

Ecological site R030XB214AZ Limy Upland 6-9" 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

AZ CRA 30.2 – Middle Mohave Desert

Elevations range from 1500 to 3200 feet and precipitation averages 6 to 9 inches per year. Vegetation includes creosotebush, white bursage, yucca, prickly pear and cholla species, Mormon tea, flattop buckwheat, ratany, winterfat, bush muhly, threeawns, and big galleta. The soil temperature regime is thermic and the soil moisture regime is typic aridic. 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.

Associated sites

R030XB203AZ	Basalt Slopes 6-9" p.z.
R030XB205AZ	Sandy Loam Upland 6-10" p.z. Limy Subsurface, Gravelly
R030XB208AZ	Gypsum Hills 6-9" p.z.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Ambrosia dumosa</i> (2) <i>Larrea tridentata</i>
Herbaceous	Not specified

Physiographic features

This site occurs in an upland position on ridges, summits and shoulders of plateaus, mesas and fans. The soils associated with this site are generally shallow to a lime cemented root restricting layer. Occasionally the soil associated with the site is moderately deep or deep, but in these instances there is a weakly lime cemented layer at a shallow depth. The soil is calcareous throughout the profile. Slopes range from 1 to 25 percent.

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Mesa (3) Fan
Flooding frequency	None
Ponding frequency	None
Elevation	457–975 m
Slope	1–25%
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid and warm. Annual precipitation ranges from 6 to 9 inches. About 65 percent of the rainfall comes from October through May as gentle rain from Pacific storms which may last for a couple of days. The rest of the rainfall comes during the summer monsoon season from July through September as spotty, brief, intense thunderstorms. Snow rarely falls, and only remains on the ground a few hours at most. Annual air temperature ranges from 59 to 70 degrees F. The average frost-free period ranges from 156 to 259 days.

Table 3. Representative climatic features

Frost-free period (average)	259 days
Freeze-free period (average)	290 days
Precipitation total (average)	229 mm

Influencing water features

Soil features

The soil of this site ranges from shallow to deep, but is generally shallow to a plant root restricting lime cemented layer. Those that are deeper have are weakly lime cemented at a shallow depth. The soil surface is gravelly or cobbly and has a texture ranging from sandy loam to loam. The subsoil is generally very gravelly to very cobbly. Subsoil textures range sandy loam to clay. The soil is calcareous throughout the profile.

A typical soil profile is:

A1--0 to 1 inch; reddish brown (5YR 5/4) very gravelly fine sandy loam, reddish brown (5YR 4/4) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; few fine and medium tubular pores; disseminated calcium carbonate; 40 percent pebbles and cobbles; strongly effervescent; strongly alkaline (pH 8.8); abrupt smooth boundary.

A2--1 to 6 inches; reddish brown (5YR 5/4) very gravelly fine sandy loam, reddish brown (5YR 4/4) moist; weak medium platy structure parting to fine granular; slightly hard, very friable, nonsticky and nonplastic; common fine roots; common very fine, fine and medium tubular pores; disseminated calcium carbonate; 40 percent pebbles; strongly effervescent; strongly alkaline (pH 8.8); clear smooth boundary. (Combined thickness of the A horizons is 5 to 10 inches.)

Bk1--6 to 12 inches; light reddish brown (5YR 6/4) very gravelly fine sandy loam, reddish brown (5YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine roots; common fine and medium tubular pores; disseminated calcium carbonate; 40 percent pebbles and cobbles; strongly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.

Bk2--12 to 16 inches; light reddish brown (5YR 6/4) very cobbly fine sandy loam, reddish brown (5YR 4/4) moist; massive, soft, very friable, nonsticky and nonplastic; common fine roots; few fine and medium tubular pores; disseminated calcium carbonate; 60 percent pebble and cobble size pan fragments; strongly effervescent; strongly alkaline (pH 8.8); abrupt wavy boundary. (Combined thickness of the Bk horizons is 6 to 12 inches.)

Bkm--16 to 20 inches; indurated petrocalcic horizon..

Table 4. Representative soil features

Parent material	(1) Colluvium–conglomerate (2) Residuum–limestone
Surface texture	(1) Very cobbly sandy loam (2) Gravelly very fine sandy loam (3) Extremely gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	28–51 cm
Surface fragment cover ≤3"	5–50%
Surface fragment cover >3"	0–30%
Available water capacity (0-101.6cm)	3.3–4.32 cm
Calcium carbonate equivalent (0-101.6cm)	15–25%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Soil reaction (1:1 water) (0-101.6cm)	7.9–9
Subsurface fragment volume ≤3" (Depth not specified)	5–60%
Subsurface fragment volume >3" (Depth not specified)	0–25%

Ecological dynamics

The historic climax plant community (HCPC) for a site in North America is the plant community that existed at the time of European immigration and settlement. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site at that time. The HCPC was in dynamic equilibrium with its environment and was able to avoid displacement by the suite of disturbances and disturbance patterns (magnitude and frequency) that naturally occurred within the area occupied by the site. Natural disturbances, such as drought, fire, grazing of native fauna, and insects, were inherent in the development and maintenance of the plant community. The effects of these disturbances are part of the range of characteristics of the site that contribute

to the dynamic equilibrium. Fluctuations in the plant community's structure and function caused by the effects of these natural disturbances establish the boundaries of dynamic equilibrium. They are accounted for as part of the range of characteristics for the ecological site. The HCPC is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. Variability is apparent in productivity and occurrence of individual species.

The HCPC for this ecological site has been estimated by sampling relict or relatively undisturbed sites and/or reviewing historic records.

A plant community that is subjected to abnormal disturbances and physical site deterioration or that is protected from natural influences, such as fire and grazing, for long periods seldom typifies the HCPC. Any physical site deterioration caused by the abnormal disturbance may result in the crossing of a threshold or irreversible boundary to another state, or equilibrium, for the ecological site. There may be multiple thresholds and states possible for an ecological site, determined by the type and or severity of abnormal disturbance. The known states and transition pathways for this ecological site are described in the accompanying state and transition model.

The "Plant Community Plant Species Composition" table provides a list of species and each species or group of species' annual production in pounds per acre (air-dry weight) expected in a normal rainfall year. Low and high production yields represent the modal range of variability for that species or group of species across the extent of the ecological site.

The "Annual Production by Plant Type" table provides the median air-dry production and the fluctuations to be expected during favorable, normal, and unfavorable years.

The present plant community on an ecological site can be compared to the various common vegetation states that can exist on the site. The degree of similarity is expressed through a similarity index. To determine the similarity index, compare the production 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 representative value shown in the "Annual Production by Plant Type" table for the reference plant community. Variations in production due to above or below normal rainfall, incomplete growing season or utilization must be corrected before comparing it to the site description. The "Worksheet for Determining Similarity Index" is useful in making these corrections. The accompanying growth curve can be used as a guide for estimating percent of growth completed.

State and transition model



**State 1
Historic Climax Plant Community**

**Community 1.1
Historic Climax Plant Community**

The dominant aspect of this ecological site is mixed desert shrub. The dominant shrubs are white bursage, creosotebush, Nevada Mormon tea and white ratany. Very little perennial grass occurs on this site. During years of average or below average production the majority of the annual herbage production is from shrubs. In wetter than average years production is from shrubs. Many species are only seen in above annual precipitation years. No estimate of stocking rate is provided. The stocking rate will have to be determined each year based on growth from winter and spring moisture.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	206	346	485
Forb	8	17	26
Grass/Grasslike	2	13	25
Tree	8	16	25
Total	224	392	561

Table 6. Ground cover

Group	Common Name	Symbol	Scientific Name	(Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				0–10	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–10	–
2				0–4	
3				0–4	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–4	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–4	–
	threeawn	ARIST	<i>Aristida</i>	0–4	–
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0–4	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	0–4	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–4	–
4				4–15	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	4–16	–
Forb					
4				4–16	
	globemallow	SPHAE	<i>Sphaeralcea</i>	4–16	–
5				0–10	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–10	–
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0–10	–
	winding mariposa lily	CAFL	<i>Calochortus flexuosus</i>	0–10	–
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	0–10	–
6				4–16	
	Forb, annual	2FA	<i>Forb, annual</i>	0–4	–
	trailing windmills	ALIN	<i>Allionia incarnata</i>	0–4	–
	devil's spineflower	CHRI	<i>Chorizanthe rigida</i>	0–4	–
	dyssodia	DYSSO	<i>Dyssodia</i>	0–4	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–4	–
	spurge	EUPHO	<i>Euphorbia</i>	0–4	–
	New Mexico plumeseed	RANE	<i>Rafinesquia neomexicana</i>	0–4	–
Shrub/Vine					
8				126–177	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	126–177	–
9				76–126	
	creosote bush	LATR2	<i>Larrea tridentata</i>	76–126	–
10				4–25	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	4–25	–
11				4–25	
	white ratany	KRGR	<i>Krameria grayi</i>	4–25	–
12				0–25	
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–25	–
13				10–30	
	pricklypear	OPUNT	<i>Opuntia</i>	10–30	–

14				10-25	
	turpentinebroom	THMO	<i>Thamnosma montana</i>	10-25	-
15				4-16	
	water jacket	LYAN	<i>Lycium andersonii</i>	4-16	-
16				0-16	
	echinocactus	ECHIN2	<i>Echinocactus</i>	0-16	-
	barrel cactus	FEROC	<i>Ferocactus</i>	0-16	-
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	0-16	-
17				25-50	
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	4-25	-
	button brittlebush	ENFR	<i>Encelia frutescens</i>	4-25	-
	mormon tea	EPVI	<i>Ephedra viridis</i>	4-25	-
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	4-25	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	4-25	-
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	4-25	-
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	4-25	-
Tree					
18				16-25	
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	16-25	-

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T36 N. R16 W. S36
General legal description	Pakoon Springs Quad; about 4 1/2 miles north of Pakoon Springs Ranch; Sec. 36, T. 36 N., R. 16 W.; Mohave County, Arizona.
Location 2: Mohave County, AZ	
Township/Range/Section	T17 N. R17 W. S17
General legal description	Yucca SE Quad; near junction of Alamo Road and Boriana Mine Road; Sec. 17, T 17 N., R. 17 W.; Mohave County, Arizona.

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)	
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Contact for lead author	
Date	
Approved by	
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:**
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17. **Perennial plant reproductive capability:**
-