USDA Natural Resources Conservation Service

Ecological site R030XB021NV
STREAMBANK

Last updated: 2/18/2025
Accessed: 05/10/2025

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.

MLRA notes

Major Land Resource Area (MLRA): 030X–Mojave Basin and Range

The Mojave Desert Major Land Resource Area (MLRA 30) 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 Mojave Desert is a transitional area between hot deserts and cold deserts where close proximity of these desert types exert enough influence on each other to distinguish these desert types from the hot and cold deserts beyond the Mojave. Kottek et. al 2006 defines hot deserts as areas where mean annual air temperatures are above 64 F (18 C) and cold deserts as areas where mean annual air temperatures are below 64 F (18 C). Steep elevation gradients create islands of low elevation hot desert surrounded by islands of high elevation cold desert.

The Mojave Desert receives less than 10 inches of mean annual precipitation. Low elevation hot desert areas are often hyper-arid while high elevation cold deserts are often semi-arid with the majority of the Mojave being an arid climate. Hyper-arid areas receive less than 4 inches of mean annual precipitation and semi-arid areas receive more than 8 inches of precipitation (Salem 1989). The western Mojave receives nearly no precipitation during the summer months while the eastern Mojave experiences some summer monsoonal activity.

In summary, the Mojave is a land of extremes. Elevation gradients contribute to extremely hot and dry summers and cold moist winters where temperature highs and lows can fluctuate greatly between day and night, from day to day and from winter to summer. Precipitation falls more consistently at higher elevations while lower elevations can experience long intervals without any precipitation. Lower elevations also experience a low frequency of precipitation events so that the majority of annual precipitation may come in only a couple precipitation events during the whole year. Hot desert areas influence cold desert areas by increasing the extreme highs and shortening the length of below freezing events. Cold desert areas influence hot desert areas by increasing the extreme lows and increasing the length of below freezing events. Average precipitation and temperature values contribute little understanding to the extremes which govern wildland plant communities across the Mojave.

LRU notes

The Mojave Desert is currently divided into 5 Land Resource Units (LRUs). This ecological site is within the Arid Eastern Mojave LRU where precipitation is bi-modal, occurring during the winter months and summer months. The Arid Eastern Mojave LRU is designated by the 'XB' symbol within the ecological site ID. This LRU is found across the eastern half of California, much of the mid-elevations of Nevada, the southernmost portions of western Utah, and the mid-elevations of northwestern Arizona.

Elevations range from 1650 to 4000 feet and precipitation is between 4 to 8 inches per year. This LRU is distinguished from the Arid Western Mojave (XA) by the summer precipitation, falling between July and September, which tends to support more warm season plant species. The 'XB' LRU is generally east of the Mojave River and the 117 W meridian (Hereford et. al 2004). Vegetation includes creosote bush, burrobush, Nevada jointfir, ratany, Mojave yucca, Joshua tree, cacti, big galleta grass and several other warm season grasses. At the upper portions

of the LRU, plant production and diversity are greater and blackbrush is a common dominant shrub.

Ecological site concept

This site occurs on flood plains, river valleys and valley floors of perennial streams where a water table is close to the soil surface at elevations below 3000 feet.

This is a group concept and provisional STM that also covers R030XF034CA.

Associated sites

R030XB005NV	**Arid Active Alluvial Fans** This site is found on adjacent alluvial fans.
R030XB019NV	**Eroded Fan Remnant Pavette 4-6 P.Z.** This site is found on adjacent alluvial fans with a pavette microfeature.
R030XB020NV	**LOAMY BOTTOM** This site is found on adjacent outer margins of the stream terrace.
R030XB001NV	**LIMY HILL 5-7 P.Z.** This site is found on adjacent hill slopes.
R030XB028NV	**VALLEY WASH** This site is found on nearby ephemeral streams without a water table near the soil surface.

Similar sites

R030XB020NV	**LOAMY BOTTOM** This site is found on adjacent outer margins of the stream terrace.
R030XA125AZ	**Sandy Bottom 3-6" p.z. Wet** Essentially the same ecological site concept.
R030XA111AZ	**Saline Bottom 3-6" p.z.** Essentially the same ecological site concept.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Prosopis*
Herbaceous	(1) *Sporobolus airoides*

Physiographic features

This site occurs on inset fans and axial stream channels on the marigns and adjacent banks of perennial streams. Slopes from 0 to 2 percent are most typical. Elevations are below 3000 feet.

Table 2. Representative physiographic features

Landforms	(1) Flood plain (2) River valley (3) Valley floor
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	0–3,000 ft
Slope	0–2%
Water table depth	17–48 in

Aspect	Aspect is not a significant factor

Climatic features

The climate of the Mojave Desert has extreme fluctuations of daily temperatures, strong seasonal winds, and clear skies. The climate is arid and is characterized with cool, moist winters and hot, dry summers. Most of the rainfall falls between November and April. Summer convection storms from July to September may contribute up to 25 percent of the annual precipitation. Average annual precipitation is 3 to 7 inches. Mean annual air temperature is 55 to 76 degrees F. The average growing season is about 140 to 360 days.

Table 3. Representative climatic features

Frost-free period (average)	360 days
Freeze-free period (average)	
Precipitation total (average)	7 in

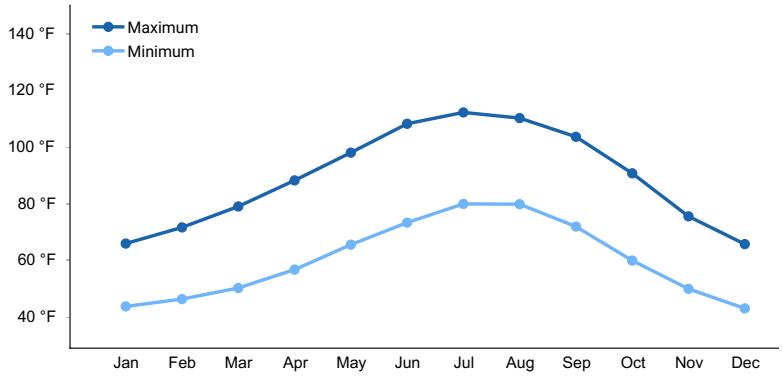


Figure 1. Monthly average minimum and maximum temperature

Influencing water features

Periodic flooding due to flash flooding events.

Soil features

The soils associated with this site are highly variable due to the close proximity of a perennial water flow with a table close to the soil surface. Soils can be deposits or what remains after material has been removed due to the landforms being the flood plains, river valleys and valley floors. The overriding abiotic factors are a perennial source of moisture and rare to frequent flash flooding events. Surface textures vary from sand to silty clay loam. Water intake rates are impermeable to moderate and available water capacity is very low to moderate. These soils are very poorly drained to somewhat excessively well drained and runoff is low to high.

Table 4. Representative soil features

Surface texture	(1) Silty clay loam (2) Sandy loam (3) Loamy sand
Family particle size	(1) Fine-silty (2) Sandy
Drainage class	Very poorly drained to somewhat excessively drained
Permeability class	Moderate
Soil depth	72–84 in
Surface fragment cover <=3"	4–57%

Available water capacity (0-40in)	2–6.6 in
Calcium carbonate equivalent (0-40in)	5–60%
Electrical conductivity (0-40in)	0–32 mmhos/cm
Sodium adsorption ratio (0-40in)	0–30
Soil reaction (1:1 water) (0-40in)	6.6–9
Subsurface fragment volume <=3" (Depth not specified)	4–57%

Ecological dynamics

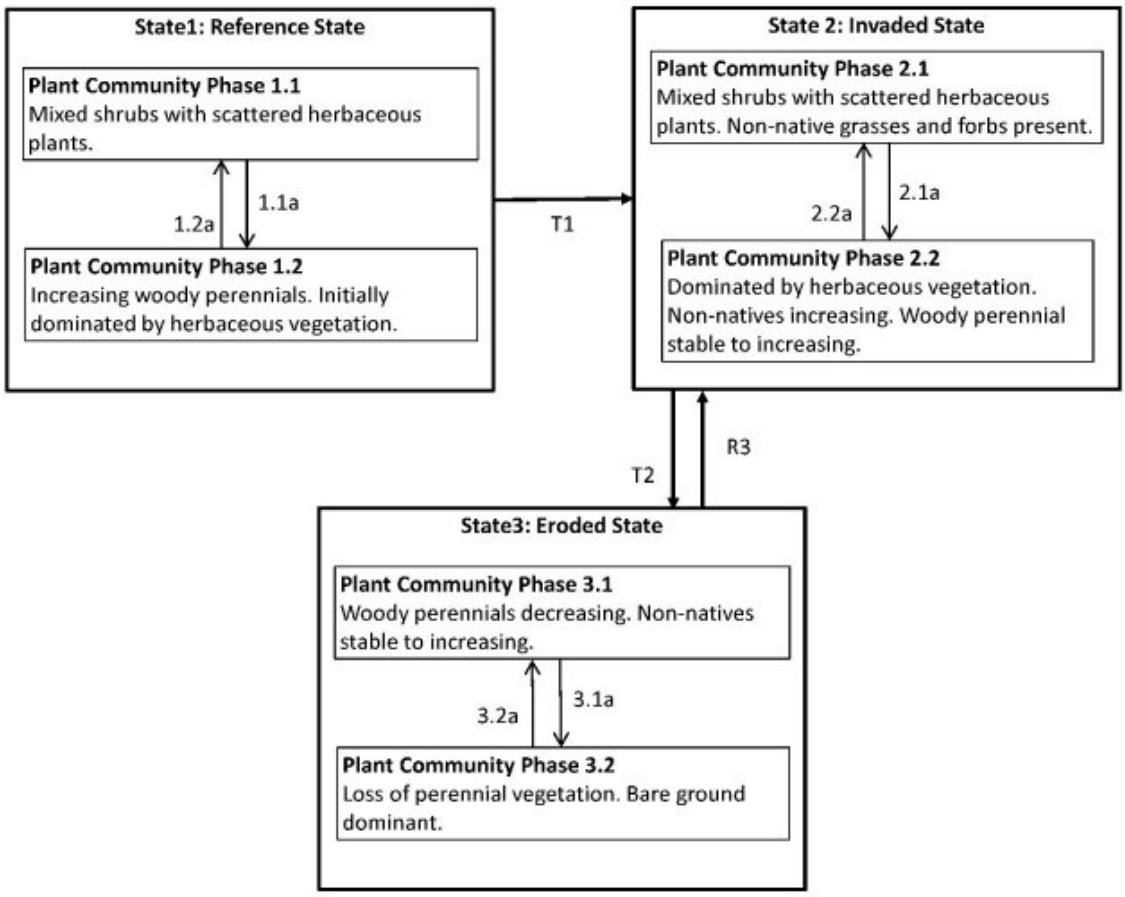
This ecological site occurs along perennial streams. The sparseness of vegetation along desert stream banks contributes to channel widening tendencies (Levick et al 2008). Along the desert washes, vegetation composition and structure overlap considerably with those of the surrounding desert uplands. An example of this is creosotebush and white bursage commonly occur in the washes and adjoining uplands. As water availability increases, the vegetation becomes increasingly distinct from the upland vegetation with respect of physiognomy and species composition. Canopy cover increases and mesoriparian and hydroriparian species increase in abundance (Levick et al 2008). The four wash ecological sites are characterized as having intermediate water availability and support more drought-tolerant shrubs.

As a result of decreased flow rates in the downstream direction, more silts and fines are deposited in the channel, which can be advantageous to biotic communities. Many of the species (white burrobush, desert rabbitbrush, baccharis, sweetbush) occurring on these sites are generally considered to be increasers or pioneers in the presence of disturbance (Abella 2010). These species produce prolific numbers of wind-dispersed seeds and are more abundant in ephemeral streams with intense flood scour (Levick et al 2008). Rainfall and flood flow events can trigger a pulse of germination of annual and perennial forbs from a diverse soil seed bank. Some species, such as catclaw acacia, desert willow, purple sage (*Salvia dorrii*), and bladdersage (*Salazaria mexicana*) have resprouting capabilities; an adaptation to withstand flooding flows. Catclaw acacia also has nitrogen fixing bacteria associated with its roots, which can be an important influence on local nitrogen availability. The increased availability of nutrients on these sites compared to the surrounding area increases the likelihood of encountering invasive species, like saltcedar (Tamarix spp.). Saltcedar is successful in arid environments due to its ability to tolerate unpredictable periods of moisture. Perturbation of these systems by natural or anthropogenic causes can result in the development of continuous incised channels.

Flooding is a natural disturbance within these ecological sites due to their location on the landscape. Floods help to redistribute nutrients across the landscape, as well as, encouraging resprouting and seedling establishment. Seedling establishment and canopy expansion is greater for plants growing in the drainageways than the surrounding area. However, these plants are less tolerant of extended dry periods because they are adapted to increased soil moisture (Hamerlynk and McAuliffe 2008). Very large rainfall events rarely occur but have the potential to remove existing vegetation and deposit new sediment, initiating secondary succession.

Wildfire is infrequent and patchy in this system. However, years with increased annual precipitation result in increased production from annuals and increase the chances of wildfire. Post fire creosotebush, baccharis and other fire intolerant shrubs decrease. Fire tolerant species such as bursage, burrowbrush, ephedra, desert willow and acacia are able to sprout from the root crown and may increase following wildfire. Fire also favors an increase by perennial native grasses.

State and transition model



State 1
Reference State

The reference state is representative of the natural range of variability under pristine conditions. It is maintained by periodic flooding in response to heavy rainfall events and has increased available moisture and nutrients. Fire is rare in this system. This ecological site experiences seasonal flooding and is important for redistributing moisture and nutrients throughout the landscape. Timing of disturbances combined with weather events determines plant community dynamics.

Community 1.1
Reference Plant Community

The visual aspect of the reference plant community is dominated by Fremont cottonwood, mesquite, desertwillow, and willow. Fremont cottonwood canopy cover is less than 10 percent. Potential vegetative composition is about 20% grasses, 10% forbs, 65% shrubs and 5% trees. Approximate ground cover (basal and crown) is less than 15 to 25 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	325	650	1625
Grass/Grasslike	100	200	500
Forb	50	100	250
Tree	25	50	125
Total	**500**	**1000**	**2500**

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	15-20%
Grass/grasslike foliar cover	0%
Forb foliar cover	2-3%
Non-vascular plants	0%
Biological crusts	0%
Litter	0%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Table 7. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	7-10%
Grass/grasslike basal cover	0%
Forb basal cover	1-2%
Non-vascular plants	0%
Biological crusts	0%
Litter	1-2%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Community 1.2
Plant Community 1.2

This plant community is characteristic of a post-disturbance plant community phase. Initially, it is heavily dominated by herbaceous vegetation and short-lived perennials. Sprouting shrubs quickly recover and provide a favorable environment for establishment of shrub seedlings. This plant community is ‘at-risk’ of invasion by non-natives. Non-native species are able to take advantage of increased availability of critical resources following disturbances.

Pathway 1.1a
Community 1.1 to 1.2

Drought, wildfire, disease or insect attack or other event which reduces vegetation cover

Pathway 1.2a
Community 1.2 to 1.1

Absence from disturbance and natural regeneration over time.

State 2
Representative Plant Community

The invaded state is characterized by the presence of non-native species in the understory. A biotic threshold is crossed with the introduction of non-natives that are difficult to remove from the system and have they potential to significantly alter disturbance regimes from their historic range of variation. Non-native annuals will persist once introduced into the plant community, due to their annual growth form, abundant seed production and long term seed viability. Non-native annuals such as red brome and cheatgrass are potential invaders on this ecological site. These non-native annuals are highly flammable and promote wildfires where fires historically have been infrequent.

Community 2.1
Plant Community Phase 2.1

Species composition is similar to the reference plant community. Ecological processes have not been compromised at this time, however, ecological resilience is reduced by the presence of non-natives. This plant community phase will respond differently following disturbance, when compared to the reference plant community. Management focused on decreasing the amount of anthropogenic disturbance is important for maintaining the health of perennial native species that protect the site against erosion.

Community 2.2
Plant Community Phase 2.2

This plant community is characteristic of a post-disturbance plant community. It is dominated by herbaceous vegetation, which may or may not be non-native, woody perennials are increasing. Nevada ephedra, desert almond and desert willow commonly sprout from rhizomes following disturbance. Sprouting species provide favorable sites for germination of species such as brittlebush, ratany, and bursage which reproduce sexually and are prolific seed producers. This plant community is ‘at-risk’ of increased erosion due to reduction of deep rooted perennials and increased non-native annuals.

State 3
Eroded State

This state is characterized by reduced cover of woody perennials. Bare ground is increasing, leading to increased erosion, decreased infiltration and loosening of the soil surface causing channeling. An abiotic threshold has been crossed preventing the natural repair of this plant community. Feedbacks keeping this state stable include reduced perennial vegetative cover causing increased runoff and decreased infiltration preventing the establishment of desirable perennial vegetation.

Community 3.1
Plant Community Phase 3.1

This plant community is characteristic of a short disturbance return interval. Long-lived woody perennials are decreasing. The ability of this site to dissipate energy during large flow events is severely reduced contributing to ecological damage downstream.

Community 3.2

Plant Community Phase 3.2

This plant community is characterized by the loss of long-lived woody perennials. Ecological processes have been altered including connectivity within the watershed, ground water recharge and habitat quality. Soil and soil nutrients are being redistributed down stream, leading to down cutting and channel widening.

Pathway 3.1a
Community 3.1 to 3.2

Seasonal flooding, drought, wildfire, disease, insect attack or other mechanism which reduces vegetation cover.

Pathway 3.2a
Community 3.2 to 3.1

Absence from disturbance and natural regeneration over time, allow some perennials to return to the system increasing stability.

Transition T1
State 1 to 2

Introduction of non-native species due to a combination of factors including: 1) surface disturbance, 2) changes in the kinds of animals and their grazing patterns, 3) drought and/or 4) changes in fire history.

Transition T2
State 2 to 3

Large scale reoccurring disturbance, natural or anthropogenic.

Restoration pathway R3
State 3 to 2

Ecological processes can be restored to the site, but non-natives remain. Possible restoration techniques include stabilizing the site by reestablishing native perennials and the use of artificial rip-rap to dissipate energy and reestablish the flood plain.

Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			90–220	
	alkali sacaton	SPAI	*Sporobolus airoides*	50–100	–
	rush	JUNCU	*Juncus*	20–50	–
	big galleta	PLRI3	*Pleuraphis rigida*	10–40	–
2	**Secondary Perennial Grasses**			20–80	
	sedge	CAREX	*Carex*	5–30	–
	cattail	TYPHA	*Typha*	5–30	–
3	**Annual Grasses**			1–50	
	feather fingergrass	CHVI4	*Chloris virgata*	5–30	–
Forb					
4	**Perennial Forbs**			20–80	
	dock	RUMEX	*Rumex*	5–30	–
5	**Annual Forbs**			10–30	
Shrub/Vine					
6	**Primary Shrubs**			270–700	
	mesquite	PROSO	*Prosopis*	100–250	–
	desert willow	CHLI2	*Chilopsis linearis*	50–150	–
	arrowweed	PLSE	*Pluchea sericea*	50–100	–
	willow	SALIX	*Salix*	50–100	–
	big saltbush	ATLE	*Atriplex lentiformis*	10–50	–
	baccharis	BACCH	*Baccharis*	10–50	–
	honey mesquite	PRGL2	*Prosopis glandulosa*	10–30	–
	screwbean mesquite	PRPU	*Prosopis pubescens*	10–30	–
7	**Secondary Shrubs**			50–150	
	catclaw acacia	SEGR4	*Senegalia greggii*	10–30	–
	cattle saltbush	ATPO	*Atriplex polycarpa*	10–30	–
	rubber rabbitbrush	ERNAN3	*Ericameria nauseosa ssp. nauseosa*	10–30	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. Alkali sacaton is a valuable forage species in arid and semiarid regions. Plants are tolerant to moderate grazing and can produce abundant herbage utilized by livestock. Big galleta is considered a valuable forage plant for cattle and domestic sheep. Its coarse, rigid culms make it relatively resistant to heavy grazing and trampling. The fruit of honey mesquite is valuable forage for livestock. Numerous wild and domestic animals consume and disperse honey mesquite seed. The fruit of honey mesquite is valuable forage for livestock. Cattle, horses, domestic sheep and goats, eat large quantities of the ripe fruit during summer and fall. Livestock do not consume the foliage to any great extent. Foliage consumption is high only during drought years, especially in the early spring when other forage is sparse. Honey mesquite provides cover for large wildlife species and shade for livestock. Screwbean mesquite is eaten by livestock. In the West, willows are generally considered to be more palatable to sheep than to cattle, but cattle may make greater use of willow because they tend to frequent riparian areas.

Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year.

Wildlife Interpretations:
The fruit of honey mesquite is valuable forage for wildlife. Mules and burros eat large quantities of the ripe fruit during summer and fall. The fruit crop of honey mesquite is quite predictable, annually providing an abundant and nutritious food source for numerous wildlife species upon ripening in July and August. Honey mesquite seeds form an important part of the diet of mice, kangaroo rats, woodrats, chipmunks, ground squirrels, rock squirrels, cottontail, skunks, quail, doves, ravens, the black-tailed prairie dog, black-tailed jackrabbit, porcupine, raccoon, coyote, collared peccary, white-tailed deer, mule deer, wild turkey, and mallard. Many species of small rodents derive a large portion of their diet from mesquite seeds. Many species of quail eat mesquite buds and flowers in the spring and seeds during the fall and winter. Mesquite browse is generally not a very important wildlife food source. The sweet, nutritious seed pods of honey mesquite are highly palatable to all types of livestock and to numerous small and large wildlife species. For both livestock and wildlife, the palatability of leaves and twigs is relatively low. Screwbean mesquite is important as cover and food to wildlife. Willows provide food and cover for many wildlife species. Willows, in general, are a preferred food and building material of beaver. It is especially important for deer and nongame birds. Willow is moderately to highly palatable for mule deer and elk, and is an important browse during winter. Ducks, grouse, other birds, and small mammals eat willow shoots, catkins, buds, and leaves. The western salt desert shrub and grassland communities where alkali sacaton is common support an abundance of mule deer, pronghorn, carnivores, small mammals, birds, amphibians, and reptiles.

Hydrological functions

Runoff is low to high. Permeability is impermeable to moderate.

Wood products

Honey mesquite wood is used chiefly for firewood. The wood is easily sawed and split, is dry and heavy, ignites readily, and produces intense heat. It is often the only fuel wood available in regions where it grows. There has been an increased interest in using honey mesquite wood in manufacturing furniture, flooring, and handcrafts. Manufacturers like the wood because it is easy to work with and has unique grain patterns that make the finished products attractive. The wood of mesquites is hard, durable, and attractive. Due to the slender nature of the branches and often shrubby growth form screwbean mesquite is most typically used for fuel and fence. Custom woodworkers use mesquite wood, including that of screwbean mesquite, for making small pieces of furniture and specialty items.

Other products

Mesquites were probably the most important wild plant staple of indigenous Southwest Native Americans. The pods were a very reliable food source because fruiting occurred even during drought years. Pods were collected in large quantities and stored in granary baskets on the roofs of houses or sheds. The beans were ground into flour which was used to prepare cakes and breads, the main staple of the diet. Various refreshing drinks were made from the pods. An alcoholic drink was sometimes prepared by allowing the juices of the pods to ferment. Flowers were eaten raw or roasted, formed into balls, and stored in pottery vessels. Native Americans used the wood for fuel as well as for weapons, tools, and construction. The wood is also used locally for small items, such as tool handles and trinkets. Screwbean mesquite was a food source for many southwestern tribes. Screwbean mesquite was used by many southwestern tribes in a variety of other ways. The bark and roots had medicinal value and were used to treat wounds. The use of gum, bark, and blossoms as food, medicine, dyes, and in making pottery have been reported for other southwestern mesquites, but it is uncertain if screwbean mesquite was also used for these purposes. Native Americans used the leaves of willows to treat mosquito bites, bee stings and stomach aches and used to stems for implements such as baskets, arrow shafts, scoops and fish traps.

Other information

Alkali sacaton is one of the most commonly used species for seeding and stabilizing disturbed lands. Due to alkali sacaton’s salt tolerance, is recommended for native grass seeding on subirrigated saline sites. Big galleta's clumped growth form stabilizes blowing sand. Only recently has serious attention been given to harvesting mesquite on areas where it has increased. Harvesting honey mesquite could provide additional income to ranchers wishing to control mesquite on grazing lands. Due to its growth form, honey mesquite is difficult to harvest economically. A mobile mesquite harvester that can economically cut the plant near the base, chop the wood into chips, and deliver

and dump the chips to a transport vehicle has been developed but has received limited use. Mesquites are widely used as ornamental shade trees throughout the Southwest because they need little or no watering and can survive on limited rainfall. Honey mesquite provides an excellent source of nectar for honey bees. Honey mesquite causes an allergic contact dermatitis in some humans. Willow is useful in stabilizing streambanks and providing erosion control on severely disturbed sites. It is valuable in revegetating disturbed riparian sites having high water tables and low elevations.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T32S R66E S24
General legal description	Along the Colorado River near Bullhead City, Clark County, Nevada.

Other references

Hereford, R., R.H. Webb and C. I. Longpre. 2004. Precipitation history of the Mojave Desert region, 1893-2001 (No. 117-03).

Kottek, M., Grieser, J., Beck, C., Rudolf, B., & Rubel, F. (2006). World map of the Köppen-Geiger climate classification updated. Meteorologische Zeitschrift, 15(3), 259-263.

Salem, B. B. (1989). Arid zone forestry: a guide for field technicians (No. 20). Food and Agriculture Organization (FAO).

Contributors

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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	05/10/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

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3. **Number and height of erosional pedestals or terracettes:**

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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):**

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:**