USDA Natural Resources
Conservation Service

Ecological site R030XB206AZ
Cobbly Limy Upland 6-9" p.z. Deep

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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.

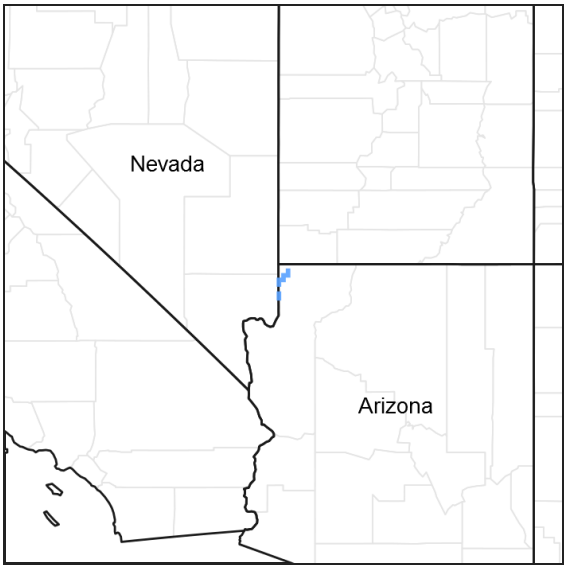


Figure 1. Mapped extent

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 30-2 – 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.

Ecological site concept

This ecological site is located on gently sloping uplands. Soils are deep, skeletal sandy loams with no root restricting

layer. They are non-effervescent at the surface. Calcium carbonates increase with depth and soil is strongly effervescent at about 8 inches.

Associated sites

R030XB214AZ	**Limy Upland 6-9" p.z.**
R030XC306AZ	**Granitic Hills 10-13" p.z. Alkaline**

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Ambrosia dumosa* (2) *Larrea tridentata*
Herbaceous	(1) *Pleuraphis rigida*

Physiographic features

This ecological site is found in an upland position on summits, shoulders and sideslopes of fan terraces and fan piedmonts. The soil surface of the ecological site is covered with gravel, cobbles and stones. Slopes range from 5 to 15 percent.

Table 2. Representative physiographic features

Landforms	(1) Terrace (2) Fan piedmont
Flooding frequency	None
Ponding frequency	None
Elevation	1,900–3,000 ft
Slope	5–15%
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)	9 in

Influencing water features

Soil features

The soils of this ecological site are deep to very deep to any plant root restricting layer. Surface textures range from very gravelly sandy loam to very stony sandy loam. Subsurface textures range from very gravelly sandy loam to extremely cobbly loamy coarse sand. The available water capacity is low. Hazard of erosion by water is slight to

moderate and by wind is slight. The soil surface may by non-effervescent, but the soil subsurface is slightly to strongly effevescent.

A typical soil profile is as follows:
A--0 to 2 inches; very gravelly sandy loam, 20 percent gravel, 10 percent cobble and 10 percent stones; noneffervescent; moderately alkaline (pH 8.2)
Bk1--2 to 8 inches; gravelly sandy loam, 20 percent gravel and 5 percent cobble; slightly effervescent with disseminated and segregated calcium carbonate as pendants on sand grains and rock fragments, 7 percent calcium carbonate equivalent; moderately alkaline (pH 8.2)
Bk2--8 to 30 inches; extremely cobbly loamy coarse sand, 35 percent gravel, 25 percent cobble and 10 percent stones; strongly effervescent with disseminated and segregated calcium carbonate as pendants on sand grains and rock fragments, 10 percent calcium carbonate equivalent; moderately alkaline (pH 8.4)
Bk3--30 to 62 inches; very gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; single grained; 50 percent gravel and 5 percent cobble; strongly effervescent with disseminated and segregated calcium carbonate as pendants on sand grains and rock fragments, 7 percent calcium carbonate equivalent; moderately alkaline (pH 8.4)
2C--62 to 64 inches; coarse sand, 5 percent gravel; slightly effervescent with disseminated calcium carbonate, 2 percent calcium carbonate equivalent; moderately alkaline (pH 8.4)

Soil map units correlated to this ecological site include 623013, Blind Family and Shelly, Shivwits Area, Arizona SSA.

Table 4. Representative soil features

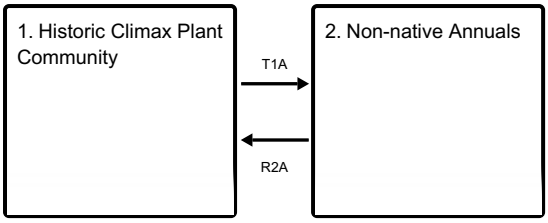
Surface texture	(1) Very gravelly sandy loam (2) Very stony sandy loam
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Moderate to very rapid
Soil depth	60 in
Surface fragment cover <=3"	20–50%
Surface fragment cover >3"	0–50%
Calcium carbonate equivalent (0-40in)	0–25%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Soil reaction (1:1 water) (0-40in)	7.4–8.6
Subsurface fragment volume <=3" (Depth not specified)	20–50%
Subsurface fragment volume >3" (Depth not specified)	0–50%

Ecological dynamics

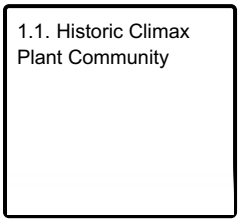
This ecological site is a dispersed desert shrub dominated ecological site. Trees are widely scattered with a well-dispersed understory of large shrubs, small shrubs, and perennial grasses. Annual forbs and grasses flourish following rainfall. Natural disturbances are rare. After introduction of non-native annuals (forbs and/or grasses), the shift in total productivity with shift slightly toward seasonal herbaceous production following periods of rain. Dominant shrubs are creosote and white bursage. Assorted half-shrubs are widely scattered.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

This ecological site is dominated by creosotebush and white bursage with an easthetically pleasing distribution of Joshua Trees. There are minor amounts of perennial grasses on this site. The cobbles and stones inhibit livestock movement. Degradation occurs only because of catastrophic events such as fire or man caused disturbances. The soil will always be protected by the gravels and cobbles. The site's total biomas production by weight (air-dried)is comprised of: grasses and grasslike plants - 5 to 10 percent, forbs 1 to 5 percent, shrubs 80 to 90 and trees 5 to 10 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	88	210	313
Tree	5	15	35
Grass/Grasslike	5	18	35
Forb	2	7	17
Total	**100**	**250**	**400**

Table 6. Ground cover

Tree foliar cover	0-2%
Shrub/vine/liana foliar cover	0-2%
Grass/grasslike foliar cover	0-1%
Forb foliar cover	0-1%
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	–	–	–	0-1%
>0.5 <= 1	–	–	0-2%	–
>1 <= 2	–	4-7%	–	–
>2 <= 4.5	–	–	–	–
>4.5 <= 13	0-2%	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 5. Plant community growth curve (percent production by month). AZ3022, 30.2 6-9" p.z. upland sites. Growth begins in the late winter, most growth occurs in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	19	33	18	7	7	11	3	0	0	0

Figure 6. Plant community growth curve (percent production by month). AZ3030, 40-3AZ 7-10" p.z. big galleta. Growth begins in the 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	0	10	10	0	0	15	55	10	0	0	0

State 2
Non-native Annuals

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

Transition T1A
State 1 to 2

Introduction of non-native annual forb and grass seed.

Restoration pathway R2A
State 2 to 1

None known.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				12–25	
	big galleta	PLRI3	*Pleuraphis rigida*	12–25	–

2				0–2	
	low woollygrass	DAPU7	*Dasyochloa pulchella*	0–2	–
3				0–5	
	threeawn	ARIST	*Aristida*	0–5	–
4				0–5	
	bush muhly	MUPO2	*Muhlenbergia porteri*	0–5	–
5				0–5	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0–5	–
6				2–5	
	Grass, annual	2GA	*Grass, annual*	2–5	–
Forb					
7				0–2	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	0–2	–
8				2–5	
	Forb, annual	2FA	*Forb, annual*	2–5	–
9				2–8	
	Forb, perennial	2FP	*Forb, perennial*	2–8	–
Shrub/Vine					
10				50–75	
	creosote bush	LATR2	*Larrea tridentata*	50–75	–
11				100–125	
	burrobush	AMDU2	*Ambrosia dumosa*	100–125	–
12				5–12	
	littleleaf ratany	KRER	*Krameria erecta*	2–12	–
	white ratany	KRGR	*Krameria grayi*	2–12	–
13				0–2	
	turpentinebroom	THMO	*Thamnosma montana*	0–2	–
14				2–8	
	pricklypear	OPUNT	*Opuntia*	2–8	–
15				2–5	
	spiny menodora	MESP2	*Menodora spinescens*	2–5	–
16				0–5	
	winterfat	KRLA2	*Krascheninnikovia lanata*	0–5	–
17				0–8	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	0–8	–
18				2–12	
	rayless goldenhead	ACSP	*Acamptopappus sphaerocephalus*	0–10	–
	burrobrush	HYSA	*Hymenoclea salsola*	0–10	–
	water jacket	LYAN	*Lycium andersonii*	0–10	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–2	–
Tree					
19				12–25	
	Joshua tree	YUBR	*Yucca brevifolia*	12–25	–

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:**