

Evaluation Matrix for Rangeland Health

State: OK & KS Office _____ Ecological Site: Loamy Bottomland Site ID: R080AY0500K

Reference Site Locations: Lat: N 36.48934 Long: W -98.19568 Elevation: 1358 Feet

Authors: Mark Moseley, Kay Anderson, Jack Eckroat, Harry Fritzler, Steve Glasgow

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	Departure from Ecological Site Description/Ecological Reference Worksheet				
Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills	Active eroding rills are common. Headcutting on rills is active. Few, if any, of the sides are covered with vegetation. Rills merge to form conductive channels for water erosion.	There is a presence of rills. Headcutting on most rills is active, and few of the sides are covered with vegetation.	There is a presence of rills. Headcutting on some rills is active, and most of the sides are covered with vegetation.	There is a presence of rills. There is no active headcutting, but a portion of the sides are not covered with vegetation.	Ecological Reference Worksheet: This site usually has flatter slopes. There are few, if any, rills (only in lowest area where flooding occurs) and there is no active headcutting and sides are covered with vegetation.
2. Water Flow Patterns	Water eroded channels are numerous and extensive. Most channels have signs of headcutting and actively eroding bottom channels.	Water flow patterns are visible in the soil surface. Headcutting and/or deposition are common in the water flow channels.	Water flow patterns are visible in the vegetation, but not in the soil surface. Deposition and erosion is moderate. Water tends to flow in channels rather than evenly over the ground.	Some water flow patterns are found in the vegetation, but not in the soil surface. The general flow of the water is distributed evenly over the landscape.	Ecological Reference Worksheet: There is some evidence of soil deposition or erosion (particularly after a flood event). Water generally flows evenly over the entire landscape.
3. Pedestals and/or Terracettes	Abundant active pedestalling (> 1 inch) and terracettes common. Many rocks and plants are pedestaled; exposed plant roots are common.	Moderate active pedestalling; terracettes common. Some rocks and plants are pedestaled with occasional exposed roots.	Slight active pedestalling (< 1/2 inch); most pedestals are in flow paths and interspaces. Occasional terracettes present.	Active pedestalling or terracette formation is rare; some evidence of past pedestal formation, especially in water flow patterns on exposed slopes.	Ecological Reference Worksheet: There should not be any evidence of erosional pedestals or terracettes on this site.
4. Bare Ground	Much higher (>20%) than expected for the site. Bare areas are large and generally connected. If fire exposes short-term high bare ground, then use Moderate if no other problems exist.	Moderate to much higher than expected for the site. Bare areas are large and occasionally connected.	Moderately higher (10-15%) 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.	Ecological Reference Worksheet: There is 0-5% bare ground on this site. Bare areas are small and not connected.

Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
5. Gullies	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	Moderate in number to common 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, vegetation is stabilizing the bed and slopes; no signs of active headcuts nick points, or bed erosion.	Ecological Reference Worksheet: Usually none. Most drainages are represented as natural stable channels; vegetation is common with no signs of erosion. Some nick points can occur where trees are uprooted from floods.
6. Wind Scoured, Blowout and/or Depositional Areas	Extensive in the sandier depositional areas following flooding. (>2% of the area).	Common in the sandier depositional areas following flooding. (<2% of the area).	Occasionally present.	Infrequent and few.	Ecological Reference Worksheet: None.
7. Litter Movement (wind or water)	Extreme movement (>120 inches); concentrated around obstructions and in depressions. Most size classes of litter have been displaced.	Moderate to extreme; loosely concentrated near obstructions. Moderate (twigs) to small size classes of litter have been displaced.	Moderate movement (~60 inches) of smaller size classes in scattered concentrations around obstructions and in depressions.	Slightly to moderately more than expected for the site with only small size classes (leaves and stems) of litter being displaced.	Ecological Reference Worksheet: Uniform distribution of litter. Litter rarely moves >12 inches on flatter slopes and may be as much as doubled on steeper slopes, then only during high intensity storms.
8. Soil Surface Resistance to Erosion	Extremely reduced (Stability Score <2) throughout the site. Biological stabilization agents including organic matter and biological crusts virtually absent.	Significantly reduced in most plant canopy interspaces and moderately reduced beneath plant canopies. Stabilizing agents present only in isolated patches.	Significantly reduced (Stability Score 4) in at least half of the plant canopy interspaces, or moderately reduced throughout the site.	Some reduction in soil surface stability in plant interspaces or slight reduction throughout the site. Stabilizing agents reduced below expected.	Ecological Reference Worksheet: Surface soil is stabilized (Stability Score 5 – 6). Stability scores based on a minimum of 6 samples tested.
9. Soil Surface Loss or Degradation	Soil surface horizon nearly absent to absent (<25% of A 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 A horizon still in place) or degradation in plant interspaces with some degradation beneath plant canopies. Soil structure is degraded (more medium granular structure) 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.	Ecological Reference Worksheet: Ap horizon: 0 to 7 inches; dark grayish brown silt loam, weak fine granular structure. A horizon: 7 to 21 inches; dark grayish brown silt loam, moderate fine and medium granular structure.

Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
10. Plant Community Composition & Distribution Relative to Infiltration & Runoff	Infiltration is severely decreased due to adverse changes in plant community composition (increased shrubs, woodies, shortgrasses and annuals and loss of midgrasses) and/or distribution (large plant interspaces). Adverse plant cover changes have occurred.	Infiltration is greatly decreased due to adverse changes in plant community composition and/or distribution (plant interspaces connected and bare ground has increased). Detrimental plant cover changes have occurred.	Infiltration is moderately reduced due to adverse changes in plant community composition (increasing forbs and shortgrasses) and/or distribution (plant interspaces increasing). 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.	Ecological Reference Worksheet: Infiltration and runoff are not affected by any changes in plant community composition and distribution. (Tallgrass dominated). Any changes in infiltration and runoff can be attributed to other factors (e.g. compaction).
11. Compaction Layer (below soil surface)	Extensive; severely restricts water movement and root penetration.	Widespread; greatly restricts water movement and root penetration.	Moderately widespread, moderately restricts water movement and root penetration.	Rarely present or is thin and weakly restrictive to water movement and root penetration.	Ecological Reference Worksheet: There is usually no compaction layer.
12. Functional/ Structural Groups (F/S Groups) See Functional/ Structural Groups Worksheet	Others now dominant (>40%)	Number of F/S groups reduced AND/OR One dominant group and/or one or more sub-dominate groups replaced by F/S groups not expected for the site AND/OR Number of species within F/S groups significantly reduced.	Subdominants > Dominants > Other	Number of F/S groups slightly reduced AND/OR Relative dominance of F/S groups has been modified from that expected for the site AND/OR number of species within F/S groups slightly reduced.	Ecological Reference Worksheet: This site is made up of a plant community described as the Historic Plant Community in the range or ecological site descriptions. Dominants (>40%): Tallgrasses, Midgrasses Subdominants (10-40%): Forbs, Cool-Season Perennial Grasses Other (<10%): Shortgrasses, Shrubs, Trees
13. Plant Mortality/ Decadence	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.	Ecological Reference Worksheet: There is some plant mortality and decadence on the perennial grasses, especially in the absence of fire and herbivory, but usually <5%.

Indicator	Extreme	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
14. Litter Amount	Largely absent or dominant relative to site potential and weather. <55% coverage with <1/2 inch depth; or greater than 5 inches of litter.	Greatly increased or reduced relative to site potential and weather.	Moderately more or less relative to site potential and weather. ~75% coverage with ~3/4 inch depth; or greater than 4 inches of litter.	Slightly more or less relative to site potential and weather.	Ecological Reference Worksheet: Litter should cover >95% of the area between plants with accumulations of 1-3 inches deep.
15. Annual Production	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.	Ecological Reference Worksheet: Normal production is 8,000-14,000 pounds per year.
16. Invasive Plants	Dominate the site or a thick stand of annuals. (Woodies: >30% canopy cover; Herbaceous: >40% composition by weight).	Common throughout the site. (Woodies: 10-30% canopy cover; Herbaceous: 25-40% composition by weight).	Scattered throughout the site. (Woodies: 5-10% canopy cover; Herbaceous: 10-25% composition by weight).	Occasional within the site. (Woodies: Up to 5% canopy cover; Herbaceous: Up to 10% composition by weight).	Ecological Reference Worksheet: No invasive species. Invasives might include: eastern redcedar, locust, salt cedar, Russian olive, annuals and non-natives. Also mesquite in the south.
17. Reproductive Capability of Perennial Plants (native or seeded)	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).	Ecological Reference Worksheet: All plants capable of reproducing at least every year. 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_ **Loamy Bottomland** __ Site ID_ **R080AY050OK**__

Observers _____ Date _____

Functional/Structural Groups			Species List for Functional/Structural Groups
Name	Potential ¹	Actual ²	Plant Names
Tallgrasses	D		
Midgrasses	D		
Shortgrasses	M		
Forbs	S		
Cool-Season Perennial Grasses	S		
Shrubs	M		
Annuals	M		
Additional species groups of interest			
Noxious Weeds			
Invasive Native Plants			Eastern Red Cedar, Salt Cedar, Locust, Russian Olive, Annuals, Mesquite (in the south)
Invasive Exotic Plants			Non-Natives
Biological Crust ³			

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., “Actual²” column) relative to the “Potential²” column derived from information found in the ecological site/description and/or at the ecological reference area.

Biological Crust³ 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)) _____