

National Resources Inventory Rangeland Resource Assessment



Regional Interpretation

Texas and Oklahoma (excluding panhandles and West Texas)

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, grasslike 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 wheatgrass, 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: Rangelands of in this area of Texas and Oklahoma are extremely diverse. They include the Gulf prairies and marshes, post oak savannahs, blackland prairies, tall- and mixed-grass prairie, cross timbers and prairies, south Texas plains and the eastern fringe of the Edwards Plateau and Rolling Plains. Climate in this region is variable, but is characterized as a warm-temperate/subtropical zone. Winters are dry and summers are humid. Drought, a recurring phenomenon in Texas, is generally unpredictable and can have an extreme effect on vegetation.

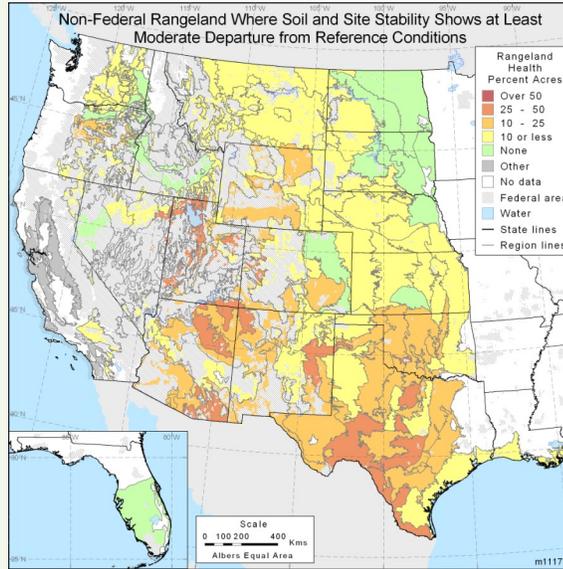
Soil and Site Stability: Soil and site stability show moderate or greater levels of departure for relatively high proportions of rangelands in this region (Figure 1). The proportion of the area showing significant departure is particularly high along the Rio Grande. An increase and dominance of mesquite (Figures 2-5), a simultaneous loss of grasses, and increased bare ground (Figures 6-10), runoff, and erosion may explain a portion of the change.

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.

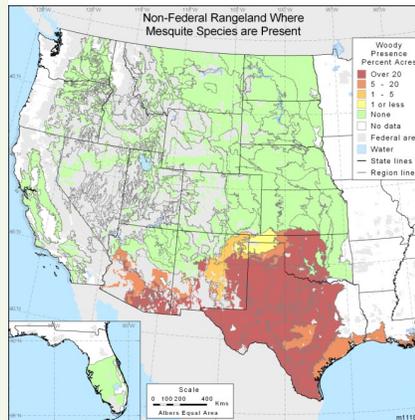
Quality assurance and statistical procedures are designed/developed to ensure data are scientifically legitimate. Irrespective of the scale of analysis, margins of error must be considered. Margins of error (at the 95 percent confidence level) are presented for all NRI estimates.

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

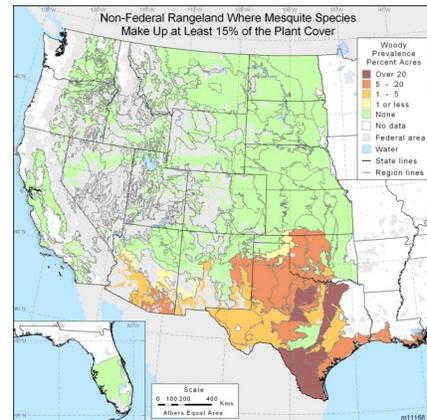


Figures 2-3. Non-Federal rangeland where mesquite species are present and where they make up at least 15 percent of the plant cover

2. Present



3. At least 15%



About the Protocols

The findings presented here are derived using data collected for three 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,

Figures 4-5. Non-Federal rangeland where mesquite species make up at least 30 or 50 percent of the plant cover

4. At least 30%

5. At least 50%

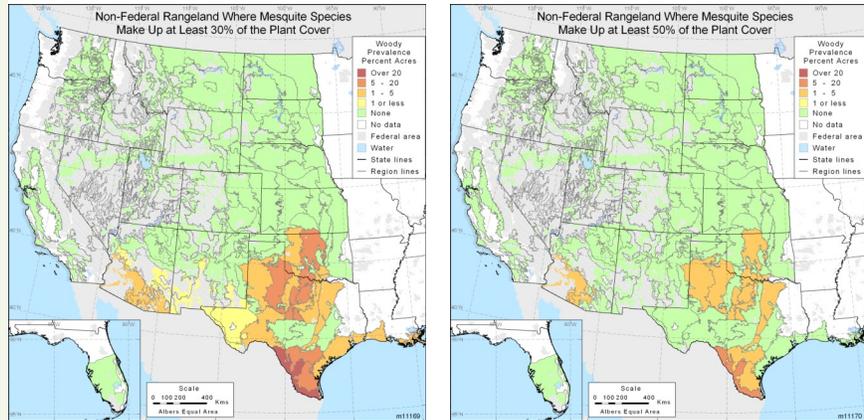
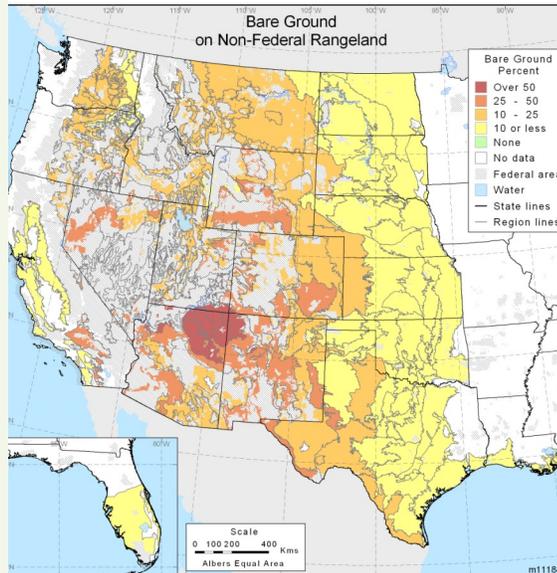


Figure 6. Bare ground on non-Federal rangeland



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

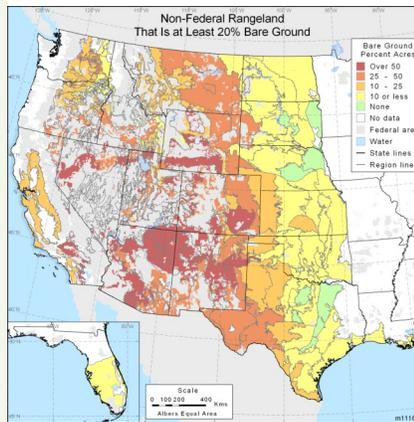
Soil aggregate stability is a recognized indicator of soil quality and rangeland health. Data collectors immerse soil surface peds collected at the sample site in water and subject the soil peds to five dipping cycles. Soil stability is rated based on the outcomes of these water exposure techniques. Ratings range from 1 (very unstable) to 6 (very sta-

About the Maps

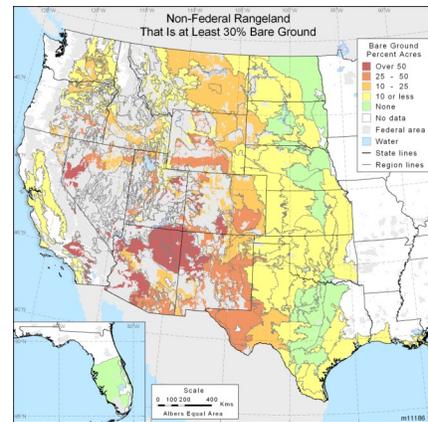
The maps are constructed with NRI rangeland data collected in the field on rangeland during the period 2003-2006. The mapping regions are based on Common Resource Area (CRA) boundaries; in some cases CRAs were combined to include more sample sites. Regions without non-Federal rangeland are described as “No

Figures 7-10. Non-Federal rangeland that is at least 20, 30, 40, or 50 percent bare ground

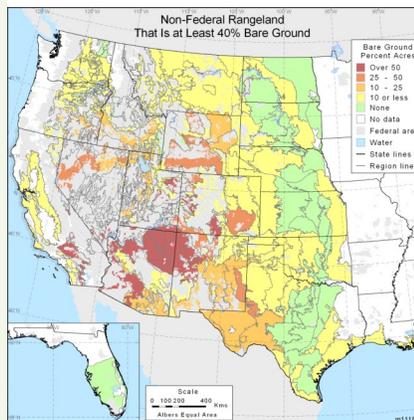
7. At least 20%



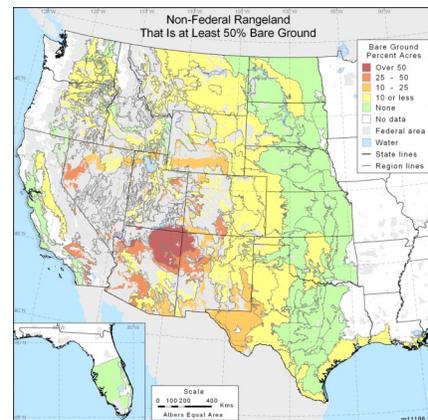
8. At least 30%



9. At least 40%



10. At least 50%



Hydrologic Function: Hydrologic function shows patterns similar to soil and site stability in this region, with even higher proportions of land showing at least moderate departure in many parts of the region (Figure 11). This is due to the sensitivity of hydrologic function to both soil degradation and, frequently, changes in the plant community associated with invasive woody plants. Mesquite (mainly *Prosopis glandulosa* Torr.) and juniper (*Juniperus* spp.) are particularly widespread in this region (Figures 12-15). While native, they can and do increase in the absence of fire. Where increased woody cover is associated with reduced grass cover, infiltration capacity can decline with increased runoff in interspace areas between shrubs. Accelerated

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%, 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

runoff over time can result in changes of natural water flow paths and the formation of interspace rills which may develop into gullies. Soil loss can be excessive and recovery on these sites can be slow. On shallow soils, these channels can quickly erode to bedrock. In contrast, dense grass cover and associated root mass tend to increase both soil porosity, soil aggregate stability (Figure 16), and overall soil health.

Figure 11. Non-Federal rangeland where hydrologic function shows at least moderate departure from reference conditions

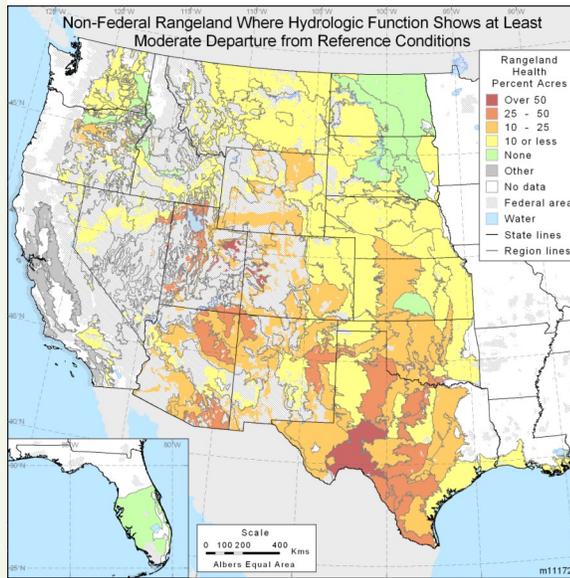
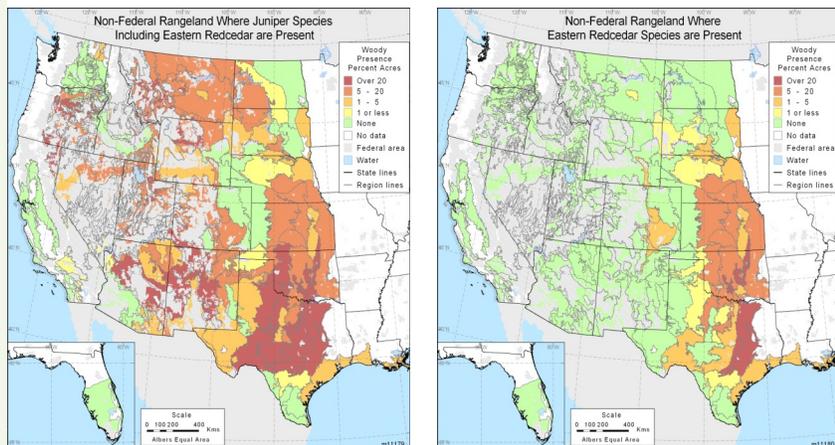


Figure 12-13. Non-Federal rangeland where invasive woody species groups are present

12. Juniper including eastern redcedar

13. Eastern redcedar



groups are present or make up at least 15, 30, or 50 percent of the plant cover.

Bare Ground Maps

The bare ground and canopy gap maps present the percent by classes (none, 10% or less, 10-25%, 25-50%, over 50%) of non-Federal rangeland for the average proportion of bare ground; where at least 20, 30, 40, or 50 percent is bare ground.

Soil Aggregate Stability Maps

The soil aggregate stability maps present the percent by classes (none, 25% or less, 25-50%, 50-75%, over 75%) of non-Federal rangeland where soil aggregate stability ratings are 4 or less, indicating less stable soil.

Figure 14-15. Non-Federal rangeland where invasive woody species groups are present

14. Juniper excluding eastern redcedar 15. Mesquite

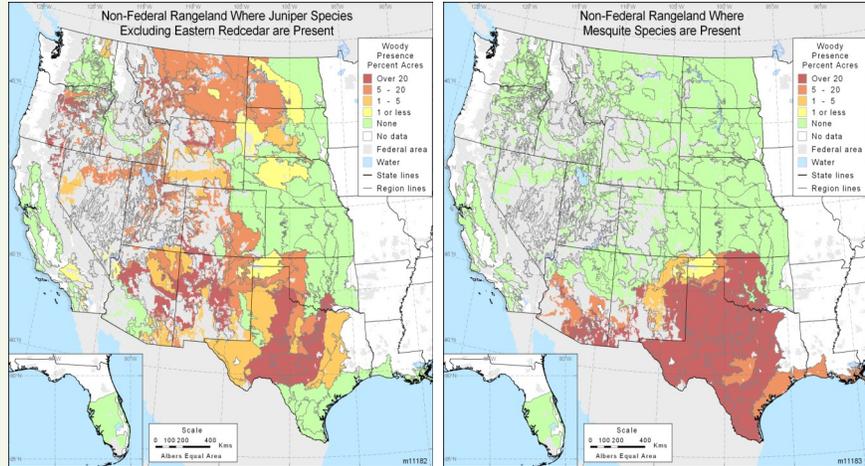
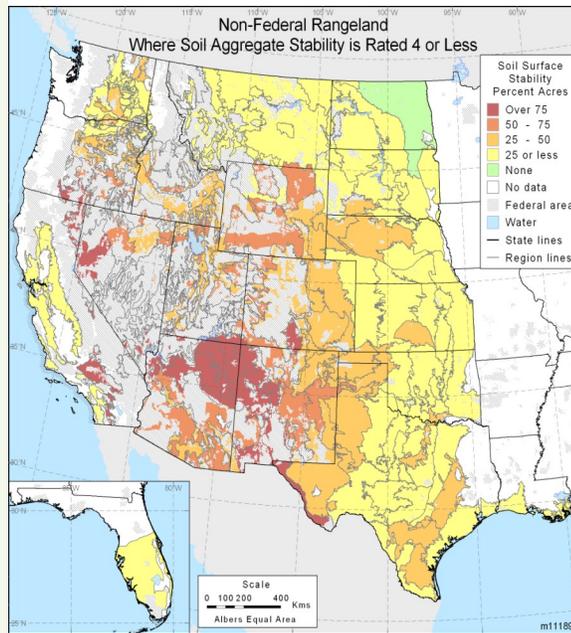
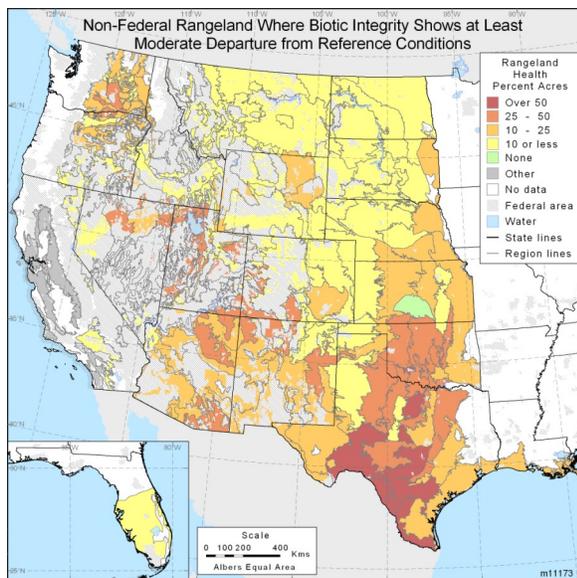


Figure 16. Non-Federal rangeland where soil aggregate stability ratings are 4 or less



Biotic integrity: Significant shifts in plant community composition associated with increased dominance of invasive species, both grasses and shrubs, are reflected in significantly reduced biotic integrity throughout most of this region (Figure 17). While many of these species (e.g. mesquite and juniper) are native throughout this region, the high biotic integrity departure ratings reflect the fact that they have invaded soils where they would not normally occur or become dominant under a natural disturbance regime, or have significantly increased on soils where they are native. The potential plant communities for most of this region are grassland and savanna ecosystems.

Figure 17. Non-Federal rangeland where biotic integrity shows at least moderate departure from reference conditions



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).