

Ecological site R030XB203AZ Basalt 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.

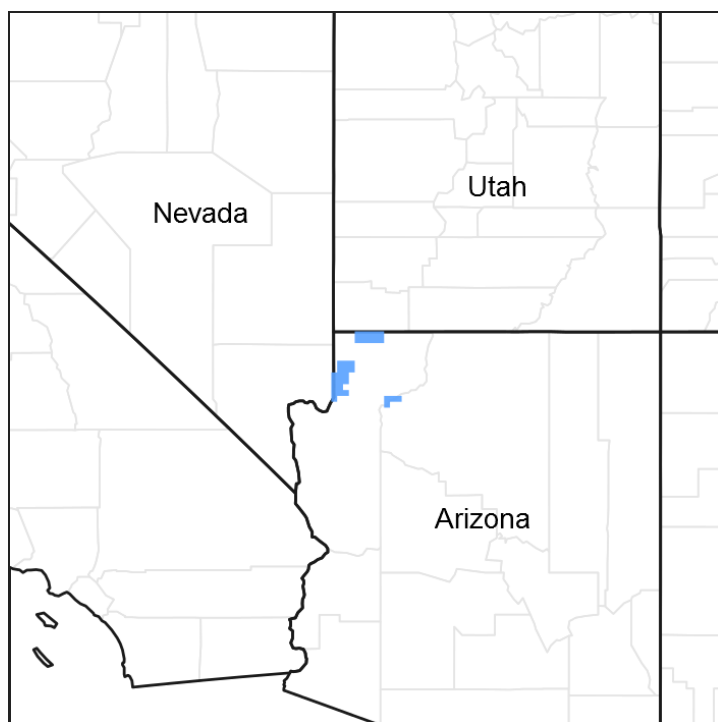


Figure 1. Mapped extent

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

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 found on steeply sloping uplands (slopes 15%-65%). Soils are armored with basalt fragments (gravel, stone, cobbles).

Associated sites

R030XB210AZ	Limestone Hills 6-9" p.z.
R030XB214AZ	Limy Upland 6-9" p.z.
R030XB218AZ	Sandy Wash 6-9" p.z.
R030XB222AZ	Gypsum Hills 6-9" p.z. Alkaline

Similar sites

R030XB202AZ	Basalt Hills 6-9" p.z.
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Table 1. Dominant plant species

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

Physiographic features

This ecological site occurs on escarpments below basalt flows. It is often in association with basalt talus slopes and exposed mudstone. Soil depth ranges from shallow to very deep. Slopes range from 10 to 40 percent.

Table 2. Representative physiographic features

Landforms	(1) Escarpment
Flooding frequency	None
Ponding frequency	None
Elevation	1,600–4,500 ft
Slope	10–40%
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 soil of this ecological site is shallow to very deep. The surface texture ranges from very cobbly fine sandy loam to loam. Subsoil textures range from very cobbly loam to loamy sand. Basalt gravels, stone and cobbles cover much of the soil surface.

Soil map units correlated to this ecological site include 623056, Nikey family and Ruesh family, Shivwits Area, Arizona, Part of Mohave County SSA.

Table 4. Representative soil features

Surface texture	(1) Very cobbly fine sandy loam (2) Sandy loam (3) Loam
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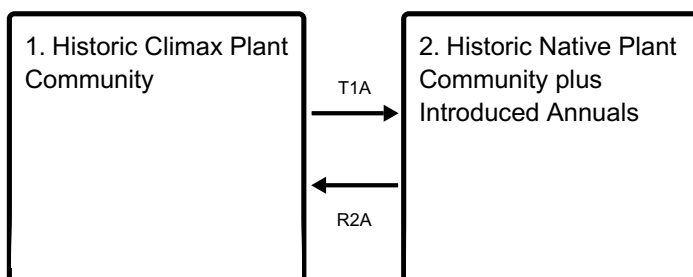
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to moderately rapid
Soil depth	20–60 in
Surface fragment cover ≤ 3 "	10–25%
Surface fragment cover > 3 "	5–30%
Calcium carbonate equivalent (0-40in)	10–40%
Electrical conductivity (0-40in)	2–4 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume ≤ 3 " (Depth not specified)	5–25%
Subsurface fragment volume > 3 " (Depth not specified)	0–10%

Ecological dynamics

Basalt Slopes, 6"-9" p.z., is a dispersed desert shrub dominated ecological site. Perennial grasses and forbs are present in natural depressions. 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

1.1. Historic Climax
Plant Community

State 2 submodel, plant communities

2.1. Non-native
Annuals

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The dominant aspect of this site is a perennial grass - desert shrubland mix. The major grasses are bush muhly and big galleta. The major shrubs are white bursage and creosotebush. Grass and grasslike plants make up 20 to 35 percent of the plant community, forbs 5 to 10 percent, shrubs 55 to 75 percent and trees 0 to 1 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	69	163	217
Grass/Grasslike	25	69	102
Forb	6	17	29
Tree	0	1	2
Total	100	250	350

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	1-3%
Grass/grasslike foliar cover	0-2%
Forb foliar cover	0-1%

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	—	—	1-3%	—
>1 <= 2	—	—	—	—
>2 <= 4.5	—	6-10%	—	—
>4.5 <= 13	—	—	—	—
>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). AZ3070, 30.23 6-9" p.z. big galleta. Growth begins in the spring, most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	15	5	0	10	45	15	0	0	0

Figure 7. Plant community growth curve (percent production by month). AZ3074, 30.23, 6-9 p.z., Nevada Mormon Tea. Growth primarily in spring and early summer months..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	15	25	20	15	15	10	0	0	0	0

Figure 8. Plant community growth curve (percent production by month). AZ3075, 30.23 6-9" p.z. white ratany. Most growth occurs in the spring, some growth occurs in the summer. Flowers in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	20	35	5	10	15	10	0	0	0

Figure 9. Plant community growth curve (percent production by month). AZ3077, 30.23 6-9" p.z. bush muhly. Growth begins in the spring, most growth occurs during the summer rainy season, green most of the year..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	5	5	5	15	40	20	5	0	0

State 2

Historic Native Plant Community plus Introduced Annuals

Community 2.1

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				25–38	
	big galleta	PLRI3	<i>Pleuraphis rigida</i>	25–38	–
2				12–18	
	bush muhly	MUPO2	<i>Muhlenbergia porteri</i>	12–18	–
3				2–8	
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	2–8	–
	mesa dropseed	SPFL2	<i>Sporobolus flexuosus</i>	0–8	–
4				2–8	
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	2–8	–
5				2–5	
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	2–5	–
6				0–12	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–12	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–12	–
	threeawn	ARIST	<i>Aristida</i>	0–12	–
	slim tridens	TRMU	<i>Tridens muticus</i>	0–12	–
7				0–12	
	Grass, annual	2GA	<i>Grass, annual</i>	0–12	–
	sixweeks grama	BOBA2	<i>Bouteloua barbata</i>	0–12	–
Forb					
8				2–8	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	2–8	–
9				2–5	
	desert globemallow	SPAM2	<i>Sphaeralcea ambigua</i>	2–5	–
10				2–8	
	trailing windmills	ALIN	<i>Allionia incarnata</i>	2–8	–
11				2–8	
	Forb, perennial	2FP	<i>Forb, perennial</i>	2–8	–
12				2–8	
	Forb, annual	2FA	<i>Forb, annual</i>	0–8	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0–8	–
	spurge	EUPHO	<i>Euphorbia</i>	0–8	–
	woolly tidestromia	TILA2	<i>Tidestromia lanuginosa</i>	0–8	–
Shrub/Vine					

Shrub/Vine

13				38–75	
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	38–75	–
14				25–38	
	creosote bush	LATR2	<i>Larrea tridentata</i>	25–38	–
15				8–22	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	8–22	–
16				2–12	
	white ratany	KRGR	<i>Krameria grayi</i>	2–12	–
17				0–12	
	water jacket	LYAN	<i>Lycium andersonii</i>	0–12	–
18				0–12	
	Fremont's dalea	PSFR	<i>Psoralea fremontii</i>	0–12	–
19				0–10	
	rayless goldenhead	ACSP	<i>Acamptopappus sphaerocephalus</i>	0–10	–
20				25–50	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0–25	–
	Wright's beebrush	ALWR	<i>Aloysia wrightii</i>	0–25	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	0–25	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	0–25	–
	Eastern Mojave buckwheat	ERFAP	<i>Eriogonum fasciculatum</i> var. <i>polifolium</i>	0–25	–
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	0–25	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–25	–
	pricklypear	OPUNT	<i>Opuntia</i>	0–25	–
	Mexican bladdersage	SAME	<i>Salazaria mexicana</i>	0–25	–
	American threefold	TRCA8	<i>Trixis californica</i>	0–25	–
Tree					
21				0–2	
	Joshua tree	YUBR	<i>Yucca brevifolia</i>	0–2	–

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	07/20/2025
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:**
