USDA Natural Resources
Conservation Service

Ecological site R035XB269AZ
Loamy Bottom 6-10" p.z. Perennial

Accessed: 05/13/2025

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.

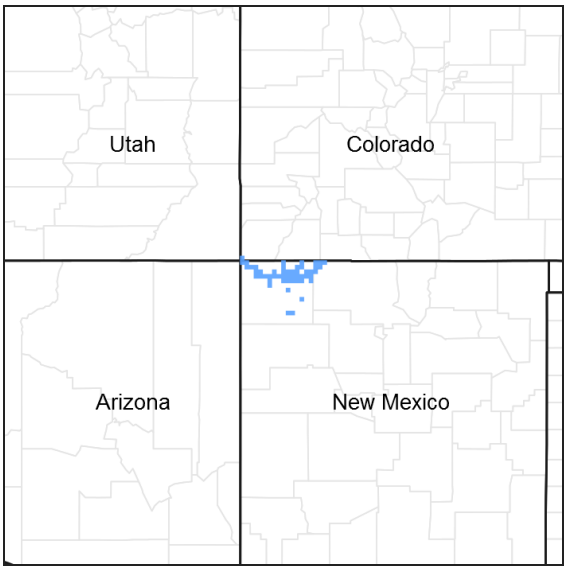


Figure 1. Mapped extent

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

“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 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.

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	(1) *Populus fremontii*
Shrub	(1) *Salix exigua* (2) *Ericameria nauseosa ssp. consimilis*
Herbaceous	(1) *Distichlis spicata* (2) *Pascopyrum smithii*

Physiographic features

This site occurs on low braided flood plains (intermittent channels) and alluvial fans of the San Juan River and the Little Colorado River. It receives additional moisture from frequent brief periods of flooding. Depth to seasonal water table is 24 to 42 inches that also benefits the site. It occurs on all exposures.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) Alluvial fan
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Elevation	1,402–1,524 m
Slope	0–5%
Water table depth	61–107 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of the land resource unit is arid with warm summers and cool winters. This is one of the driest land resource units on the Colorado Plateau with an average annual precipitation ranging from 6 to 10 inches per year. It is also very erratic, often varying substantially from year to year. 40 to 50 percent of the precipitation is received from October through early May. This precipitation comes as gentle rain or snow from frontal storms coming out of the Pacific Ocean. Snow is common from November through February. Generally no more than an inch or two of snow accumulates and usually melts within a day or two. The remaining precipitation, approximately 50 to 60 percent, is received from July through September as spotty, unreliable and sometimes violent thunderstorms. The moisture for this precipitation originates in the Gulf of Mexico (and the Pacific Ocean in the fall) and flows into the area on the north end of the Mexican monsoon. Late May through late June is generally a dry period. The mean annual temperature ranges from 53 to 56 degrees Fahrenheit (F). The frost-free period (air temperature > 32 degrees F) ranges from 135 to 160 days (@ 50 percent probability). Strong winds are common, especially in the spring.

Table 3. Representative climatic features

Frost-free period (average)	160 days
Freeze-free period (average)	184 days
Precipitation total (average)	254 mm

Influencing water features

Soil features

The soils on this site are very deep (>60"). They are formed in alluvium from sandstone, shale and quartzite.
Surface textures include fine sandy loam and loam.
Subsurface textures include loamy fine sand, fine sandy loam, silt loam, stratified very gravelly coarse sand and sand.
Water erosion hazard is none while the wind erosion hazard is severe.

Typical taxonomic units:

SSA AZ707 Little Colorado River MU 18 Ives(unpublished)
SSA-713 Chinle Area
SSA-717 Shiprock 142 Walrees;

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Sandy loam (2) Fine sandy loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Moderately slow to slow
Soil depth	152–203 cm
Surface fragment cover <=3"	0–10%
Available water capacity (0-101.6cm)	6.35–12.7 cm
Electrical conductivity (0-101.6cm)	4–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.4–8.4

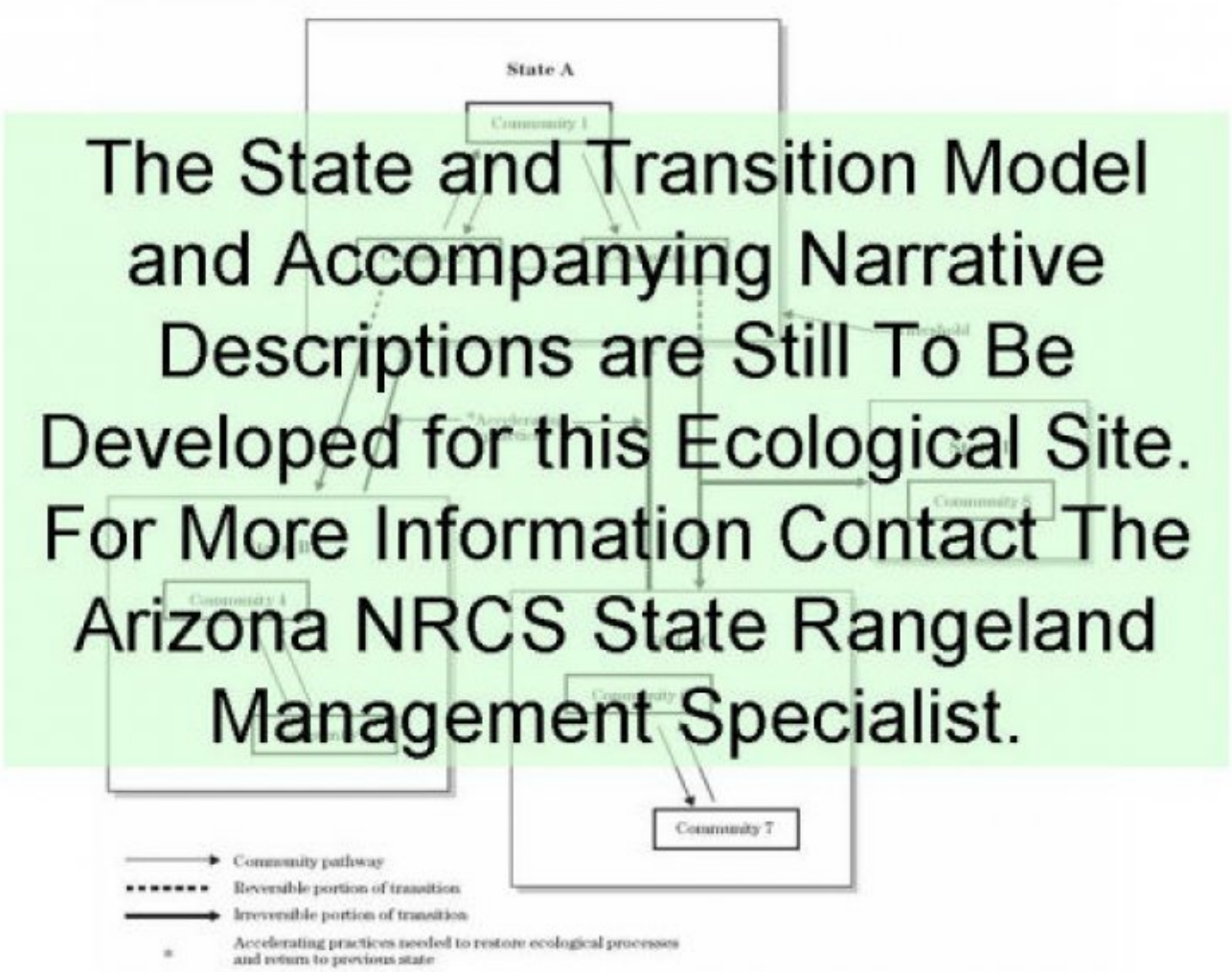
Ecological dynamics

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

The historic climax plant community (HCPC) for a site in North America is the plant community that existed at the time of European immigration and settlement. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site at that time. The HCPC was in dynamic equilibrium with its environment and was able to avoid displacement by the suite of disturbances and disturbance patterns (magnitude and frequency) that naturally occurred within the area occupied by the site. Natural disturbances, such as drought, fire, grazing of native fauna, and insects, were inherent in the development and maintenance of the plant community. The effects of these disturbances are part of the range of characteristics of the site that contribute to the dynamic equilibrium. Fluctuations in the plant community's structure and function caused by the effects of these natural disturbances establish the boundaries of dynamic equilibrium. They are accounted for as part of the range of characteristics for the ecological site. The HCPC is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. Variability is apparent in productivity and occurrence of individual species. The HCPC for this ecological site has been estimated by sampling relict or relatively undisturbed sites and/or reviewing historic records. A plant community that is subjected to abnormal disturbances and physical site deterioration or that is protected from natural influences, such as fire and grazing, for long periods seldom typifies the HCPC. Any physical site deterioration caused by the abnormal disturbance may result in the crossing of a threshold or irreversible boundary to another state, or equilibrium, for the ecological site. There may be multiple thresholds and states possible for an ecological site, determined by the type and or severity of abnormal disturbance. The known states and transition pathways for this ecological site are described in the accompanying state and transition model. The "Plant Community Plant Species Composition" table provides a list of species and each species or group of species' annual production in pounds per acre (air-dry weight) expected in a normal rainfall year. Low and high production yields represent the modal range of variability for that species or group of species across the extent of the ecological site. The "Annual Production by Plant Type" table provides the median air-dry production and the fluctuations to be expected during favorable, normal, and unfavorable years. The

present plant community on an ecological site can be compared to the various common vegetation states that can exist on the site. The degree of similarity is expressed through a similarity index. To determine the similarity index, compare the production 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 representative value shown in the “Annual Production by Plant Type” table for the reference plant community. Variations in production due to above or below normal rainfall, incomplete growing season or utilization must be corrected before comparing it to the site description. The “Worksheet for Determining Similarity Index” is useful in making these corrections. The accompanying growth curve can be used as a guide for estimating percent of growth completed.

Community 1.1
Historic Climax Plant Community

This site has a plant community made up primarily of shrubs and mid grasses. Some water tolerant grass-like species are present. The shrub species form dense groves. Plant species most likely to invade or increase on this site when it deteriorates are annual weeds, Russian olive, saltcedar, quackgrass and saltgrass.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	673	757	1009
Grass/Grasslike	673	757	841
Tree	84	127	168
Forb	17	50	84
Total	**1447**	**1691**	**2102**

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

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Tree					
0				84–168	
	Fremont cottonwood	POFR2	*Populus fremontii*	84–168	–
Shrub/Vine					
0				673–841	
	narrowleaf willow	SAEX	*Salix exigua*	420–504	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–84	–
	rubber rabbitbrush	ERNAC2	*Ericameria nauseosa ssp. consimilis*	17–84	–
Grass/Grasslike					
0				673–841	
	saltgrass	DISP	*Distichlis spicata*	252–336	–
	western wheatgrass	PASM	*Pascopyrum smithii*	168–252	–
	sedge	CAREX	*Carex*	17–84	–
	mountain rush	JUARL	*Juncus arcticus ssp. littoralis*	17–84	–
	Grass, perennial	2GP	*Grass, perennial*	0–84	–
	redtop	AGGI2	*Agrostis gigantea*	0–50	–
	slender wheatgrass	ELTRT	*Elymus trachycaulus ssp. trachycaulus*	0–50	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–34	–
	common reed	PHAU7	*Phragmites australis*	0–34	–
Forb					
0				17–84	
	Forb, perennial	2FP	*Forb, perennial*	17–50	–
	Forb, annual	2FA	*Forb, annual*	0–34	–

Animal community

This site is suitable for year-long grazing by all classes of livestock. Grazing systems adapt well to this site and should be used. When the intermittent channels are i flood stage, this site can be very hazardous to livestock. Overgrazed areas may have wind erosion occurring.
This wetland site attracts maximum numbers of species of upland wildlife. The adjacent river attracts wetland species which use this site for feeding, nesting and resting. Competition with livestock can be high year around.

Recreational uses

This site in on low braided flood plains (intermittent channels) and the thick shrub/tree groves can be aesthetically pleasing.
The winters are cold and the spring is usually windy. The summers are mild with typical Southwest thunderstorms. Main activities are birdwatching and other wildlife observations with some hunting.

Type locality

Location 1: San Juan County, NM	
Township/Range/Section	T30N R17W S34
General legal description	Shiprock quad; 3miles east of Shiprock, NM north side of San Juan River.

Contributors

Harmon Hodgkinson
Karlynn Huling
Larry D. Ellicott
Peter Lefebvre

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:**