

Ecological site HX076XY109 Gravelly Flint Hills

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** No natural rill formation common or part of the Gravelly Flint Hills ecological site.

2. **Presence of water flow patterns:** There are no water flow patterns evidenced by litter, soil, or gravel redistribution, or pedestalling of vegetation or stones that break the flow of water as a result of overland flow.

3. **Number and height of erosional pedestals or terracettes:** There is no evidence of pedestals or terracettes that would indicate the movement of soil by water and/or by wind on this site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Less than 5% bare ground is found on this site. It is the remaining ground cover after accounting for ground surface covered by vegetation (basal and canopy [foliar] cover), litter, standing dead vegetation, gravel/rock, and visible biological crust (e.g., lichen, mosses, algae).

5. **Number of gullies and erosion associated with gullies:** No evidence of accelerated water flow resulting in downcutting of the soil.

6. **Extent of wind scoured, blowouts and/or depositional areas:** No wind-scoured or blowout areas where the finer particles of the topsoil have blown away, sometimes leaving residual gravel, rock, or exposed roots on the soil surface. Also, there are no areas of redeposited soil onto this site from another site due to the wind, i.e., depositional areas.

7. **Amount of litter movement (describe size and distance expected to travel):** No evidence of litter movement (i.e., dead plant material that is in contact with the soil surface).

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surfaces may be stabilized by soil organic matter which has been fully incorporated into aggregates at the soil surface, adhesion of decomposing organic matter to the soil surface, and biological crusts. A soil stability kit will score a range from 5-6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Florence OSD:

A1--0 to 4 inches; dark grayish brown (10YR 4/2) gravelly silt loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, friable; many medium roots; 15 percent chert fragments 1/4 to 2 inches in diameter; neutral; clear smooth boundary.

A2--4 to 11 inches; dark grayish brown (10YR 4/2) extremely gravelly silty clay loam, very dark brown (10YR 2/2) moist; moderate medium and fine granular structure; slightly hard, friable; many medium roots; 80 percent chert fragments 1/4 to 4 inches in diameter; slightly acid; gradual smooth boundary. (Combined thickness of the A horizons 9 to 16 inches.)

BA--11 to 15 inches; brown (7.5YR 4/2) extremely gravelly silty clay loam, dark brown (7.5YR 3/2) moist; strong fine and very fine subangular blocky structure; hard, firm; many fine roots; 80 percent chert fragments up to 4 inches in diameter; slightly acid; gradual smooth boundary. (0 to 8 inches thick)

Bt--15 to 44 inches; dark reddish brown (2.5YR 3/4) extremely cobbly clay, dark red (2.5YR 3/6) moist; strong medium and fine blocky structure; extremely hard, very firm; common fine roots; few faint discontinuous clay films on faces of peds; common dark stains and fine black concretions; 80 percent chert fragments 4 to 8 inches in diameter; slightly acid; clear irregular boundary. (20 to 40 inches thick)

R--44 inches; cherty limestone that has a few vertical and lateral fractures.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Functional and structural groups are that of the Reference Plant Community (see functional and structural group worksheet). Note changes to plant communities if different than that of the functional and structural group worksheet.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** There is no evidence of a compacted soil layer less than 6 inches from the soil surface. Soil structure is similar to that described in Indicator 9. Compacted physical features will include platy, blocky, dense soil structure over less dense soil layers, horizontal root growth, and increase bulk density (measured by weighing a known volume of oven-dry soil).

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: Group 1 Tallgrass dominant 39% 1160 lbs. big bluestem 500-1000, Indiangrass 50-150, switchgrass 25-125, composite dropseed 0-50.

Sub-dominant: Group 2 Midgrass subdominant 33% 990 lbs. little bluestem 300-800, sideoats grama 100-350

Other: Group 3 Shortgrass minor 7% 200 lbs. buffalograss 25-100, blue grama 25-100

Group 4 Cool-season grass Minor 6% 200 lbs. Sedge 15-40, Canada wildrye 15-40, Virginia wildrye 15-40, prairie junegrass 15-40, Scribner's rosette grass 15-40.

Additional: Group 5 forbs minor 10% 300 lbs. see Reference Plant community for entire list

Group 6 shrub minor 5% 150 lbs. leadplant 15-60 lbs. New Jersey tea 15-60, prairie rose 10-40

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Recruitment of plants is occurring and there is a mixture of many age classes of plants. The majority of the plants are alive and vigorous. Some mortality and decadence is expected for the site, due to drought, unexpected wildfire, or a combination of the two events. This would be expected for both dominant and subdominant groups.

14. **Average percent litter cover (%) and depth (in):** Plant litter is distributed evenly throughout the site. There is no restriction to plant regeneration due to depth of litter. When prescribed burning is practiced, there will be little litter the first half of the growing season.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** All species (e.g., native, seeded, and weeds) alive in the year of the evaluation, are included in the determination of total above ground production. Site potential (total annual production) ranges from 1,500 lbs in a below-average rainfall year and 4,000 lbs in an above-average rainfall year. The representative value for this site is 3,000 lbs production per year.

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** There are no noxious weeds present. Invasive plants make up a small percentage of plant community, and invasive brush species are < 5% canopy.

17. **Perennial plant reproductive capability:** Plants on site exhibit the required vigor and growth to be able to reproduce vegetatively or by seed. Current management activities do not adversely effect the capability of plants to reproduce.
