

# Evaluation Matrix for Rangeland Health

State: OK Office  
 Authors: Jack Eckroat

Ecological Site: Meadow ID: 078CY0900K  
 Date: September, 2008

	Departure from Ecological Site Description/Ecological Reference Worksheet				
Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
<b>1. Rills</b>	Rill formation is severe and well defined throughout the entire area.	Rill formation is moderately active and well defined throughout most of the area	There is evidence of slight active rill formation at infrequent intervals, mostly on exposed areas.	No recent formation of rills; Old rills have blunt or muted features	<b>Ecological Reference Worksheet:</b> Minimum evidence of current or past formation of rills.
<b>2. Water Flow Patterns</b>	Water eroded channels are numerous, extensive and mostly connected throughout. Most channels have signs of headcutting and actively eroding bottom channels.	Water flow patterns are visible in the soil surface and numerous and occasionally connected. erosion and/or deposition are common in the water flow channels.	Water flow patterns are visible in vegetation and water tends to flow in channels in the soil that are short and stable rather than evenly over the ground; some minor erosion is evident with some instability and deposition occurring.	Some water flow patterns are found in the vegetation but not visible in the soil. The general flow of the water is distributed evenly over the landscape.	<b>Ecological Reference Worksheet:</b> No current visible patterns of water flow or evidence of soil movement.
<b>3. Pedestals and/or Terracettes</b>	Abundant active pedestalling and numerous terracettes. Most rocks and plants are pedestalled; exposed plant roots are common.	Moderate active pedestalling; terracettes common. Some rocks and plants are pedestalled with occasional exposed roots.	Slight active pedestalling; most pedestals are in flow paths and interspaces and/or exposed slopes. Occasional terracettes present.	No active pedestalling but some evidence of past pedestal formation, especially in water flow patterns or from wind on exposed slopes. No evidence of terracettes.	<b>Ecological Reference Worksheet:</b> No current and minimal evidence of past pedestalling. Terracettes absent or uncommon
<b>4. Bare Ground</b>	Much higher (%) than expected for the site. Bare areas are large and generally connected.	Moderate to much higher than expected for the site. Bare areas are large and occasionally connected.	Moderately higher than expected for the site. Bare areas are of moderate size and sporadically connected.	Slightly to moderately higher than expected for the site. Bare areas are small and rarely connected.	<b>Ecological Reference Worksheet:</b> Amount and size of bare areas matches what is expected for the site. Less than 20% and may vary throughout site
<b>5. Gullies</b>	Common with indications of active erosion and down cutting; vegetation is infrequent on slopes and/or bed. Nick points and headcuts are numerous and active.	Commonly present in number with indications of active erosion; vegetation is intermittent on slopes and/or bed. Headcuts are active; down-cutting is not apparent.	Moderate in number with indications of active erosion; vegetation is intermittent on slopes and/or bed. Occasional headcuts may be present.	Uncommon in number; Vegetation is stabilizing the bed and slopes; no signs of active headcuts nick points, or bed erosion.	<b>Ecological Reference Worksheet:</b> Drainages are represented as natural stable channels; no signs of erosion with vegetation common throughout drainages.

Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
<b>6. Wind Scoured, Blowout and/or Depositional Areas</b>	Wind scoured areas extensive with exposed roots common.	Wind scoured areas are common throughout site with some exposed roots.	Occasional wind scoured areas present with some exposed roots; Mostly on exposed slopes	Infrequent evidence of wind scoured areas or exposed roots;	<b>Ecological Reference Worksheet:</b> None
<b>7. Litter Movement (wind or water)</b>	Extreme; concentrated around obstructions. Most size classes of litter have been displaced.	Moderate to extreme; loosely concentrated near obstructions. Moderate (stems, seedheads) to small size classes of litter have been displaced.	Moderate movement of smaller size classes in scattered concentrations around obstructions and in depressions.	Slightly more movement than expected for the site with only small size classes (leaf litter) of litter being displaced.	<b>Ecological Reference Worksheet:</b> Litter movement is minimal to none; distribution of litter is fairly uniform
<b>8. Soil Surface Resistance to Erosion</b>	Extremely reduced throughout the site. Biological stabilization agents including organic matter and biological crusts virtually absent. Soil Stability scores typically less than 2.	Significantly reduced in most plant canopy interspaces and moderately reduced beneath plant canopies. Stabilizing agents present only in isolated patches.	Surface stability significantly reduced in at least half of the plant canopy interspaces or moderately reduced throughout the site. Soil stability scores range from 3-4	Some reduction in soil surface stability in plant interspaces or slight reduction throughout the site. Stabilizing agents reduced below expected.	<b>Ecological Reference Worksheet: Stability Scores of Surface soil</b> is stabilized by decomposing organic matter and/or biological crusts. Soil Stability scores typically 5-6 with good organic matter content
<b>9. Soil Surface Loss or Degradation</b>	Soil surface horizon nearly absent to absent (<25% of surface horizon in place). Soil structure near surface is similar to, or more degraded, than that in subsurface horizons. No distinguishable difference in subsurface organic matter content.	Soil loss or degradation severe throughout site. Minimal differences in soil organic matter content and structure of surface and subsurface layers.	Moderate soil loss (50-75% of surface horizon still in place) or degradation in plant interspaces with some degradation beneath plant canopies. Soil structure is degraded and soil organic matter content is significantly reduced.	Some soil loss has occurred and/or soil structure shows signs of degradation especially in plant interspaces.	<b>Ecological Reference Worksheet:</b> Soil surface horizon intact. Soil structure and organic matter content match what is expected for the site. Refer to soils series description for site
<b>10. Plant Community Composition &amp; Distribution Relative to Infiltration &amp; Runoff</b>	Infiltration is severely decreased due to adverse changes in plant community composition and/or distribution. Adverse plant cover changes have occurred.	Infiltration is greatly decreased due to adverse changes in plant community composition and/or distribution. Detrimental plant cover changes have occurred.	Infiltration is moderately reduced due to adverse changes in plant community composition and/or distribution. Plant cover changes negatively affect infiltration.	Infiltration is slightly to moderately affected by minor changes in plant community composition and/or distribution. Plant cover changes have only a minor effect on infiltration.	<b>Ecological Reference Worksheet:</b> Overstory of trees help slow water impact and infiltration is good. Grass component slows runoff to allow for slow infiltration into soils that are usually poorly drained. Runoff not typically a concern

Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
<b>11. Compaction Layer (below soil surface)</b>	Extensive; severely restricts water movement and root penetration.	Widespread; greatly restricts water movement and root penetration.	Moderately wide-spread, moderately restricts water movement and root penetration.	Rarely present or is thin and weakly restrictive to water movement and root penetration.	<b>Ecological Reference Worksheet:</b> None
<b>12. Functional/ Structural Groups (F/S Groups)</b> <b>See Functional/ Structural Groups Worksheet</b>	Less dominant functional groups dominate the site. Original dominant functional groups non-existent. Plant functional groups not present in the HPC also may dominate. Number of species in most functional groups is extremely low.	Dominant plant functional groups represented by only a scattered few individual species. Less dominant functional groups now dominate the site. Plant functional groups not present in the HPC are common. Number of species in most functional groups is low.	Dominant plant functional groups occur, but no longer dominate; less dominant groups now dominate the site. Some plant functional groups not present in the HPC may be present. Number of species in most functional groups is low to moderate	Dominant plant functional groups are diminished but still dominate. Less dominant plant functional groups are represented in slightly higher proportion than expected for the site. Number of species are nearly equal to that expected.	<b>Ecological Reference Worksheet:</b> Dominant: Trees Sub-dominant: Tallgrasses, Midgrasses, Shortgrasses, Cool-season Perennial Grasses Other: Forbs Additional
<b>13. Plant Mortality/ Decadence</b>	Dead and/or decadent plants are common	Dead plants and/or decadent plants are somewhat common.	Some dead and/or decadent plants are present	Slight plant mortality and/or decadence.	<b>Ecological Reference Worksheet:</b> Some decadence with perennial grasses in the absence of fire and herbivory but usually matches what is expected for the site.
<b>14. Litter Amount</b>	Largely absent or dominant relative to site potential and weather.	Greatly increased or reduced relative to site potential and weather.	Moderately more or less relative to site potential and weather.	Slightly more or less relative to site potential and weather.	<b>Ecological Reference Worksheet:</b> 95% coverage at no more than 1 inch depth.
<b>15. Annual Production</b>	Less than 20% of potential production for the site based on recent weather.	20-40% of potential production for the site based on recent weather.	40-60% of potential production for the site based on recent weather.	60-80% of potential production for the site based on recent weather.	<b>Ecological Reference Worksheet:</b> <b>2500 – 6500 lbs per acre</b>
<b>16. Invasive Plants</b>	Dominate the site ( <b>Woody species &gt;30% canopy or 200 plants per acre</b> ) <b>Herbaceous &gt;40% composition by weight</b>	Common throughout the site.	Scattered throughout the site <b>(Woody species 5-10% canopy or &lt;100 plants per acre;</b> <b>Herbaceous 10-25% composition by weight)</b>	Occasional within the site.	<b>Ecological Reference Worksheet:</b> Rarely present on this site  Potential invaders include annual during dry periods; eastern redcedar

Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
<b>17.Reproductive Capability of Perennial Plants (native or seeded)</b>	Capability to produce seed or vegetative tillers is severely reduced. (<25% as compared to what should be expected).	Capability to produce seed or vegetative tillers is greatly reduced. (25-50% as compared to what should be expected).	Capability to produce seed or vegetative tillers is moderately reduced (50-75% as compared to what should be expected).	Capability to produce seed or vegetative tillers is slightly reduced (>75% as compared to what should be expected).	<b>Ecological Reference Worksheet:</b> Capability to produce seed and vegetative tillers is not reduced relative to recent climatic conditions. Seed stalks, stalk length, and seedheads are numerous and what would be expected. Overall health of plants is what would be expected.

# Functional/Structural Groups Worksheet

State OK Office \_\_\_\_\_ Ecological Site Meadow Site ID 078CY090OK

Observers \_\_\_\_\_ Date \_\_\_\_\_

Functional/Structural Groups			Species List for Functional/Structural Groups
Name	Potential <sup>1</sup>	Actual <sup>2</sup>	Plant Names
Trees	D		Cottonwood, Willows
Tallgrasses	S		Bushy bluestem, switchgrass, big bluestem
Midgrasses	S		Little bluestem, broomsedge, beaked panicum
Cool season	S		Sedges, rushes
Forbs	M		Annuals, some perennial
Additional species groups of interest			
Noxious Weeds			
Invasive Native Plants			
Invasive Exotic Plants			
Biological Crust <sup>3</sup>			

Indicate whether each “structural/functional group” is a **Dominant (D)** (roughly 40-100 % composition), a **Sub-dominant (S)** (roughly 11-40% composition) a **Minor Component (M)** (roughly 2-10% composition), or a **Trace Component (T)** (<2% composition) based on weight or cover composition in the area of interest (e.g., “Actual<sup>2</sup>” column) relative to the “Potential<sup>2</sup>” column derived from information found in the ecological site/description and/or at the ecological reference area.

**Biological Crust<sup>3</sup>** dominance is evaluated solely on **cover** not composition by weight.

# Evaluation Worksheet for Rangeland Health

Aerial Photo: \_\_\_\_\_

Management Unit \_\_\_\_\_ State \_\_\_\_\_ Office \_\_\_\_\_ Range/Ecol. Site Code: \_\_\_\_\_  
(Allotment or pasture)

Ecological Site Name: \_\_\_\_\_ Soil Map Unit/Component Name: \_\_\_\_\_

Observers: \_\_\_\_\_ Date: \_\_\_\_\_

Location (description): \_\_\_\_\_

T. \_\_\_\_\_ R. \_\_\_\_\_ or \_\_\_\_\_ N. Lat. Or UTM E \_\_\_\_\_ m Position by GPS? Y / N  
UTM Zone \_\_\_\_\_, Datum \_\_\_\_\_  
Sec. \_\_\_\_\_ W. Long. N \_\_\_\_\_ m Photos taken? Y / N

Size of evaluation area \_\_\_\_\_

## Soil / site verification:

Range/Ecol. Site Descr., Soil Surv., and/or Ecol. Ref. Area:

Evaluation Area:

Surface texture \_\_\_\_\_

Surface texture \_\_\_\_\_

Depth: very shallow \_\_, shallow \_\_, moderate \_\_, deep \_\_

Depth: very shallow \_\_, shallow \_\_, moderate \_\_, deep \_\_

Type and depth of diagnostic horizons:

Type and depth of diagnostic horizons:

1. \_\_\_\_\_ 3. \_\_\_\_\_

1. \_\_\_\_\_ 3. \_\_\_\_\_

2. \_\_\_\_\_ 4. \_\_\_\_\_

2. \_\_\_\_\_ 4. \_\_\_\_\_

Surf. Efferv.: none \_\_, v. slight \_\_, slight \_\_, strong \_\_, violent \_\_

Surf. Efferv.: none \_\_, v. slight \_\_, slight \_\_, strong \_\_, violent \_\_

Parent material \_\_\_\_\_ Slope \_\_\_\_\_% Elevation \_\_\_\_\_ ft.

Topographic position \_\_\_\_\_ Aspect \_\_\_\_\_

Average annual precipitation \_\_\_\_\_ inches

Seasonal distribution \_\_\_\_\_

Recent weather (last 2 years) (1) drought \_\_, (2) normal \_\_, or (3) wet \_\_.

Wildlife use, livestock use (intensity and season of allotted use), and recent disturbances:

---

---

---

Off-site influences on evaluation area:

---

---

---

Criteria used to select this particular evaluation area as REPRESENTATIVE (specific info. And factors considered; degree of "representativeness")

---

---

---

Other remarks (continue on back if necessary)

---

---

---

Reference: (1) Ecological Reference Worksheet: \_\_\_\_\_; Author: \_\_\_\_\_; Creation Date: \_\_\_\_\_  
or (2) Other (e.g. name and date of ecological site description, locations of ecological reference area(s)) \_\_\_\_\_