

Ecological site R030XC381AZ

Limestone/Sandstone Cliffs 13-17" 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

R030XC380AZ	Sandy Loam Upland 13-17" p.z. Cobbly Surface
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Table 1. Dominant plant species

Tree	(1) <i>Quercus gambelii</i> (2) <i>Juniperus osteosperma</i>
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Shrub	(1) <i>Artemisia tridentata ssp. wyomingensis</i> (2) <i>Garrya flavescens</i>
Herbaceous	(1) <i>Koeleria macrantha</i>

Physiographic features

This site occurs on footslopes, backslopes and summits of mountains and escarpments.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	1,524–1,981 m
Slope	35–50%

Climatic features

Precipitation in this LRU ranges from 13-17 inches. Winter-summer rainfall ratios range from 70-30% to 60-40%. Snowfall is common throughout the area and ranges from a trace to 10 inches. At the lower elevations, snow seldom persists more than a day. Summer rains fall July-September, originate in the Gulf of Mexico, and are convective thunderstorms. Winter moisture is frontal, originates in the northern Pacific, and falls as rain or snow in widespread storms of low intensity and long duration. May and June are the driest months of the year. Humidity is generally low. Temperatures are warm in the summer and cold in the winter. Freezing temperatures are common October-May. Winter-summer rainfall ratios in this LRU average 65% to 35%.

Table 3. Representative climatic features

Frost-free period (average)	230 days
Freeze-free period (average)	300 days
Precipitation total (average)	432 mm

Influencing water features

Soil features

The soils of this site range from shallow to deep with slopes ranging from 35 to 50 percent. They are very gravelly or cobbly on the surface and throughout the soil profile.

A typical soil profile is:

0 to 2 inches-brown very gravelly loam

2 to 14 inches-dark brown and light gray, calcareous very gravelly loam

14 inches-limestone bedrock

Soils correlated to this ecological site include 623095, Yumtheska, Shivwits Area, Arizona, Part of Mohave County Soil Survey Area.

Table 4. Representative soil features

Surface texture	(1) Extremely cobbly loam (2) Very cobbly
Family particle size	(1) Loamy

Drainage class	Moderately well drained
Permeability class	Moderate
Soil depth	25–152 cm
Surface fragment cover <=3"	40%
Surface fragment cover >3"	5%
Available water capacity (0-101.6cm)	3.56–6.1 cm
Calcium carbonate equivalent (0-101.6cm)	0–10%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	40%
Subsurface fragment volume >3" (Depth not specified)	5%

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.

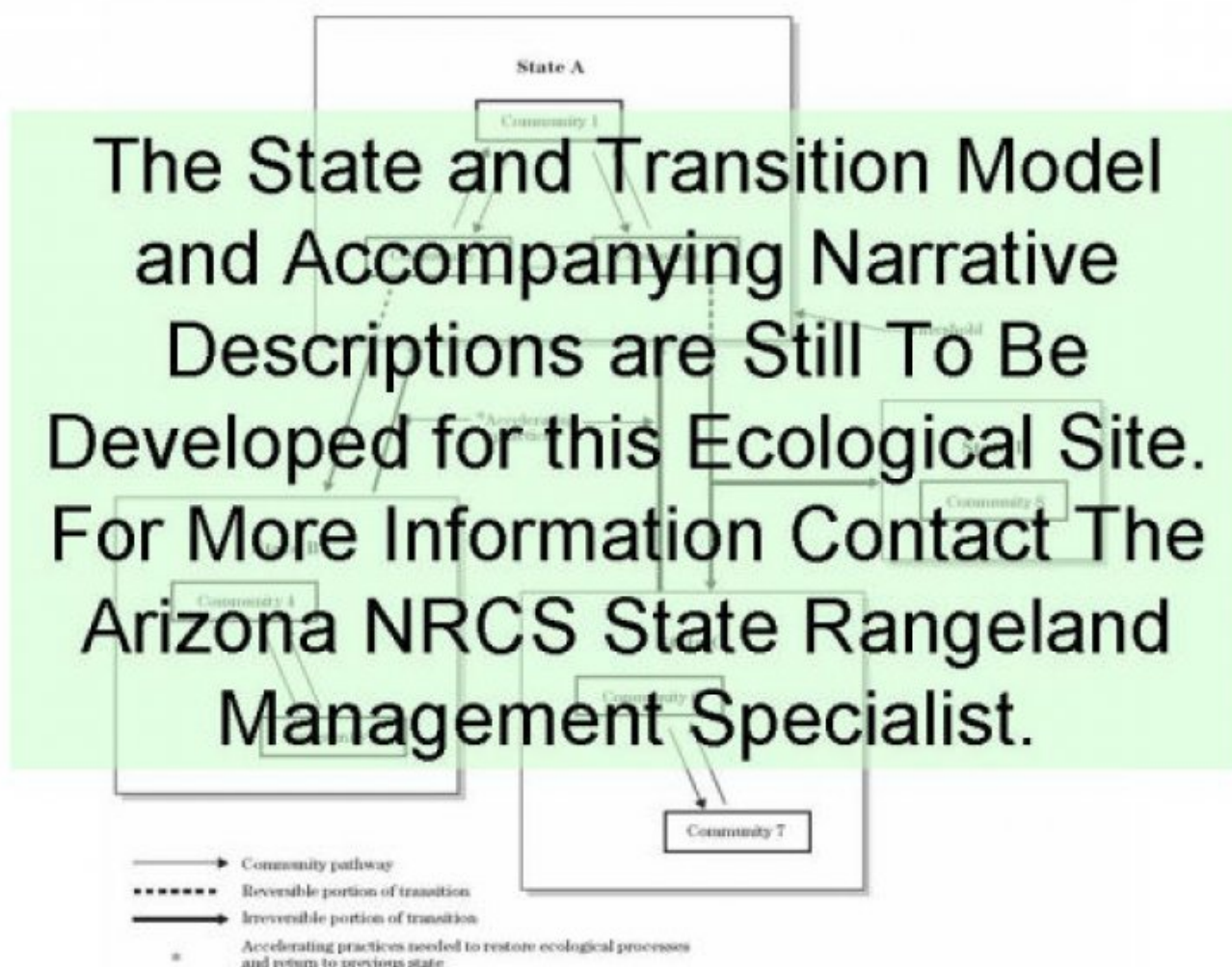
The Plant Community Plant Species Composition table provides a list of species and each species or group of species' annual production in pounds per acre (air-dry weight) expected in a normal rainfall year. Low and high production yields represent the modal range of variability for that species or group 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 site is one of chaparral shrubs and scattered trees with an understory of perennial grasses and forbs. Common trees are gambel oak, Utah juniper and Colorado pinyon. Common shrubs include turbinella oak, yellow silktassel, Utah serviceberry, desert ceanothus and Wyoming big sagebrush. Cool season grasses are more common than warm season grasses. Muttongrass and prairie junegrass are the most common grass species. Spiny phlox and rock goldenrod are the most common forb species. In the absence of fire the plant community trends towards one with a substantial amount of pinyon and juniper trees, especially at higher elevations and cooler aspects. Immediately after burning the plant community will be dominated by annual grasses,

forbs and half shrubs, including red brome and/or cheatgrass and broom snakeweed. Yerba santa will be one of the earliest shrub species to increase. Within 5 to 10 years chaparral shrub species, such as turbinella oak, desert ceanothus and manzanita, will begin to reestablish in substantial amounts. If not disturbed again the plant community will return to the former mix of trees, shrubs, forbs and grasses with trees again a major component in the cooler/wetter niches. If the site burns again before re-establishment of trees, especially if the occurrence of fire is frequent, the trees and less fire tolerant shrubs will be essentially removed from the plant community.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	803	1004	1189
Tree	114	63	238
Grass/Grasslike	57	103	159
Forb	35	63	95
Total	1009	1233	1681

Table 6. Ground cover

Tree foliar cover	2%
Shrub/vine/liana foliar cover	5%
Grass/grasslike foliar cover	1%
Forb foliar cover	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%

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	Common Native Perennial Spring Grasses			67–135	
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	27–54	–
	muttongrass	POFE	<i>Poa fendleriana</i>	27–54	–
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	13–27	–
2	Occasional Native Perennial Spring Grasses			13–27	
	sedge	CAREX	<i>Carex</i>	0–13	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–13	–
3	Occasional Native Perennial Summer Grasses			0–13	
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–13	–
Forb					
4	Occasional Native Perennial Forbs			40–81	

	rockcress	ARABI2	<i>Arabis</i>	0–13	–
	white sagebrush	ARLU	<i>Artemisia ludoviciana</i>	0–13	–
	aster	ASTER	<i>Aster</i>	0–13	–
	mariposa lily	CALOC	<i>Calochortus</i>	0–13	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–13	–
	bastard toadflax	COMAN	<i>Comandra</i>	0–13	–
	cryptantha	CRYPT	<i>Cryptantha</i>	0–13	–
	sulphur-flower buckwheat	ERUM	<i>Eriogonum umbellatum</i>	0–13	–
	Munz's bedstraw	GAMU3	<i>Galium munzii</i>	0–13	–
	hymenaea	HYMEN	<i>Hymenaea</i>	0–13	–
	lupine	LUPIN	<i>Lupinus</i>	0–13	–
	Colorado four o'clock	MIMU	<i>Mirabilis multiflora</i>	0–13	–
	evening primrose	OENOT	<i>Oenothera</i>	0–13	–
	firecracker penstemon	PEEA	<i>Penstemon eatonii</i>	0–13	–
	toadflax penstemon	PELI2	<i>Penstemon linarioides</i>	0–13	–
	beardtongue	PENST	<i>Penstemon</i>	0–13	–
	spiny phlox	PHHO	<i>Phlox hoodii</i>	0–13	–
	goldenrod	SOLID	<i>Solidago</i>	0–13	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	0–13	–
5	Occasional Native Annual Forbs			0–13	
	gilia	GILIA	<i>Gilia</i>	0–13	–
Shrub/Vine					
6	Common Native Shrubs			673–1009	
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>	135–202	–
	desert ceanothus	CEGR	<i>Ceanothus greggii</i>	67–108	–
	ashy silktassel	GAFL2	<i>Garrya flavescens</i>	67–108	–
	Sonoran scrub oak	QUTU2	<i>Quercus turbinella</i>	67–108	–
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	67–108	–
	snowberry	SYMPH	<i>Symphoricarpos</i>	67–108	–
	Utah serviceberry	AMUT	<i>Amelanchier utahensis</i>	67–108	–
	manzanita	ARCTO3	<i>Arctostaphylos</i>	67–108	–
7	Occasional Native Shrubs			108–202	
	alderleaf mountain mahogany	CEMO2	<i>Cercocarpus montanus</i>	27–67	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	27–67	–
	New Mexico locust	RONE	<i>Robinia neomexicana</i>	13–27	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	0–13	–
	Eastern Mojave buckwheat	ERFA2	<i>Eriogonum fasciculatum</i>	0–13	–
	goldenbush	ERICA2	<i>Ericameria</i>	0–13	–
	sulphur-flower buckwheat	ERUM	<i>Eriogonum umbellatum</i>	0–13	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–13	–
	rough menodora	MESC	<i>Menodora scabra</i>	0–13	–
	beardtongue	PENST	<i>Penstemon</i>	0–13	–

8	Occasional Native Cacti			13–40	
	pricklypear	OPUNT	<i>Opuntia</i>	13–40	–
9	Occasional Native Agave-Yucca-Likes			13–40	
	agave	AGAVE	<i>Agave</i>	0–27	–
	banana yucca	YUBA	<i>Yucca baccata</i>	0–27	–
Tree					
10	Occasional Native Trees			135–202	
	velvet ash	FRVE2	<i>Fraxinus velutina</i>	27–40	–
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	27–40	–
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	27–40	–
	singleleaf pinyon	PIMO	<i>Pinus monophylla</i>	27–40	–
	Gambel oak	QUGA	<i>Quercus gambelii</i>	27–40	–

Animal community

Steep slopes and dense woody vegetation found on this site in some areas limit accessibility to livestock.

This site is used extensively by wildlife, especially mule deer. Year-round browse is provided.

Potential wildlife species present include scrub jay, bushtit, long-eared owl, ash-throated flycatcher, rufous-sided towhee, American kestrel, mule deer, coyote woodrat, brush mouse, great basin pocket mouse, cottontail, gray fox, cougar, striped whipsnake, great basin rattlesnake.

Recreational uses

Recreational uses include hunting, wildlife observation and hiking.

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T39 N. R15 W. S24
General legal description	Arizona, Mohave County, Mt. Bangs 7 1/2 min. quad. map, Sec. 24, T. 39 N., R. 15 W.

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:**

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:**
-