USDA Natural Resources
Conservation Service

Ecological site R030XY120UT
Desert Sand (Indian ricegrass)

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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.

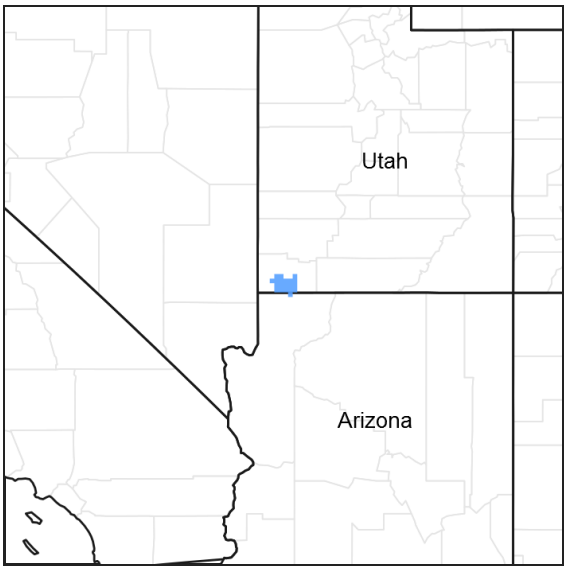

Figure 1. Mapped extent

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

R030XY110UT	**Desert Loam (Creosotebush)**
R030XY140UT	**Desert Shallow Hardpan (Creosotebush)**

Similar sites

R030XY110UT	**Desert Loam (Creosotebush)**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Achnatherum hymenoides* (2) *Hilaria rigida*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat
Elevation	792–1,158 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

Characteristic soils in this stie are 16 to 60 inches deep over sandstone and well drained. They formed in deposits of windblown sand derived mainly from weathered sandstone parent materials. The surface soil is loamy fine sand to find sand in texture. About 1 percent of the soil surface is covered by rock fragments. The volume of rock fragments in the soil profile is 0 to 3 percent. The sand surface may be blown over an older more developed soil. Toquerville fine sand is a shallow soil and presently described as part of the site. Toquerville find sand is only mapped in a complex with pintura, this explains why the same vegetation occurs on both soils. Also due to the low annual precipitation and low water holding capacity of these soils, soil depth has little to do with the vegetation type and amount.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Fine sand
Drainage class	Well drained
Soil depth	41–152 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 impacts such as 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

The dominant vegetative aspect in this site is grass. The plant composition by air-dry weight is approximately 65 percent grasses, 5 percent forbs, and 30 percent shrubs in excellent condition. Important plants include big galleta, Indian ricegrass, mesa dropseed, annual forbs and Nevada mormontea. Red brome is always present.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	183	291	401
Shrub/Vine	84	135	185
Forb	15	22	31
Total	**282**	**448**	**617**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	2-4%
Grass/grasslike foliar cover	1-3%
Forb foliar cover	0%
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%	–
>0.15 <= 0.3	–	–	–	–
>0.3 <= 0.6	–	–	–	–
>0.6 <= 1.4	–	2-4%	–	–
>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**			87–159	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	26–50	–
	threadleaf snakeweed	GUMI	*Gutierrezia microcephala*	16–26	–
	white ratany	KRGR	*Krameria grayi*	10–26	–
	sand sagebrush	ARFI2	*Artemisia filifolia*	16–26	–
	burrobush	AMDU2	*Ambrosia dumosa*	10–16	–
	winterfat	KRLA2	*Krascheninnikovia lanata*	10–16	–
3	**Sub-Dominant Shrubs**			129–252	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	26–50	–
	brittlebush	ENFA	*Encelia farinosa*	26–50	–
	littleleaf ratany	KRER	*Krameria erecta*	26–50	–
	water jacket	LYAN	*Lycium andersonii*	26–50	–
Grass/Grasslike					
0	**Dominant Grasses**			214–318	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	76–101	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	26–50	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	26–50	–
	spike dropseed	SPCO4	*Sporobolus contractus*	10–16	–
1	**Sub-Dominant Grasses**			94–155	
	Grass, annual	2GA	*Grass, annual*	16–26	–
	Grass, perennial	2GP	*Grass, perennial*	16–26	–
	black grama	BOER4	*Bouteloua eriopoda*	16–26	–
	red brome	BRRU2	*Bromus rubens*	16–26	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	16–26	–
	sixweeks fescue	VUOC	*Vulpia octoflora*	16–26	–
Forb					
0	**Dominant Forbs**			0–30	
	desert marigold	BAMU	*Baileya multiradiata*	0–10	–
	redstem stork's bill	ERCI6	*Erodium cicutarium*	0–10	–
	globemallow	SPHAE	*Sphaeralcea*	0–10	–
2	**Sub-Dominant Forbs**			40–103	
	Forb, annual	2FA	*Forb, annual*	10–26	–
	Forb, perennial	2FP	*Forb, perennial*	10–26	–
	sand verbena	ABRON	*Abronia*	10–26	–
	milkvetch	ASTRA	*Astragalus*	10–26	–

Animal community

Wildlife species commonly found on this site include, cottontail rabbits, kit fox, coyote, hawks, and desert tortoise. This site provides food and cover for a few species of wildlife.

Wood products

None

Other references

Modal Soil: Pintura Loamy Fine Sand, 1-5% Slopes – mixed, thermic Typic Torripsamments

Type Location: Warner Valley and Snow Canyon

Contributors

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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

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.

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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).

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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.

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.

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.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** There is no A horizon.

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.

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.

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: Perennial warm-season grasses (big galleta, sand dropseed, mesa dropseed) > perennial cool-season bunchgrasses (Indian ricegrass)

    Sub-dominant: Sub-dominant: Shrubs (Nevada jointfir, sand sagebrush, white ratany, threaleaf snakeweed)

    Other: Other: Other shrubs > other perennial grasses > 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):** 350-450 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, red brome, kochia, Russian thistle, yerba santa

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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.
