USDA Natural Resources
Conservation Service

Ecological site R035XB205AZ
Loamy Upland 6-10" p.z. Gypsic

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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): 035X–Colorado Plateau

AZ CRA 35.2 - Colorado Plateau Shrub – Grasslands

Elevations range from 3500-5500 feet and precipitation averages 6 to 10 inches per year. Vegetation includes shadscale, fourwing saltbush, Mormon tea, blackbrush, Indian ricegrass, galleta, blue grama, and black grama. The soil temperature regime is mesic and the soil moisture regime is typic 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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex canescens* (2) *Artemisia bigelovii*
Herbaceous	(1) *Pleuraphis jamesii* (2) *Sporobolus nealleyi*

Physiographic features

Site occurs in an upland position. It neither benefits significantly from run-in of moisture from adjacent areas no does it suffer from excessive loss of moisture from runoff, unless denuded of its vegetative cover. It is on gently sloping to rolling plains and slopes are usually less than eight percent. It occurs as fans or terraces.

Table 2. Representative physiographic features

Landforms	(1) Plain (2) Fan (3) Terrace
Flooding duration	Extremely brief (0.1 to 4 hours)
Flooding frequency	None to rare
Elevation	4,500–5,500 ft
Slope	0–8%
Aspect	Aspect is not a significant factor

Climatic features

About 50% of moisture falls as rain Jul-Sept and is effective moisture for plant growth. The remaining moisture comes as snow during the winter. Winds of high velocity during the winter and spring are common to this subresource area.

Mean temperatures for the hottest month (Jul) is 72 degrees F; for the coldest month (Jan) is 32 degrees F. Extreme temperatures of 105 degrees F and -26 degrees F have been recorded. Long periods with little or no effective moisture are relatively common.

Cool season plants begin growth in early spring and mature in the early summer. Warm season plants take advantage of the summer rains and grow and retain their nutrition from July through September.

Table 3. Representative climatic features

Frost-free period (average)	181 days
Freeze-free period (average)	207 days
Precipitation total (average)	10 in

Influencing water features

Soil features

Soil on this site is moderately deep and well drained. They formed from weathered gypsiferous sandy shale. The surface layer is sandy loam to very fine sandy loam with 0 to 60 percent gravel. The substratum is sandy loam to clay loam. The water erosion hazard is slight to moderate. The wind erosion hazard is moderate. A layer of soft powdery gypsum may be present in the profile.

Typical taxonomic units include:

SSA 631 Coconino County Central Part - MU 34 Purgatory gravelly fine sandy loam;
SSA 633 Navajo County Central Part - MU 48 Purgatory.

Table 4. Representative soil features

Parent material	(1) Residuum–mudstone

Surface texture	(1) Sandy loam (2) Very fine sandy loam (3) Gravelly fine sandy loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	20–40 in
Surface fragment cover <=3"	0–30%
Surface fragment cover >3"	0–20%
Available water capacity (0-40in)	3–6 in
Calcium carbonate equivalent (0-40in)	0–15%
Soil reaction (1:1 water) (0-40in)	7.9–9

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 grazing, fire, 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 shown for the group. Divide the resulting total by the total normal year production shown in the plant community description. If 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

The State and Transition Model and Accompanying Narrative Descriptions are Still To Be Developed for this Ecological Site. For More Information Contact The Arizona NRCS State Rangeland Management Specialist.

State 1
Historic Climax Plant Community

Community 1.1
Historic Climax Plant Community

The plant community is made up primarily of mid and short grasses with relatively large portion of low growth form desert shrubs. Plant species most likely to invade or increase on this site when it deteriorates are broom snakeweed, Russian thistle and Annual forbs. Continuous grazing during the winter and spring periods will decrease the cool season grasses, which are replaced by warm season, lower forage value grasses and shrubs

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	195	275	330
Shrub/Vine	120	175	210
Forb	35	50	60
Total	**350**	**500**	**600**

Figure 5. Plant community growth curve (percent production by month). AZ3521, 35.2 6-10" p.z. all sites. Growth begins in the spring and continues through the summer. Most growth in this CRA occurs in the spring using stored winter moisture..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	9	20	27	14	10	11	5	3	0	0

Figure 6. Plant community growth curve (percent production by month). AZ5201, 35.2 6-10" p.z. galleta. Growth begins in spring, most growth occurs during summer rains..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	10	20	10	15	35	5	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 (%)
Shrub/Vine					
0				10–25	
	shadscale saltbush	ATCO	*Atriplex confertifolia*	10–25	–
2				125–175	
	fourwing saltbush	ATCA2	*Atriplex canescens*	45–60	–
	jointfir	EPHED	*Ephedra*	45–60	–
	Bigelow sage	ARBI3	*Artemisia bigelovii*	35–55	–
3				10–15	
	broom snakeweed	GUSA2	*Gutierrezia sarothrae*	4–5	–
	pricklypear	OPUNT	*Opuntia*	3–5	–
	narrowleaf yucca	YUAN2	*Yucca angustissima*	3–5	–
Grass/Grasslike					
0				125–175	
	James' galleta	PLJA	*Pleuraphis jamesii*	125–175	–
	gyp dropseed	SPNE	*Sporobolus nealleyi*	25–100	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	25–75	–
	alkali sacaton	SPAI	*Sporobolus airoides*	25–75	–
	spike dropseed	SPCO4	*Sporobolus contractus*	5–25	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	5–25	–
	black grama	BOER4	*Bouteloua eriopoda*	15–25	–
	blue grama	BOGR2	*Bouteloua gracilis*	15–25	–
	needle and thread	HECOC8	*Hesperostipa comata ssp. comata*	5–25	–
	New Mexico feathergrass	HENE5	*Hesperostipa neomexicana*	5–25	–
	mesa dropseed	SPFL2	*Sporobolus flexuosus*	0–15	–
	threeawn	ARIST	*Aristida*	0–15	–
Forb					
1				25–75	
	milkvetch	ASTRA	*Astragalus*	2–8	–
	buckwheat	ERIOG	*Eriogonum*	3–8	–
	menodora	MENOD	*Menodora*	3–8	–
	globemallow	SPHAE	*Sphaeralcea*	3–8	–
	princesplume	STANL	*Stanleya*	2–7	–
	blazingstar	MENTZ	*Mentzelia*	2–7	–
	spurge	EUPHO	*Euphorbia*	2–7	–
	cryptantha	CRYPT	*Cryptantha*	2–7	–
	phlox	PHLOX	*Phlox*	1–6	–
	Rocky Mountain zinnia	ZIGR	*Zinnia grandiflora*	1–6	–
	aster	ASTER	*Aster*	1–6	–

Animal community

This site is suitable for yearlong grazing by either cows and calves aor stocker caattle, and is easliy traversed by all

classes of livestock.

Site has good plant species diverstiy for wildlife.

Gypsiferous soils are very susceptible to erosion, particularly in overgrazed areas, old roads, and areas of livestock concentration. This site will seldomly used as a key management area.

Recreational uses

Site is typically low, gently rolling hills or flats. It can be very picturesque in any condition class.

Winters are cold, however, relatively mild spring, fall and summer months are attractive to recreationists.

Activities include hunting, cross-country riding, photography, hiking, rock collecting, and wildlife observation.

Other information

Golden eagles and prairie falcons may forage on this site.

Type locality

Location 1: Coconino County, AZ	
Township/Range/Section	T20N R14E S34
General legal description	Site is located west of Winslow, Arizona on Section 34, T20N, R14E. Used in Field Offices Flagstaff, Holbrook and Springerville.

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.

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Date	08/05/2013
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rare on more gentle slopes (<5 %) and very few expected to occur on steeper slopes (> 5 %).

2. **Presence of water flow patterns:** In areas of less than 5 percent slope no water flow patterns expected. In areas with greater than 5 percent slope water flow patterns are somewhat common, sinuous and widely scattered.

3. **Number and height of erosional pedestals or terracettes:** Occasional pedestals form at the base of long lived perennial bunch grasses that occur on the edge of rills and water flow patterns.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground ranges from 40-60 percent. Soil may have typically have up to 30 percent rock cover.

5. **Number of gullies and erosion associated with gullies:** None. Very few on steeper slopes (>5%) or areas adjacent and below exposed bedrock.

6. **Extent of wind scoured, blowouts and/or depositional areas:** None.

7. **Amount of litter movement (describe size and distance expected to travel):** On gentle slopes (<5%) most litter accumulates at base of plants and moved by wind or water. Some down slope redistribution caused by water. Some litter removal may occur in flow patterns or rills with deposition occurring at points of obstruction, especially following major storm events. Litter movement will increase with slope.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** The soil has a natural crust which is very resistant to wind and water erosion. Expected soil stability rating of 3 or 4 under the plant canopies and a rating of 2 to 3 in the interspaces using the soil stability kit test. The average should be a 3.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface horizon is typically 1 to 2 inches deep. Structure is typically weak thick platy to moderate thin platy. Colors are typically light brown (7.5YR 6/4) or yellowish red (5YR 5/6). The A horizon would be expected to be more strongly developed under plant canopies. It is important if you are sampling to observe the A horizon under plant canopies as well as the interspaces. Use the specific information for the soil you are assessing found in the published soil survey to supplement this description.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** This site is characterized by an even distribution of grasses (55%) with scattered shrubs (35%) and forbs (10%). Both plant cover values decrease during a prolonged drought. This type of plant community is slightly to moderately effective at capturing and storing precipitation.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. Subsurface soils have weak structure with typically ranging from fine sandy loam to clay loam. They are natural and not considered compaction layers.

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: Warm season colonizing grasses > Warm season bunch grasses

    Sub-dominant: Cool season bunch grasses > Half-shrubs > Large shrubs

    Other: Perennial forbs > Annual forbs >= Yucca & Cacti

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** During “normal” precipitation years the overall number of dead plants on the site should not be more than 10 percent. During years of severe drought up to 20% mortality may occur on shrubs and perennial grasses.

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):** Average annual production is expected to be 500 lbs/ac. in a year of average precipitation.

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:** Russian thistle and cheatgrass are most likely to invade and increase on the site.

17. **Perennial plant reproductive capability:** All plants native to this site are adapted to the climate and are capable of producing seeds, stolons, and/or rhizomes except during the most severe drought