

## Ecological site EX043B23B128 Lowland (LL) Absaroka Upper Foothills

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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:** Rare to nonexistent, but variable depending on precipitation events. This site is subject to frequent disturbance caused by seasonal flooding with its' associated soil scouring and deposition activities. Where rills are present they should be less than 1 inch deep, somewhat widely spaced (10 to 15 feet), and may be connected. They will often run the length of the streambank to a point of depositional interruption. An increase in rill development may be observed following large storm events or spring runoff periods. Rill development may also increase where the site is adjacent to other sites that produce large amounts of runoff (i.e. steeper sites).
- Presence of water flow patterns:** Water flow patterns sometimes evident in floodplain zone where this site occurs. They may be straight and/or sinuous and wind around perennial plant bases. They may be long (15 to 25 feet), 1 to 3 feet wide, and spaced from 5 to 20 feet apart. They should become somewhat stable between flooding events. These become ideal locations for the establishment of new riparian vegetation.
- Number and height of erosional pedestals or terracettes:** Rare to nonexistent. However, plants are expected to show some pedestalling where they are adjacent to water flow patterns. Exposed roots may be present where scouring has occurred. Terracettes are also typically present following flooding events. They often develop behind debris such as twigs and tree branches that act as dams within water flow patterns.
- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is variable on this site, but should range from 0 to 25%. Bare ground openings should be

approximately 1 to 3 feet in size and may be connected as flow channels. Adapted rhizomatous riparian vegetation will often re-populate these opening between flood events.

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5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** No evidence of wind generated soil movement. Wind caused blowouts and depositional areas are not present.
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7. **Amount of litter movement (describe size and distance expected to travel):** Litter accumulates in place at the base of plant canopies between flood events. Following significant flood events, litter is expected to be transported downstream by water. Considerable accumulation is observed behind obstructions such as rocks and woody debris.
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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):** Soil Stability Index ratings range from 2 (interspaces) to 6 (under plant canopy), but average values should be 4.0 or greater. Surface textures will typically vary from sand loams and gravels in depositional areas to loams and clay loams on stable soils.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Typically an A-horizon of 8 to 20 inches (20-50 cm) with highly variable structure and color. Organic matter is typically 1 to 5%.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 50-70% grasses, 20% forbs, and 10-30% shrubs/trees. Dense plant canopy (75-100%) and litter plus moderate to rapid infiltration rates result in minimal to nonexistent runoff. Basal cover is typically greater than 5% for this site and does effectively reduce runoff on this site. Surface gravels are common on this site, which provide site stability, but reduce infiltration.
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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):** None. This site will normally have textural variation within its' soil profile. These should not be mistaken for compaction layers.
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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: cool season bunchgrasses (2 Species)

Sub-dominant: Trees (1 species) > cool season rhizomatous grasses (1 species) = perennial shrubs = perennial forbs

Other: Community 1.1 = Perennial Cool-Season bunchgrasses > Trees > cool season rhizomatous grasses > Perennial Forbs = Shrubs

12b. F/S Groups not expected for the site: Annual Grass

12c. Number of F/S Groups: 5 groups

12d. Species number in Dominate and Sub-dominate F/S Groups: 4 species

Additional: Disturbance regimes include seasonal flooding, insects, and infrequent fire. Temporal variability can be caused by fires, droughts, insects, etc. Spatial variability can be caused by periodic flooding, soil pH, and topography. Following a recent disturbance such as drought, or flooding damage that removes woody vegetation, forbs and perennial grasses and grasslikes may dominate the community. If a disturbance has not occurred for an extended period of time, woody species may continue to increase on the site, reducing herbaceous species. Yearly variations in flow and large floods that scour vegetation and deposit sediment on floodplains are ideal microsites for willow and cottonwood seedlings. These conditions may reflect community phases within the reference state.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** There should be no mortality or decadence in either trees, shrubs or grasses during years with average to above average precipitation. During severe (multi-year) droughts that affect groundwater levels, up to 15% of the trees and shrubs may die. Minor mortality of perennial grasses and grasslikes may also occur during these drought periods. There may be partial mortality of individual grasses, grasslikes and shrubs during less severe droughts.
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14. **Average percent litter cover (%) and depth ( in):** Litter ranges from 10-30% of total canopy measurement with total litter (including beneath the plant canopy) from 75-100% expected. Herbaceous litter depth typically ranges from 10-25 mm. Woody litter can be up to several inches (>8 cm).
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 2000-3000 lb/ac (2242-3363 kg/ha); with an average annual total production of 2500 pounds per acre (2802 kg/ha).
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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:** Bare ground greater than 50% or noxious weed invasion are the most common indicators of a threshold being crossed. Basin big sagebrush, silver buffaloberry, boxelder and woods rose are common increasers. Perennial pepperweed, annual mustards, Canada thistle, Russian knapweed, and Kentucky bluegrass are common invasive species.
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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
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