USDA Natural Resources Conservation Service

Ecological site R035XC338AZ
Loamy Upland 10-14" p.z. Limy

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 4800 to 6700 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

R035XC331AZ	**Shallow Upland 10-14" p.z. Warm** Shallow Upland, Calcareous, 10-14" p.z.
R035XC333AZ	**Sandstone Upland 10-14" p.z. Warm** Sandstone Upland, Calcareous, 10-14" p.z.

R035XC343AZ	**Limestone/Sandstone Cliffs 10-14" p.z.** Breaks, Calcareous, 10-14 p.z.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Coleogyne ramosissima*
Herbaceous	(1) *Achnatherum speciosum*

Physiographic features

This site occurs on summits and backslopes of plateaus and mesas.

Table 2. Representative physiographic features

Landforms	(1) Plateau (2) Mesa
Flooding frequency	None
Ponding frequency	None
Elevation	4,800–6,700 ft
Slope	4–15%
Ponding depth	0 in
Aspect	Aspect is not a significant factor

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

The soil characteristic of this site are very deep and formed in alluvium and colluvium from sedimentary formations.

Typical taxonomic units occuring on this site include:

SSA 623 Shivwits Area MU's 47 & 52 Strych;
SSA 701 Grand Canyon Area MU 150 Ustic Haplocalcids & Ustic Petrocalcids.

Table 4. Representative soil features

Surface texture	(1) Very gravelly loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	60 in
Surface fragment cover <=3"	40%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	3.2–4.6 in
Calcium carbonate equivalent (0-40in)	1–10%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.9–8.4
Subsurface fragment volume <=3" (Depth not specified)	40%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

If left undisturbed blackbrush dominates this ecological site. Although the vast majority of growth appears to occur in the spring, blackbrush appears to be able to utilize both cool and warm season precipitation, thereby preventing establishment of other plants, including cool and warm season grasses and forbs. Upon disturbance of any kind which removes it, the blackbrush is very slow to reestablish. Therefore, the plant community appears to have been left undisturbed for a very long time; hundreds, possibly thousands, of years. Fire is a major disturbance which removes blackbrush from this site. Upon removal of the blackbrush, annual grasses and forbs become prevelent, and perennial grasses and forbs increase in abundance. Snakeweed increases significantly, and big sagebrush may establish a minor component of the plant community.

The State and Transition model shows the most common occurring plant communities likely to be encountered on this ecological site. This model may not show every possible plant community, but only those that are most prevalent and observed through field inventory. As more data is collected and research is available, these plant communities may be revised, removed, and even added to reflect the ecological dynamics of this site.

State and transition model

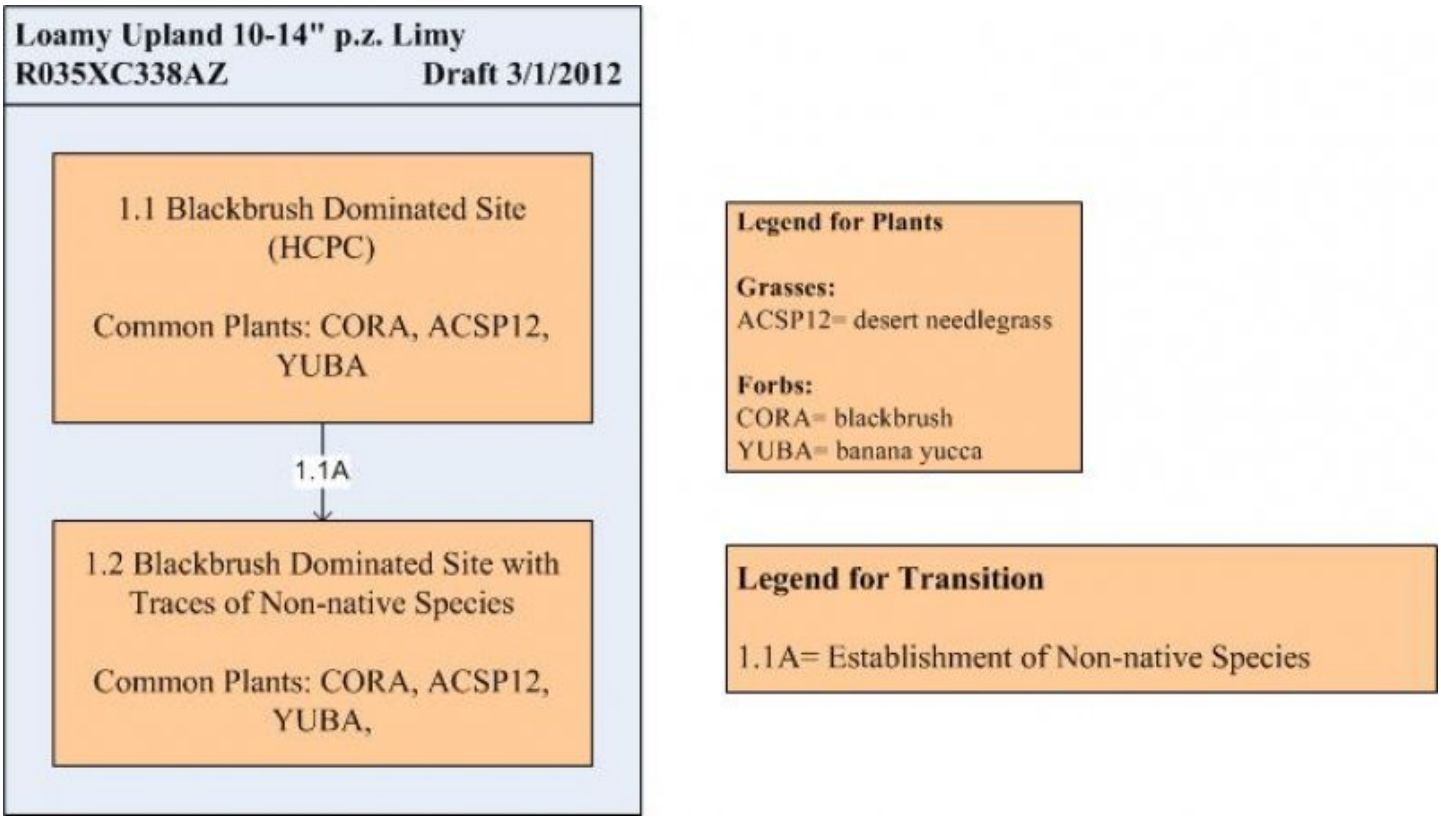

Figure 4. R035XC338AZ

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

Blackbrush dominates this site. A few perennial grasses, such as desert needlegrass, and various perennial forbs are found in the understory, but their total is less than 10 percent, by weight, of the plant community.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	540	–	570
Grass/Grasslike	18	–	36
Forb	0	–	12
Tree	0	–	12
Total	**558**	**–**	**630**

Table 6. Ground cover

Tree foliar cover	0-1%
Shrub/vine/liana foliar cover	3-7%
Grass/grasslike foliar cover	0-1%
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	–	–	–	–
>0.5 <= 1	–	–	0-1%	0-1%
>1 <= 2	–	–	–	–
>2 <= 4.5	–	30-50%	–	–
>4.5 <= 13	0-2%	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Figure 6. 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

Community 1.2
Blackbrush Dominated Site with Traces of Non-native Species

This site has the plant community seen in the HCPC, however, traces of non-native species have established. This does not change the function of the state, and small amounts will always remain.

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	**Common Native Perennial Spring Grasses**			15–35	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	15–35	–
2	**Occasional Native Annual Grasses**			0–7	
	Grass, annual	2GA	*Grass, annual*	0–7	–
Forb					
3	**Occasional Native Perennial Forbs**			0–7	
	Forb, perennial	2FP	*Forb, perennial*	0–7	–
4	**Occasional Native Annual Forbs**			0–7	
	Forb, perennial	2FP	*Forb, perennial*	0–7	–
5	**Dominant Native Shrubs**			425–630	
	blackbrush	CORA	*Coleogyne ramosissima*	425–630	–
Shrub/Vine					
6	**Occasional Native Shrubs**			15–35	
	Apache plume	FAPA	*Fallugia paradoxa*	5–14	–
	Mexican cliffrose	PUME	*Purshia mexicana*	5–14	–
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	0–7	–
	Wright's beebrush	ALWR	*Aloysia wrightii*	5–7	–
	rubber rabbitbrush	ERNAN5	*Ericameria nauseosa ssp. nauseosa var. nauseosa*	5–7	–
7	**Occasional Native Cacti**			5–14	
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	0–7	–
	dollarjoint pricklypear	OPCH	*Opuntia chlorotica*	0–7	–
8	**Occasional Native Agave-Yucca-Likes**			15–42	
	banana yucca	YUBA	*Yucca baccata*	15–35	–
	agave	AGAVE	*Agave*	0–7	–
Tree					
9	**Occasional Native Trees**			0–14	
	Utah juniper	JUOS	*Juniperus osteosperma*	0–7	–
	twoneedle pinyon	PIED	*Pinus edulis*	0–7	–

Animal community

Low production of preferred livestock forage species limits the value of this site for livestock grazing. Complex slopes also limit access to the site in some areas.

The site offers winter range habitat for mule deer, but it is limited by the lack of dependable water sources.

Recreational uses

This site occurs in the transition area between the Colorado Plateau and the Mohave Desert, an area of picturesque plateaus, mesas, cliffs, and canyons. The black color of the site provides a contrast to the varied colors of the sedimentary formations with which it is associated. It is also an area of vastness and lonesome beauty.

Wood products

No wood products are produced from this site.

Other products

Wilderness and mining.

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T32 N. R14 W. S12
General legal description	Arizona, Mohave Co., Snap Draw 7 1/2 min. quad., SE 1/4, SW 1/4, Sec. 12, T. 32 N., R. 14 W.

Contributors

Larry D. Ellicott
Stephen Cassady
Steve Cassady

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:**
