Ecological site DX035X03G602
Clay Loam Upland
13-17" p.z.
(PIED, JUOS)

Last updated: 5/20/2025
Accessed: 05/11/2026

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.

MLRA notes

Major Land Resource Area (MLRA): 035X–Colorado Plateau

This ecological site occurs in Common Resource Area 35.6 - the Colorado Plateau Pinyon-Juniper-Sagebrush The Common Resource Area occurs within the Colorado Plateau Physiographic Province. Elevations range from 5800 to 7300 feet and precipitation averages 13 to 17 inches per year. Vegetation includes pinyon, juniper, big sagebrush, cliffrose, Mormon tea, muttongrass, prairie junegrass, squirreltail, western wheatgrass, and blue grama. The soil temperature regime is mesic and the soil moisture regime is aridic ustic. 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

The soils grouped on this site are deep to very deep with clay loam surface textures. Subsoil textures are clay loam and clay. This ecological site is located on summits, footslopes, shoulders and fan terraces of hills, mesas and plateaus. It also occurs on alluvial fans and stream terraces. Slopes range from 1 to 10 percent.

Table 1. Dominant plant species

Tree	(1) *Juniperus osteosperma* (2) *Pinus edulis*
Shrub	(1) *Artemisia tridentata ssp. wyomingensis*
Herbaceous	(1) *Pascopyrum smithii*

Legacy ID

F035XF602AZ

Physiographic features

This site is located on summits, footslopes, shoulders and fan terraces of hills, mesas and plateaus. It also occurs on on alluvial fans on valley sides and stream terraces on valley floors. The soil is deep to very deep to any plant root restricting layer. Slope of the ecological site ranges from 1 to 10 percent.

Table 2. Representative physiographic features

Landforms	(1) Mesa (2) Plateau (3) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	1,770 – 2,230 m
Slope	0 – 20 %
Aspect	Aspect is not a significant factor

Climatic features

The climate of this Common Resource Area is semiarid with warm summers and cool winters. The mean annual precipitation ranges from 13 – 17 inches, but it is very erratic, often varying substantially from year to year. The majority of the precipitation comes from October through April. 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 a few inches of snow accumulates, melting within a few days, but may last a week or more. The remaining precipitation comes 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 air temperature ranges from 47 to 49 degrees Fahrenheit (F). The frost-free period (air temperature > 32 degrees F) ranges from 113 to 144 days (@ 50 percent probability). Strong winds are common, especially in the spring.

Table 3 Representative climatic features

Frost-free period (average)	140 days
Freeze-free period (average)	160 days
Precipitation total (average)	430 mm

Influencing water features

The soil moisture on this ecological site comes from precipitation. The site does not benefit significantly from run-on moisture. The clay loam to clay surface texture of the soil allows the site to capture the gentle winter storms and the light summer storms if the site has good vegetative cover. Rapid snowmelt and strong summer thunderstorms will produce runoff, reducing the amount of effective rainfall available for plant production on this site.

Soil features

The soils are deep to very deep with clay loam surface textures. Subsoil textures are clay loam and clay. Parent materials derive mainly from shale alluvium, but also colluvium and residuum from shale, siltstone and sandstone.

Soil survey map unit components correlated with this ecological site include:

Table 4. Representative soil features

Parent material	(1) Alluvium – shale
Surface texture	(1) Clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to very slow
Soil depth	100 – 150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	12.7 – 23.62 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 8.4

Ecological dynamics

An ecological site is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. In all plant communities, variability is apparent in productivity and occurrence of individual species. Spatial boundaries of the communities; however, can be recognized by characteristic patterns of species composition, association, and community structure. The historic climax plant community for this ecological site has been described by sampling relict or relatively undisturbed sites and/or

reviewing historic records. The historic climax plant community is the plant community that evolved over time with the soil forming process and long term changes in climatic conditions of the area. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site.

Natural disturbances, such as drought, fire, grazing of native fauna, and insects, are inherent in the development and maintenance of these plant communities. The effects of these disturbances are part of the range of characteristics of the ecological site. Fluctuations in plant community structure and function caused by the effects of natural disturbances help establish the boundaries and characteristics of an ecological site. They are accounted for as part of the range of characteristics of the ecological site. Recognizable plant community phases are identified in the reference state of the ecological site. Some sites may have a small range of variation, while others have a large range. Some plant community phases may exist for long periods of time, while others may only occur for a couple of years after a disturbance.

Deterioration of the plant community, hydrology, or soil site stability on an ecological site can result in crossing a threshold or potentially irreversible boundary to another state, or equilibrium. This can occur as a result of the loss of soil surface through erosion, the loss of the stability of the site due to disturbances that cause active erosion on the site, increases in the amounts and/or patterns or runoff from rainstorms, changes in availability of surface and subsurface water, significant changes in plant structural and functional types, or the introduction of non-native species. When these thresholds are crossed, the potential of the ecological site to return to the historic climax plant community can be lost, or restoration will require significant inputs . There may be multiple states possible for an ecological site, determined by the type and or severity of disturbance.

The known states and transition pathways for this ecological site are described in the state and transition model. Within each state, there may be one or more known plant community phases. These community phases describe the different plant community that can be recognized and mapped across this ecological site. The state and transition model is intended to help land users recognize the current plant community on the ecological site, and the management options for improving the plant community to the desired plant community.

Plant production information in this site description is standardized to the annual production on an air-dry weight basis in near normal rainfall years.

State and transition model

Figure 3. State and Transition Model - F05XF602AZ

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Dominant Grasses**			78-157	
	western wheatgrass	PASM	*Pascopyrum smithii*	78-157	–
2	**Codominate Grasses**			78-157	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	24-47	–
	blue grama	BOGR2	*Bouteloua gracilis*	24-47	–
	squirreltail	ELEL5	*Elymus elymoides*	24-47	–
	muttongrass	POFE	*Poa fendleriana*	24-47	–
3	**Miscellaneous Grasses**			8-39	
	Grass, annual	2GA	*Grass, annual*	0-16	–
	Grass, perennial	2GP	*Grass, perennial*	0-16	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0-16	–
	spike muhly	MUWR	*Muhlenbergia wrightii*	0-16	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	0-8	–
	White Mountain sedge	CAGE	*Carex geophila*	0-8	–
Forb					
4	**Common Forbs**			8-39	
	pingue rubberweed	HYRI	*Hymenoxys richardsonii*	1-16	–
	tansyaster	MACHA	*Machaeranthera*	1-16	–

	globemallow	SPHAE	*Sphaeralcea*	1-16	–
5	**Other Forbs**			8-39	
	Forb, annual	2FA	*Forb, annual*	0-8	–
	Forb, perennial	2FP	*Forb, perennial*	0-8	–
	rose heath	CHER2	*Chaetopappa ericoides*	0-8	–
	trailing fleabane	ERFL	*Erigeron flagellaris*	0-8	–
	buckwheat	ERIOG	*Eriogonum*	0-8	–
	scarlet gilia	IPAG	*Ipomopsis aggregata*	0-8	–
	flatspine stickseed	LAOC3	*Lappula occidentalis*	0-8	–
	Wright's deervetch	LOWR	*Lotus wrightii*	0-8	–
	beardtongue	PENST	*Penstemon*	0-8	–
	woolly plantain	PLPA2	*Plantago patagonica*	0-8	–
Shrub/Vine					
6	**Dominant Shrubs**			118-196	
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	39-118	–
	Stansbury cliffrose	PUST	*Purshia stansburiana*	8-39	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	8-39	–
7	**Other Shrubs**			39-78	
	Utah serviceberry	AMUT	*Amelanchier utahensis*	0-16	–
	black sagebrush	ARNO4	*Artemisia nova*	0-16	–
	perennial cornflower	CEMO	*Centaurea montana*	0-16	–
	snakeweed	GUTIE	*Gutierrezia*	0-16	–
	mormon tea	EPVI	*Ephedra viridis*	0-16	–
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0-8	–
	plains pricklypear	OPPO	*Opuntia polyacantha*	0-8	–
	banana yucca	YUBA	*Yucca baccata*	0-8	–
	longflower rabbitbrush	CHDE2	*Chrysothamnus depressus*	0-8	–
	Greene's rabbitbrush	CHGR6	*Chrysothamnus greenei*	0-8	–
	Whipple cholla	CYWH	*Cylindropuntia whipplei*	0-8	–
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0-8	–
Tree					
9	**Trees**			235-314	
	Utah juniper	JUOS	*Juniperus osteosperma*	78-157	–
	twoneedle pinyon	PIED	*Pinus edulis*	78-157	–
	Gambel oak	QUGA	*Quercus gambelii*	0-39	–

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Other references

Updates and revisions for this ESD were conducted as part of a 2007-2012 Interagency Technical Assistance Agreement between the Bureau of Indian Affairs–Navajo Region and the NRCS-Arizona.

Contributors

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Approval

Kendra Moseley, 5/20/2025

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	05/11/2026
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:**

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7. **Amount of litter movement (describe size and distance expected to travel):**

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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):**

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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17. **Perennial plant reproductive capability:**