

## Ecological site R035XB239AZ Clayey Fan 6-10" 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.

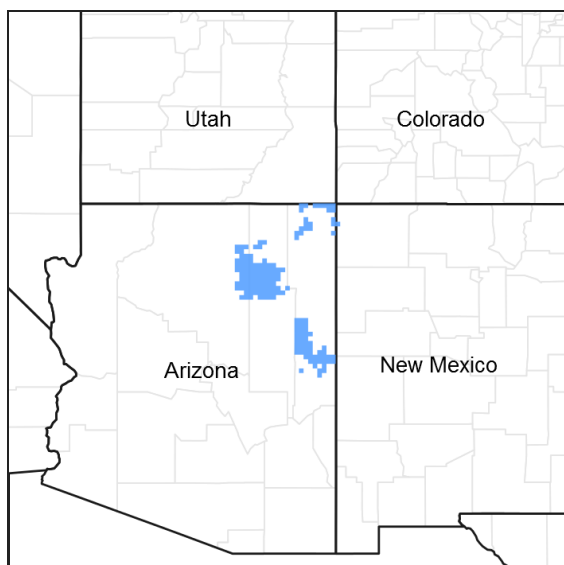


Figure 1. Mapped extent

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): 035X–Colorado Plateau

“PROVISIONAL ecological site concepts developed and described. See Project Plan [insert Project Plan Name] for more details and related milestones.”

AZ LRU 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 typical 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.

### Ecological site concept

“ATTENTION: This ecological site meets the requirements for PROVISIONAL (if not more). A provisional ecological site is established after ecological site concepts are developed and an initial state-and-transition model is drafted. A provisional ecological site typically will include literature reviews, land use history information, legacy data (prior approved range site descriptions, forage suitability groups, woodland suitability groups, etc.), and includes some

soils data, and estimates for canopy and/or species composition by weight,. A provisional ecological site provides the conceptual framework of soil-site correlation for the development of the ESD. For more information about this ecological site, please contact your local NRCS office.”

**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Atriplex canescens</i>
Herbaceous	(1) <i>Sporobolus airoides</i> (2) <i>Pleuraphis jamesii</i>

## Physiographic features

This site occurs in an upland position as fans, stream terraces and fan terraces of flood plains. It is on very deep soils that are well drained.

**Table 2. Representative physiographic features**

Landforms	(1) Alluvial fan (2) Stream terrace (3) Terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Rare to occasional
Elevation	1,463–1,859 m
Slope	0–3%
Aspect	Aspect is not a significant factor

## Climatic features

Area has a very dry and windy climate that is hot in the summer and cold in the winter. Average annual precipitation is from 6 to 10 inches. Soil moisture regime is typic aridic and the soil temperature regime is mesic. A slight majority of the precipitation arrives during the late fall, winter, and early spring. this winter season moisture originates in the Pacific Ocean and arrives as rain, or sometimes snow, during widespread frontal storms of generally low intensity. The majority of the snow falls from December through February, but rarely lasts more than a few days. The driest period is from late May to early July. Summer rains occur from July through September during brief intense local thunderstorms. The rain is sporadic in intensity and location. Windy conditions are common year round with the strongest most frequently in the spring.

**Table 3. Representative climatic features**

Frost-free period (average)	181 days
Freeze-free period (average)	207 days
Precipitation total (average)	254 mm

## Influencing water features

### Soil features

Soils on this site are deep and well drained. The surface layer is about 9 inches thick and textures include fine sandy loam, clay loam, and sandy clay loam. The subsurface textures include sandy clay loam, clay loam, very fine sandy loam, clay, silt loam, sandy loam, silty clay, fine sandy loam, loamy sand. The soil will usually hold all the

moisture the climate supplies.

Typical taxonomic units include:

SSA-635 Apache County Area MU's JR Jocity, JS Clay Springs & Jocity;  
SSA 707 Little Colorado River Area MU 19 Joraibi;  
SSA 711 Navajo Mountain Area MU 47 Sanfeco;  
SSA 713 Chinle Area MU 1010 Chomic Haplotorrerts;  
SSA 714 Hopi Area MU's 11 Jocity, 25 Polacca, 36 Tewa and 42 Wepo;  
SSA 715 Fort Defiance Area MU's 44 Jocity, 88 Polacca, 133 Wepo.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Fine sandy loam (2) Clay loam (3) Sandy clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Slow to rapid
Soil depth	152 cm
Available water capacity (0-101.6cm)	12.7–25.4 cm
Calcium carbonate equivalent (0-101.6cm)	1–15%
Electrical conductivity (0-101.6cm)	4–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	5–13
Soil reaction (1:1 water) (0-101.6cm)	7.4–9

## Ecological dynamics

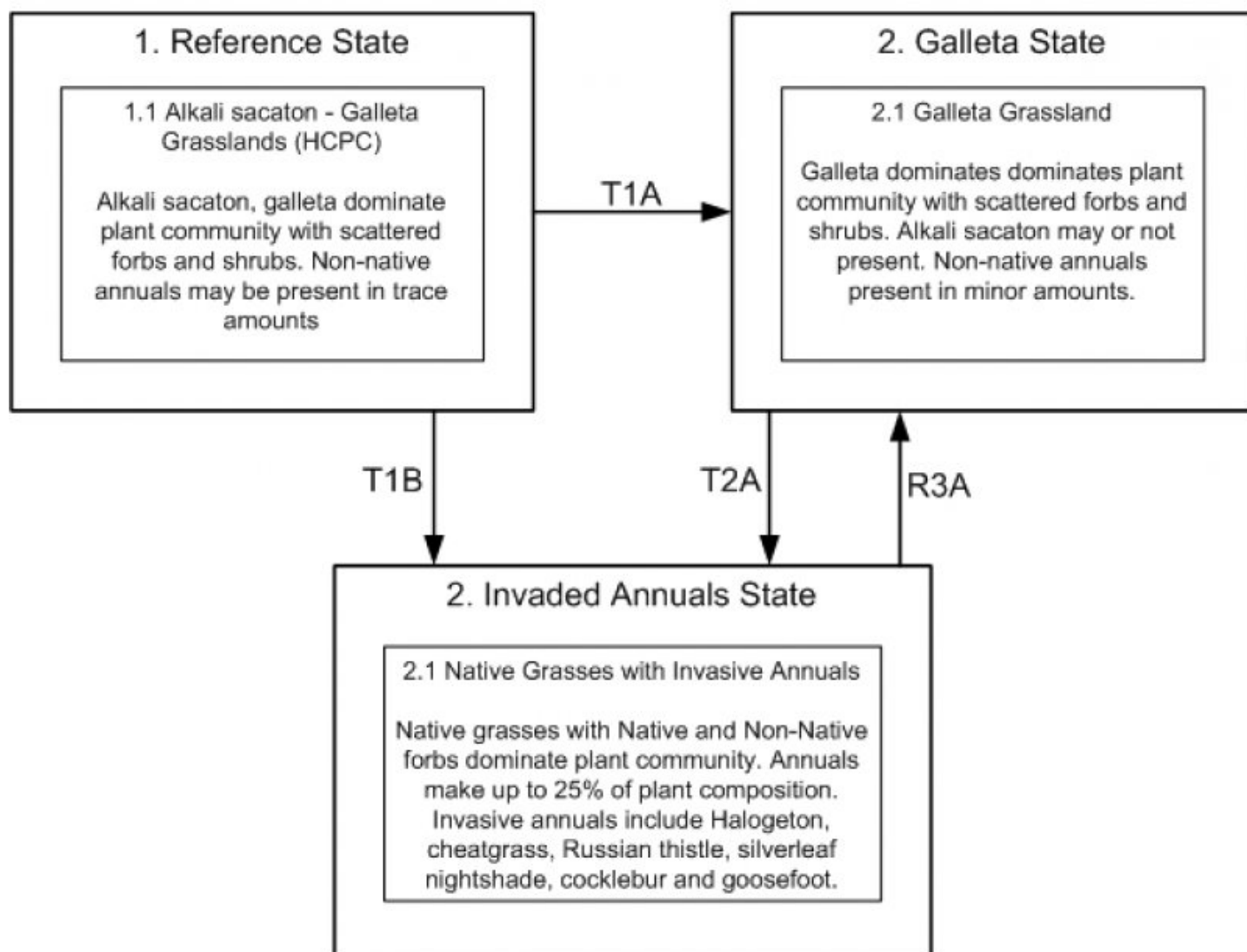
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or 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

### 35.2AZ Clayey Fan 6-10" p.z. (R035XB239AZ) Draft July 2012



**State 1**  
**Historic Climax Plant Community**

**Community 1.1**  
**Historic Climax Plant Community**



Figure 4. Clayey Fan 6-10" p.z. High elevation site

This range site has a community of mid and short grasses with shrubs and a relatively small percentage of forbs. Species most likely to increase or invade are broom snakeweed, rabbitbrush, cacti and annuals.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	314	426	538
Shrub/Vine	59	80	101
Forb	11	16	20
<b>Total</b>	<b>384</b>	<b>522</b>	<b>659</b>

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0-2%
Grass/grasslike foliar cover	2-10%
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 (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	—	0-1%	0-1%
>0.15 <= 0.3	—	—	0-4%	—
>0.3 <= 0.6	—	—	2-5%	—
>0.6 <= 1.4	—	0-2%	—	—
>1.4 <= 4	—	—	—	—
>4 <= 12	—	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

Figure 6. 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 7. 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

Figure 8. Plant community growth curve (percent production by month). AZ5203, 35.2 6-10" p.z. alkali sacaton. Growth begins in the spring, most growth occurs in the summer, goes dormant in the fall..

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

Figure 9. Plant community growth curve (percent production by month). AZ5211, 35.2 6-10" p.z. fourwing saltbush. Growth begins in spring and continues through the summer. Seed stalk extension occurs in summer with seed set in the fall..

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

## Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Shrub/Vine</b>					
0				54–106	
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	27–54	–
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	6–27	–
	Shrub (>.5m)	2SHRUB	<i>Shrub (&gt;.5m)</i>	0–16	–
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	0–11	–
	mound saltbush	ATOB	<i>Atriplex obovata</i>	6–11	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	0–11	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	0–11	–
	Mojave seablite	SUMO	<i>Suaeda moquinii</i>	0–6	–
	Greene's rabbitbrush	CHGR6	<i>Chrysothamnus Greenei</i>	0–6	–
<b>Grass/Grasslike</b>					
0				399–453	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	160–213	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	106–133	–
	squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	27–54	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	6–27	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	6–27	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	0–6	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	0–6	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	0–6	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–6	–
<b>Forb</b>					
0				6–27	
	Forb, perennial	2FP	<i>Forb, perennial</i>	6–16	–
	Forb, annual	2FA	<i>Forb, annual</i>	0–11	–

## Animal community

This site is suitable for yearlong grazing by either cows and calves or stocker cattle. It also provides good forage for sheep and goats because of the shrubs. Planned grazing systems can be readily adopted on this site.

The potential plant community produced by this site provides food for those species of wildlife that utilize grass as a major portion of their diet. When vegetative retrogression occurs, unpalatable shrubby species increase and some wildlife species may be benefited.

## Recreational uses

This site consists of outwash fans or terraces adjacent to bottom positions. It has good aesthetic appeal as a grassland with enough shrubs scattered throughout to give it good texture.

Winters are cold, however, the remainder of the year is comfortable. Springs are windy.

Site lends itself to activities such as hunting, horseback riding, photography, hiking, rock collecting, and wildlife observation.

## Type locality

Location 1: Navajo County, AZ	
Township/Range/Section	T28N R19E S32
General legal description	About two miles southeast of Five Houses, which is two to three miles south of Polacca; Section 32, T28N, R19E; Hopi Indian Reservation, AZ.

## 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)	Steve Cassady, Tom Vanzant, D. Dressler
Contact for lead author	Steve Cassady, Flagstaff ESD Office
Date	08/13/2010
Approved by	Steve Cassady
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** None to very few rills occur.

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2. **Presence of water flow patterns:** On slopes  $\leq 3$  percent none. On slopes  $> 3$  percent water flow patterns of 15 to 30 feet in length at 10 to 15 feet spacing and very sinuous may occur.

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3. **Number and height of erosional pedestals or terracettes:** Generally none, but on slopes  $> 3$  percent pedestalling of  $< 1$  inch in height may occur on long-lived plants.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground occurrence on a line-point intercept transect ranges from 45 to 55 percent.

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5. **Number of gullies and erosion associated with gullies:** None.

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



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7. **Amount of litter movement (describe size and distance expected to travel):** Generally none, but on slopes > 3 percent some movement of herbaceous litter is expected, generally limited to the water flow patterns. Movement is less than 5 to 10 feet.
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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):** Average soil surface stability rating under canopy and in interspaces is 1.0 to 1.5.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The soil surface is reddish gray (5YR 5/2), sandy clay loam with coarse, granular structure about 7 inches thick.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** By line point intercept expect grass and grasslikes to have a canopy cover of 24 to 30 percent and a basal cover of 3 to 18 percent. Expect an average fetch of 4 to 6 inches with a maximum fetch distance of 14 to 18 inches.
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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):** No compaction layer occurs. The soil profile describes a layer of sandy clay loam at about 7 inches in depth from the soil surface that with massive structure, hard when dry.
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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: Grass/Grasslikes >> Shrubs >> Forbs.
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Some decadence and mortality is expected. It should be less than 10 percent on a line-point intercept transect, except during and after prolonged, severe drought.
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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):** The median air-dry production is 475 pounds per acre.
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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: Russian thistle and cheatgrass generally occur in minor amounts (< 1%) and potentially could severely invade the site due to severe disturbance. Camelthorn is a common noxious weed in the area with the potential to invade the site.
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17. **Perennial plant reproductive capability:** The only natural limitations to reproductive capability are weather related and natural disease or herbivory that reduces reproductive capability.
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