

Ecological site R041XC332AZ**Limy Fan
12-16" p.z.
Gypsum**

Last updated: 4/12/2021

Accessed: 09/23/2026

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): 041X–Madrean Archipelago

AZ 41.3 – Chihuahuan – Sonoran Semidesert Grasslands Elevations range from 3200 to 5000 feet and precipitation ranges from 12 to 16 inches per year. Vegetation includes mesquite, catclaw acacia, netleaf hackberry, palo verde, false mesquite, range ratany, fourwing saltbush, tarbush, littleleaf sumac, sideoats grama, black grama, plains lovegrass, cane beardgrass, tobosa, vine mesquite, threeawns, Arizona cottontop and bush muhly. The soil temperature regime is thermic and the soil moisture regime is ustic aridic. This unit occurs within the Basin and Range Physiographic Province and is characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys and basins. Igneous and metamorphic rock classes dominate the mountain ranges and sediments filling the basins represent combinations of fluvial, lacustrine, colluvial and alluvial deposits.

Ecological site concept

Limy fan, Gypsum, 12-16" pz., ecological site occurs on gently sloping alluvial fans and uplands with deep, calcareous soils. Soils may be gypsic throughout or have gypsum within subsurface horizon making them vulnerable to accelerated erosion.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

Site is located on relic basin floors and alluvial fans.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Basin floor
Elevation	1,130 – 1,400 m

Slope	0 – 20 %
Aspect	Aspect is not a significant factor

Climatic features

Precipitation in this common resource area ranges from 12-16 inches yearly in the eastern part with elevations from 3600-5000 feet, and 13-17 inches in the western part where elevations are 3300-4500 feet. Winter-Summer rainfall ratios are 40-60% in the west and 30-70% in the east. Summer rains fall July-September, originate in the Gulf of Mexico and are convective, usually brief, intense thunderstorms. Cool season moisture tends to be frontal, originates in the Pacific and Gulf of California, and falls in widespread storms with long duration and low density. Snow rarely lasts more than one day. May and June are the driest months of the year. Humidity is generally very low.

Temperatures are mild. Freezing temperatures are common at night from December-April; however temperatures during the day are frequently above 50 F. Occasionally in December-February, brief 0 F temperatures may be experienced some nights. During June, July and August, some days may exceed 100 F.

Cool season plants start growth in early spring and mature in early summer. Warm season plants take advantage of summer rains and are growing and nutritious July-September. Warm season grasses may remain green throughout the year.

Table 3 Representative climatic features

Frost-free period (average)	220 days
Freeze-free period (average)	
Precipitation total (average)	410 mm

Influencing water features

There are no water features on this site.

Soil features

These soils are mapped on basin floors and alluvial fans. Hazard of erosion is moderate for both water and wind. Shrink swell potential is moderate. Calcic horizon at 10 to 40 inches.

Soils mapped on this unit include: SSA-665 Wilcox area MU's Ef Elfrida, Mc & Mk Mcallister; SSA-666 Cochise county NW part MU 51 Kahn; SSA-671 Cochise county Douglas-Tombstone part MU's 90 & 91 Kahn, 92 Karro L, Karro L saline-sodic and 150 Moco.

Table 4. Representative soil features

Surface texture	(1) Fine sandy loam (2) Loam (3) Clay loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained

Permeability class	Slow to moderately slow
Soil depth	100 – 150 cm
Surface fragment cover <=3"	30 – 40 %
Available water capacity (0-101.6cm)	17.78 – 25.4 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 50 %

Ecological dynamics

Limy Fan, Gypsum, 12"-16" pz, ecological site is a robust desert shrub-grassland. Fire dynamically maintains the balance between shrubs and perennial grasses. Immediately after burning, shrubs will be top-killed, fire effects on perennial grasses will be variable; the site will have exposed bare ground and annual forbs and grasses (sunflowers, feather fingergrass) will flourish. As time after burning progresses, perennial grasses will increase as will subsequent amounts of litter cover. Shrubs will continue to regrow. Natural fire interval is approximately 15-20 years.

Long-term, unmanaged grazing affects this site in two ways: selectively removing native perennial grasses and, consequently, removing fine fuels for fire. Without fire, shrubs such as white-thorn acacia, wait-a-bit, mesquite, and catclaw acacia grow without inhibition to transition to the Shrubland State. Chemical brush management practices will temporarily remove shrub dominance to create a Managed Grassland Community phase (mechanical brush management will thrust site into Eroded State!). The managed grassland is ephemeral, lasting about 5 years without repeated brush management (fire or chemical spot treatment).

Gypsum is highly soluble in water. Therefore, this ecological site will erode like crazy if soil surface is disturbed. Soil disturbances, such as mechanical brush management, land treatments (ie. ripping), road cuts, or heavy trailing (by livestock, wildlife, or humans) will trigger unstoppable erosion. Plant community is absent due to adverse changes in soil hydrology (limited infiltration, excessive run-off). In extremely eroded condition, head-cuts, gullies and piping erosion can be more than 8' deep.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

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

Wilma J Renken

Approval

Curtis Talbot, 4/12/2021

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	09/23/2026
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:

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:
