

## Ecological site R047XA306UT Upland Gravelly Loam (Bonneville big sagebrush)

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

### Indicators

- Number and extent of rills:** Old rills will weather quickly because of loamy surface textures. A slight increase in rill formation may be caused by major disturbance events such as severe thunderstorms.
- Presence of water flow patterns:** Flow patterns around perennial plants bases will show minor evidence of erosion. They will be short (1 to 3 feet long) and look stable. There is slight evidence of deposition.
- Number and height of erosional pedestals or terracettes:** Plants should show slight ( $1/8 - 1/2$  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 no evidence of soil being re-deposited.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 10 to 30 % (10 – 15 % on slopes up to 25 % and 15 – 30 % on slopes from 25 % up)
- 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.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Very slight wind generated soil movement is normal. Wind caused blowouts are extremely 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. 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 decompositional and incorporated (Stability Class 4). This should be observable in that water flow patterns 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 5 to 18 inches thick. Color is a grayish brown gravelly 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, with increased numbers of and/or 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. The amount of gravel can make it hard to use a probe to determine this.

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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: Perennial bunchgrasses (bluebunch wheatgrass, slender wheargrass, nevada bluegrass), Perennial rhizomatous grass (western wheatgrass) > Non-sprouting shrubs (bonneville big sagebrush, utah snowberry) > Sprouting shrubs (antelope bitterbrush).

Sub-dominant: Bunchgrasses > Perennial forbs > Rhizomatous grasses > Annual forbs.

Other: A wide variety of other perennial grasses, both perennial and annual forbs and shrubs can be expected to occur in this plant community.

Additional: Invaders such as cheatgrass brome and japanese brome are examples. Dominants: Bonneville big sagebrush Bluebunch wheatgrass; Sub-dominants: Slender Wheatgrass, Western wheatgrass, Antelope bitterbrush. The perennial bunchgrass about 30 to 60 %; non-sprouting shrub 10 to 20 % (composition by biomass) functional groups are expected on this site.

Assumed fire cycle of 20-40 years.

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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 % of decadent and/or dead plants should not exceed 5 %.
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14. **Average percent litter cover (%) and depth ( in):** Litter cover will be heavier under plants. Most litter will be herbaceous and shown amounts and depths would be considered normal. Perennial vegetation should be well distributed on the site.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 950 – 1100 lb./acre on slopes 20 to 30 % and 1000 to 1300 lb./acre on slopes less than 20 % under normal growing conditions.
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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:** As ecological condition deteriorates due to outside disturbances, perennial bunch grasses decrease while less desirable plants like Low rabbitbrush, and Pricklypear increase along with invasive plants like Cheatgrass brome and Utah juniper. When the Reference plant community is burned, Bonneville big sagebrush will decrease while Antelope bitterbrush, perennial grasses, forbs and Low rabbitbrush increase markedly with fast summer fires. Broom snakeweed and Antelope bitterbrush increase to a much lesser extent with cooler or erratic hot fires. 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.
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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.
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