

Ecological site R030XB011CA

Braided Hyperthmic Ephemeral Drainage Complex

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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): 030X–Mojave Basin and Range

MLRA Statement: Major Land Resource Area (MLRA) 30, Mojave Desert, is found in southern California, southern Nevada, the extreme southwest corner of Utah and northwestern Arizona within the Basin and Range Province of the Intermontane Plateaus. The climate of the area is hot (primarily hyperthermic and thermic; however at higher elevations, generally above 5000 feet, mesic, cryic and frigid) and dry (aridic). Elevations range from below sea level to over 12,000 feet in the higher mountain areas found within the MLRA. Due to the extreme elevational range found within this MLRA, land resource units (LRUs) were designated to group the MLRA into similar land units.

LRU notes

This LRU (designated by 'XD') is found on the eastern side of California and much of the low-elevations of Nevada and northwestern Arizona. Elevations range from 400 to 2200 feet on average, but may be found up to 3600 feet on southern exposures. Precipitation ranges from 1 to 6 inches per year, but averages between 2-4 inches. This LRU is characterized primarily by the extreme aridity, hot air temperatures, hyperthermic soil temperatures, and low vigor/low stature of widely spaced vegetation. Temperatures can reach over 110 degrees Fahrenheit for several weeks in July and August. Summer precipitation falls between July and September, ranging from 20-33% in the form of rain, and winter precipitation falls starting in November and ends between February and March, ranging from 56-70%, also mostly in the form of rain. Vegetation is primarily small, widely-spaced, low-producing creosote bush (*Larrea tridentata*), burrobush (*Ambrosia dumosa*), and brittlebush (*Encelia farinosa*).

Ecological site concept

This ecological site occurs on inset fans and channel margins of braided, small (1st or 2nd order) ephemeral drainageways on hyperthermic fan aprons. Drainageways intermittently flood during high precipitation events, but since they occur on fan aprons away from the base of mountains, flow is relatively diffuse. Soils are very deep and gravelly. Intermittent flooding provides soil disturbance and additional moisture that supports a more productive and diverse plant community than surrounding upland fan aprons, but hyperthermic temperatures, low precipitation, and relatively diffuse flow keep the plant community relatively simple and of lower production than larger drainage systems, or drainage systems receiving greater precipitation. White burrobush (*Hymenoclea salsola*) is a dominant plant, and burrobush (*Ambrosia dumosa*) and creosote bush (*Larrea tridentata*) are important secondary species. Desert senna (*Senna armata*) is often present. This site is part of group concept R030XB187CA.

Associated sites

R030XD014CA	Hyperthermic Sandy Plains This ecological site occurs on adjacent sand sheets.
R030XD015CA	Hyper-Arid Fans This ecological site occurs on adjacent upland fan aprons with very rare to rare flooding.

Similar sites

R030XY136CA	Dry Wash This ecological site occurs on larger drainageways (order 2 to 3), and occurs in valleys draining mountains, or close to the base of mountains. Flow is more concentrated, and channels are deeper and more complex. Species composition is similar, but a greater diversity of species and plant communities is present.
R030XD015CA	Hyper-Arid Fans This ecological site occurs on fan aprons with very rare to rare sheet flooding. It is not associated with drainageways. Creosote bush and burrobush are the dominant species. If white burrobush or desert senna are present, they are confined to a patch of localized disturbance.
R030XY223CA	Dry Wash This ecological site occurs on similar diffuse, braided channels on fan aprons, but it occurs on lower fan positions at lower elevations. More arid conditions, finer soil textures, and greater salinity increase habitat suitability for cattle saltbush (<i>Atriplex polycarpa</i>) which is a dominant species on this site. White burrobush is trace if present.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Hymenoclea salsola</i> (2) <i>Larrea tridentata</i>
Herbaceous	Not specified

Physiographic features

This ecological site occurs on channel margins and inset fans of small (1st or 2nd order) ephemeral drainageways. Elevations range from 300 to 900 feet, and slopes range from 1 to 8 percent, but slopes below 5 percent are typical. This site occasionally flooded, and runoff class is very low.

Table 2. Representative physiographic features

Landforms	(1) Drainageway (2) Inset fan
Flooding frequency	Occasional
Elevation	90 – 270 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

Influencing water features

Soil features

The dominant soils associated with this ecological site are very deep, somewhat excessively drained soils that formed in alluvium from mixed parent material. These soils are sandy in the particle size control section, and permeability is rapid. Surface textures are gravelly sand and fine sand, and subsurface horizons (1 to 59 inches) are composed of stratified layers of very gravelly to gravelly sand and coarse sand. Surface gravels (3 mm in diameter) range from 25 to 49 percent, and larger rock fragments (> 3 mm in diameter) range from 4 to 6 percent. Subsurface gravels by volume (for a depth of 0 to 59 inches) range from 28 to 80 percent, and larger fragments range from 10 to 50 percent.

This ecological site is associated with the Carrwash soils (Sandy-skeletal, mixed, hyperthermic Typic Torriorthents); and the Carrizo soils (Sandy-skeletal, mixed, hyperthermic Typic Torriorthents).

Table 3. Representative soil features

Surface texture	(1) Gravelly sand (2) Fine sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained
Soil depth	150 cm
Surface fragment cover <=3"	30 – 50 %
Surface fragment cover >3"	0 – 10 %
Subsurface fragment volume <=3" (Depth not specified)	30 – 80 %
Subsurface fragment volume >3" (Depth not specified)	10 – 50 %

Ecological dynamics

These small, braided ephemeral streams are on inset fans and drainageways on mid-fan positions on fan aprons. Mid fan positions mean that high volume concentrated flow off of mountains does not occur, and channels are shallow with relatively diffuse flow. Soils are very deep gravelly sands.

Intermittent flooding provides soil disturbance and additional moisture that supports a more productive and diverse plant community than surrounding upland fan aprons, but hyperthermic temperatures, low precipitation, and relatively diffuse flow keeps the plant community relatively simple and of lower production than larger drainage systems, or drainage systems receiving greater precipitation. White burrobush (*Hymenoclea salsola*) is a dominant shrub, and burrobush (*Ambrosia dumosa*) and creosote bush (*Larrea tridentata*) are important secondary species. Desert senna (*Senna armata*) is often present.

This ecological site is very unlikely to burn, or to burn extensively due to extremely low production of surrounding hyperthermic fan

aprons.

Road development and associated ditches alter drainage patterns, which may cause drainageways to become wider, deeper, and alter their course, or may divert flow away from channels which would transition them to an upland community. If the site experiences significant surface disturbance, the abundance of white burrobush (*Hymenoclea salsola*) would increase. Initially after the disturbance, the site would experience heavier sediment loads down the active channel, becoming more deeply incised. Later on as white burrobush invaded those disturbed areas, the surface layers would stabilize. If the hydrology were to change, routing water away from the wash, the site would loose its wash-dependant species like white burrobush and desertsenna. The site would then be colonized by the plants characteristic of the surrounding alluvial fans and fan remnants, burrobush and creosote bush.

State and transition model

Figure 1. Braided Hyperthmic Ephemeral Drainage Complex

Additional community tables

Table 4. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Shrub/Vine					
1	Shrubs			45-224	
	burrobrush	HYSA	<i>Hymenoclea salsola</i>	15-157	–
	burrobush	AMDU2	<i>Ambrosia dumosa</i>	34-67	–
	creosote bush	LATR2	<i>Larrea tridentata</i>	0-6	–
	desertsenna	SEAR8	<i>Senna armata</i>	0-2	–
Forb					
2	Native Annual Forbs			0-6	
	bristly fiddleneck	AMTE3	<i>Amsinckia tessellata</i>	0-1	0-1
	sandmat	CHAMA15	<i>Chamaesyce</i>	0-1	0-1
	pincushion flower	CHFR	<i>Chaenactis fremontii</i>	0-1	0-1
	cryptantha	CRYPT	<i>Cryptantha</i>	0-1	0-1
	birdcage evening primrose	OEDE2	<i>Oenothera deltoides</i>	0-1	0-1
	manybristle chinchweed	PEPA2	<i>Pectis papposa</i>	0-1	0-1
	desert Indianwheat	PLOV	<i>Plantago ovata</i>	0-1	0-1
Grass/Grasslike					
3	Non-native annual grasses			0-1	
	common Mediterranean grass	SCBA	<i>Schismus barbatus</i>	0-1	0-1

Table 5. Community 2.2 plant community composition

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

Community Phase 2.1, 2012 Mojave National Preserve: 2012CA795112 2012CA795127 2012CA795150

Approval

Kendra Moseley, 2/18/2025

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	09/10/2026
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:
