USDA Natural Resources Conservation Service

Ecological site R030XY128CA
Broad, Gravelly, Hyperthermic Ephemeral Stream

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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.

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): 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.

"XY" LRU:
This LRU is found throughout the Mojave Desert MLRA. This LRU designation is set aside for ecological sites that are ubiquitous throughout the MLRA. These sites are driven by environmental or chemical features that override the climatic designations of the other LRU's or are atypical compared to the surrounding landscape. Common overriding XY characteristics within this MLRA include: ephemeral streams subject to flash flood events, riparian areas or other water features, and soils with strong chemical influence (Na, Ca, etc).

Ecological Site Concept:
This ecological site occurs at the base of steep mountains, receiving flow from third order channels or larger. Landforms are channels, drainageways, and inset fans. This site is subject to large flash flood events, which

become less concentrated as flow disperses across the fan. The soils are primarily hyperthermic, very deep, and composed of stratified layers of gravelly sands. The site is dominated by burrobrush (Hymenoclea salsola), Schott's dalea (*Psorothamnus schottii*), desert lavender (Hyptis emoryi), creosote bush (Larrea tridentata), brittlebush (Encelia farinosa), and sweetbush (*Bebbia juncea*). Elevations range from 390 to 3770 feet with slope ranging from 2 to 15 percent.

Data ranges in the physiographic data, climate data, water features, and soil data sections of this Ecological Site Description are based on major and minor components, since it is often only associated with minor components.

Associated sites

R030XB139CA	**Shallow Dry Hill 4-6 P.Z.** This ecological site is on footslopes of mountains at higher elevations on thermic soils, with creosote bush and burrobush.
R030XB140CA	**Shallow Hill 4-6" P.Z.** This ecological site is on north facing mountain slopes at higher elevations on thermic soils with burrobush, creosote bush and other species.
R030XB172CA	**Warm Gravelly Shallow Hills** This ecological site is found on thermic rocky slopes with creosote bush, Parish's goldeneye, and a diversity of other species.
R030XB213CA	**Moderately Deep Gravelly Mountain Slopes** This ecological site is found on steep slopes on the upper mountains, with California juniper and Eastern Mojave buckwheat.
R030XD003CA	**Hyperthermic Steep South Slopes** This ecological site is on hyperthemic soils, generally on south facing slopes, and is dominated by brittlebush and creosote bush.
R030XD039CA	**Coarse Gravelly Fans** This site is on the adjacent alluvial fans and is dominated by brittlebush and creosote bush.
R030XD040CA	**Hyperthermic Steep North Slopes** This ecological site is on hyperthermic mountains slopes, generally north facing, and has creosote bush, burrobush and brittlebrush.

Similar sites

R040XD034CA	**Gravelly, Braided, Ephemeral Stream** This ephemeral stream is similar, but is within the Sonoran Desert, and smoketree is more common.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Hymenoclea salsola* (2) *Psorothamnus schottii*
Herbaceous	(1) *Camissonia* (2) *Phacelia tanacetifolia*

Physiographic features

This site is found on occasionally to frequently flooded channels, drainageways and inset fans. This ecological site occurs at elevations of 390 to 3770 feet. Slopes are typically 2 to 8 percent, but may range from 2 to 15 percent.

Table 2. Representative physiographic features

Landforms	(1) Channel (2) Drainageway (3) Inset fan
Flooding duration	Very brief (4 to 48 hours)

Flooding frequency	None to frequent
Ponding frequency	None
Elevation	119–1,149 m
Slope	2–15%
Aspect	Aspect is not a significant factor

Climatic features

The climate is arid with hot, dry summers and warm, moist winters. The mean annual precipitation is 75 to 178 millimeters (3 to 7 inches) and the mean annual air temperature is 17 to 23 degrees C (63 to 73 degrees F.). The frost-free season is 280 to 340 days, and the freeze-free season is 310 to 360 days.

The tabular climate summary for this ESD was generated by the Climate Summarizer (http://www.nm.nrcs.usda.gov/technical/handbooks/nrph/Climate_Summarizer.xls) using data from the climate stations listed below (results are unweighted averages).

Table 3. Representative climatic features

Frost-free period (average)	340 days
Freeze-free period (average)	360 days
Precipitation total (average)	178 mm

Influencing water features

This ecological site is influenced by high volume and high intensity occasional to frequent flash flood events.

Soil features

The soils associated with this ecological site are very deep, somewhat excessively to excessively drained, and formed in alluvium from gneiss and/or granitoid rocks. The surface textures are very gravelly loamy sand, gravelly sand, and sand. Subsurface horizons (1 to 59 inches) are composed of stratified layers of sandy textures with non gravelly to extremely gravelly modifiers. Surface rock fragments less than 3 inches range from 5 to 75 percent cover, and fragments greater than 3 inches range from 0 to 5 percent cover. Subsurface percent by volume of rock fragments less than 3 inches ranges from 10 to 65, and greater that 3 inch fragments range from 0 to 20.

The Carrizo soils are: sandy-skeletal, mixed, hyperthermic Typic Torriorthents. The Pintobasin soils are: mixed, hyperthermic Typic Torripsamments. The Cajon soils are associated with one mapunit and are: mixed, thermic Typic Torripsamments. The Cajon soils have a thermic soil temperature regime which is unusual for this ecological site, but this ecological site can be found in warm-thermic soil temperature zones.

This ecological site is associated with the following map units and soil components within the Joshua Tree National Park Soil Survey (CA794):

Map unit,Component and local phase, percent
1241; Meccapass-Seanna-Contactmine complex, 15 to 75 percent slopes; Cajon;rarely flooded; 4
1240; Meccapass-Bulletproof-Rock outcrop complex, 30 to 75 percent slopes; Carrizo; occasionally flooded; 1
1250; Ironlung-Rock outcrop complex, 30 to 75 percent slopes; Carrizo; occasionally flooded; 2
1255; Goldenhills-Bulletproof-Fanhill-Whiterobe complex, 30 to 75 percent slopes; Carrizo; occasionally flooded; 2
1260; Whiterobe-Bigbernie complex, 30 to 75 percent slopes; Carrizo; occasionally flooded; 3
1527; Pintobasin gravelly loamy fine sand, 4 to 15 percent slopes; Carrizo; frequently flooded; 3
1542; Carrizo complex, 4 to 15 percent slopes;Carrizo; occasionally flooded; 20
and Carrizo; frequently flooded;3
2111; Descent-Rubylee association, 8 to 50 percent slopes; Carrizo; occasionally flooded; 5
2840; Rock outcrop-Stormjade complex, 30 to 75 percent slopes; Carrizo; frequently flooded; 2

1527; Pintobasin gravelly loamy fine sand, 4 to 15 percent slopes; Pintobasin; occasionally flooded, gravelly surface; 7
2835; Rock outcrop-Blackeagle complex, 30 to 75 percent slopes; Rizzo; frequently flooded; 1

Table 4. Representative soil features

Parent material	(1) Alluvium–gneiss
Surface texture	(1) Very gravelly loamy sand (2) Gravelly sand (3) Sand
Family particle size	(1) Sandy
Drainage class	Somewhat excessively drained to excessively drained
Permeability class	Rapid
Soil depth	152 cm
Surface fragment cover <=3"	5–75%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	2.54–7.37 cm
Calcium carbonate equivalent (0-101.6cm)	0–5%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–4
Soil reaction (1:1 water) (0-101.6cm)	6–8.4
Subsurface fragment volume <=3" (Depth not specified)	10–65%
Subsurface fragment volume >3" (Depth not specified)	0–20%

Ecological dynamics

This ecological site occurs at the base of steep mountains on channels, drainageways, and inset fans on fan piedmonts. This site is distinguished by predominately hyperthermic soils, large drainage size and high sediment transport capacity. This site receives flow from large, third-order (or greater) drainageways, which drain steep erodible mountains. The stream channel on the upper fan is typically braided with little entrenchment, but there may be channel sections with active erosion that have caused the channel to become deeply entrenched. Channel entrenchment may be caused by natural sediment adjustments (such as flood after a drought) or by human causes, such as OHV's travelling up the channel and alluvial fans. At lower fan positions, deposition occurs with sheet flow across inset fans and into divergent channels.

Soil disturbance from flash flood events is the primary driver of plant community dynamics within this ecological site. Ephemeral streams lack permanent flow except in response to rainfall events (Bull 1997, Levick et al. 2008). These ephemeral streams are characterized by extreme and rapid variations in flooding regime, and a high degree of temporal and spatial variability in hydrologic processes (Bull 1997, Stanley et al. 1997, Levick et al. 2008, Shaw and Cooper 2008).

This site can experience channel avulsion (defined as the "diversion of the majority of the surface flow to a different channel, with total or partial abandonment of the original channel" [(Field 2001)]). As sediment deposits in the active drainageway the likelihood of channel avulsion increases because of decreased drainageway volume. Cycles of channel avulsion on alluvial fans are an ongoing and a long-term process in the development of alluvial fans, and can occur after any substantial overland flow event when existing channel capacity is rapidly and dramatically exceeded.

The active channels on the upper fans have a broad active channel that is often braided, with low cover of burrobrush. Along channel edges or among the braided islands, Schott's dalea and desert lavender are common and catclaw acacia (*Acacia greggii*) and smoketree (*Psorothamnus spinosus*) are occasionally present. Lower on the fans, when flow volume and velocity have decreased, burrobrush has high cover in the active channel. In areas of less frequent flooding, there is higher diversity of shrubs, such as creosote bush, brittlebush, sweetbush (*Bebbia juncea*), desert lavender, and Schott’s dalea. Creosote bush is present along the channel margins of this site or on raised bars within the active flooding zone. Individuals are larger and more productive in the wash than in neighboring alluvial fans, without the extra run-on. Burrobrush is a pioneer species that can quickly colonize disturbed areas, and may establish in ephemeral washes and upland sites.

Other disturbances such as drought, fire, and human hydrologic alterations can affect the community composition and/or hydrologic process of this site. Drought is common in the desert, and can cause mortality or die-back of vegetation. Decreased vegetative cover can lead to increased erosion and change sediment deposition patterns, possibly increasing the chance of channel migration.

Historically fire was very uncommon in these ephemeral drainages; however the presence of continuous and flashy fuels from non-native grasses in adjacent upland sites can increase the possibility of fire. Invasion by non-native annual grasses has increased the flammability of desert vegetation communities (Brooks 1999, Brooks et al. 2004), and after fire, Mojave Desert ecosystems appear to be more susceptible to invasion by exotic grasses, leading to a grass-fire cycle (D'Antonio and Vitousek 1992). Very wet (El Nino) years followed by severe drought produce conditions where large areas where creosote scrub burn (Brown and Minnich 1986, DeFalco et al. 2010).

A properly functioning ephemeral drainage will provide some similar hydrologic functions as perennial streams. Ephemeral streams maintain water quality by allowing energy dissipation during high water flow. They transport nutrients and sediments, store sediments and nutrients in deposition zones, provide temporary storage of surface water, and longer duration storage of subsurface water. The structure and forage provided by diverse vegetation, and the availability of water (although brief), significantly increases animal abundance along ephemeral streams relative to upland areas. The open channels provide important migration corridors for wildlife (Levick et al. 2008).

When modifications affect the hydrologic function of this ephemeral stream system, this ecological site has the potential to transition to a hydrologically altered state (State 3). Once this threshold is crossed, it is extremely difficult to repair the hydrologic system.

Modifications to hydrology such as surface flow alterations, ground water depletion, and loss of vegetative cover can have irreversible impacts on hydrologic processes (Nishikawa et al. 2004, Levick et al. 2008). An increase in cover of impermeable surfaces (such as pavement, homes, malls, etc.) reduces the amount of runoff that can infiltrate into the soil creating higher surface runoff and greater peak flows. The runoff is collected in ditches, culverts, and drainage networks, and diverted to the nearest ephemeral stream. In some areas, ephemeral streams are armored to reduce damage to property from flood events. These confined channels reduce the ability for the stream to spread out and decrease flow velocity to allow sediment deposition. As a result, the channels will generally incise, with a higher volume of concentrated flows. These processes eventually cause higher peak flows due to increased runoff and concentrated flows. Higher flow velocities may cause uprooting, stem breakage or scour under the roots of vegetation. This loss of root structure along the stream increases scour potential, and the loss of above ground vegetation will increase flow velocity. When the vegetative community is degraded, important animal species dependent upon this community may be lost from the area as well. Ground water drawdown from household wells (Nishikawa et al. 2004) can deplete the water source for deep rooted species such as desert lavender, catclaw acacia, and smoketree.

State and transition model

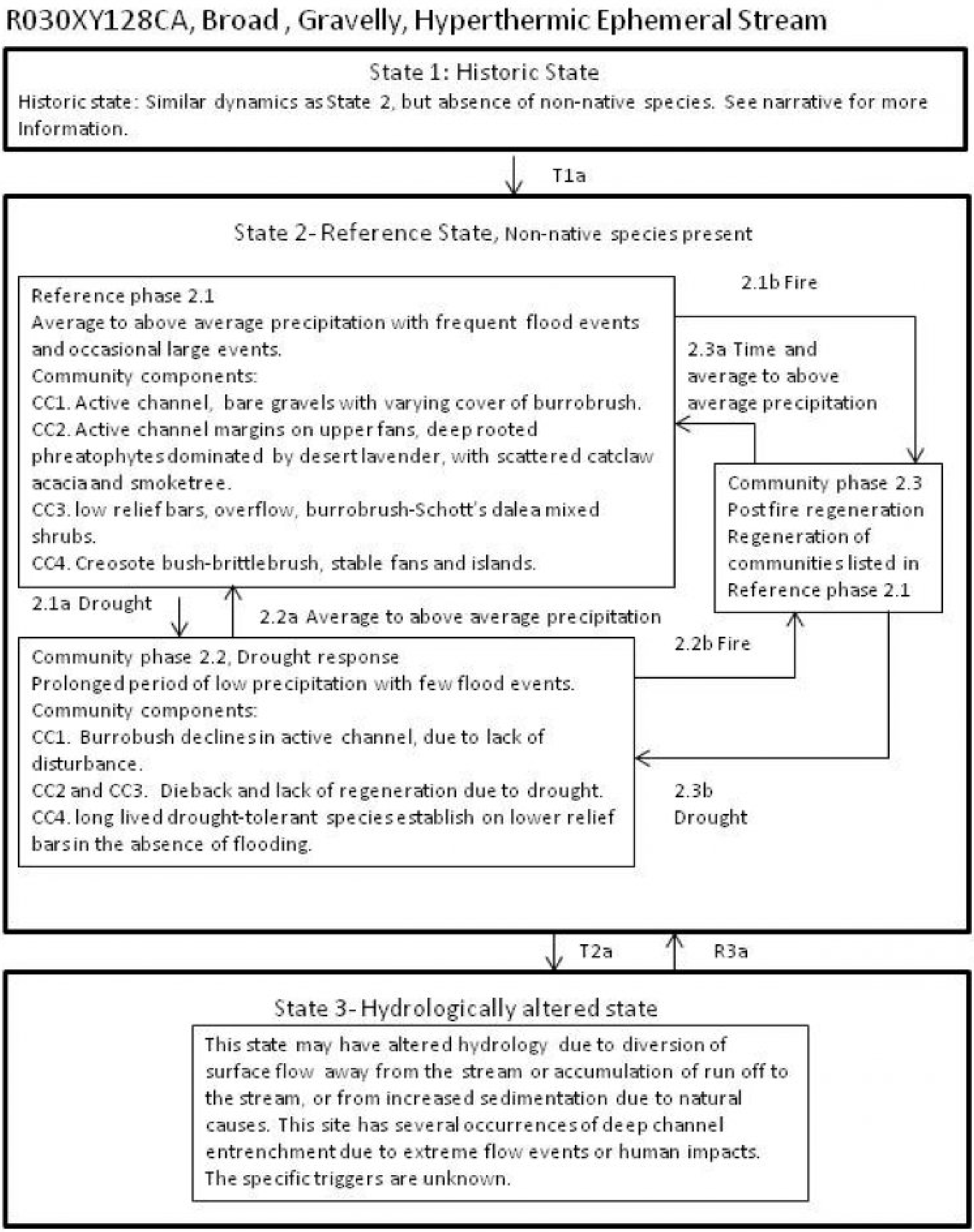

Figure 4. R030XY128CA Model

State 1
Historic State

State 1 represents the historic-natural condition for this ecological site. It is similar to State 2, but has only native species. If we were to include dynamics for this state it would be the same as displayed in State 2. The presence of non-native species is minimal in State 2, and has not altered the hydrology or fire frequency.

State 2
Reference State

This state represents the most common and most ecologically intact condition for this ecological site at the present time.

Community 2.1
Reference Phase

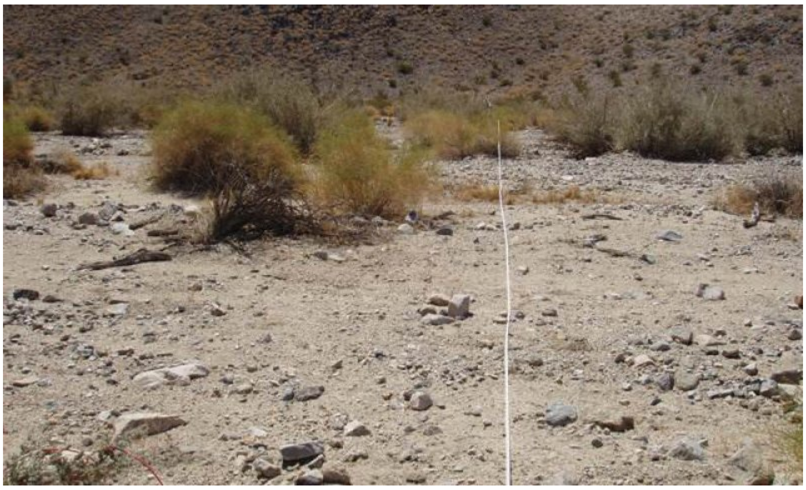

Figure 5. Active channel on upper fans

Figure 6. Active channel on lower fans

Figure 7. Mixed shrubs on lower fan

This community phase is dependent upon unimpaired hydrologic function and average to above average precipitation. At any given point along the stream the following community components are generally present. The relative spatial extent of these communities varies as the channel morphology fluctuates from flash flood events. Steeper reaches may be more incised with less chance of sheet flow over the banks. In lower slope reaches sediment fills the main channel, increasing the chance of sheet flow across the area. Four community components are present, including: Community Component 1 (CC1): This community is on the active channels near the fan apex, there is higher flow volume and intensity, creating zones of high scour with little vegetation. On the more distal reaches of the alluvial fan, flow disperses into divergent channels and infiltrates into the soil, thus decreasing scour potential and increasing sediment deposition. In these zones of less scour intensity burrobrush may have high cover in the active channel. Data for this community phase was not collected independently for the different community types, so the data is combined in the tables below. The active channels closer the mountains are mostly barren, while the active channels on more distal segments are dominated by burrobrush and annual forbs. Community Component 2 (CC2): This community is on the active channels margins near the apex of the alluvial fan in mountain drainageways. It has high transport capacity, creating a wide barren active channel, with many braided channels. Schott's dalea is common in this site and it depends on flood water for dispersal and seed germination (Vogl and McHargue 1966). It occurs on hyperthermic soils in habitats receiving additional run-on such as rocky hill-slopes, washes, and alluvial fans with regular sheet-flow. This site is at the northern most distribution of Schott's dalea. It is more common further south in California and Northern Mexico. Data is lacking on the ecology of this species. Desert lavender is an important species in this community. Desert lavender is found on rocky mountains slopes where additional runon is available, but is confined to washes in more arid zones of its distribution, which is where this site is located. In more arid zones, it considered a phreatophyte, which means it has deep roots and is dependent upon a deep water source (Nilsen et al. 1984). Other phreatophytes occasionally present in this community are catclaw acacia and smoketree. The presence of these phreatophytes indicates that there is deep water source below the channels, for some duration of the year. Forbs are abundant in years of high rainfall, but may be patchily present every year due to run-on. Common forbs include cryptantha (Cryptantha spp.), Western Mojave buckwheat (*Eriogonum mohavense*), smooth desertdandelion (*Malacothrix glabrata*), sowthistle desertdandelion (*Malacothrix sonchoides*), and chia (*Salvia columbariae*). Community Component 3 (CC3): This community is present on low relief bars with occasional sheet floods. Burrobrush and desert lavender dominate with a mix of shrubs such as sweetbush, bladderpod spiderflower (*Cleome isomeris*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), Schott's dalea (*Psorothamnus schottii*), brittlebrush, creosote bush, and desertsenna (*Senna armata*). The forbs listed in CC2 are present in this community as well. Community Component 4 (CC4): This community is an upland community that may be found on stable islands or at higher positions along the drainage adjacent to the stable alluvial fans. It is dominated by creosote bush, brittlebrush and occasional burrobush (*Ambrosia dumosa*). The non-native annual forb redstem stork's bill (*Erodium cicutarium*) is present but with low cover. Red brome (*Bromus rubens*) and Mediterranean grass (Schismus sp.) are present, but have less than 1 percent cover.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	108	230	353
Forb	–	17	28
Grass/Grasslike	–	1	2
Total	**108**	**248**	**383**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	13-42%
Grass/grasslike foliar cover	0%
Forb foliar cover	0-5%
Non-vascular plants	0%
Biological crusts	0%
Litter	15-36%
Surface fragments >0.25" and <=3"	30-80%

Surface fragments >3"	1-12%
Bedrock	0%
Water	0%
Bare ground	18-40%

Community 2.2
Drought Response

This community develops with prolonged or severe drought. It is difficult to determine the exact duration or intensity of drought that will cause this change, but a one to two year severe drought (of approximately 60 percent or less of average annual precipitation) can cause severe mortality in short lived perennials (Bowers 2005, Hereford et al. 2006, Miriti et al. 2007). During drought years, flood events are unlikely. The plant community components remain similar to those described in Community Phase 2.1, but show a decline in overall health, cover and production due to drought. Shorter lived species (such as burrobrush, sweetbush, brittlebush and desertsenna) may suffer high mortality while longer lived species with deeper roots (desert lavender, smoketree, catclaw acacia, creosote bush and Schott's dalea) may take longer to respond to drought conditions, but may eventually have severe branch die back. Desert lavender is summer deciduous, and produces sun and shade leaves. The sun leaves are small, thick and densely pubescent, while the shade leaves are larger and thinner with fewer hairs. During periods of drought, desert lavender can adjust it leaf type and production to eliminate water loss and slow photosynthesis. Catclaw acacia is winter deciduous species that relies heavily on a deep water source, conducting photosynthesis in the early morning and closing stomata during the heat of the day. Smoketree utilizes a deep water source and is primarily stem photosynthetic, as it leafless most of the year, thus reducing water loss through leaves (Nilsen et al. 1984).

Community 2.3
Post-fire Regeneration

Initially annuals and short-lived perennials will dominate the post-fire plant community. Short-lived shrubs capable of quickly colonizing after fire include burrobrush and brittlebrush, sweetbush, burrobush, and Mojave rabbitbrush. These species produce prolific amounts of seed that are easily wind dispersed. Creosote bush is generally killed by fire, and is slow to re-colonize burned areas due to specific recruitment requirements. Desert lavender and catclaw acacia can resprout prolifically after a burn and may increase in cover after the first few years post-fire (Brown and Minnich 1986, Brooks et al. 2007, Steers and Allen 2011).

Pathway 2.1a
Community 2.1 to 2.2

This pathway is caused by a prolonged or severe drought.

Pathway 2.1b
Community 2.1 to 2.3

This pathway is caused by moderate to severe fire.

Pathway 2.2a
Community 2.2 to 2.1

This pathway occurs with the return of average to above average precipitation and associated flood events.

Pathway 2.2b
Community 2.2 to 2.3

This pathway occurs as a result of fire. Given low cover of annuals during drought, this pathway is unlikely except in periods immediately following heavy precipitation years

Pathway 2.3a
Community 2.3 to 2.1

This pathway occurs in response to the passing of time with average to above average precipitation and associated flood events.

Pathway 2.3b
Community 2.3 to 2.2

This pathway occurs in response to the passing of time with drought conditions and absence of flooding.

State 3
Hyrologically Altered

State 3 represents altered hydrological conditions. Data is needed to develop a successional diagram for this state. This site may be hydrologically altered due to surface flow alterations, changes in sediment transport capacity, or ground water depletion.

Community 3.1
Hydrologically Altered

Channel entrenchment can develop due to a range of interacting factors (Bull 1997), including the creation of drainage ditches in urban areas (NRCS staff observations) which cause increased runoff in downstream reaches due to an increase in impervious surfaces with urbanization (Nishikawa et. al. 2004). Incised arroyos may form due to extreme climatic events, especially if they follow a period of drought or a fire that also burns upslope hill communities (Bull 1997). Landform alterations or road development can divert water away from washes, eliminating water flow and flood disturbances. Over time, disturbance or flood- adapted species like burrobrush, Schott’s dalea, and desertsenna may die out, leaving a community dominated by stable upland species. Ground water drawdown from household wells (Nishikawa et. al. 2004) or the diversion of surface flow in the upper watershed can deplete the water source for deep rooted species such as desert lavender, catclaw acacia and smoketree.

Transition T2a
State 2 to 3

Triggers that can cause a transition to State 3 include surface flow alterations and prolonged drought. Any of the community phases from this state can cross the threshold to State 3, but community phase 2.3 and the later stages of 2.2 are especially vulnerable because decreases in vegetation density (and upland vegetation density) leave soils more susceptible to erosion (Bull 1997).

Restoration pathway R3a
State 3 to 2

Restoration from State 3 back to State 2 would be an intensive task. Individual site assessments would be required to determine proper restoration methods. Some hydrological modifications are not feasible restored, such as ground water depletion. However, road diversions can be redesigned to allow proper stream alignment and flow. Seeds or plants of appropriate species may need to be reintroduced to the restored channels.

Additional community tables

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Shrub/Vine					
1	**Shrubs**			108–353	
	burrobrush	HYSA	*Hymenoclea salsola*	45–317	7–40
	Schott's dalea	PSSC5	*Psorothamnus schottii*	0–87	0–4
	sweetbush	BEJU	*Bebbia juncea*	0–56	0–11

	creosote bush	LATR2	*Larrea tridentata*	11–56	1–3
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0–34	0–5
	brittlebush	ENFA	*Encelia farinosa*	0–34	0–2
	desert lavender	HYEM	*Hyptis emoryi*	0–18	0–2
	desertsenna	SEAR8	*Senna armata*	0–17	0–2
	smoketree	PSSP3	*Psorothamnus spinosus*	0–11	0–1
	California barrel cactus	FECY	*Ferocactus cylindraceus*	0–11	0–1
	catclaw acacia	ACGR	*Acacia greggii*	0–11	0–1
	burrobush	AMDU2	*Ambrosia dumosa*	0–11	0–1
	Nevada jointfir	EPNE	*Ephedra nevadensis*	0–9	0–1
	bladderpod spiderflower	CLIS	*Cleome isomeris*	0–6	0–1
	branched pencil cholla	CYRA9	*Cylindropuntia ramosissima*	0–1	0–1
	Schott's pygmycedar	PESC4	*Peucephyllum schottii*	0–1	0–1
Forb					
2	**Native Forbs**			0–27	
	burrobrush	HYSA	*Hymenoclea salsola*	69–140	–
	water jacket	LYAN	*Lycium andersonii*	24–45	–
	sweetbush	BEJU	*Bebbia juncea*	19–45	–
	catclaw acacia	ACGR	*Acacia greggii*	20–39	–
	Mexican bladdersage	SAME	*Salazaria mexicana*	19–36	–
	desert lavender	HYEM	*Hyptis emoryi*	20–35	–
	suncup	CAMIS	*Camissonia*	0–34	0–2
	lacy phacelia	PHTA	*Phacelia tanacetifolia*	0–34	0–2
	brittlebush	ENFA	*Encelia farinosa*	17–34	–
	smooth desertdandelion	MAGL3	*Malacothrix glabrata*	0–20	0–1
	slender poreleaf	POGR5	*Porophyllum gracile*	6–11	–
	button brittlebush	ENFR	*Encelia frutescens*	4–9	–
	sowthistle desertdandelion	MASO	*Malacothrix sonchoides*	0–3	0–1
	cryptantha	CRYPT	*Cryptantha*	0–1	0–1
	Western Mojave buckwheat	ERMO3	*Eriogonum mohavense*	0–1	0–1
	desert Indianwheat	PLOV	*Plantago ovata*	0–1	0–1
	chia	SACO6	*Salvia columbariae*	0–1	0–1
3	**Non-native forb**			0–1	
	redstem stork's bill	ERCI6	*Erodium cicutarium*	0–1	0–1
	brownplume wirelettuce	STPA4	*Stephanomeria pauciflora*	0–1	–
Grass/Grasslike					
4	**non-native annual grasses**			0–2	
	red brome	BRRU2	*Bromus rubens*	0–1	0–1
	Mediterranean grass	SCHIS	*Schismus*	0–1	0–1

Animal community

Small animals utilize or live in this ecological site. Animal diversity in this ecological site may be greater than in other areas due to the higher diversity of species on this site. Large shrubs and trees, such as desert lavender, catclaw acacia, and smoketree provide structural diversity and additional food sources that may support a higher diversity of fauna. Annual and perennial forbs provide forage. Ephemeral drainages are important wildlife migration corridors.

Hydrological functions

Ephemeral drainages provide some similar hydrologic functions as perennial streams. A properly functioning system will maintain water quality by allowing energy dissipation during high water flow. These systems transport nutrients and sediments, and store sediments and nutrients in deposition zones. Ephemeral drainages provide temporary storage of surface water, and longer duration storage of subsurface water (Levick et al. 2008)

Recreational uses

This site provides many opportunities to view wildlife, and provides relatively easy access. Many bird, lizard and small mammal species make use of and live in the site, and wildflower displays may occur even in years with lower rainfall.

Inventory data references

The following NRCS vegetation plots were used to describe this ecological site:

1249720503
1249810417- type location
1249810419

Type locality

Location 1: Riverside County, CA	
UTM zone	N
UTM northing	3756192
UTM easting	555837
General legal description	The type location is in Joshua Tree National Park, east of Desert Hot Springs, about .5 miles northeast of Aqueduct Road.

Other references

Bowers, J. E. 2005. Effects of drought on shrub survival and longevity in the northern Sonoran Desert. Journal of the Torrey Botanical Society 132:421-431.

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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:**