

Ecological site R029XY024NV SODIC TERRACE 5-8 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.

Associated sites

R029XY017NV	LOAMY 5-8 P.Z.
R029XY021NV	LOAMY HILL 5-8 P.Z.
R029XY032NV	SODIC LOAM 3-5 P.Z.
R029XY033NV	LOAMY SLOPE 3-5 P.Z.
R029XY035NV	LOAMY 3-5 P.Z.

Similar sites

R029XY059NV	SHALLOW SILTY 5-8 P.Z. Less shrub diversity: essentially a homogeneous ATCO community
R029XY035NV	LOAMY 3-5 P.Z. Lycium spp. codominant shrub
R029XY017NV	LOAMY 5-8 P.Z. More productive site
R029XY087NV	GRAVELLY LOAM 5-8 P.Z. SAVEB dominant shrub

R029XY033NV	LOAMY SLOPE 3-5 P.Z. Less productive site
R029XY021NV	LOAMY HILL 5-8 P.Z. GRSP-LYAN codominant shrubs

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Atriplex confertifolia</i> (2) <i>Sarcobatus vermiculatus</i>
Herbaceous	(1) <i>Achnatherum hymenoides</i>

Physiographic features

This site occurs on alluvial plains and flats, fan skirts, lake plain terraces and stream terraces. Slopes range from 0 to 8 percent, but slope gradients of 0 to 4 percent are most typical. Elevations are 3500 to about 6600 feet.

Table 2. Representative physiographic features

Landforms	(1) Alluvial flat (2) Fan skirt (3) Lake plain
Flooding duration	Brief (2 to 7 days) to very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,070 – 2,010 m
Slope	0 %
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is arid, characterized by cool, moist winters and hot, dry summers. Average annual precipitation is 5 to 8 inches. Mean annual air temperature is 49 to 58 degrees F. The average growing season is about 120 to 180 days.

Table 3 Representative climatic features

Frost-free period (average)	180 days
Freeze-free period (average)	0 days
Precipitation total (average)	200 mm

Influencing water features

This site may receive additional moisture by flooding and ponding due to its occurrence on alluvial flats and inset fans.

Soil features

The soils associated with this site are very deep and moderately well to excessively drained. Surface soils are medium to moderately coarse textured and less than 10 inches thick. These soils are strongly to very strongly salt and sodium affected within 10 inches of the surface. A seasonal water table forms in these soils below depths of five feet that can supply additional moisture to deep-rooted shrubs. The surface layer will normally crust and bake upon drying, inhibiting water infiltration and seedling emergence. Permeability is slow to moderately rapid. Available water holding capacity is very low to high. Runoff is very low to very high. Soil series associated with this site are Cirac, Delacit, Koyen, Mazuma, Nyserva, Penoyen, Slaw, Wardenot, and Yomba.

Table 4. Representative soil features

Surface texture	(1) Sand (2) Loam (3) Sandy loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to excessively drained
Permeability class	Slow to moderately rapid
Soil depth	180 – 210 cm
Surface fragment cover <=3"	10 – 50 %
Surface fragment cover >3"	0 – 20 %
Available water capacity (0-101.6cm)	5.08 – 19.3 cm

Calcium carbonate equivalent (0-101.6cm)	0 – 30 %
Electrical conductivity (0-101.6cm)	0 – 30 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 100
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 60 %
Subsurface fragment volume >3" (Depth not specified)	0 – 20 %

Ecological dynamics

Where management results in abusive grazing use by cattle and/or feral horses, shadscale and black greasewood increase in the plant community as Indian ricegrass, bud sagebrush, fourwing saltbush and bottlebrush squirreltail decrease. Species likely to invade this site are annuals such as mustards and brome grasses.

Fire Ecology:

Shadscale communities are usually unaffected by fire because of low fuel loads, although a year of exceptionally heavy winter rains can generate fuels by producing a heavy stand of annual forbs and grasses. The mean fire return interval for shadscale-greasewood communities range from 35 to 100 years. Increased presence of non-native annual grasses, such as cheatgrass, can alter fire regimes by increasing fire frequency under wet to near-normal summer moisture conditions. When fire does occur, the effect on the ecosystem may be extreme. Black greasewood may be killed by severe fires, but it commonly sprouts soon after low to moderate-severity fire. Budsage is killed by fire. Fire top-kills or kills fourwing saltbush, depending upon ecotype. Fourwing saltbush may sprout after top-kill. Fourwing saltbush probably establishes primarily from seed after fire, with some populations also regenerating vegetatively.

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. Bottlebrush squirreltail's small size, coarse stems, and sparse leafy material aid in its tolerance of fire. Postfire regeneration occurs from surviving root crowns and from on- and off-site seed sources. Frequency of disturbance greatly influences postfire response of bottlebrush squirreltail. Undisturbed plants within a 6 to 9 year age class generally contain large amounts of dead material, increasing bottlebrush squirreltail's susceptibility to fire. Budsage is killed by fire. Fire top-kills or kills fourwing saltbush, depending upon ecotype. Fourwing saltbush may sprout after top-kill. Fourwing saltbush probably establishes primarily from seed after fire, with some populations also regenerating vegetatively.

State and transition model

Figure 3. DRAFT STM

Figure 4. DRAFT STM LEGEND

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			16-59	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	8-39	—
	squirreltail	ELEL5	<i>Elymus elymoides</i>	8-20	
2	Secondary Perennial Grasses			8-31	
	saltgrass	DISP	<i>Distichlis spicata</i>	2-12	—
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	2-12	—
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	2-12	—
Forb					
3	Perennial			8-31	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	2-10	—
	milkvetch	ASTRA	<i>Astragalus</i>	2-8	—
4	Annual			1-20	
Shrub/Vine					
5	Primary Shrubs			224-393	
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	118-196	—
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	78-138	—
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	20-39	—
	Forb, annual	2FA	<i>Forb, annual</i>	0-20	—
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	8-20	—
6	Secondary Shrubs			20-59	
	Parry's saltbush	ATPA3	<i>Atriplex parryi</i>	2-12	—
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	2-12	—
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	2-12	—
	desert-thorn	LYCIU	<i>Lycium</i>	2-12	—
	seepweed	SUAED	<i>Suaeda</i>	2-12	—
	horsebrush	TETRA3	<i>Tetradymia</i>	2-12	

Animal community

Livestock Interpretations: This site is suited to livestock grazing. Grazing management should be keyed to Indian ricegrass and perennial grass production. 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. Bottlebrush squirreltail is very palatable winter forage for domestic sheep of Intermountain ranges. Domestic sheep relish the green foliage. Overall, bottlebrush squirreltail is considered moderately palatable to livestock. Shadscale provides good browse for domestic sheep. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets. Black greasewood is an important winter browse plant for domestic sheep and cattle. It also receives light to moderate use by domestic sheep and cattle during spring and summer months. Black greasewood contains soluble sodium and potassium oxalates that may cause poisoning and death in domestic sheep and cattle if large amounts are consumed in a short time. Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a wide variety of livestock. Budsage is palatable and nutritious forage for domestic sheep in the winter and spring although it is known to cause mouth sores in lambs. Budsage can be poisonous or fatal to calves when eaten in quantity. Budsage, while desired by cattle in spring, is poisonous to cattle when consumed alone. Fourwing saltbush is one of the most palatable shrubs in the West. Its protein, fat, and carbohydrate levels are comparable to alfalfa. It provides nutritious forage for all classes of livestock. Palatability is rated as good for domestic sheep and domestic goats; fair for cattle; fair to good for horses in winter, poor for horses in other seasons. 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: Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a wide variety of wildlife particularly during spring and summer before the hardening of spiny twigs. It supplies browse, seed, and cover for birds, small mammals, rabbits, deer, and pronghorn antelope. Black greasewood is an important winter browse plant for big game animals and a food source for many other wildlife species. It also receives light to moderate use by mule deer and pronghorn during spring and summer months. Budsage is palatable, nutritious forage for upland game birds, small game and big game in winter. Budsage is rated as "regularly, frequently, or moderately taken" by mule deer in Nevada in winter and is utilized by bighorn sheep in summer, but the importance of budsage in the diet of bighorns

is not known. Bud sage comprises 18 – 35% of a pronghorn's diet during the spring where it is available. Chukar will utilize the leaves and seeds of bud sage. Budsage is highly susceptible to effects of browsing. It decreases under browsing due to year-long palatability of its buds and is particularly susceptible to browsing in the spring when it is physiologically most active. Fourwing saltbush provides valuable habitat and year-round browse for wildlife. Fourwing saltbush also provides browse and shelter for small mammals. Additionally, the browse provides a source of water for black-tailed jackrabbits in arid environments. Granivorous birds consume the fruits. Wild ungulates, rodent and lagomorphs readily consume all aboveground portions of the plant. Palatability is rated good for deer, elk, pronghorn and bighorn sheep. Indian ricegrass is an important forage for several wildlife species. Bottlebrush squirreltail is a dietary component of several wildlife species. Bottlebrush squirreltail may provide forage for mule deer and pronghorn.

Hydrological functions

Rills are rare. A few can be expected on steeper slopes in areas subjected to summer convection storms or rapid spring snowmelt. Water flow patterns are often numerous in areas subjected to summer convection storms. Flow patterns short and stable. Pedestals are rare with occurrence typically limited to areas within water flow patterns. Gullies are rare in areas of this site that occur on stable landforms. Where this site occurs on inset fans, gullies and head-cuts associated with ephemeral channel entrenchment are common. Gullies and head-cuts should be healing or stable. Sparse shrub canopy and associated litter break raindrop impact. Medium to fine textured surface soils have moderate to slow infiltration and medium runoff.

Recreational uses

Aesthetic value is derived from the diverse floral and faunal composition and the colorful flowering of wild flowers and shrubs during the spring and early summer. This site offers rewarding opportunities to photographers and for nature study. This site is used for camping and hiking and has potential for upland and big game hunting.

Other products

Shadscale seeds were used by Native Americans of Arizona, Utah and Nevada for bread and mush. The leaves, seeds and stems of black greasewood are edible. Indian ricegrass was traditionally eaten by some Native American peoples. The Paiutes used seed as a reserve food source. Fourwing saltbush is traditionally important to Native Americans. They ground the seeds for flour. The leaves, placed on coals, impart a salty flavor to corn and other roasted food. Top-growth produces a yellow dye. Young leaves and shoots were used to dye wool and other materials. The roots and flowers were ground to soothe insect bites.

Other information

Black greasewood is useful for stabilizing soil on wind-blown areas. It successfully revegetates processed oil shale and is commonly found on eroded areas and sites too saline for most plant species. Indian ricegrass is well-suited for surface erosion control and desert revegetation although it is not highly effective in controlling sand movement. Fourwing saltbush is widely used in rangeland and riparian improvement and reclamation projects, including burned area recovery. It is probably the most widely used shrub for restoration of winter ranges and mined land reclamation. Bottlebrush squirreltail is tolerant of disturbance and is a suitable species for revegetation.

Type locality

Location 1: Esmeralda County, NV	
Township/Range/Section	T3N R39E S24
UTM zone	N
UTM northing	4216935
UTM easting	452367
Latitude	38° 5′56″

Longitude	117° 29'17"
General legal description	About 3 miles northeast of Gilbert Junction, Big Smokey Valley, Esmeralda County, Nevada. This site also occurs in Lincoln, Mineral, and Nye Counties, Nevada.
Location 2: Nye County, NV	
Township/Range/Section	T3N R40E S4&5
UTM zone	N
UTM northing	4221766
UTM easting	457211
Latitude	38° 8'33"
Longitude	117° 29'17"
General legal description	About 10 miles north of Tonopah along north side of US Hwy 95, Nye County, Nevada. This site also occurs in Esmeralda, Lincoln, and Mineral Counties, 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

HA/GD/VWM

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)	GK BRACKLEY
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Contact for lead author	State Rangeland Management Specialist
Date	06/20/2006
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- 1. Number and extent of rills:** Rills are rare. A few can be expected on steeper slopes in areas subjected to summer convection storms or rapid spring snowmelt.

- 2. Presence of water flow patterns:** Water flow patterns are often numerous in areas subjected to summer convection storms. Flow patterns short and stable.

- 3. Number and height of erosional pedestals or terracettes:** Pedestals are rare with occurrence typically limited to areas within water flow patterns.

- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground $\pm$ 50 to 60%; surface rock fragments $\pm$ 5 to 35%; shrub canopy 10 to < 20%; basal area for perennial herbaceous plants <2%.

- 5. Number of gullies and erosion associated with gullies:** Gullies are rare in areas of this site that occur on stable landforms. Where this site occurs on inset fans, gullies and head-cuts associated with ephemeral channel entrenchment are common. Gullies and head-cuts should be healing or stable.

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

- 7. Amount of litter movement (describe size and distance expected to travel):** Fine litter (foliage from grasses and annual & perennial forbs) is expected to move the 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.

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 2 to 4 on most soil textures found on this site. Areas of this site occurring on soils that have a physical crust will probably have stability values less than 3. Soils having thin surface sand sheet will have lower stability values. (To be field tested.)

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

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Sparse shrub canopy and associated litter break raindrop impact. Medium to fine textured surface soils have moderate to slow infiltration and medium runoff.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): Compacted layers are not typical. Platy or massive sub-surface horizons, subsoil calcic, argillic horizons or hardpans shallow to the surface are not to be interpreted as compacted layers.

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: Reference Plant Community: Salt desert shrubs (shadscale & black greasewood) >> cool season perennial grasses. (By above ground production)

Sub-dominant: Associated shrubs = rhizomatous grasses = deep-rooted, cool season, perennial forbs = fibrous, shallow-rooted, cool season, annual and perennial forbs. (By above ground production)

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 are common and standing dead shrub canopy material may be as much as 35% of total woody canopy; mature bunchgrasses commonly ($\pm 25\%$) have dead centers.

14. Average percent litter cover (%) and depth (in): Between plant interspaces ($\pm 2\%$) and depth ($\pm \frac{1}{4}$ in.)

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): For normal or average growing season (February thru April [May]) ± 350 lbs/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: Douglas'' rabbitbrush; horsebrush, halogeton; Russian thistle; annual mustards, cheatgrass, knapweeds

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