native species including buffelgrass (*Pennisetum ciliare* (L.) Link) and Lehmann lovegrass (*Eragrostis lehmanniana* Nees) in southern Arizona. This shift in species composition negatively impacts nutrient cycling and the quality of wildlife habitat, both directly and through its effects on the fire regime (Fire intensity and frequency often increases with higher densities of certain invasive plant species.). This shift also affects soil surface and soil-plant-water relations, which affects soil and site stability. These feedbacks occur in all regions, but are particularly important in the Southwest and Intermountain West regions.

25-50%, and >50%) of non-Federal rangeland where rangeland health attributes have at least moderate departures from the reference conditions. An additional category, referred to as “Other”, represents areas for which the ecological site descriptions are under development and there is no reported rangeland health data.

Invasive Woody Species Maps

The maps display the percent by classes (None, 1% or less, 1-5%, 5-20%, and over 20%) of non-Federal rangeland where native invasive woody species groups are present.

Bare Ground Map

The bare ground map present the percent by classes (none, 10% or less, 10-25%, 25-50%, over 50%) of non-Federal rangeland for the proportion of bare ground.

Figure 4. Non-Federal rangeland where biotic integrity shows at least moderate departure from reference conditions

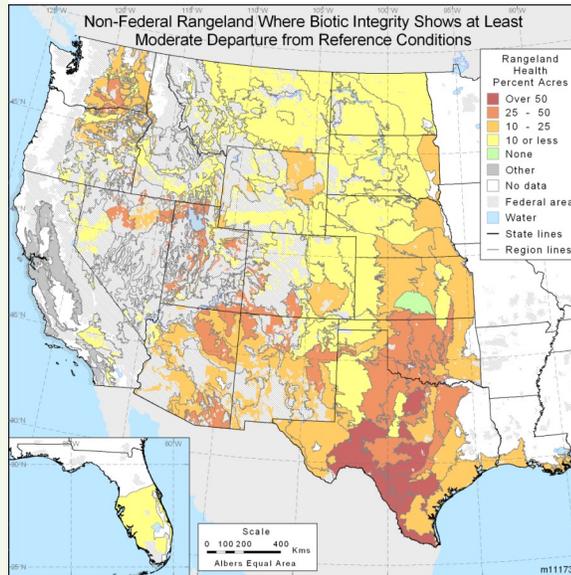
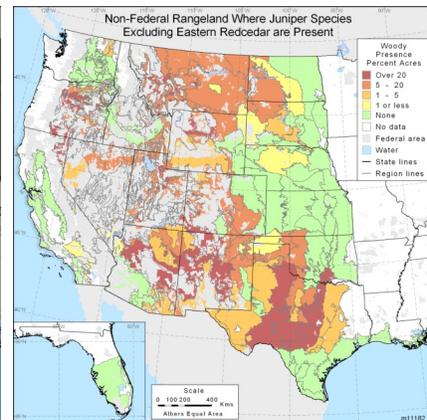
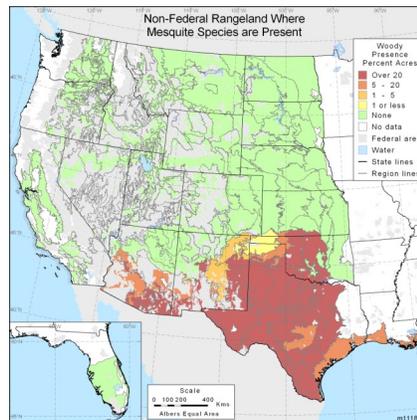


Figure 5-6. Non-Federal rangeland where mesquite and junipers other than eastern redcedar are present

5. Mesquite

6. Juniper species excluding eastern redcedar



More Information

For more information about the NRI, visit <http://www.nrcs.usda.gov/technical/NRI/>

Send comments and questions to the NRI Help Desk (nri@wdc.usda.gov).