

## Ecological site R035XD412AZ Sandy Upland 7-11" p.z.

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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.

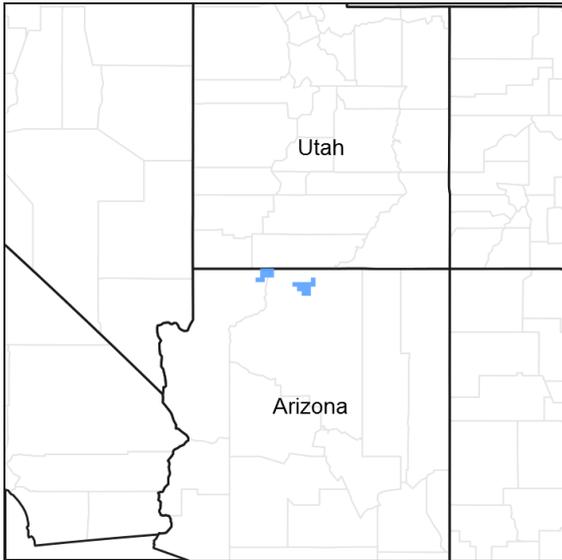


Figure 1. Mapped extent

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.

### MLRA notes

Major Land Resource Area (MLRA): 035X–Colorado Plateau

AZ CRA 35.4 – Colorado Plateau Cold Sagebrush – Grasslands

Elevations range from 4200 to 5100 feet and precipitation averages 7 to 11 inches. Vegetation includes winterfat, fourwing saltbush, buckwheat species, needlegrass, bottlebrush squirreltail, Indian ricegrass, black grama, blue grama, sideoats grama, gyp dropseed, and galleta. The soil temperature regime is mesic and the soil moisture regime is typic aridic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia filifolia</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i> (2) <i>Hesperostipa comata</i>

### Physiographic features

This site occurs in an upland position, not benefiting from excess run-in moisture. It usually occurs at the foot of sandstone plateaus and mesas as rolling hills, dunes, or plains. It may also occur in bottom positions as alluvial fans or entrenched bottoms. May occur on structural benches and terraces.

**Table 2. Representative physiographic features**

Landforms	(1) Alluvial fan (2) Plain (3) Dune
Flooding frequency	None to rare
Ponding frequency	None to rare
Elevation	3,800–5,300 ft
Slope	0–15%
Aspect	Aspect is not a significant factor

### Climatic features

Winter-Summer moisture ratios are typically 70:30 on the west side of this LRU and shift to 60:40 on the east side. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall June-September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture October-May tends to be frontal; it originates in the Pacific and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow December-February. Accumulations above 10 inches are not common, but can occur. Snow usually lasts 3-4 days, but can persist much longer. Summer daytime temperatures are commonly 95-100 F and, on occasion, exceed 105F. Winter air temperatures can regularly go below 15 F and have been recorded below -15 F.

**Table 3. Representative climatic features**

Frost-free period (average)	220 days
Freeze-free period (average)	150 days
Precipitation total (average)	11 in

### Influencing water features

#### Soil features

The soils characterizing this site are moderately deep to deep to any plant root restricting layer. They are excessively drained. The surface soil is sand or loamy sand and the subsurface ranges from sand to sandy clay loam. Soluble salt accumulations are low. Cobble, gravel, or stones are generally less than 15 percent of the total soil volume. The soils are very susceptible to wind erosion especially when the vegetative cover is disturbed.

Taxonomic units are:

SSA625 Mohave County NE part MU 55 & 56 Sheppard;  
SSA629 Coconino County North Kaibab part MU 1 Aneth.

**Table 4. Representative soil features**

Parent material	(1) Eolian deposits–sandstone
Surface texture	(1) Sand (2) Loamy fine sand (3) Fine sand
Family particle size	(1) Sandy

Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	20–60 in
Available water capacity (0-40in)	0–2.5 in
Calcium carbonate equivalent (0-40in)	0–10%
Soil reaction (1:1 water) (0-40in)	7.4–8.4

## Ecological dynamics

The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as grazing, fire, or drought.

Production data provided in this site description is standardized to air-dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity Index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine Similarity Index, compare the production (air-dry weight) of each species to that shown in the plant community description. For each species, count no more than the maximum amount shown for the species, and for each group, count no more than the maximum shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If rainfall has been significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

## State and transition model



**State 1  
Historic Climax Plant Community**

**Community 1.1  
Historic Climax Plant Community**

This site has a plant community made up primarily of mid and short grasses with smaller percentages of forbs and shrubs. In the potential plant community there is a mixture of both cool and warm season species. Plants most likely to increase on this site are sand sagebrush, snakeweed, goldenweed, sandhill muhly, rabbitbrush, and annuals. Invader species include russian thistle and cheatgrass.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	488	525	563
Shrub/Vine	150	188	225
Forb	38	56	75
<b>Total</b>	<b>676</b>	<b>769</b>	<b>863</b>

Figure 5. Plant community growth curve (percent production by month). AZ0004, 35.4 7-11" p.z. fourwing saltbush. Some growth in spring, most growth in summer to early fall rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	15	30	40	5	0	0	0

Figure 6. Plant community growth curve (percent production by month). AZ0005, 35.4 7-11" p.z. Indian ricegrass. Most growth occurs in the spring, some growth occurs in the fall..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	40	40	0	0	0	5	5	0	0

Figure 7. Plant community growth curve (percent production by month). AZ3541, 35.4 7-11" p.z. all sites. Most growth occurs in the spring and during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	9	20	15	5	16	25	6	2	1	0

Figure 8. Plant community growth curve (percent production by month). AZ3542, 35.4 7-11" p.z. Needle and thread. Growth occurs mostly in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	15	60	20	5	0	0	0	0	0	0

Figure 9. Plant community growth curve (percent production by month). AZ3562, 35.4 7-11" p.z. bottlebrush squirreltail. Most growth occurs in the spring, plants may remain green during the winter..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	30	35	15	5	0	0	0	5	5	0

Figure 10. Plant community growth curve (percent production by month). AZ0001, 35.4 7-11" p.z. galleta. Growth begins in the spring, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	3	15	5	25	40	10	2	0	0

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Shrub/Vine</b>					
0				80–160	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	40–90	–
	jointfir	EPHED	<i>Ephedra</i>	35–80	–
	sand sagebrush	ARFI2	<i>Artemisia filifolia</i>	8–75	–
4				8–75	
	rabbitbrush	CHRS9	<i>Chrysothamnus</i>	5–25	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	5–25	–
	slender goldenweed	MAGR10	<i>Machaeranthera gracilis</i>	3–25	–
<b>Grass/Grasslike</b>					
0				70–150	
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	40–75	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	40–75	–
1				225–340	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	75–95	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	60–90	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	65–90	–
	thickspike wheatgrass	ELLA3	<i>Elymus lanceolatus</i>	55–85	–
2				40–75	
	sandhill muhly	MUPU2	<i>Muhlenbergia pungens</i>	10–20	–
	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	8–20	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	10–20	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	8–20	–
4				75–150	
	black grama	BOER4	<i>Bouteloua eriopoda</i>	40–75	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	35–75	–
<b>Forb</b>					
0				40–75	
	globemallow	SPHAE	<i>Sphaeralcea</i>	10–20	–
	Forb, annual	2FA	<i>Forb, annual</i>	8–20	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	10–20	–
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	5–15	–

## Animal community

Ground cover should be maintained or improved wherever possible to avoid blowing sand. This site is suitable for year-round grazing by all classes of livestock. Livestock watering facilities are lacking on large bodies of this site.

Ground cover is fair to good for wildlife. Plant diversity is fair. These areas lack permanent open waters. Some species of wildlife present are mule deer, pronghorn, and cottontail rabbits.

## Recreational uses

This site occurs as rolling hills and plains, usually dunelike. It is a grassland with a fair amount of shrubs.

Winters are cold and summers are quite warm. These are also the wet seasons. Spring and fall are usually dry, cool

and windy.

Activities include hunting, cross-country riding, photography and wildlife observation.

## Other products

The sand is used for domestic activities by local people.

## Other information

Threatened and Endangered Species: Golden eagles and Prairie falcons occasionally use the site for feeding areas.

## Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T40N R3W S11
General legal description	About 12 miles east-southeast of Moccasin AZ; Section 11, T40N, R3W.

## 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.

Author(s)/participant(s)	Steve Cassady, Kyle Spencer
Contact for lead author	Steve Cassady
Date	05/01/2008
Approved by	S. Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None
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2. **Presence of water flow patterns:** None
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3. **Number and height of erosional pedestals or terracettes:** No pedestalling, but turf building (1-2 inches) by long-lived grasses is common.
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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is < 45%.
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5. **Number of gullies and erosion associated with gullies:** None
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6. **Extent of wind scoured, blowouts and/or depositional areas:** None
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7. **Amount of litter movement (describe size and distance expected to travel):** No appreciable movement of litter
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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 associated with this site develop a thin cap that is resistant to erosion.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface 0 to 2 inches of soils associated with this site are single grained; loose. Color is yellowish red (5YR 5/6) dry, yellowish red (5YR 4/6) moist.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Randomly scattered plants consisting of about 70 percent grasses, 25 percent shrubs and 15 percent forbs promote infiltration and reduce runoff. The average distance to the nearest perennial plant (fetch) is 4 inches, with the majority ranging from 2 to 6 inches, but occasionally as far as 14 inches.
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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
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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: Grasses (65 to 75%) >> Shrubs (20 to 30%) > Forbs (5 to 10%).
- Sub-dominant:
- Other:
- Additional:
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Due to the droughty nature of the soils associated with this site plant mortality is common, but should never be more than 10 percent except in severe drought conditions.
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14. **Average percent litter cover (%) and depth ( in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Average annual production on this site is expected to be 700 to 800 lbs/ac. in a year of average annual precipitation

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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 (*Bromus tectorum*) and Russian thistle (*Salsola kali*) are commonly found in small amounts on the site (< 2 percent). During years of above average winter and spring moisture the composition of these may increase slightly.

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17. **Perennial plant reproductive capability:** All plants native to this site are adapted to the climate and are capable of producing seeds, stolons, and/or rhizomes except during the most severe droughts.

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