

Ecological site R035XC341AZ
Gypsum Hills 10-14" p.z. Calcareous

Accessed: 05/11/2025

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.

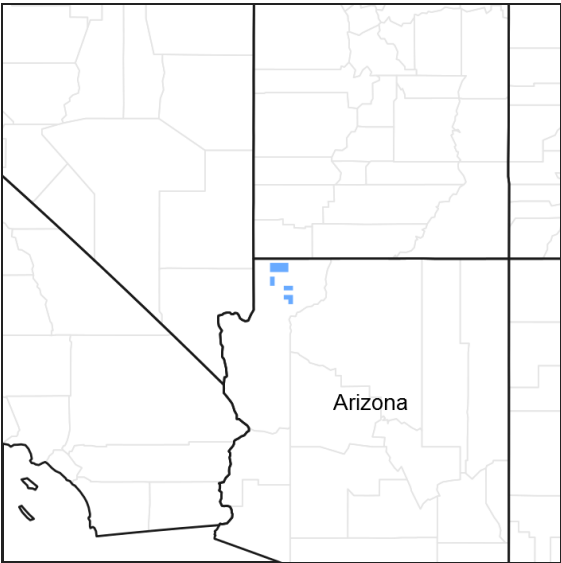


Figure 1. Mapped extent

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): 035X–Colorado Plateau

AZ CRA 35.3 – Colorado Plateau Sagebrush – Grasslands

Elevations range from 4500 to 6000 feet and precipitation averages 10 to 14 inches. Vegetation includes Wyoming big sagebrush, Utah juniper, Colorado pinyon - cliffrose, Mormon tea, fourwing saltbush, blackbrush Indian ricegrass, needle and thread, western wheatgrass Galleta, black grama, blue grama, and sand dropseed. The soil temperature regime is mesic and the soil moisture regime is ustic aridic. This unit occurs within the Colorado Plateau Physiographic Province and is characterized by a sequence of flat to gently dipping sedimentary rocks eroded into plateaus, valleys and deep canyons. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

Associated sites

R035XC308AZ	Limestone/Sandstone Hills 10-14" p.z.
R035XC342AZ	Gypsum Hills 10-14" p.z.

Table 1. Dominant plant species

Tree	(1) <i>Juniperus osteosperma</i> (2) <i>Pinus edulis</i>
Shrub	(1) <i>Coleogyne ramosissima</i> (2) <i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>
Herbaceous	(1) <i>Sporobolus nealleyi</i> (2) <i>Elymus elymoides</i> ssp. <i>elymoides</i>

Physiographic features

This desert shrub-blackbrush site occurs in an upland position. It does not benefit from runoff moisture, but excessive runoff can occur because of steep slopes. Landform and position are summits and backslopes of hills, plateaus, mesas and escarpments.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Plateau (3) Mesa
Flooding frequency	None
Ponding frequency	None
Elevation	4,200–6,000 ft
Slope	15–75%
Aspect	N, E

Climatic features

Winter summer moisture ratios range from 70:30 to 60:40. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall from June through September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture from October through May tends to be frontal; it originates in the Pacific and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow from December through February. Accumulations above 12 inches are not common but can occur. Snow usually lasts for 3-4 days, but can persist much longer. Summer daytime temperatures are commonly 95 - 100 F and on occasion exceed 105 F. Winter air temperatures can regularly go below 10 F and have been recorded below - 20 F.

Table 3. Representative climatic features

Frost-free period (average)	168 days
Freeze-free period (average)	193 days
Precipitation total (average)	14 in

Influencing water features

Soil features

Moisture regime is ustic aridic; temperature regime is mesic. Subsoil textures are crystalline gypsum, gypsite. Geologic parent material is old tectonics that have shaped landform and exposed gypsum, parent material is formed in local alluvium derived from gypsum, influence of colluvial surface layer on soil properties is pronounced. pH range is 7.8-8.0.

Plant-soil moisture relationship is hindered by shallow depths and the gypsum content that make plant-available

water capacity very low.

Major soils are in:

SSA-623 Shivwits Area MU's 50 & 75 Tanbark.

Table 4. Representative soil features

Parent material	(1) Alluvium–rock gypsum
Surface texture	(1) Cobbly loam (2) Very cobbly sandy loam
Drainage class	Well drained
Permeability class	Moderate
Soil depth	2–14 in
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	30–40%
Available water capacity (0–40in)	0.1–0.8 in
Calcium carbonate equivalent (0–40in)	1–5%
Electrical conductivity (0–40in)	2–4 mmhos/cm
Sodium adsorption ratio (0–40in)	0–5
Soil reaction (1:1 water) (0–40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–5%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

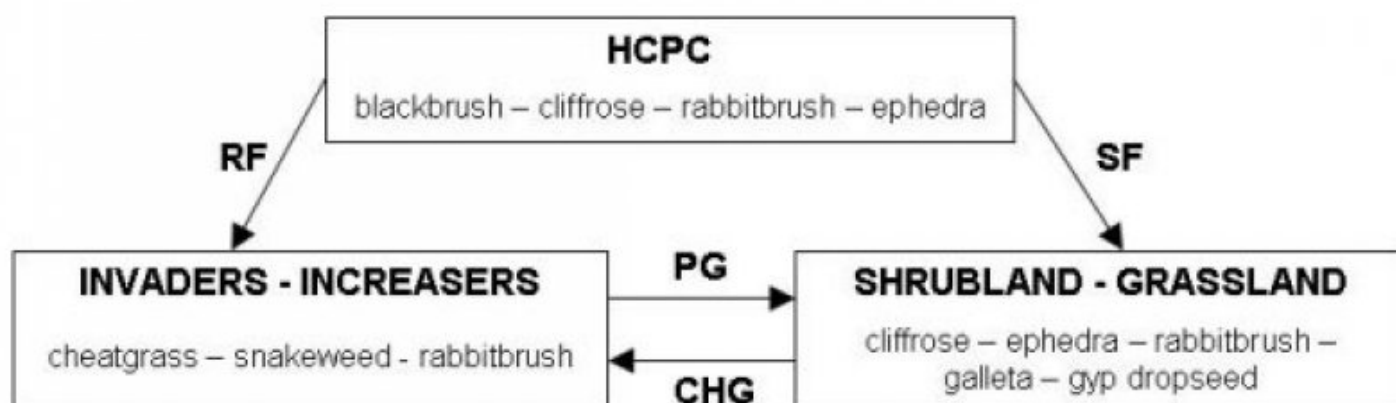
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The Historical Climax Plant Community represents the natural potential plant communities found on relict or relatively undisturbed sites. Other plant communities described here represent plant communities that are known to occur when the site is disturbed by factors such as fire, grazing, or drought.

Production data provided in this site description is standardized to air dry weight at the end of the summer growing season. The plant communities described in this site description are based on near normal rainfall years.

NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine Similarity index, compare the production (air dry weight) 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 amount shown for each group. Divide the resulting total by the total normal year production shown in the plant community description. If the rainfall has been significantly above or below normal, use the total production shown for above or below normal years. If field data is not collected at the end of the summer growing season, then the field data must be corrected to the end of the year production before comparing it to the site description. The growth curve can be used as a guide for estimating production at the end of the summer growing season.

State and transition model

Gypsum Hills, calcareous 10-14" pz = 035XC341AZ



SF = some fire

RF = repeated fire

PG = prescribed grazing

CHG = continuous heavy grazing

Figure 4. Gypsum Hills, calcareous 10-14" pz = 035XC341AZ

State 1

Historic Climax Plant Community

Community 1.1

Historic Climax Plant Community

This site is primarily desert shrubs (blackbrush, cliffrose, ephedra and rabbitbrush). Scattered pockets of perennial grasses (gyp dropseed, galleta, bottlebrush squirreltail, Indian ricegrass) are present, as are perennial forbs such as globemallow and desert trumpet. Annuals can be a significant component if winter-spring moisture is favorable. Typical perennial plant spacing is 1.5-2.0 feet. Because of the scattered canopy cover and sparse understory, this site does not have a history of regular fire disturbance. Blackbrush plant communities are often quite old and tend to be stable. If it is severely disturbed, this site will revert to an early seral stage of mostly annuals, including an increase of cheatgrass brome, broom snakeweed and rabbitbrush. A more advanced plant community will contain scattered desert shrubs and a small increase in perennial grasses, with little regeneration of blackbrush. It is speculated that blackbrush communities evolved under a different climatic regime, and once removed will not readily return to the site.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	195	270	350
Forb	24	35	45
Grass/Grasslike	25	35	45
Tree	6	9	12
Total	250	349	452

Table 6. Ground cover

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	5-20%

Grass/grasslike foliar cover	0-1%
Forb foliar cover	0-1%
Non-vascular plants	0%
Biological crusts	0-10%
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	—	—	—	—
>0.5 <= 1	—	—	0-1%	0-1%
>1 <= 2	—	—	—	—
>2 <= 4.5	—	5-20%	—	—
>4.5 <= 13	0-1%	—	—	—
>13 <= 40	—	—	—	—
>40 <= 80	—	—	—	—
>80 <= 120	—	—	—	—
>120	—	—	—	—

Figure 6. Plant community growth curve (percent production by month).
AZ3503, 35.3 10-14" p.z. galleta. Growth begins in spring, most growth occurs during summer and early fall rainy season. Plants will green up again in the fall..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	5	20	15	20	30	10	0	0

Figure 7. Plant community growth curve (percent production by month).
AZ3504, 35.3 10-14" p.z. bottlebrush squirreltail. Growth occurs in late winter, spring, and fall. Plants often remain green through the winter..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	15	35	25	10	0	0	5	5	0	0

Figure 8. Plant community growth curve (percent production by month).
AZ3505, 35.3 10-14" p.z. Indian ricegrass. Growth begins in spring, with semi-dormancy occurring during July through August. Plants will green up again in the fall..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	10	20	25	20	5	5	10	5	0	0

Figure 9. Plant community growth curve (percent production by month).
AZ3531, 35.3 10-14" p.z. all 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	3	17	18	10	19	20	10	1	1	0

Figure 10. Plant community growth curve (percent production by month).
AZ3533, Nevada mormon tea. Grows mainly in spring and early summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	25	25	20	15	10	0	0	0	0

Figure 11. Plant community growth curve (percent production by month).
AZ3535, 35.3 10-14" p.z. gyp dropseed. Growth occurs mostly during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	5	5	30	50	10	0	0	0

Figure 12. Plant community growth curve (percent production by month).
AZ3563, 35.3 10-14" p.z. fourwing saltbush. Growth occurs in late spring through summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	25	35	25	5	0	0	0

Figure 13. Plant community growth curve (percent production by month).
AZ5105, Blackbrush. Cool season grower, shuts down quickly when it gets hot..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	5	20	50	20	5	0	0	0	0	0	0

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Tree					
0				0–18	
	Utah juniper	JUOS	<i>Juniperus osteosperma</i>	0–18	–
	twoneedle pinyon	PIED	<i>Pinus edulis</i>	0–18	–
Shrub/Vine					
0				35–70	
	blackbrush	CORA	<i>Coleogyne ramosissima</i>	35–70	–
5				5–10	
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	18–53	–
	mormon tea	EPVI	<i>Ephedra viridis</i>	18–53	–
	Fredonia buckwheat	ERMO9	<i>Eriogonum mortonianum</i>	18–53	–
	rubber rabbitbrush	ERNAG	<i>Ericameria nauseosa</i> ssp. <i>nauseosa</i> var. <i>glabrata</i>	18–53	–
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	18–30	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	18–30	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	17–28	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	6–15	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	5–10	–
6				4–11	
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	4–11	–
	banana yucca	YUBA	<i>Yucca baccata</i>	4–11	–

7				4–11	
	Bigelow sage	ARBI3	<i>Artemisia bigelovii</i>	53–88	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	53–88	–
	Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	18–53	–
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	4–11	–
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	4–11	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	4–11	–
	water jacket	LYAN	<i>Lycium andersonii</i>	4–11	–
Grass/Grasslike					
0				4–18	
	gyp dropseed	SPNE	<i>Sporobolus nealleyi</i>	4–18	–
1				7–18	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	7–18	–
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	7–18	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	0–7	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–7	–
2				4–18	
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	4–18	–
3				0–4	
	Grass, annual	2GA	<i>Grass, annual</i>	0–18	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–4	–
	low woollygrass	DAPU7	<i>Dasyochloa pulchella</i>	0–4	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–4	–
	burrograss	SCBR2	<i>Scleropogon brevifolius</i>	0–4	–
Forb					
0				7–25	
	desert trumpet	ERIN4	<i>Eriogonum inflatum</i>	7–25	–
	globemallow	SPHAE	<i>Sphaeralcea</i>	7–25	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	0–7	–
	needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	0–7	–
4				4–18	
	Forb, annual	2FA	<i>Forb, annual</i>	7–25	–
	lettuce	LACTU	<i>Lactuca</i>	7–25	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	4–18	–
	aster	ASTER	<i>Aster</i>	4–18	–
	pepperweed	LEPID	<i>Lepidium</i>	4–18	–
	desert princesplume	STPI	<i>Stanleya pinnata</i>	4–18	–
	lettuce	LACTU	<i>Lactuca</i>	2–10	–

Animal community

Steep slopes, lack of water and low production of palatable forage limit livestock use of this site. Winter use can be greater due to the more palatable shrub component. This site is rarely found as an extensive area of land - more commonly, small areas are intermixed with other economical uses.

This is mostly winter range for mule deer, and not extensively used. Prescribed burning can improve shrub variety and quantity, but it is difficult to accomplish. Management should be concentrated on prescribed burning and limiting off-road vehicular use.

Potential species present on this site are great horned owl, black-throated sparrow, gopher snake, leopard lizard, coyote, white-throated antelope squirrel, red-tailed hawk, common raven, western rattlesnake, fringed myotis, mule deer, golden eagle, rock wren, collared lizard, deer mouse, badger, and blacktailed rabbit.

Recreational uses

Hiking, hunting, photography and wildlife observations are recreational activities for this site.

Other information

Aspect differences near MLRA boundaries: Near the lower elevation limit, this site may more closely resemble the thermic site D30-2 Gypsum Hills 9-12" pz on hotter south and west faces. Production will decrease and the blackbrush component may increase. At the upper elevation ent the trees, big sagebrush, cliffrose and ephedra components will likely increase while blackbrush decreases.

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T40N R12W S14
General legal description	Wolf Hole Mountain East 7.5 quad.

Other references

Sampling Technique EC GC FC PC

NRCS Range 417 1

NRCS AZ Range-1 2 2

NRCS Dry-Weight Rank 2 1

Contributors

Larry D. Ellicott

Steve Barker

UNKNOWN

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	

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:**
-