

Ecological site F035XF624AZ
Basalt Slopes 13-17" p.z. (JUOS, PIED)

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.

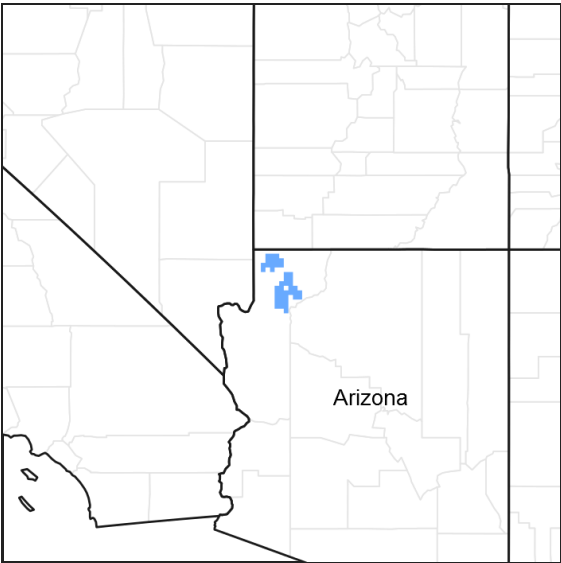


Figure 1. Mapped extent

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

AZ CRA 35.6 - Colorado Plateau Pinyon-Juniper-Sagebrush

Elevations range from 5500 to 7000 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.

Associated sites

DX035X02B611	Clay Loam Upland 13-17" p.z. Gravelly (PIED, JUOS) Clay Loam Upland 13-17" p.z. Gravelly (PIED, JUOS)
F035XF620AZ	Basalt Upland 13-17" p.z. (JUOS) Basalt Upland 13-17" p.z. (JUOS)

Table 1. Dominant plant species

Tree	(1) <i>Juniperus osteosperma</i> (2) <i>Pinus edulis</i>
Shrub	(1) <i>Purshia stansburiana</i> (2) <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Herbaceous	(1) <i>Hesperostipa comata</i> (2) <i>Pleuraphis jamesii</i>

Physiographic features

This juniper-pinyon site occurs in an upland position. It does not receive any benefit from run-on moisture, but excessive run-off can occur because of steep slopes of 15 to 50 percent. Elevations range from 5800 to 6600 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,768–2,012 m
Slope	15–50%
Aspect	Aspect is not a significant factor

Climatic features

The climate of this land resource unit 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)	144 days
Freeze-free period (average)	160 days
Precipitation total (average)	432 mm

Influencing water features

Soil features

The characteristic soil of this site is shallow to moderately deep. The surface is covered with a layer of gravels, cobbles and a few stones. The surface layer is about 4 inches deep with a texture of loam to clay loam. The subsoil, from about 4 inches to generally about 20 inches, has a texture of clay loam to clay. Subsoil fragments make up from 50 to 95 percent (% volume). The water erosion hazard of the soil is moderate to very severe due to the slope and surface texture.

Typical taxonomic units include:

SSA-623 Shivwits Area MU's 20 Dermala family & Guy family, 14 Boquillas family & Showlow;
SSA-701 Grand Canyon area MU's 56 Kellypoint, 64 Lithic haplustals, 76 Luzena.

Table 4. Representative soil features

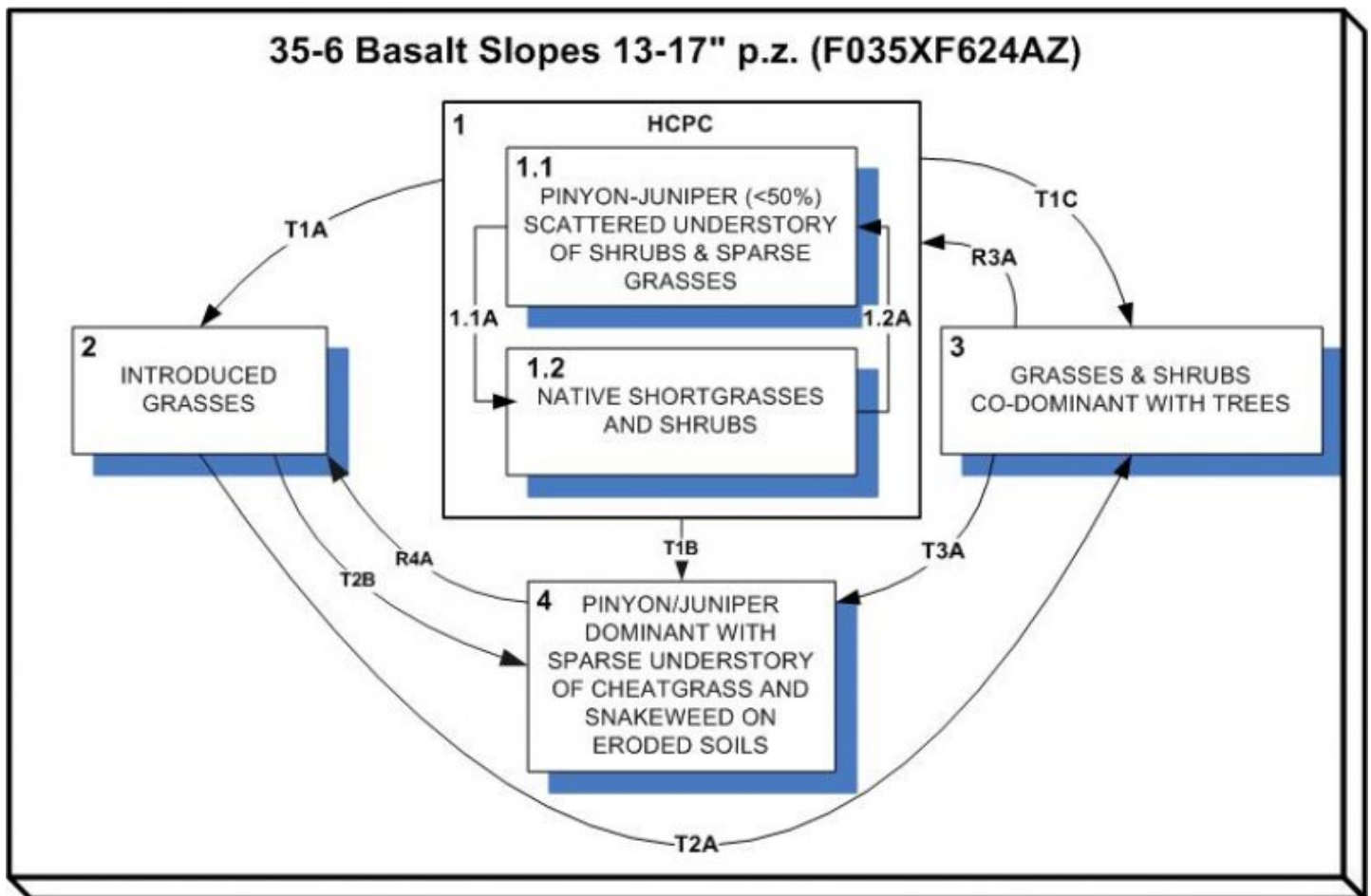
Parent material	(1) Colluvium–basalt
Surface texture	(1) Very gravelly loam (2) Very cobbly clay loam (3) Very cobbly
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Very slow to slow
Soil depth	38–102 cm
Surface fragment cover ≤3"	20–30%
Surface fragment cover >3"	30–60%
Available water capacity (0–101.6cm)	5.33–13.97 cm
Calcium carbonate equivalent (0–101.6cm)	5–15%
Electrical conductivity (0–101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0–101.6cm)	0
Soil reaction (1:1 water) (0–101.6cm)	7.4–8.2
Subsurface fragment volume ≤3" (Depth not specified)	15–35%
Subsurface fragment volume >3" (Depth not specified)	35–60%

Ecological dynamics

In the absence of regular disturbance this site has a dominant overstory of pinyon and juniper (rarely exceeds 50%), with a scattered understory of shrubs and sparse grasses and forbs. Typically perennial plant spacing is 1.5–2 feet. Major disturbance such as fire or diseased trees will result in a balanced mixture of these grasses, forbs, and shrubs. They are strongly competitive, but will gradually allow pinyon and juniper to re-establish. After 25–40 years, medium sized trees will be co-dominant with shrubs - grasses and forbs will begin to decline. As trees begin to dominate the site and canopy cover exceeds 30%, shrub component will decline as well. Continuous heavy grazing will accelerate this process and will allow native grasses to be replaced by cheatgrass and broom snakeweed.

State and transition model

35-6 Basalt Slopes 13-17" p.z. (F035XF624AZ)



State 1

Historic Climax Plant Community

Community 1.1

Historic Climax Plant Community

1. In the absence of regular disturbance, this site has a dominant overstory of pinyon and juniper (rarely exceeds 50%) with a scattered understory of shrubs and sparse grasses and forbs. Typical perennial plant spacing is 1.5-2 ft. 1.1A. Major disturbance such as fire or diseased trees will result in a balanced mixture of these grasses, forbs and shrubs. 1.2A. The natives are strongly competitive, but will gradually allow pinyon and juniper to re-establish. T1A. Application of (314) Brush Management will change the community to introduced grasses that have been seeded in the aftermath of the brush removal. 2. Plant community of introduced grasses and forbs. T2A. Continuous grazing with some fire will reduce the introduced grasses and return the plant community to a co-dominance of the understory and overstory. 3. Plant community with some fires and after 25-40 years, medium sized trees will be in co-dominance with shrubs and grasses. R3A. Continuous heavy grazing with no fire will decrease the understory species and as trees begin to dominate the site and canopy cover exceeds 30%, shrub component will decline as well. T1B. With continuous heavy grazing the trees will dominate and the shrubs will decline along with the native grasses and forbs. This allows the invasion and dominance of the understory by cheatgrass and snakeweed. T1C. With some fires and after 25-40 years, medium sized trees will be co-dominant with shrubs. Grasses and forbs will begin to decline. T2B. Continuous and heavy grazing will remove the introduced species ability to compete allowing the invasion of annuals. T3A. Continuous heavy grazing will accelerate this process and will allow native grasses to be replaced by cheatgrass and broom snakeweed. 4. Plant community of tree overstory with eroded soils and understory of cheatgrass, snakeweed and other annuals. R4A. Brush Management, Prescribed Burning and Range Planting will change the plant community to introduced species.

Forest overstory. Tree species: Utah juniper/Colorado pinyon

Site index: 50-60

Fuelwood (cords per acre): 6-8

Fence posts (7') per acre: 50-60

CMAI per year: 6 cu ft
Productivity class: 1

Table 5. Canopy structure (% cover)

Height Above Ground (M)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.15	—	—	—	—
>0.15 <= 0.3	—	—	1-3%	—
>0.3 <= 0.6	—	—	—	1-3%
>0.6 <= 1.4	—	3-5%	—	—
>1.4 <= 4	—	—	—	—
>4 <= 12	40-60%	—	—	—
>12 <= 24	—	—	—	—
>24 <= 37	—	—	—	—
>37	—	—	—	—

Figure 4. Plant community growth curve (percent production by month).
AZ3512, 35.6 13-17" p.z. Stansbury cliffrose. Growth begins in spring and continues through the summer. Stem elongation, flowering, and seed set occur in summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	20	20	30	20	5	0	0	0

Figure 5. Plant community growth curve (percent production by month).
AZ3560, 35.6 13-17" p.z. galleta. Growth begins in spring, but most growth occurs during the summer rainy season..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	20	5	30	35	5	0	0	0

Figure 6. Plant community growth curve (percent production by month).
AZ3565, 35.6 13-17" p.z. needle and thread. Growth occurs mostly in the spring..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	5	40	40	5	0	0	5	5	0	0

Figure 7. Plant community growth curve (percent production by month).
AZ3603, 35.6 13-17" p.z. Wyoming big sagebrush. Most growth occurs in the summer. Seed set occurs in the fall..

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

Additional community tables

Table 6. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)	Diameter (Cm)	Basal Area (Square M/Hectare)
Tree							
Utah juniper	JUOS	Juniperus osteosperma	Native	0.3–5.5	25–35	7.6–30.5	—
twoneedle pinyon	PIED	Pinus edulis	Native	1.5–6.1	15–25	7.6–25.4	—

Table 7. Community 1.1 forest understory composition

Common Name	Symbol	Scientific Name	Nativity	Height (M)	Canopy Cover (%)
Grass/grass-like (Graminoids)					
needle and thread	HECOC8	<i>Hesperostipa comata ssp. comata</i>	Native	0.9–1.2	5–15
sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	Native	0.1–0.5	2–10
Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	Native	0–0.6	1–5
desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	Native	0.1–0.7	1–5
New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	Native	0.2–0.9	1–5
blue grama	BOGR2	<i>Bouteloua gracilis</i>	Native	0–0.3	1–5
James' galleta	PLJA	<i>Pleuraphis jamesii</i>	Native	0–0.3	3–5
squirreltail	ELELE	<i>Elymus elymoides ssp. elymoides</i>	Native	0.1–0.6	1–4
black grama	BOER4	<i>Bouteloua eriopoda</i>	Native	0–0.5	1–3
Shrub/Subshrub					
Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	Native	0.2–1.2	1–10
broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	Native	0–0.3	1–10
Stansbury cliffrose	PUST	<i>Purshia stansburiana</i>	Native	0.3–2.1	3–7
Sonoran scrub oak	QUTU2	<i>Quercus turbinella</i>	Native	0.3–1.5	1–4
mormon tea	EPVI	<i>Ephedra viridis</i>	Native	0.2–0.9	1–3
fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	Native	0.2–1.2	1–3
banana yucca	YUBA	<i>Yucca baccata</i>	Native	0–0.8	1–2
Fremont's mahonia	MAFR3	<i>Mahonia fremontii</i>	Native	0.3–2.1	1–2
Tree					
Utah juniper	JUOS	<i>Juniperus osteosperma</i>	Native	0.3–5.5	20–30
twoneedle pinyon	PIED	<i>Pinus edulis</i>	Native	1.2–6.7	15–20

Animal community

The major factors influencing this site are lack of water, steep and stony slopes and winter snow cover. Typically, the site is used from late spring until early winter. Livestock distribution is poor - water development, cross-fencing and good grazing management are necessary.

This site may be used extensively by wildlife, especially mule deer. Tree removal or burning should be done in mosaics or small scattered patches to benefit big game use and provide an assortment of ecological successional stages for wildlife indigenous to this site. Snag and large tree removal may impact cavity-nesting birds. Sites with old growth trees, low herbaceous production or unsuitable soils should remain primarily in woodland cover. Ridges and arroyos should be maintained as travel and feeding corridors.

Recreational uses

Hiking, hunting, photography and wildlife observation are recreational activities on this site.

Table 8. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation
Utah juniper	JUOS	50	60	5	6	—	—	—	

Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T39N R12W S30
General legal description	Wolf Hole Mountain West 7.5 minute quad; south end of Wolf Hole Mountain

Contributors

Arthur Meen
Karlynn Huling
Larry D. Ellicott
Stephen 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:**

