

# Ecological site F038XA122AZ Basalt Upland 12-16 (JUOS)

Last updated: 9/05/2019  
Accessed: 02/17/2025

## 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.

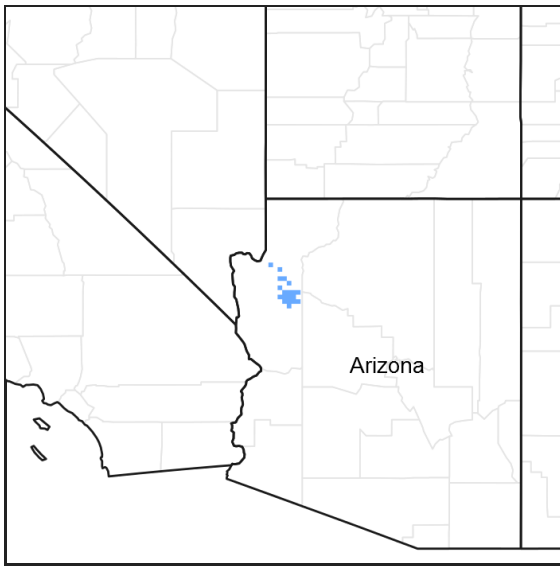


Figure 1. Mapped extent

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): 038X–Mogollon Transition South

AZ 38.1 – Lower Mogollon Transition

Elevations range from 3,000 to 4,500 feet and precipitation averages 12 to 16 inches per year. Vegetation includes canotia, one-seed juniper, mesquite, catclaw acacia, jojoba, turbinella oak, ratany, shrubby buckwheat, algerita, skunkbush, tobosa, vine mesquite, bottlebrush squirreltail, grama species, curly mesquite, desert needlegrass, and New Mexico feathergrass. The soil temperature regime is thermic and the soil moisture regime is ustic aridic. The MLRA occurs within the Transition Zone Physiographic Province and is characterized by canyons and structural troughs or valleys. Igneous, metamorphic, and sedimentary rock classes occur on rough mountainous terrain in association with less extensive sediment filled valleys exhibiting little integrated drainage.

## Ecological site concept

The Basalt Upland ecological site is on hills of undulating plateaus. The soils on this site are very shallow to shallow and well drained. The parent material is alluvium and residuum from a basalt geologic formation. The surface textures include extremely gravelly sandy loam and extremely cobbly sandy clay loam.

Table 1. Dominant plant species

Tree	(1) <i>Juniperus osteosperma</i>
Shrub	(1) <i>Yucca baccata</i> (2) <i>Ephedra viridis</i>
Herbaceous	(1) <i>Bouteloua curtipendula</i> (2) <i>Pleuraphis jamesii</i>

## Physiographic features

The Basalt Upland ecological site is on hills of undulating plateaus.

**Table 2. Representative physiographic features**

Landforms	(1) Hill
Elevation	3,000–4,500 ft
Slope	5–35%
Aspect	Aspect is not a significant factor

## Climatic features

Precipitation in this common resource area averages 12 to 16 inches annually. The winter/summer rainfall ratio ranges from about 60/40 percent in the northwest part of the area to 50/50 percent in the southeast part. Summer rains fall July through September; are from high-intensity, convective thunderstorms. This moisture originates primarily from the Gulf of Mexico, but can come from the remnants of Pacific hurricanes in September. Winter moisture is frontal, originates in the north Pacific, and falls as rain or snow in widespread storms of low intensity and long duration. Snowfall ranges from a trace to 10 inches per year and can occur from November through March. Snow seldom persists for more than a day except on north aspects. May and June are the driest months of the year. Humidity is generally low all year. Average annual air temperatures range from 59 to 70 degrees F (thermic temperature regime). Daytime temperatures in the summer are commonly in the high 90's. Freezing temperatures are common from October through April, usually during the night or early morning hours. The actual precipitation, available moisture, and temperature vary, depending on region, elevation, rain shadow effect, and aspect.

**Table 3. Representative climatic features**

Frost-free period (average)	230 days
Freeze-free period (average)	285 days
Precipitation total (average)	16 in

## Influencing water features

### Soil features

The soils on the Basalt Upland ecological site are very shallow to shallow and well drained. The parent material is alluvium and residuum from a basalt geologic formation. The surface textures include extremely gravelly sandy loam and extremely cobbly sandy clay loam. The subsurface textures include very gravelly clay loam, extremely cobbly sandy clay loam, and extremely cobbly clay loam. Hazard of erosion from water or wind is slight. There is basalt bedrock at 9 to 15 inches. Soil moisture regime is ustic aridic and the temperature regime is mesic. Typical taxonomic units mapped on this site include: SSA-697 Central Mohave MU, Taine-141; and SSA-699 Hualapai/Havasupai Area MU, Wyva family-59.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–basalt
Surface texture	(1) Extremely gravelly sandy loam (2) Extremely cobbly sandy clay loam

Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderate to moderately slow
Soil depth	5–20 in
Surface fragment cover <=3"	10–20%
Surface fragment cover >3"	30–45%
Available water capacity (0-40in)	0–2.5 in
Soil reaction (1:1 water) (0-40in)	7.4–7.8

## Ecological dynamics

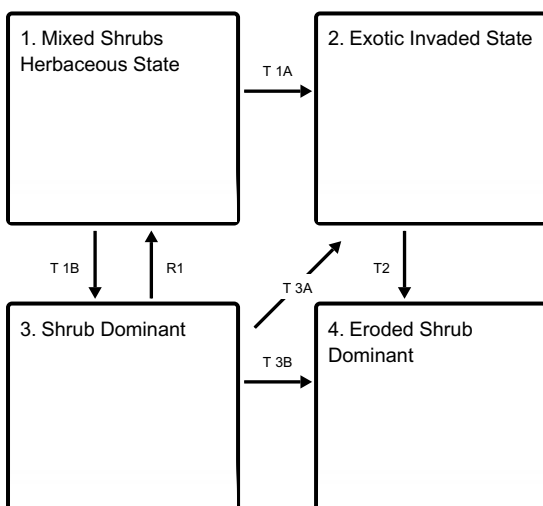
The plant communities found on an ecological site are naturally variable. Composition and production will vary with yearly conditions, location, aspect, and the natural variability of the soils. The historical climax plant community represents the natural potential plant communities found on relict or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

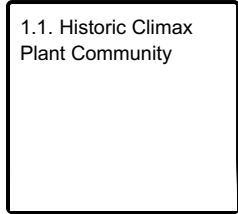
NRCS uses a Similarity Index to compare existing plant communities to the plant communities described here. Similarity Index is determined by comparing the production and composition of a plant community to the production and composition of a plant community described in this site description. To determine 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

### Ecosystem states



**State 1 submodel, plant communities**



**State 1  
Mixed Shrubs Herbaceous State**

Shrubs and succulents are greater than annual grass and forbs which are greater than perennial grass

**Community 1.1  
Historic Climax Plant Community**

The aspect view of this site is trees with an understory of grasses and shrubs. Tree canopy cover is 20-30% with the major overstory species of Utah juniper as 95% and singleleaf pinyon as 5% of the species present. Understory species include: Grasses and grass-like as 60% - sideoats grama, galleta, and slim tridens. Forbs as 5% - birdbeak. Shrubs as 30% - banana yucca and green Mormon tea. Trees (<4.5') as 5% - Utah juniper. Plant community changes that occur after disturbance: Herbaceous/Shrub stage: Grasses dominate with some shrubs and seedling trees. Immature stage: Medium-size juniper are in balance with the grasses and shrubs. Mature/Climax stage: Utah juniper trees dominate with grasses and shrubs in moderate amounts. Forbs are a minor component.

Figure 4. Plant community growth curve (percent production by month). AZ3811, 38.1 12-16" p.z. all sites. Growth begins in the spring, most growth occurs in the summer..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	7	15	20	22	20	10	5	0	0

**State 2  
Exotic Invaded State**

Exotic annuals with 10-50% canopy cover

**State 3  
Shrub Dominant**

Shrubs with greater than 50% canopy cover

**State 4  
Eroded Shrub Dominant**

10-30% canopy cover

**Transition T 1A  
State 1 to 2**

Invaded exotic species coupled with an increase in fire frequency

**Transition T 1B  
State 1 to 3**

A decrease in fire frequency, continuous season-long herbivory, coupled with drought

**Transition T2**

## **State 2 to 4**

Decrease in vegetative canopy cover; increase in soil erosion; increase in fire frequency; decrease in perennial herbaceous

## **Restoration pathway R1**

### **State 3 to 1**

Brush control coupled with grazing management that allows for adequate recovery periods

## **Transition T 3A**

### **State 3 to 2**

Introduction of exotic, invasive species coupled with a change to a wetter climate

## **Transition T 3B**

### **State 3 to 4**

Decrease in vegetative canopy cover; increase in soil erosion; increase in fire frequency; decrease in perennial plants

## **Additional community tables**

### **Animal community**

The Basalt Upland ecological site is suitable for grazing by cattle, horses, and sheep. It is used primarily as a late spring to early fall seasonal range.

Prescribed Grazing should be applied and stock trails on steep slopes. Young trees should be protected from trampling and other damage.

Factors on the site that affect wildlife include:

Water - scarce in natural springs and pockets.

Cover - good for most species and topography provides escape habitat.

Food - good diversity.

### **Recreational uses**

Landscape quality is good for the following activities: Hiking, wildlife observations, and photography.

### **Wood products**

Woodland Overstory Production:

JUOS/PIED

Site Index: 30 - 35

Fuelwood (Cords/Ac): 3 - 4

Fence posts (7ft)/Ac: 0 - 5

Christmas Trees/Ac: 0 - 2

CMAI\* per year:(bd ft/ac) 2.5 ft<sup>3</sup>/ac

Productivity Class: 1

\* CMAI is the "Culmination of Mean Annual Increment" or highest average growth rate of the stand in the units specified.

Woodland Uses and Interpretations

Equipment Suitability:

Harvesting: Cobbles and slope limits use of rubber tire equipment

Site Preparation: Cobbles and slope limits equipment type

Tree Planting: Best to do by hand; not equipment

Pre-Commercial Thinning: Crawler tractor type best on slopes above 15 percent

#### Equipment Limitations:

Slope: Moderate because of slope and cobbles

Unsurfaced Roads: Moderate; slope, cobbles, soil textures.

Stoniness/Rock Outcrop: Cobbles and some rock outcrop restrict use

Water Table/Flooding: None

#### Erosion Potentials:

Cutover areas/bare ground: Water and wind – slight; cobbles and gravel on surface protects the soil

Roads/Trails/Landings: Water and wind – slight on slopes less than 15 percent and moderate with slopes 15 to 35 percent

#### Soil Management:

Compaction potential: Fair to good; rock and soil mix well

Rutting potential: Some rutting may occur when wet

Re-vegetation potential: Poor because of cobbles, rooting depth, soil texture

#### Silviculture Potentials and Limitations:

Harvest Cutting: harvest mature trees when canopy exceeds 30 percent and slopes less than 25 percent.

Thinning and Improvement: Because of this low producing site, thinning usually is not necessary

Prescribed Burning: Not recommended

Mechanical Tree Removal: Hard to do with cobbles, shallow soils, and steep slopes

Pest Control: Control pests to prevent tree damage and loss

Fire Hazard: Low; shallow cobble soils helps keep fuel load low

Suitability for Replanting: Poor – shallow, cobbly soils

Seedling Mortality: Soil depth, cobbles causes a severe mortality rating

Natural Regeneration: Very slow but will occur in time

Seedling Protection: Seedlings should be protected from grazing and trampling

Plant Competition: Severe, because of competition for limited moisture

Windthrow Hazard: Some trees may blow over if they get tall enough

### Type locality

Location 1: Mohave County, AZ	
Township/Range/Section	T24N R13W S23
General legal description	Valentine Quad: 4.5 miles west of Truxton, north and south of Highway 66.
Location 2: Mohave County, AZ	
Township/Range/Section	T23N R12W S3
General legal description	Taine type location is about 2,500 feet west and 2,100 feet north of the southeast corner of sec. 3 T. 23 N., R. 12 W.

### Contributors

Karlynn Huling

Larry D. Ellicott

### Approval

Scott Woodall, 9/05/2019

### 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:**
-