USDA Natural Resources
Conservation Service

Ecological site EX044B01A040
Loamy Steep (LoStp) 10-14" PZ Frigid

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

Indicators

1. **Number and extent of rills:** Rills are not present in the reference condition on gentle slopes, if present will be short and inconspicuous on the steepest southerly facing slopes exceeding 25%

2. **Presence of water flow patterns:** Water flow patterns are rare in the reference condition but may be present on the steeper, south facing slopes when runoff exceeds infiltration. These patterns will be short and infrequent across the landscape.

3. **Number and height of erosional pedestals or terracettes:** Pedestals are rarely evident in the reference condition, if present will be on slopes greater than 25% and associated with waterflow patterns.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is low (15-25 percent). It consists of randomly scattered small patches.

5. **Number of gullies and erosion associated with gullies:** Not Present

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind erosion will be extremely rare due to the limited bare ground and natural crusting the soil. Post natural disturbances in reference state, extremely limited, short term wind

erosion may occur as plants re-establish.

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7. **Amount of litter movement (describe size and distance expected to travel):** Minimal fine herbaceous litter movement is to be expected on steeper slopes. Distance traveled is short (less than 12 inches)

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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):** Soils on this site are stable and should have stability ratings of 3-6 using the Soil Stability Method. A Horizon should be 4-6 inches thick. Areas under dense sagebrush canopy will tend to have lower stability ratings.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil Structure at the surface is typically weak fine to medium granular. A Horizon should be 4-6 inches thick with color, when wet, typically ranging in Value of 4 or less and Chroma of 3 or less. Local geology may affect color in which it is important to reference the Official Series Description (OSD) for characteristic range.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Site is well drained. The mixed fibrous rooting depth of dominant bunchgrasses combined with the taproots of forbs and shrubs in reference state allows for good infiltration. Plant cover (distribution and amount of canopy) currently adequate for site protection varies however in reference canopy percentage may be from 55-70% with even distribution of mid stature bunchgrasses, (60-70% of site production), cool season rhizomatous grasses (10-15% of site production) along with a mix of shortgrass, forbs and shrubs.

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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):** Not present, some soils profiles on this ecological site may contain an abrupt transition to an Argillic horizon (increase in clay) which can be interpreted as compaction however the subsoil structure will typically be fine to medium subangular blocky whereas a compaction layer will tend to be structureless.

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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 mid-statured bunchgrasses (Bluebunch wheatgrass, Green needlegrass, Rough Fescue (extremely limited extent))

    Sub-dominant: Cool season increaser bunchgrasses > Cool season increaser rhizomatous grasses ≥ Shrubs ≥ Forbs > Subshrubs

    Other: Native annual forbs and Cactus may be present accounting for trace amounts

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Mortality in herbaceous species is not evident. Species with bunch growth forms may have some natural mortality in centers is 3% or less.

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14. **Average percent litter cover (%) and depth (in):** Total litter cover ranges from 20 to 40%, varies based on aspect with a mean value of 35%. Most litter is irregularly distributed on the soil surface and is not at a measurable depth.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Average annual production is 925. Low: 720 High 1200. Production varies based on effective precipitation and natural variability of soil properties for this ecological site.

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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:** Non-native invasive species on this ecological site include but not limited to: Dandelion (Taraxicum spp), Cheatgrass (Bromus techtorum), Field brome (Bromus arvensis), Spotted knapweed (*Centaurea stoebe*), Yellow toadflax (*Linaria vulgaris*), Leafy Spurge (*Euphorbia esula*), Ventenata, Crested wheatgrass

    Native species with the ability to indicate degradation however species presence alone does not imply degradation: Sandberg bluegrass (*Poa secunda*), Big sagebrush (*Artemisia tridentata*), Three-tip sagebrush (Artemisia tripartita), Broom snakeweed (*Gutierrezia sarothrae*), Rubber rabbitbrush (*Ericameria nauseosa*), Yellow rabbitbrush (*Chrysothamnus viscidiflorus*), Rocky Mountain Juniper (*Juniperus scopulorum*), Douglas fir (Psuedotsuga menziesii), Ponderosa pine (*Pinus ponderosa*)

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17. **Perennial plant reproductive capability:** In the reference condition, all plants are vigorous enough for reproduction either by seed or rhizomes in order to balance natural mortality with species recruitment.
