

# Ecological site R030XB212AZ

## Limy Slopes 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

R030XA107AZ	<b>Limy Slopes 3-6" p.z.</b>
R030XB211AZ	<b>Limy Fan 6-9" p.z.</b>

**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 desert shrub ecological site is in an upland position of narrow, sloping, inter-locking ridges with steep sides. It does not receive any benefit from run-on moisture, but excessive runoff can occur because of steep slopes. Cooler aspects are more productive with closer plant spacing and growthier shrubs. It is found on all aspects.

**Table 2. Representative physiographic features**

Landforms	(1) Ballena (2) Fan (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	1,600–3,000 ft
Slope	15–50%

## 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 soil of this ecological site is moderately deep to any plant root restricting layer. The soil is strongly to violently effervescent throughout the soil profile. The soil's moisture regime is typical aridic and the temperature regime is thermic. The soil is well drained, non-saline and non-sodic with a pH range of 8.0-8.6. The soil's water erosion hazard is moderate and wind erosion hazard is slight. The plant-soil moisture relationship is limited due to shallow soils, gravel and lime content.

A typical soil profile is:

A-0 to 2 inches; extremely gravelly sandy loam; 65 percent gravel; strongly effervescent

Bw1-2 to 8 inches; gravelly sandy clay loam; 30 percent gravel; strongly effervescent

Bw2-8 to 17 inches; extremely gravelly sandy clay loam; 75 percent gravel; strongly effervescent

Bk-17 to 27 inches; extremely gravelly sandy clay loam; 80 percent gravel; strongly effervescent

Cr-27 inches; weathered fanglomerate dominated by granite, schist and gneiss clasts

The taxonomic classification is Loamy-skeletal, mixed, superactive, thermic Typic Haplocambids

Soils correlated to this ecological site include map units 701012 and 102013, Bobzbulz soil, 701087, Meadview soil, and 701086 and 701087, Orrubo soil in the Grand Canyon Area, AZ, Parts of Coconino and Mohave Counties.

**Table 4. Representative soil features**

Surface texture	(1) Very gravelly sandy loam (2) Extremely gravelly loam (3) Clay
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	13–24 in
Surface fragment cover <=3"	35–45%
Surface fragment cover >3"	5–20%
Available water capacity (0-40in)	1–3 in
Calcium carbonate equivalent (0-40in)	15–35%
Electrical conductivity (0-40in)	0–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	40–70%
Subsurface fragment volume >3" (Depth not specified)	10–25%

## 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.

In the absence of fire, this is a stable plant community, although the annual component will vary greatly with precipitation. The shrub component does not change much with extended periods of drought. Historic fire frequency is rare, but does occur, resulting in an earlier seral stage of predominantly annual and perennial forbs. Perennial grasses at higher elevations will increase if fire reduces the shrub competition. Introduction and invasion has resulted in replacement of some of the native annual component with red brome and filaree - the presence of red brome in particular has increased the chance of fire. A regular fire cycle on this site will create an annual plant community dominated by red brome. This vegetative state is also quite stable and needs a prolonged absence of fire to slowly shift back toward perennials.

## **State and transition model**

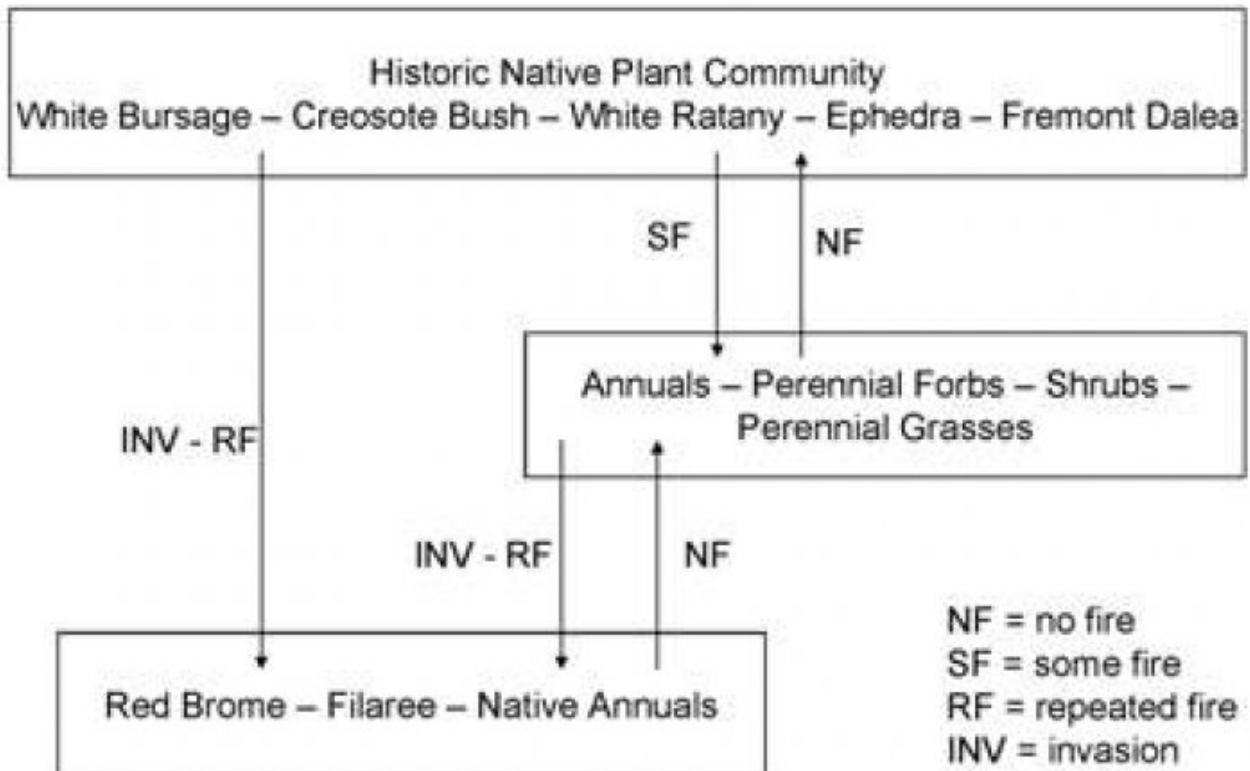


Figure 4. Simple State and Transition Model

**State 1  
 Historic Climax Plant Community**

**Community 1.1  
 Historic Climax Plant Community**

The plant community of this state of the ecological site is a mixed desert shrub site with white bursage and creosote bush as the dominant species. There is a lesser, but significant amount, of white ratany. Fremont dalea and ephedra. Very little perennial grasses occur; perennial forbs desert globemallow and desert trumpet are usually present. During years of average or below precipitation, the herbage production is mainly from shrubs, while the annual grass and forb content is relatively small. In unusually wet years, the annual and perennial forb production may equal that of the shrubs. Some species of annuals are only seen in wet years. Typical perennial plant spacing is 2.0-2.75 feet. In the absence of fire, this is a stable plant community, although the annual component will vary greatly with precipitation. The shrub component does not change much with extended periods of drought. Historic fire frequency is rare, but does occur, resulting in an earlier seral stage of predominantly annual and perennial forbs. Perennial grasses at higher elevations will increase if fire reduces the shrub competition. Introduction and invasion has resulted in replacement of some of the native annual component with red brome and filaree - the presence of red brome in particular has increased the chance of fire. A regular fire cycle on this site will create an annual plant community dominated by red brome. This vegetative state is also quite stable and needs a prolonged absence of fire to slowly shift back toward perennials.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	92	160	300
Forb	7	25	67
Grass/Grasslike	1	15	33
<b>Total</b>	<b>100</b>	<b>200</b>	<b>400</b>

Figure 6. 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

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				2-10	
	threeawn	ARIST	<i>Aristida</i>	2-8	-
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	2-8	-
2				0-4	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-2	-
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0-2	-
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0-2	-
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	0-2	-
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0-2	-
	tridens	TRIDE	<i>Tridens</i>	0-2	-
3				0-10	
	Grass, annual	2GA	<i>Grass, annual</i>	0-10	-
<b>Forb</b>					
4				2-10	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	2-10	-
5				2-10	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	2-10	-
6				0-2	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-1	-
	trailing windmills	ALIN	<i>Allionia incarnata</i>	0-1	-
	desert marigold	BAMU	<i>Baileya multiradiata</i>	0-1	-
	sego lily	CANU3	<i>Calochortus nuttallii</i>	0-1	-
	brownplume wirelettuce	STPA4	<i>Stephanomeria pauciflora</i>	0-1	-
7				2-20	
	Forb, annual	2FA	<i>Forb, annual</i>	0-4	-
	mustard	BRASS2	<i>Brassica</i>	0-4	-
	cryptantha	CRYPT	<i>Cryptantha</i>	0-4	-
	dyssodia	DYSSO	<i>Dyssodia</i>	0-4	-

	buckwheat	ERIOG	<i>Eriogonum</i>	0-4	-
	beardtongue	PENST	<i>Penstemon</i>	0-4	-
	phacelia	PHACE	<i>Phacelia</i>	0-4	-
	ives' phacelia	PHIVP	<i>Phacelia ivesiana</i> var. <i>pediculoides</i>	0-4	-
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0-4	-
	primrose	PRIMU	<i>Primula</i>	0-4	-
	woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0-4	-
<b>Shrub/Vine</b>					
8				50-80	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	50-80	-
9				30-60	
	creosote bush	LATR2	<i>Larrea tridentata</i>	30-60	-
10				20-40	
	Torrey's jointfir	EPTO	<i>Ephedra torreyana</i>	10-20	-
	white ratany	KRGR	<i>Krameria grayi</i>	10-20	-
	Fremont's dalea	PSFR	<i>Psoralea fremontii</i>	10-20	-
11				2-10	
	staghorn cholla	CYVE3	<i>Cylindropuntia versicolor</i>	2-5	-
	echinocactus	ECHIN2	<i>Echinocactus</i>	2-5	-
	hedgehog cactus	ECHIN3	<i>Echinocereus</i>	2-5	-
	beavertail pricklypear	OPBA2	<i>Opuntia basilaris</i>	2-5	-
12				0-4	
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	0-4	-
	Mojave yucca	YUSC2	<i>Yucca schidigera</i>	0-4	-
13				2-6	
	Shrub, other	2S	<i>Shrub, other</i>	0-3	-
	catclaw acacia	ACGR	<i>Acacia greggii</i>	0-3	-
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0-3	-
	beehive cactus	CORYP	<i>Coryphantha</i>	0-3	-
	brittlebush	ENFA	<i>Encelia farinosa</i>	0-3	-
	button brittlebush	ENFR	<i>Encelia frutescens</i>	0-3	-
	mormon tea	EPVI	<i>Ephedra viridis</i>	0-3	-
	ocotillo	FOSP2	<i>Fouquieria splendens</i>	0-3	-
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0-3	-
	burrobush	HYSA	<i>Hymenoclea salsola</i>	0-3	-
	littleleaf ratany	KRER	<i>Krameria erecta</i>	0-3	-
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0-3	-
	woody crinklemat	TICA3	<i>Tiquilia canescens</i>	0-3	-

## Animal community

Spring use on this ecological site by livestock and feral burros should be managed to leave sufficient herbage for the desert tortoise.

Potential wildlife species present on this ecological site include red-tailed hawk, common raven, common kingsnake,

speckled rattlesnake, chuckwalla, coyote, feral burro, round-tailed ground squirrel, golden eagle, black-throated sparrow, gopher snake, western whiptail, Mexican free-tailed bat, desert cottontail, kit fox, desert tortoise, turkey vulture, roadrunner, Mohave rattlesnake, cactus mouse, zebra-tailed lizard, desert woodrat and Merriam's kangaroo rat. Many other species are present as well, and migratory birds are common at times.

## Recreational uses

Hiking, hunting, wildlife observation and photography.

## Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T32N R15W S6
General legal description	Lake Mead REcreational area approximately 1/2 mile east of God's Pocket Wash, Snap Canyon WEst 7.5 Quad.

## Contributors

Art Meen  
Larry D. Ellicott

## 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):**

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

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

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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:**

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