

Ecological site R030XY110UT **Desert Loam (Creosotebush)**

Accessed: 05/19/2024

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.



Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

| | |
|-------------|--|
| R030XY120UT | Desert Sand (Indian ricegrass) |
| R030XY140UT | Desert Shallow Hardpan (Creosotebush) |

Similar sites

| | |
|-------------|---------------------------------------|
| R030XY120UT | Desert Sand (Indian ricegrass) |
|-------------|---------------------------------------|

Table 1. Dominant plant species

| | |
|------------|------------------------------|
| Tree | Not specified |
| Shrub | (1) <i>Larrea tridentata</i> |
| Herbaceous | (1) <i>Hilaria rigida</i> |

Physiographic features

Table 2. Representative physiographic features

| | |
|-----------|------------------|
| Landforms | (1) Valley floor |
|-----------|------------------|

| | |
|-----------|-------------|
| Elevation | 762–1,067 m |
| Slope | 1–20% |

Climatic features

Table 3. Representative climatic features

| | |
|-------------------------------|----------|
| Frost-free period (average) | 0 days |
| Freeze-free period (average) | 210 days |
| Precipitation total (average) | 178 mm |

Influencing water features

Soil features

The soils are moderately deep to deep and well drained. Texture of the surface layer is commonly fine sandy loam but ranges to sil loam. Permeability is moderately rapid so runoff is slow. Available water holding capacity is 3.5 to 12 inches in the root zone.

Table 4. Representative soil features

| | |
|---|--------------------------------------|
| Surface texture | (1) Fine sandy loam (2) Silt loam |
| Drainage class | Well drained |
| Permeability class | Moderately rapid |
| Soil depth | 51–152 cm |
| Available water capacity (0–101.6cm) | 8.89–30.48 cm |

Ecological dynamics

Natural disturbances such as fire do not appear to be a part of this ecosystem. However, Russian thistle and other annuals would likely invade the site if such disturbances were to occur. Since drought is a natural occurrence on this site, most plants are well adapted to severe drought conditions and respond by going into dormancy. Being an extremely arid climate, this plant community is extremely fragile and sensitive to overgrazing.

State and transition model

Ecosystem states

| |
|--------------------|
| 1. Reference State |
|--------------------|

State 1 submodel, plant communities

| |
|----------------------|
| 1.1. Reference State |
|----------------------|

State 1 Reference State

Community 1.1 Reference State

In excellent condition, this site has a dominant vegetative aspect of Creosotebush. The plant community is made up of 55 percent grasses, 10 percent forbs, and 35 percent shrubs. Important plants include big galleta, mesa dropseed, Indian ricegrass, annual forbs, fillaree, creosotebush, Nevada mormontea, and range ratany.

Table 5. Annual production by plant type

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|-----------------|---------------------|--------------------------------------|----------------------|
| Grass/Grasslike | 185 | 308 | 401 |
| Shrub/Vine | 118 | 196 | 256 |
| Forb | 34 | 56 | 73 |
| Total | 337 | 560 | 730 |

Table 6. Ground cover

| | |
|-----------------------------------|------|
| Tree foliar cover | 0% |
| Shrub/vine/liana foliar cover | 7-9% |
| Grass/grasslike foliar cover | 1-3% |
| Forb foliar cover | 0-2% |
| Non-vascular plants | 0% |
| Biological crusts | 0% |
| Litter | 0% |
| Surface fragments >0.25" and <=3" | 0% |
| Surface fragments >3" | 0% |
| Bedrock | 0% |
| Water | 0% |
| Bare ground | 0% |

Table 7. Canopy structure (% cover)

| Height Above Ground (M) | Tree | Shrub/Vine | Grass/ Grasslike | Forb |
|-------------------------|------|------------|---------------------|------|
| <0.15 | — | — | 1-3% | 0-2% |
| >0.15 <= 0.3 | — | — | — | — |
| >0.3 <= 0.6 | — | — | — | — |
| >0.6 <= 1.4 | — | 7-9% | — | — |
| >1.4 <= 4 | — | — | — | — |
| >4 <= 12 | — | — | — | — |
| >12 <= 24 | — | — | — | — |
| >24 <= 37 | — | — | — | — |
| >37 | — | — | — | — |

Additional community tables

Table 8. Community 1.1 plant community composition

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|------------------------|-----------------------------|--------|---|--------------------------------|------------------|
| Shrub/Vine | | | | | |
| 0 | Dominant Shrubs | | | 208–336 | |
| | creosote bush | LATR2 | <i>Larrea tridentata</i> | 135–202 | – |
| | Nevada jointfir | EPNE | <i>Ephedra nevadensis</i> | 34–67 | – |
| | littleleaf ratany | KRER | <i>Krameria erecta</i> | 20–34 | – |
| | burrobush | AMDU2 | <i>Ambrosia dumosa</i> | 13–20 | – |
| | winterfat | KRLA2 | <i>Krascheninnikovia lanata</i> | 7–13 | – |
| 3 | Sub-Dominant Shrubs | | | 101–168 | |
| | Shrub (>.5m) | 2SHRUB | <i>Shrub (>.5m)</i> | 20–34 | – |
| | burrobush | AMDU2 | <i>Ambrosia dumosa</i> | 20–34 | – |
| | fourwing saltbush | ATCA2 | <i>Atriplex canescens</i> | 20–34 | – |
| | threadleaf snakeweed | GUMI | <i>Gutierrezia microcephala</i> | 20–34 | – |
| | pricklypear | OPUNT | <i>Opuntia</i> | 20–34 | – |
| Grass/Grasslike | | | | | |
| 0 | Dominant Grasses | | | 276–410 | |
| | Indian ricegrass | ACHY | <i>Achnatherum hymenoides</i> | 67–168 | – |
| | mesa dropseed | SPFL2 | <i>Sporobolus flexuosus</i> | 20–34 | – |
| | sand dropseed | SPCR | <i>Sporobolus cryptandrus</i> | 13–20 | – |
| | red brome | BRRU2 | <i>Bromus rubens</i> | 13–20 | – |
| 1 | Sub-Dominant Grasses | | | 161–269 | |
| | Grass, annual | 2GA | <i>Grass, annual</i> | 20–34 | – |
| | Grass, perennial | 2GP | <i>Grass, perennial</i> | 20–34 | – |
| | black grama | BOER4 | <i>Bouteloua eriopoda</i> | 20–34 | – |
| | squirreltail | ELEL5 | <i>Elymus elymoides</i> | 20–34 | – |
| | bush muhly | MUPO2 | <i>Muhlenbergia porteri</i> | 20–34 | – |
| | spike dropseed | SPCO4 | <i>Sporobolus contractus</i> | 20–34 | – |
| | false mayweed | TRMAP | <i>Tripleurospermum maritimum</i> ssp. <i>phaeocephalum</i> | 20–34 | – |
| | sixweeks fescue | VUOC | <i>Vulpia octoflora</i> | 20–34 | – |

Animal community

Good winter range for cattle, excellent winter climate, forage is marginal due to the invasions of annuals to the site. This site provides food and cover for a few species of wildlife. Wildlife species commonly found on this site include desert tortoise, cottontail rabbits, jackrabbits, kit fox, and coyote.

Wood products

None

Contributors

Tom Simper

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.

| | |
|---|---|
| Author(s)/participant(s) | Jack Alexander, Range Specialist, Synergy Resource Solutions, Inc. Julia Kluck, Soil Scientist, Synergy Resource Solutions, Inc. , Shane Green, NRCS |
| Contact for lead author | shane.green@ut.usda.gov |
| Date | 01/08/2013 |
| Approved by | Shane A. Green |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

Indicators

- 1. Number and extent of rills:** No rills present. Very minor rill development may occur in sparsely vegetated areas. If rills are present, they should be widely spaced and not connected. Rill development may increase following large storm events, but should begin to heal during the following growing season. Frost heaving will accelerate recovery. Rill development may increase when run inflow enters site from adjacent sites that produce large amounts of runoff (i.e. steeper sites, slickrock, rock outcrop). Site is essentially level and rills do not form.

- 2. Presence of water flow patterns:** Water flow patterns will be very short (1-3'), narrow (<1'), and meandering; interrupted by plants and exposed rocks. Slight to no evidence of erosion or deposition associated with flow patterns. Where slopes exceed 5%, water flow patterns may be of medium length (5 –10 feet).

- 3. Number and height of erosional pedestals or terracettes:** The occurrence of pedestals or terracettes in the reference state is rare; however small pedestals (1-3") of bunch grasses and shrubs may occur. This is due to natural wind erosion and redistribution of surface soil. Some plants may appear to have a pedestal but rather than be formed by erosion, they are the result of litter and soil accumulating at plant bases, forming the appearance of a pedestal. Well-developed biological crusts may appear pedestalled, but are actually a characteristic of the crust formation. Some plants may appear to have a pedestal but rather than be formed by erosion, they are the result of litter and soil accumulating at plant bases, forming the appearance of a pedestal.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 30-45% bare ground (soil with no protection from raindrop impact). Very few if any bare spaces of greater than 1 square foot. In general, bare ground increases as production decreases. As species composition of shrubs relative to grasses increases, bare ground is likely to increase. Poorly developed biological soil crust that is susceptible to erosion from raindrop impact should be recorded as bare ground.

- 5. Number of gullies and erosion associated with gullies:** No gullies present.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Very small areas (less than 4 square feet) may be present. Slight depositional mounding occurs at plant bases. Wind scour or deposition areas may be associated with fire activity.
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7. **Amount of litter movement (describe size and distance expected to travel):** Most litter resides in place with some redistribution caused by water and wind movement. Very minor litter removal may occur in water flow paths with deposition occurring at points of obstruction. Where litter movement does occur, litter accumulates at plant bases. Some leaves, stems, and small twigs may accumulate in soil depressions adjacent to plants. Woody stems are not likely to move.
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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):** This site should have an erosion rating of 3 to 5 under plant canopies and a rating of 2 to 3 in the interspaces with an average rating of 3 using the soil stability kit test.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Ap--0 to 5 inches; light brown (7.5YR 6/4) silt loam; reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, very friable, slightly sticky, slightly plastic; common fine, few medium and coarse roots; strongly effervescent, lime is disseminated; moderately alkaline (pH 8.0); diffuse smooth boundary. (3 to 15 inches thick)
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses and shrubs are equally important for increasing infiltration and reducing runoff. Plant litter and canopy cover from all functional groups intercept rainfall and prevent splash erosion. Bunchgrasses contribute organic matter directly to soil through root decay, and organic matter helps stabilize soil aggregates and maintain soil porosity. Shrubs hold snow and slow wind evaporation. Bunchgrass bases intercept litter and soil in water flow paths, reducing runoff. Biological soil crusts (where present) are resistant to raindrop impact and splash erosion. Spatial distribution of vascular plants and well-developed biological soil crusts (where present) provides detention storage and surface roughness that slows runoff allowing time for infiltration. Interspaces between plants and any well-developed biological soil crusts (where present) may serve as water flow patterns during episodic runoff events, with natural erosion expected in severe storms.
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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):** A compaction layer is not expected.
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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: Dominant: Shrubs (creosote bush, Nevada jointfir, burrowbush) = perennial warm-season bunchgrasses (big galleta, sand dropseed, mesa dropseed) > perennial cool-season bunchgrasses (Indian ricegrass, red brome)
- Sub-dominant:
- Other: Other: Other perennial grasses = other shrubs > perennial forbs
- Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** During years with average to above average precipitation, there should be very little recent mortality or decadence apparent in either the shrubs or grasses. Some mortality of bunchgrass and other shrubs may occur during very severe (long-term) droughts. Long-lived species dominate the site. Open spaces from disturbance are quickly filled by new plants through seedlings and asexual reproduction (tillering).
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14. **Average percent litter cover (%) and depth (in):** Litter cover includes litter under plants. Most litter will be fine (herbaceous) litter. Almost all litter is concentrated under plant canopies. Litter between plant canopies is very sparse. Average litter cover is 5-15% and average litter depth is 0.25-0.5 inches.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 450-550 lbs/acre.
Even the most stable communities exhibit a range of production values. Production will vary between communities and across the MRLA. Refer to the community descriptions in the ESD. Production will differ across the MLRA due to the naturally occurring variability in weather, soils, and aspect. The biological processes on this site are complex; therefore, representative values are presented in a land management context.
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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:** Cheatgrass, halogeton, kochia, Russian thistle
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17. **Perennial plant reproductive capability:** Reproduction restricted by effective precipitation, rock cover, soil depth, and generally harsh growing conditions; all to be expected for site. Site provides harsh environment for seedling establishment.
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