USDA Natural Resources
Conservation Service

Ecological site R030XB033NV
SANDY PLAIN 7-9 P.Z.

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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.

Ecological site concept

This site occurs on fan remnants. Slope gradients of 2 to 8 percent are typical. Elevations are 3800 to 5200 feet. The soils associated with this site are very deep and well drained and have formed in mixed alluvium. The soils are coarse textured throughout.

Please refer to group concept R030XB148CA to view the provisional STM.

Associated sites

R030XB014NV	**SHALLOW GRAVELLY LOAM 7-9 P.Z.**
R030XB034NV	**SANDY PLAIN 5-7 P.Z.**
R030XB039NV	**LIMY FAN 5-7 P.Z.**

Similar sites

R030XB034NV	**SANDY PLAIN 5-7 P.Z.** BOER4 absent
R030XB032NV	**DRY FLOODPLAIN** BOER4 absent
R030XB121NV	**SANDY PLAIN 3-5 P.Z.** BOER4 absent
R030XB039NV	**LIMY FAN 5-7 P.Z.** BOER4 absent

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Pleuraphis rigida* (2) *Bouteloua eriopoda*
Herbaceous	Not specified

Physiographic features

This site occurs on fan remnants. Slope gradients of 2 to 8 percent are typical. Elevations are 3800 to 5200 feet.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant
Elevation	1,158–1,585 m
Slope	2–8%
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 7 to 9(10) inches. Mean annual air temperature is 54 to 60 degrees F. The average growing season is about 170 to 210 days.

Table 3. Representative climatic features

Frost-free period (average)	210 days
Freeze-free period (average)	
Precipitation total (average)	229 mm

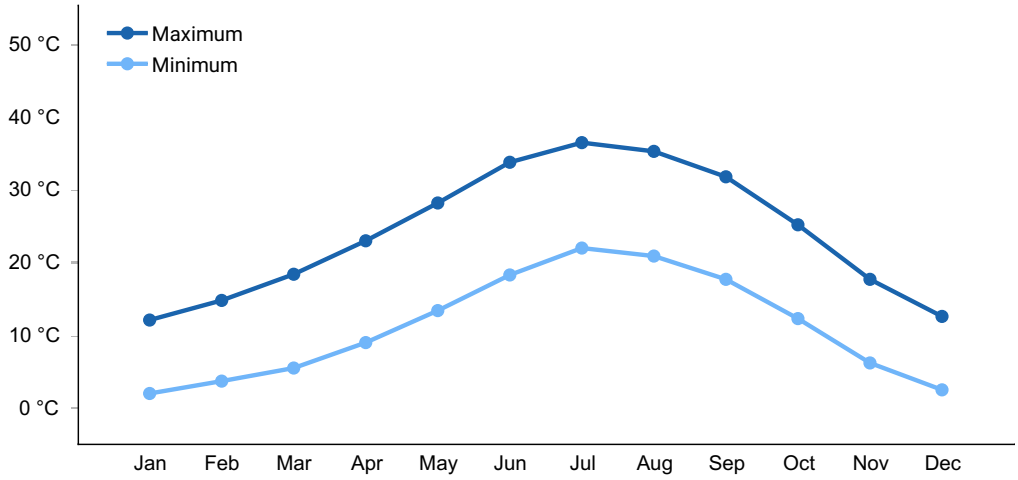

Figure 1. Monthly average minimum and maximum temperature

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are very deep and well drained and have formed in mixed alluvium. The soils are coarse textured throughout. Available water capacity is moderate and runoff is high. The soils associated with this site are classified as Ustic Haplargids.

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam (2) Gravelly loam (3) Sandy clay loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow
Soil depth	183–213 cm
Surface fragment cover <=3"	13–40%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	13.46–13.72 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm

Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	7.9–9
Subsurface fragment volume <=3" (Depth not specified)	13–40%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Please refer to group concept R030XB148CA to view the provisional STM.

As ecological condition deteriorates, cool-season perennial grasses, black grama and bush muhly decrease. Big galleta and dropseed initially increase but with further site degradation these grasses also decrease. Creosotebush, white bursage and wolfberry and annual grasses and forbs increase as perennial grasses decline in the community.

Fire Ecology:
Fires in the Mojave Desert are infrequent and of low severity because production of annual and perennial herbs seldom provide a fuel load capable of sustaining fire. Nevada ephedra is top-killed by fire. Underground regenerative structures commonly survive when aboveground vegetation is consumed by fire. Nevada ephedra generally sprouts after fire damages aboveground vegetation and may increase in plant cover. Range ratany is top-killed by fire. Range ratany resprouts from the root crown after fire. Spanish dagger is top-killed by fire. Spanish dagger sprouts following fire. Vegetative regeneration predominates following fire; seedlings are rarely observed. Fire generally consumes the aboveground shrub layer of banana yucca. Mortality rates of banana yucca after fire likely depend on water stress and severity of damage sustained by the plant. Live plant material is often damaged by adjacent dead plant material that burns at higher temperatures. The ability of banana yucca to sprout from rhizomes and basal stem buds below the surface likely increases its chances of survival in ecosystems prone to fire. Fire most likely top-kills big galleta. Big galleta sprouts from rhizomes following fire. Damage to big galleta from fire varies, depending on whether big galleta is dormant when burned. If big galleta is dry, damage may be severe. However, when plants are green, fire will tend to be less severe and damage may be minimal, with big galleta recovering quickly. Black grama is reported to be fire sensitive. Black grama is generally top-killed by fire. It usually recovers from fire slowly, through vegetative spread. However, black grama grows quickly in response to summer moisture, and its postfire recovery can be good if the stand was healthy before fire and there is adequate precipitation in the first two growing seasons after fire. Bush muhly regenerates following fire from soil-stored seed. Fire probably top-kills bush muhly. Burning causes at least short-term decline of bush muhly. Recovery time is thought to vary considerably and is probably dependent on postfire weather and competition. Indian ricegrass can be killed by fire, depending on severity and season of burn. Indian ricegrass

reestablishes on burned sites through seed dispersed from adjacent unburned areas. Desert needlegrass has persistent dead leaf bases, which make it susceptible to burning. Fire removes the accumulation; a rapid, cool fire will not burn deep into the root crown and surviving tufts will resprout.

State and transition model

Ecosystem states

1. Reference Plant Community

State 1 submodel, plant communities

1.1. Reference Plant Community

State 1
Reference Plant Community

Community 1.1
Reference Plant Community

The reference plant community is dominated by big galleta and black grama. Bush muhly, Indian ricegrass, desert needlegrass and Nevada ephedra are other important species associated with this site. Potential vegetative composition is about 80% grasses, 5% annual and perennial forbs, 15% shrubs. Approximate ground cover (basal and crown) is less than 40 to 50 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1076	1524	2152
Shrub/Vine	202	286	404
Forb	67	95	135
Total	**1345**	**1905**	**2691**

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			1219–2306	
	big galleta	PLRI3	*Pleuraphis rigida*	667–953	–
	black grama	BOER4	*Bouteloua eriopoda*	381–762	–
	bush muhly	MUPO2	*Muhlenbergia porteri*	95–286	–
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	38–152	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	38–152	–
2	**Secondary Perennial Grasses**			36–191	
	sideoats grama	BOCU	*Bouteloua curtipendula*	10–57	–
	low woollygrass	DAPU7	*Dasyochloa pulchella*	10–57	–
	spike dropseed	SPCO4	*Sporobolus contractus*	10–57	–
	sand dropseed	SPCR	*Sporobolus cryptandrus*	10–57	–
3	**Annual Grasses**			1–57	
	sixweeks grama	BOBA2	*Bouteloua barbata*	10–57	–
Forb					
4	**Perennial forbs**			38–152	
	desert globemallow	SPAM2	*Sphaeralcea ambigua*	10–57	–
5	**Annual forbs**			19–95	
Shrub/Vine					
6	**Primary shrubs**			56–244	
	Nevada jointfir	EPNE	*Ephedra nevadensis*	19–95	–
	banana yucca	YUBA	*Yucca baccata*	9–27	–
	Mojave yucca	YUSC2	*Yucca schidigera*	9–27	–
7	**Secondary shrubs**			38–152	
	fourwing saltbush	ATCA2	*Atriplex canescens*	19–38	–
	snakeweed	GUTIE	*Gutierrezia*	19–38	–

	burrobrush	HYSA	*Hymenoclea salsola*	19–38	–
	creosote bush	LATR2	*Larrea tridentata*	19–38	–
	water jacket	LYAN	*Lycium andersonii*	19–38	–
	Mexican bladdersage	SAME	*Salazaria mexicana*	19–38	–
	Joshua tree	YUBR	*Yucca brevifolia*	19–38	–

Animal community

Livestock Interpretations:
This site is suitable for livestock grazing. 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. Overall, black grama is one of the most nutritious desert winter grasses for livestock. The protein content of perennial grasses is generally high when individuals are developmentally young, and declines rapidly with maturity. Black grama is considered excellent forage for all livestock classes. Black grama provides highly palatable, yearlong forage for domestic cattle. Bush muhly is readily eaten by livestock throughout the year when available; however, it is usually not abundant enough to provide much forage. It is grazed heavily in winter when other species become scarce. Because of its branching habit, it is extremely susceptible to heavy grazing. Bush muhly is damaged when continuously grazed to a stubble height of less than 4 inches (10 cm). Indian ricegrass is highly palatable to all classes of livestock in both green and cured condition. It supplies a source of green feed before most other native grasses have produced much new growth. Desert needlegrass produces considerable basal foliage and is good forage while young. Young desert needlegrass is palatable to all classes of livestock. Mature herbage is moderately grazed by horses and cattle but rarely grazed by sheep. Nevada ephedra is important winter range browse for domestic cattle, sheep and goats. Range ratany is an important forage species for all classes of livestock. Palatability of range ratany is rated fair to good for cattle and sheep. Spanish dagger is rarely utilized by livestock, evidence of cattle browsing is a sign of poor range condition. Banana yucca provides browse to a variety of livestock in Arizona. In the Mojave Desert rangelands, domestic sheep and cattle do not utilize banana yucca as forage although cattle have been observed eating the leaves in western Texas.

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:
Mule deer, bighorn sheep, and pronghorn browse Nevada ephedra, especially in spring and late summer when new growth is available. Mountain quail eat ephedra seeds. Range ratany is an important forage species for deer. Mule deer browse range ratany year-long with seasonal peaks. Mule deer peak use is from February to April and from August to

October. Spanish dagger is important to a variety of desert wildlife species. Small mammals, birds, and reptiles utilize Spanish dagger for food, nest materials, nesting sites, and habitat. Deer often use banana yucca as a food source searching out new leaves that sprout after fire and eating from the plant at a higher frequency than when it is not burned. Banana yucca is consumed by elk in the pinyon-juniper woodlands. Bighorn sheep browse on the leaves and fruit of banana yucca, and various parts of the plant are also utilized by small rodents, birds, and insects. Black grama is considered excellent forage for many wildlife species. The palatability of bush muhly for wildlife species is rated fair to poor. Indian ricegrass is eaten by pronghorn in moderate amounts whenever available. In Nevada it is consumed by desert bighorns. A number of heteromyid rodents inhabiting desert rangelands show preference for seed of Indian ricegrass. Indian ricegrass is an important component of jackrabbit diets in spring and summer. In Nevada, Indian ricegrass may even dominate jackrabbit diets during the spring through early summer months. Indian ricegrass seed provides food for many species of birds. Doves, for example, eat large amounts of shattered Indian ricegrass seed lying on the ground. Desert bighorn sheep and feral horses and burros will graze desert needlegrass.

Hydrological functions

Runoff is high. Permeability is moderately slow.

Other products

Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used seed as a reserve food source. Some Native American tribes steeped the twigs of Nevada ephedra and drank the tea as a general beverage. Native people ate Mojave yucca fruits raw, cooked, and ground into a meal. Fibers were used in ropes, sandals, and baskets. Various Native American tribes have extended histories encompassing a wide range of uses for banana yucca. It has commonly been utilized as a food source with fruits often consumed in their raw form before fully ripening. Cakes were often made by pit roasting the fruits, grinding them into a paste, and drying the resulting material in the form of cakes which could later be traded or rehydrated and made into a syrup or jell.

Other information

Big galleta's clumped growth form stabilizes blowing sand. Desert needlegrass may be used for groundcover in areas of light disturbance, but it is susceptible to excessive trampling. Mojave yucca plants salvaged from sites that will be disturbed in the future may be useful for revegetation or for ornamental use.

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T28S R62E S17

General legal description	Approximately 9 miles west of Searchlight, along south side of Nevada Highway 164, Clark County, Nevada.

Other references

Fire Effects Information System (Online; http://www.fs.fed.us/database/feis/plants/).

USDA-NRCS Plants Database (Online; http://www.plants.usda.gov).

Contributors

RRK/GKB

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)	P Novak-Echenique
Contact for lead author	State Rangeland Management Specialist
Date	04/27/2011
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None

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2. **Presence of water flow patterns:** Water flow patterns are rare. A few waterflow patterns may be evident in areas recently subjected to summer convection storms. Where flow patterns are observed, they are short in length and stable.

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3. **Number and height of erosional pedestals or terracettes:** None

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground to 40%; surface rock fragments to 40%; shrub canopy to 5%; basal area for perennial herbaceous plants ±20%.

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5. **Number of gullies and erosion associated with gullies:** None

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None

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7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) expected to move distance of slope length during intense summer convection storms or rapid snowmelt events. Persistent litter (large woody material) will remain in place except during catastrophic events.

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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):** Soil stability values should be 1 to 3 on the coarse soil textures found on this site. (To be field tested.)

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Surface soil structure is typically single grained to medium platy. Soil surface colors are light and soils are typified by an ochric epipedon. Organic matter of the surface 2 to 3 inches is less than to 1 percent.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Shrub canopy and associated litter break raindrop impact.

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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):** None

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: warm-season, perennial bunchgrasses

    Sub-dominant: Mojave Desert shrubs > cool-season, perennial bunchgrasses > perennial forbs > annual forbs > annual grasses.

    Other:

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Dead branches within individual shrubs common and standing dead shrub canopy material may be as much as 25% of total woody canopy; mature bunchgrasses commonly (±15%) have dead centers.

14. **Average percent litter cover (%) and depth (in):** Between plant interspaces 30-35% and depth (±¼-inch).

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** For normal or average growing season ±1700lbs/ac.

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:** Red brome, red-stem filaree and Mediterranean grass are invaders on this site.

17. **Perennial plant reproductive capability:** All functional groups should reproduce in above average growing season years.
