Ecological site R030XB159CA
Broad Gravelly Wash

Last updated: 2/25/2025
Accessed: 08/30/2026

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.

Ecological site concept

This site occurs in broad drainageways. The soils on this site are very deep, coarse-textured soils derived from either limestone or mixed alluvium, and are classified as Typic Torriorthents. Please refer to group concept R030XB052NV to view the provisional STM.

Associated sites

R030XB156CA	**Limy 5-7" p.z. (Low Production)** Occurs on alluvial fans at lower elevations.
R030XB158CA	**Ballena Summit** Occurs on adjacent fan remnants and ballenas at higher elevations.

Similar sites

R030XB145CA	**Valley Wash** This site has a lower production and is dominated by white burrobush.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Encelia virginensis* (2) *Acacia greggii*
Herbaceous	Not specified

Physiographic features

This site occurs in broad drainageways.

Table 2. Representative physiographic features

Landforms	(1) Drainageway

Flooding duration	Extremely brief (0.1 to 4 hours) to very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	None to rare
Elevation	760 – 1,520 m
Slope	0 – 10 %
Ponding depth	0 cm
Water table depth	150 cm
Aspect	Aspect is not a significant factor

Climatic features

The Mojave Desert experiences clear, dry conditions for a majority of the year. Winter temperatures are mild, summer temperatures are hot, and seasonal and diurnal temperature fluctuations are large. Monthly minimum temperature averages range from 30 to 80 degrees F (-1 to 27 degrees C). Monthly maximum temperature averages range from 60 to 110 degrees F (16 to 43 degrees C) (CSU 2002).

Average annual rainfall is between 2 and 8 inches (50 to 205 millimeters) (USDA 2006). Snowfall is more common at elevations above 4000 feet (1220 meters), but it may not occur every year (WRCC 2002b). The Mojave Desert receives precipitation from two sources. Precipitation falls primarily in the winter as a result of storms originating in the northern Pacific Ocean. The Sierra Nevada and Transverse Ranges create a rain shadow effect, causing little precipitation to reach the Mojave Desert. Sporadic rainfall occurs during the summer as a result of convection storms formed when moisture from the Gulf of Mexico or Gulf of California moves into the region. Summer rainfall is more common and has a greater influence on soil moisture in the eastern Mojave Desert.

Windy conditions are also common in the Mojave Desert, particularly in the west and central Mojave Desert. Spring is typically the windiest season, with winds averaging 10-15 miles per hour (WRCC 2002a). Winds in excess of 25 miles per hour and gusts in excess of 50 miles per hour are not uncommon (CSU 2002).

In the BLM Grazing Allotments Soil Survey (Northeast Part of Mojave Desert Area, CA (CA805)), most areas receive approximately 5 to 7 inches of precipitation annually (WRCC 2002b). At elevations above 4000 feet (1370 meters), average annual precipitation in the form of rain may reach 8 inches or more, and average annual snowfall may reach up to 10 inches (WRCC 2002b).

The data from the following climate stations were used to describe the climate in the BLM Grazing Allotments Soil Survey (station number in parentheses):
Pahrump, NV (265890)
Mountain Pass, CA (045890)
Searchlight, NV (267369)
Red Rock Canyon State Park, NV (266691)

"Maximum monthly precipitation" represents average monthly precipitation.

Table 3 Representative climatic features

Frost-free period (average)	320 days
Freeze-free period (average)	280 days
Precipitation total (average)	180 mm

Influencing water features

Soil features

The soils on this site are very deep, coarse-textured soils derived from either limestone or mixed alluvium, and are classified as Typic Torriorthents. Soils have no development throughout due to constant deposition and removal from flooding. Soils are occasionally to frequently flooded, with rapid permeability and low runoff. Soils are moderately alkaline.

Soil survey area - Map unit symbol - Component
CA805 - 3320 - Colosseum (minor component)
CA805 - 3520 - Arizo, frequently flooded (minor component)
CA805 - 3650 - Colosseum, occasionally flooded (minor component)
CA805 - 3660 - Colosseum, occasionally flooded (minor component)
CA805 - 4122 - Arizo, occasionally flooded (minor component)
CA805 - 4190 - Colosseum, occasionally flooded (minor component)

Table 4. Representative soil features

Surface texture	(1) Sand
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	150 – 200 cm
Surface fragment cover <=3"	70 – 90 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	1.27 – 3.81 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 50 %

Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	10 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	40 – 80 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

Please refer to group concept R030XB052NV to view the provisional STM.

This ecosite occurs in drainageways in which seasonal rainstorms may produce moderate to heavy flooding, but evidence indicating regular uprooting of established plants by these events is minimal. Small or young plants without well-developed root systems are more likely to be uprooted by flooding. The dominant plants on this ecosite—Virgin River brittlebush (Encelia virginensis) and catclaw acacia (Acacia greggii)—are known to adapt to disturbance by water movement. Species in both genera have well-developed lateral root systems that enhance water uptake, particularly near the soil surface (Rundel and Gibson 1996). Their extensive root system helps to anchor the plant against uprooting by water movement.

Establishment of catclaw acacia on this ecosite may have been facilitated by the plant's ability to access water in deep horizons as well as the occurrence of flooding events that can disperse seeds. Catclaw acacia has a large taproot to access water. Water, as well as animals, is an important seed dispersal mechanism (Gucker 2005). The dynamics of catclaw acacia in other ecosystems also suggest that edaphic conditions may have played a role in its establishment on this ecosite. In a desert plains grassland, catclaw acacia was often more abundant on alkaline soils in drainageways and floodplains (Whitfield and Anderson 1938).

Information specific to Virgin River brittlebush was minimal, but characteristics of other Mojave Desert brittlebush species may offer insight into Virgin River brittlebush's successional status. Button brittlebush (Encelia frutescens) is a similar species and is often found in drainageways. It has an intermediate life span (

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 (%)
Shrub/Vine					
1	**Perennial Shrubs**			276-605	
	Virgin River brittlebush	ENVI	*Encelia virginensis*	112-249	–
	catclaw acacia	ACGR	*Acacia greggii*	52-112	–
	burrobrush	HYSA	*Hymenoclea salsola*	28-62	–
	water jacket	LYAN	*Lycium andersonii*	17-38	–
	Death Valley jointfir	EPFU	*Ephedra funerea*	11-25	–

	littleleaf ratany	KRER	*Krameria erecta*	9-18	–
	creosote bush	LATR2	*Larrea tridentata*	9-18	–
	Mojave yucca	YUSC2	*Yucca schidigera*	6-12	–
	mesquite mistletoe	PHCA8	*Phoradendron californicum*	7-12	–
	purple sage	SADO4	*Salvia dorrii*	6-12	–
	Mexican bladdersage	SAME	*Salazaria mexicana*	6-12	–
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	2-6	–
	beavertail pricklypear	OPBA2	*Opuntia basilaris*	2-6	–
	burrobush	AMDU2	*Ambrosia dumosa*	2-6	–
	Engelmann's hedgehog cactus	ECEN	*Echinocereus engelmannii*	2-6	–
Grass/Grasslike					
2	**Perennial Grasses**			2-6	
	desert needlegrass	ACSP12	*Achnatherum speciosum*	2-6	–
Forb					
3	**Annual Forbs**			2-6	
	desert trumpet	ERIN4	*Eriogonum inflatum*	2-6	–

Animal community

Catclaw acacia and Virgin River brittlebush are consumed by large browsers such as deer. Both species are also important as food and shelter for birds and small mammals. Desert tortoises have been observed near this ecosite. Catclaw acacia is grazed in spring when new growth is available or when forage is scarce, but it is generally considered marginal forage for livestock (Ladyman 2003). Catclaw acacia may also cause injury to livestock due to the prickles on its branches. Forage values specific to Virgin River brittlebush were unavailable, but other Mojave Desert species of Encelia are considered to have little forage value for livestock (Esser 1993).

Hydrological functions

This ecological site is located in drainageways that may be flooded during rainstorms. Bimodal rainfall patterns and variability in the frequency and intensity of storms may limit the ability to manage this ecosite. Flooding may cause losses or injuries. Uses occurring during the rainy season (recreational use, etc.) would likely have to be such that people and/or property can be easily and quickly moved out of potentially dangerous situations.

Recreational uses

Larger drainageways are often used by off-highway vehicles as travel corridors. Under this disturbance, smaller shrubs such as Virgin River brittlebush may be more easily trampled while larger shrubs such as catclaw acacia might be less affected. Species such as burrobrush often colonize sites disturbed by human activities. This ecosite blooms with wildflowers during wet years, offering recreational opportunities for people interested in desert flowers or photography.

Other information

Although not a preferred food source, Native Americans would consume the pods and seeds of catclaw acacia.

Inventory data references

Vegetation cover was sampled in lieu of production due to a poor growing season. Ten 100-foot point-intercept transects were sampled on 29 March 2006 at the type locality. The top two tiers of vegetation or other cover class (e.g. bare soil, gravel, rock, litter, biological soil crust) were recorded at every foot. Annual production numbers were estimated based on similar ecological sites.

Type locality

Location 1: San Bernardino County, CA	
UTM zone	N

UTM northing	3947690
UTM easting	638014
Latitude	35° 39′48″
Longitude	115° 28′30″
General legal description	The type site is located on Stateline Pass, about 4 miles northwest of Primm, NV.

Other references

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Contributors

Heath M. McAllister, Allison Tokunaga

Approval

Sarah Quistberg, 2/25/2025

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	08/30/2026
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):**

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5. **Number of gullies and erosion associated with gullies:**

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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:**
