USDA Natural Resources
Conservation Service

Ecological site R035XC320AZ
Shale Hills 10-14" p.z.

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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:** Rills are somewhat common and cover up to 10 percent of the site. Rills are up to 20 feet long. Areas with significant rock cover will have shorter and fewer rills

2. **Presence of water flow patterns:** Somewhat common throughout site. Flow patterns may be long, narrow and connected on steepest slopes. On sites with significant amounts of coarse fragments will have less evident water flow patterns.

3. **Number and height of erosional pedestals or terracettes:** Some long-lived plants may show some slight pedestals of less than a 1 inch. Terracettes are common along water flow patterns where obstruction or plant bases occur.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 30-50 percent.

5. **Number of gullies and erosion associated with gullies:** None to very few. When site is well vegetated and covered with rock fragments, gullies are stable and will only show minor signs of active erosion. Gullies should be shallow due to depth to shale fragments, weathered bedrock and/or armored with larger rock fragments (medium gravels and channers).

6. **Extent of wind scoured, blowouts and/or depositional areas:** Deposition and blowouts by wind are not expected.

7. **Amount of litter movement (describe size and distance expected to travel):** Due to steepness of the site, litter redistribution by water is common and expected in water flow patterns. Woody litter will travel short distances away from canopies.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** The expected soil site stability range is 4-5 under canopies and 1-2 in the interspaces. Surface rock fragments, litter, and vegetation cover aid in reducing raindrop impact and splash erosion.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface horizon is 1 to 4 inches deep. Structure is mostly moderate medium platy structure over strong fine granular to moderate or strong fine granular structure. Surface color mostly yellowish brown (10YR 6/4) to light yellowish brown (10YR 6/4).

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Due to steepness and moderate amounts of rock fragments of this site, vegetation only has minimum effect on infiltration and runoff. This site is characterized by a dominance of grasses over low shrubs with an occasional sparse scattered canopy of trees. When well vegetated the cover lends to slowing runoff and allowing for some infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. There may be a subsurface layer of platy structure or weathered shale on very shallow sites that should not be confused as a compaction layer.

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: Warm season grasses (alkali sacaton, galleta and sand dropseed) > Salt tolerant shrubs (shadscale and seepweed)>

    Sub-dominant: Cool season grasses (Indian ricegrass and squirreltail) > Other shrubs >

    Other: Forbs > Trees > Annual grasses

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All plant functional groups are adapted to survival in all but the most severe droughts. Severe winter droughts affect the shrubs the most. Severe summer droughts affect grasses the most.

14. **Average percent litter cover (%) and depth (in):** Litter depth can range from 1 leaf thickness to ¼ inch.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** The expected total annual production is 350 – 450 lbs/ac in a normal precipitation year.

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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:** Shadscale saltbush, broom snakeweed and rabbitbrush are all native to the site, but may have the potential to increase with continued disturbance. Cheatgrass, annual wheatgrass, and Russian thistle are non-native annuals that have the potential to invade the site with or without disturbance.

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17. **Perennial plant reproductive capability:** All plants native to the site are adapted to the climate and are capable of producing seeds, stolons, and/or rhizomes during the most severe droughts.
