

Rangeland health assessment - The key to understanding and assessing rangeland soil health in the Northern Great Plains

David Toledo, ARS

The USDA has placed and increased emphasis on soil health and has developed a set of key principles to soil health: 1) Use plant diversity to increase diversity in the soil; 2) Manage soils more by disturbing them less; 3) Keep plants growing throughout the year to feed the soil; and 4) Keep the soil covered as much as possible. These soil health principles were developed primarily for agricultural systems yet they are relevant to all soils and therefore also apply to rangelands. However, there are concerns regarding the application of these four soil health principles to rangeland ecology and management. This paper attempts to clarify how each of these soil health principles applies to rangeland ecology and describes how existing science based inventory and assessment protocols can be used to assess not only the health of the rangeland soil resource but also the overall health of the rangeland resource.

Table 1
Four basic soil health principles and corresponding rangeland health indicators.

Soil health principle	Qualitative rangeland assessment indicator
Plant diversity increases diversity in the soil.	Indicator 10 - Plant community composition and distribution relative to infiltration and runoff Indicator 12 - Functional/structural groups Indicator 13 - Amount of plant mortality and decadence Indicator 15 - Annual production Indicator 16 - Invasive plants
Manage soils more by disturbing them less.	Indicator 9 - Soil surface loss or degradation Indicator 8 - Soil surface resistance to erosion Indicator 11 - Compaction layer
Keep plants growing throughout the year to feed the soil.	Indicator 4 - Bare ground Indicator 12 - Functional/structural groups Indicator 15 - Annual production Indicator 16 - Invasive plants
Keep the soil covered as much as possible.	Indicator 4 - Bare ground Indicator 14 - Litter amount

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