

# Ecological site R030XC311AZ Limy Upland 10-13" 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 30.3 – Upper Mohave Desert

Elevations range from 2800 to 4500 feet and precipitation averages 9 to 12 inches per year. Vegetation includes Joshua tree, blackbrush, creosotebush, ratany, bush muhly, big galleta, black grama, desert needlegrass, and Indian ricegrass. 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

R030XC306AZ	Granitic Hills 10-13" p.z. Alkaline
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Table 1. Dominant plant species

Tree	Not specified
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Shrub	(1) <i>Larrea tridentata</i> (2) <i>Yucca schidigera</i>
Herbaceous	(1) <i>Pleuraphis rigida</i>

## Physiographic features

This ecological site is found in an upland position on shoulders, ridges, and summits of fan terraces, mesas and plateaus.

**Table 2. Representative physiographic features**

Landforms	(1) Plateau (2) Terrace (3) Mesa
Flooding frequency	None
Ponding frequency	None
Elevation	671–1,219 m
Slope	1–25%
Aspect	Aspect is not a significant factor

## Climatic features

The climate is arid and warm. Annual precipitation ranges from 10 to 13 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 46 to 76 degrees F. The average frost-free period ranges from 121 to 231 days.

**Table 3. Representative climatic features**

Frost-free period (average)	231 days
Freeze-free period (average)	269 days
Precipitation total (average)	330 mm

## Influencing water features

### Soil features

The soil of this ecological site is moderately deep with surface textures of cobbly loam, extremely gravelly loam, very gravelly sandy loam, or very cobbly loam. Subsurface textures are gravelly loam, gravelly clay loam, very gravelly loam, loam, very gravelly sandy loam, very gravelly fine sandy loam and very stony loam. The soil's parent material is alluvium from sedimentary, igneous and metamorphic rocks. The available water capacity of the soil is very low to low. Erosion hazard by water is slight to severe and by wind is slight. The soil is non-saline, non-sodic with pH range of 8.0-8.4 (moderately alkaline). The soil moisture regime is typic aridic and soil temperature regime is thermic.

A lime cemented hardpan is found at depth ranges from 15-32 inches. Lime content above the hardpan is 15-35% calcium carbonate equivalent.

A typical soil profile is:

0 to 1 inch; very cobbly loam

1 to 8 inches; calcareous very gravelly loam

8 to 49 inches; calcareous very stony loam

49 inches; weathered gneiss

The taxonomic classification of the soil includes Loamy-skeletal, mixed, thermic Typic Calciorthids.

Soil mapping units correlated to this ecological site include So. Mohave SSA: Goodspring, Alko and Castaneda; Central Mohave SSA: Shamrock, Nealy and Whitehills; and Shivwits SSA: Hobog, Tidwell and Nickel family.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–metasedimentary rock
Surface texture	(1) Gravelly loam (2) Very gravelly sandy loam (3) Very stony clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	51–102 cm
Surface fragment cover <=3"	30–50%
Surface fragment cover >3"	20–50%
Available water capacity (0-101.6cm)	6.35–10.16 cm
Calcium carbonate equivalent (0-101.6cm)	3–15%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	45–60%
Subsurface fragment volume >3" (Depth not specified)	5–20%

## 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. The historic climax plant community was in dynamic equilibrium with its environment. It is the plant community that 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 by native fauna, and insects, were inherent in the development and maintenance of these plant communities. The effects of these disturbances are part of the range of characteristics of the site that contribute to that dynamic equilibrium. Fluctuations in plant community 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 an ecological site. Some sites may have a small range of variation, while others have a large range.

The historic climax plant community of an ecological site is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. In all plant communities, variability is apparent in productivity and occurrence of individual species. Spatial boundaries of the communities; however, can be recognized by characteristic patterns of species composition, association, and community structure. The HCPC for this ecological site has been estimated by sampling relict or relatively undisturbed sites and/or reviewing historic records.

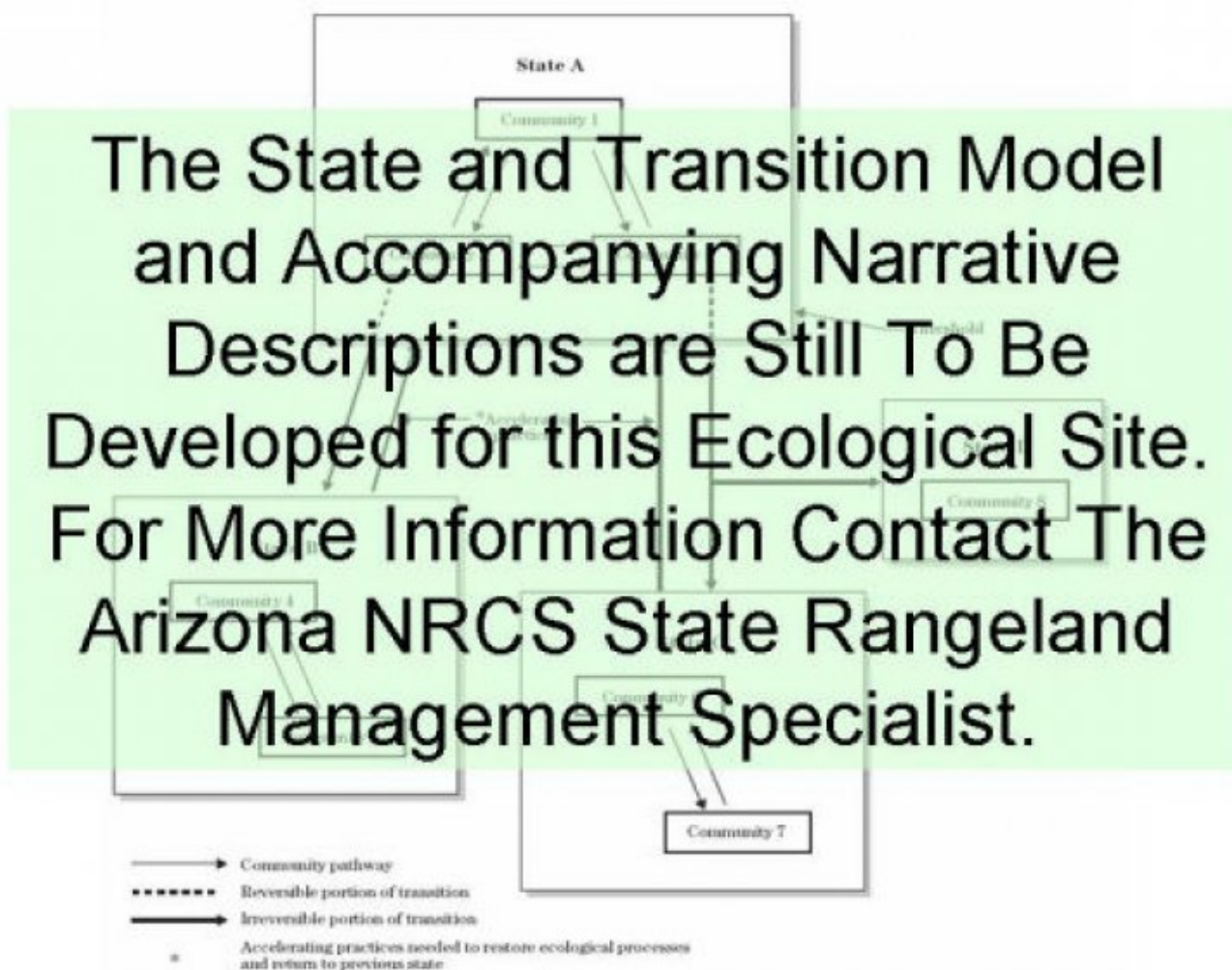
Plant communities that are subjected to abnormal disturbances and physical site deterioration or that are protected

from natural influences, such as fire and grazing, for long periods seldom typify the historic climax plant community. The physical site deterioration caused by the abnormal disturbance results 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 plant community is a desert shrub with an understory of grasses. Forbs are present in minor amounts. Major shrubs include creosotebush, Mohave yucca, white bursage, rayless goldenhead and Anderson wolfberry. Blackbush occurs in some areas. Grasses include big galleta, bush muhly and annual grasses.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	65	206	334
Grass/Grasslike	40	129	223
Forb	7	28	55
Tree	–	1	4
<b>Total</b>	<b>112</b>	<b>364</b>	<b>616</b>

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	1-3%
Grass/grasslike foliar cover	0-2%
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	–	–	–	0-2%
>0.15 <= 0.3	–	–	1-3%	–
>0.3 <= 0.6	–	–	–	–
>0.6 <= 1.4	–	9-11%	–	–
>1.4 <= 4	0-2%	–	–	–
>4 <= 12	–	–	–	–
>12 <= 24	–	–	–	–
>24 <= 37	–	–	–	–
>37	–	–	–	–

Figure 5. Plant community growth curve (percent production by month). AZ3024, 30.3 10-13" p.z. upland sites. Growth begins in the spring and continues through the summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	8	18	18	11	14	20	8	2	0	0

## Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				36–55	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	36–55	–
2				3–18	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	3–18	–
3				3–11	
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	3–11	–
4				3–11	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	3–11	–
5				4–18	
	Grass, perennial	2GP	<i>Grass, perennial</i>	3–18	–
6				18–36	
	Grass, annual	2GA	<i>Grass, annual</i>	18–36	–
<b>Forb</b>					
7				3–7	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	3–7	–
8				3–11	
	Forb, perennial	2FP	<i>Forb, perennial</i>	3–11	–
9				3–18	
	Forb, annual	2FA	<i>Forb, annual</i>	3–18	–
<b>Shrub/Vine</b>					
10				36–55	
	creosote bush	LATR2	<i>Larrea tridentata</i>	36–55	–
11				0–36	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	0–36	–
12				18–36	
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	18–36	–
13				3–18	
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0–18	–
	white ratany	KRGR	<i>Krameria grayi</i>	0–18	–
14				18–36	
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	18–36	–
15				3–18	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	3–18	–
16				0–11	
	banana yucca	YUBA	<i>Yucca baccata</i>	0–11	–
17				3–11	

17	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	3–11	–
18				3–18	
	Mexican bladdersage	SAME	<i>Salazaria mexicana</i>	3–18	–
19				0–36	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	0–36	–
20				3–18	
	water jacket	LYAN	<i>Lycium andersonii</i>	3–18	–
21				0–18	
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum var. polifolium</i>	0–18	–
22				18–36	
	Shrub, other	2S	<i>Shrub, other</i>	0–6	–
	buckhorn cholla	CYACA2	<i>Cylindropuntia acanthocarpa var. acanthocarpa</i>	0–6	–
	kingcup cactus	ECTR	<i>Echinocereus triglochidiatus</i>	0–6	–
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0–6	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	0–6	–
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	0–6	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–6	–
	whitestem paperflower	PSCO2	<i>Psilostrophe cooperi</i>	0–6	–
	woody crinklemat	TICAC	<i>Tiquilia canescens var. canescens</i>	0–6	–
<b>Tree</b>					
23				0–3	
	California juniper	JUCA7	<i>Juniperus californica</i>	0–3	–

## Animal community

Wildlife species found on this ecological site include coyote, lizards, snakes and ants.

## Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T24N R19W S31
General legal description	Grasshopper Junction Quad., approximately 4 miles NW of Grasshopper Junction, AZ.

## 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)	
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:**

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

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

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

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

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

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

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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):**

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

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

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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):**

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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:

Sub-dominant:

Other:

Additional:

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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:**
-