

Ecological site R028AY310UT Upland Loam (Bonneville Big Sagebrush) North

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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	Shane A. Green
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None to few. Any rills present should be short in length (less than 1.5 feet long) and follow the surface micro-features. If rills are present, they should be widely spaced and not connected. Old rills will weather quickly because of loamy surface textures. Frost heaving can accelerate recovery. A slight increase in rill formation may be caused by major disturbance events such as severe thunderstorms.

2. **Presence of water flow patterns:** Flow patterns around perennial plants bases will be meandering and may show minor evidence of erosion. They will be short (1 to 3 feet long) and look stable. As slopes increase water flow patterns will tend to get longer. There can be very slight evidence of deposition.

3. **Number and height of erosional pedestals or terracettes:** Plants should show slight (? – ½ in.) pedestaling. Pedestaling on the down slope side of plants may appear to be greater than this and will be more visible as slopes increase. Terracettes should be absent until slopes are greater than 20 %. At this point the terracettes should look stable and have very little to no evidence of soil being re-deposited.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** There will be 8 to 20 % bare ground. This will show as 8 – 14 % bare ground on slopes up to 25 % and 10 – 20 % bare ground on slopes from 25 % up. There should be very few if any spaces greater than one foot square.

5. **Number of gullies and erosion associated with gullies:** Number of gullies and erosion associated with gullies: None to very few. Any gullies present should show little sign of active erosion and should appear stable having perennial plants growing in the bottom and on the sides.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Slight wind generated soil movement is normal. Wind caused blowouts are very rare and are mostly stable and have healed over or started to do so. Increased wind generated soil movement can occur after severe wind events but will not be visually apparent.
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7. **Amount of litter movement (describe size and distance expected to travel):** Little redistribution can be caused by both wind and water. Very fine to fine litter movement may occur in water flow patterns with deposition occurring at points of obstruction. Very fine litter may be removed from the site by wind action.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** 80 to 90% of this site should have soil surfaces that are stabilized by organic matter both de-compositional and incorporated (Average Soil Stability Class 5). This should be observable in that water flow patterns that are not scoured to where the surface is visibly smoother than soil surfaces in non flow pattern areas.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A horizon is varies from 10 to 16 inches thick. Color is a grayish brown loam (typical mollic colors). Structure should be granular.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** When perennial plant community is intact it will maintain the organic granular structure, soil porosity, and sinuous water flow paths that allows water to infiltrate at a rate that will not lend to water leaving the site. If the plant community has been degraded then the site will show longer and/or smoother than expected water flow patterns, which will increased the numbers of rills and/or lead to longer rills, and a more platy structure.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** There should be no compaction layer.
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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: Bonneville big sagebrush, Snowberry, Bluebunch wheatgrass, Slender Wheatgrass;
- Sub-dominant: Muttongrass, Western wheatgrass, Antelope bitterbrush.
- Other: other grasses, other forbs, other shrubs
- Additional: Assumed fire cycle of 30-55 years. Perennial bunchgrasses > non-sprouting shrubs > rhizomatous grasses > fire tolerant shrubs » annuals > invaders such as Cheatgrass brome. Plant community will have Sub-dominants: Muttongrass, Western wheatgrass, Antelope bitterbrush. The perennial bunchgrass about 50 to 70 %; forbs about 8 to 25%; non-sprouting shrub 10 to 25 % (composition by biomass) are the functional groups that are expected on this site.

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** All age classes (seedling, immature, mature, and decadent) of perennial bunchgrasses and non-sprouting shrubs should be present. The percent of decadent and/or dead plants should not exceed 5 %. This may increase during long-term drought periods.

14. **Average percent litter cover (%) and depth (in):** 15 to 30 % of the ground surface should have a litter covering that is within 1 inch or less of the soil surface. Excess litter may accumulate in the absence of disturbance. Vegetative production may be reduced if litter cover exceeds 40%.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** On an average production year expect approximately 1400 to 1800 lb./acre on slopes 0 to 20 % and 1100 to 1500 lb./acre on slopes greater than 20 % under normal growing conditions.

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:** Potential invasive (including noxious) species (native and non-native). List species which characterize degraded states and which, after a threshold is crossed, "can, and often do, continue to increase regardless of the management of the site and may eventually dominate the site": As ecological condition deteriorates due to outside disturbances, perennial bunch grasses decrease while less desirable plants like yellow rabbitbrush, and prickly pear increase along with invasive plants like pinyon pine, Utah juniper and cheatgrass brome. When the historic climax plant community is burned, Bonneville big sagebrush will decrease while perennial grasses, forbs and Low rabbitbrush increase markedly. Broom snakeweed and Antelope bitterbrush increase to a much lesser extent. If the site is burned too frequently Cheatgrass brome, Halogeton, Broom snakeweed and Russian thistle are most likely to invade this site and eventually dominate it.

17. **Perennial plant reproductive capability:** All plants should have the ability to reproduce either by seed and/or vegetative tillers in all years, except after prolonged extreme drought years.
