USDA Natural Resources
Conservation Service

Ecological site R030XA115AZ
Sandy Wash 3-6" 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): 030X–Mojave Basin and Range

This unit occurs within the Basin and Range Province and is characterized by broad basins, valleys, and old lakebeds. Widely spaced mountains trending north to south occur throughout the area. Isolated, short mountain ranges are separated by an aggraded desert plain. The mountains are fault blocks that have been tilted up. Long alluvial fans coalesce with dry lakebeds between some of the ranges.

LRU notes

AZ LRU 30-1 – Lower Mohave Desert

Elevations range from 400 to 2500 feet and precipitation averages 3 to 6 inches per year. Vegetation includes creosotebush, white bursage, Mormon tea, and brittlebush. The soil temperature regime is hyperthermic and the soil moisture regime is typic aridic.

Ecological site concept

This ecological site is located in bottom position. A readily identified water flow channel of unconsolidated sand and gravel is braided throughout this ecological site. Soil textures are a wide range of gravelly sand.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Hymenoclea salsola* (2) *Acacia greggii*
Herbaceous	(1) *Pleuraphis rigida* (2) *Muhlenbergia porteri*

Physiographic features

This ecological site occurs as ephemeral washes. It occasionally receives additional run-in moisture from the surrounding ecological sites. These flows are generally of a short duration, rarely more that 1 or 2 days in duration.

Table 2. Representative physiographic features

Landforms	(1) Wash
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Occasional
Ponding frequency	None
Elevation	400–2,000 ft
Slope	0–3%
Aspect	Aspect is not a significant factor

Climatic features

The 30-1AZ Lower Mohave Desert Shrub land resource unit is characterized by a hot, dry climate. The average annual rainfall is 3 to 6 inches, but it can be extremely variable (e.g. from 0 to 11 inches). There can be long periods when little or no precipitation is received. Most of the precipitation for the year could arrive in just a couple of storms. The soil moisture regime is typic aridic and the soil temperature regime is hyperthermic. Winter precipitation from November through April occurs as gentle rains from storms coming out of the Pacific Ocean. Snow is very rare and only falls in the highest mountains. A seasonal drought occurs in May and June. Summer/fall precipitation from July through October comes from spotty, unreliable, and sometimes violent thunderstorms. The moisture originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the state on the north end of the Mexican monsoon. Strong winds are common, especially during the spring.

Table 3. Representative climatic features

Frost-free period (average)	325 days
Freeze-free period (average)	365 days
Precipitation total (average)	6 in

Influencing water features

Soil features

The soil of this ecological site is deep to very deep to any plant root restricting layer. The surface texture is loamy sand to coarse sand and is gravelly to very cobbly. Subsurface textures are loamy sand to coarse sand and is gravelly to extremely gravelly.

A typical soil profile is:
0 to 3 inches; very gravelly loamy sand
3 to 60 inches; very gravelly coarse sand and very gravelly loamy sand

This ecological site has been correlated to map unit 623015, Carrizo Series, Shivwits Area, AZ, Part of Mohave County SSA, and map units 701108 and 701109, Carrizo Series, Grand Canyon Area, AZ, Parts of Coconino and Mohave Counties SSA

Table 4. Representative soil features

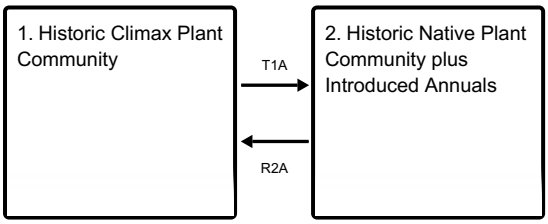
Surface texture	(1) Gravelly loamy sand (2) Very gravelly sand (3) Very cobbly sandy clay
Family particle size	(1) Sandy
Drainage class	Excessively drained
Permeability class	Very rapid
Soil depth	60 in
Surface fragment cover <=3"	50–60%
Surface fragment cover >3"	5–45%
Available water capacity (0-40in)	1–3 in
Calcium carbonate equivalent (0-40in)	5–10%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	40–60%
Subsurface fragment volume >3" (Depth not specified)	5–20%

Ecological dynamics

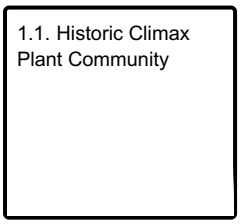
Sandy Wash, 6"-9" p.z., is a highly productive ecological site that is at the lowest point of the watershed. Water flow is intense and flashy during and after heavy rains. The plant community is mixed shrubs with a diverse understory of perennial grass and forbs. Non-native forbs and grasses are well-established on this ecological site.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities

2.1. Non-native Annuals

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The dominant aspect of the site is a desert-shrub community. Grasses and forbs are present among the shrubs. Catclaw acacia can be the tallest shrub, especially in the drainage channels. White burrobrush is the dominant shrub. Big galleta and bush muhly are the major perennial grasses.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	250	300	325
Grass/Grasslike	100	135	150
Forb	50	65	75
Total	**400**	**500**	**550**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-2%
Grass/grasslike foliar cover	0%
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 (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	0-2%
>0.5 <= 1	–	–	1-3%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	–	6-10%	–	–
>4.5 <= 13	–	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 4. Plant community growth curve (percent production by month). AZ3011, 30.1 3-6" p.z. all sites. Growth begins in late winter, most growth occurs in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	30	32	13	7	3	5	2	1	0	0

Figure 5. Plant community growth curve (percent production by month). AZ3083, 30.27 3-6" p.z. white bursage. Growth begins in early spring. Dormancy occurs during the hot summer months. With sufficient summer/fall precipitation, some plants may break dormancy and produce a flush of growth. Flowers and sets seed by July..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	20	40	20	15	0	0	0	0	0	0

Figure 6. Plant community growth curve (percent production by month). AZ3086, 30.27 3-6" p.z. big galleta. Growth begins in the late winter and early spring, goes dormant in May through June, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	10	20	10	0	0	15	40	5	0	0	0

Figure 7. Plant community growth curve (percent production by month). AZ3090, 30.27 3-6" p.z. bush muhly. Growth begins in the winter to early spring, goes semi-dormant in May through June, most growth occurs during the summer rainy season, green most of the year..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	10	10	10	5	5	15	20	20	5	0	0

Figure 8. Plant community growth curve (percent production by month). AZ3091, 30.23 6-10" p.z. catclaw acacia. Growth begins in spring and continues through summer. Flowers from May through June. Seeds from July through September..

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

Figure 9. Plant community growth curve (percent production by month). AZ3092, 30.28 10-13" p.z. white burrobrush. Growth begins in the spring and continues through the summer. Flowers and sets seed during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	20	10	10	20	20	10	0	0	0

State 2
Historic Native Plant Community plus Introduced Annuals

Community 2.1
Non-native Annuals

This plant community resembles the historic native plant community, but exotic annuals have been introduced. Non-native species include Asian mustard (*Brassica tournefortii*), red brome, Mediterranean grass (Schismus spp.), and filaree. The flourish of non-native annuals that occurs following rainfalls may preclude native annuals.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	250	305	325
Grass/Grasslike	100	125	150
Forb	50	70	75
Total	**400**	**500**	**550**

Table 9. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-2%
Grass/grasslike foliar cover	0%
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 10. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	–	–	0-2%
>0.5 <= 1	–	–	1-3%	–
>1 <= 2	–	–	–	–
>2 <= 4.5	–	6-10%	–	–
>4.5 <= 13	–	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 11. Plant community growth curve (percent production by month). AZ3011, 30.1 3-6" p.z. all sites. Growth begins in late winter, most growth

occurs in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	7	30	32	13	7	3	5	2	1	0	0

Figure 12. Plant community growth curve (percent production by month). AZ3080, 30.27 3-6" p.z. red brome (exotic). Germinates in October with fall precipitation, most growth occurs in February through April..

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

Figure 13. Plant community growth curve (percent production by month). AZ3081, 30.27 3-6" p.z. redstem filaree (exotic). Germinates in October with fall precipitation, most growth occurs in February through April..

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

Transition T1A
State 1 to 2

Introduction of non-native forb and grass seed.

Restoration pathway R2A
State 2 to 1

None known.

Additional community tables

Table 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				25–50	
	big galleta	PLRI3	*Pleuraphis rigida*	25–50	–
2				25–50	
	bush muhly	MUPO2	*Muhlenbergia porteri*	25–50	–
3				0–5	
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–5	–
4				0–5	
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–5	–
5				0–10	
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	0–10	–
6				10–40	
	Grass, annual	2GA	*Grass, annual*	10–40	–
Forb					
7				25–50	
	desert Indianwheat	PLOV	*Plantago ovata*	25–50	–
8				5–40	
	Forb, annual	2FA	*Forb, annual*	5–40	–
9				5–10	

	Forb, perennial	2FP	*Forb, perennial*	5–10	–
Shrub/Vine					
10				25–50	
	catclaw acacia	ACGR	*Acacia greggii*	25–50	–
11				125–175	
	burrobrush	HYSA	*Hymenoclea salsola*	125–175	–
12				5–25	
	smoketree	PSSP3	*Psorothamnus spinosus*	5–25	–
13				5–25	
	creosote bush	LATR2	*Larrea tridentata*	5–25	–
14				5–25	
	burrobush	AMDU2	*Ambrosia dumosa*	5–25	–
15				0–15	
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	0–15	–
16				5–25	
	water jacket	LYAN	*Lycium andersonii*	5–25	–
17				5–25	
	brittlebush	ENFA	*Encelia farinosa*	5–25	–
18				0–10	
	sweetbush	BEJU	*Bebbia juncea*	0–10	–
19				0–15	
	Mexican bladdersage	SAME	*Salazaria mexicana*	0–15	–
20				5–25	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	5–25	–

Table 12. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				25–50	
	big galleta	PLRI3	*Pleuraphis rigida*	25–50	–
2				25–50	
	bush muhly	MUPO2	*Muhlenbergia porteri*	25–50	–
3				5–25	
	red brome	BRRU2	*Bromus rubens*	5–25	–
4				0–5	
	sixweeks grama	BOBA2	*Bouteloua barbata*	0–5	–
5				0–5	
	sixweeks fescue	VUOC	*Vulpia octoflora*	0–5	–
6				0–10	
	Parish's threeawn	ARPUP5	*Aristida purpurea var. parishii*	0–10	–
7				5–15	
	Grass, annual	2GA	*Grass, annual*	5–15	–
Forb					
8				5–15	

	redstem stork's bill	ERCI6	*Erodium cicutarium*	5–15	–
9				25–50	
	desert Indianwheat	PLOV	*Plantago ovata*	25–50	–
10				0–25	
	Forb, annual	2FA	*Forb, annual*	0–25	–
11				5–10	
	Forb, perennial	2FP	*Forb, perennial*	5–10	–
Shrub/Vine					
12				25–50	
	catclaw acacia	ACGR	*Acacia greggii*	25–50	–
13				125–175	
	burrobrush	HYSA	*Hymenoclea salsola*	125–175	–
14				5–25	
	smoketree	PSSP3	*Psorothamnus spinosus*	5–25	–
15				5–25	
	creosote bush	LATR2	*Larrea tridentata*	5–25	–
16				5–25	
	burrobush	AMDU2	*Ambrosia dumosa*	5–25	–
17				0–15	
	yellow paloverde	PAMI5	*Parkinsonia microphylla*	0–15	–
18				5–25	
	water jacket	LYAN	*Lycium andersonii*	5–25	–
19				5–25	
	brittlebush	ENFA	*Encelia farinosa*	5–25	–
20				0–10	
	sweetbush	BEJU	*Bebbia juncea*	0–10	–
21				0–15	
	Mexican bladdersage	SAME	*Salazaria mexicana*	0–15	–
22				5–25	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	5–25	–

Contributors

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Approval

Kendra Moseley, 10/21/2024

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)	
Contact for lead author	
Date	05/11/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

    Sub-dominant:

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

14. **Average percent litter cover (%) and depth (in):**

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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:**

17. **Perennial plant reproductive capability:**