

Ecological site R029XY018NV SODIC DUNE

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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.

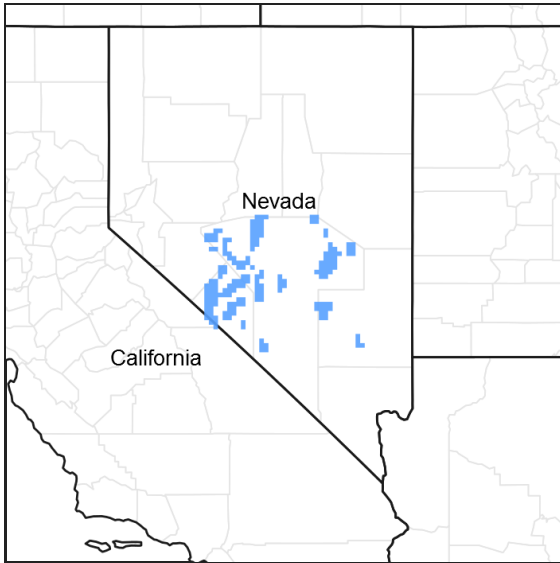


Figure 1. Mapped extent

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.

Associated sites

R029XY002NV	SALINE MEADOW
R029XY004NV	SALINE BOTTOM
R029XY024NV	SODIC TERRACE 5-8 P.Z.
R029XY076NV	SODIC FLAT

Similar sites

R029XY024NV	SODIC TERRACE 5-8 P.Z. SAVE4-ATCO dominant shrub; less productive site; does not occur on dunes
R029XY063NV	DRY SODIC TERRACE ATCO dominant shrub; less productive site; does not occur on dunes
R029XY076NV	SODIC FLAT DISP dominant grass; does not occur on dunes

Table 1. Dominant plant species

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

Physiographic features

This site occurs on partially stabilized sand dunes. Slopes range from 2 to 16 percent, but slope gradients of 2 to 8 percent are typical. Elevations are 4500 to about 6300 feet.

Table 2. Representative physiographic features

Landforms	(1) Dune (2) Fan remnant (3) Lake terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,372–1,920 m
Slope	2–8%
Water table depth	130–168 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is semiarid, characterized by cold, moist winters and warm, somewhat dry summers. Average annual precipitation is 5 to 8 inches. Mean annual air temperature is 52 to 60 degrees F. The average growing season is about 140 to 200 days.

Table 3. Representative climatic features

Frost-free period (average)	200 days
Freeze-free period (average)	0 days
Precipitation total (average)	203 mm

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are windblown fine sands, typically more than 40 inches in depth. The soil profile is excessively drained and available water capacity is low. Underground water occurs within the rooting depth of black greasewood. Because of rapid intake and deep percolation of water, surface runoff is very low. The extremely loose and unstable surfaces soils and low fertility of these soils are not favorable to uniform stands of grass. These soils are extremely susceptible to wind erosion. Soil series associated with this site include: Caudle, Jarboe and Kawich.

Table 4. Representative soil features

Surface texture	(1) Fine sand (2) Fine sandy loam (3) Loam
Drainage class	Somewhat poorly drained to excessively drained

Permeability class	Very slow to very rapid
Soil depth	183–213 cm
Available water capacity (0-101.6cm)	6.1–19.3 cm
Calcium carbonate equivalent (0-101.6cm)	0–70%
Electrical conductivity (0-101.6cm)	4–32 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–150
Soil reaction (1:1 water) (0-101.6cm)	7.9–11
Subsurface fragment volume <=3" (Depth not specified)	2–16%

Ecological dynamics

Where management results in abusive grazing use by cattle and/or feral horses, black greasewood, rabbitbrush, and horsebrush increase in density, while Indian ricegrass and other perennial grasses decline. If the vegetative cover is removed, this site typically reverts to active, unstabilized sand dunes. Species likely to invade this site are cheatgrass and Russian thistle.

Fire Ecology:

Black greasewood communities have been historically subject to stand-replacing fire regimes with intervals of <100 years. Black greasewood may be killed by severe fires, but it commonly sprouts soon after low to moderate-severity fires. 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. Shadscale is fire intolerant and it does not readily recover from fire, except for establishment through seed. Fall prescribed burning killed 100% of shadscale on study plots in a basin big sagebrush community. Spring burning left a few surviving shadscale plants but greatly reduced shadscale density and frequency. 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. Saltgrass rhizomes occur deep in the soil where they are insulated from the heat of most fires. Saltgrass survives fire by sending up new growth from rhizomes.

State and transition model

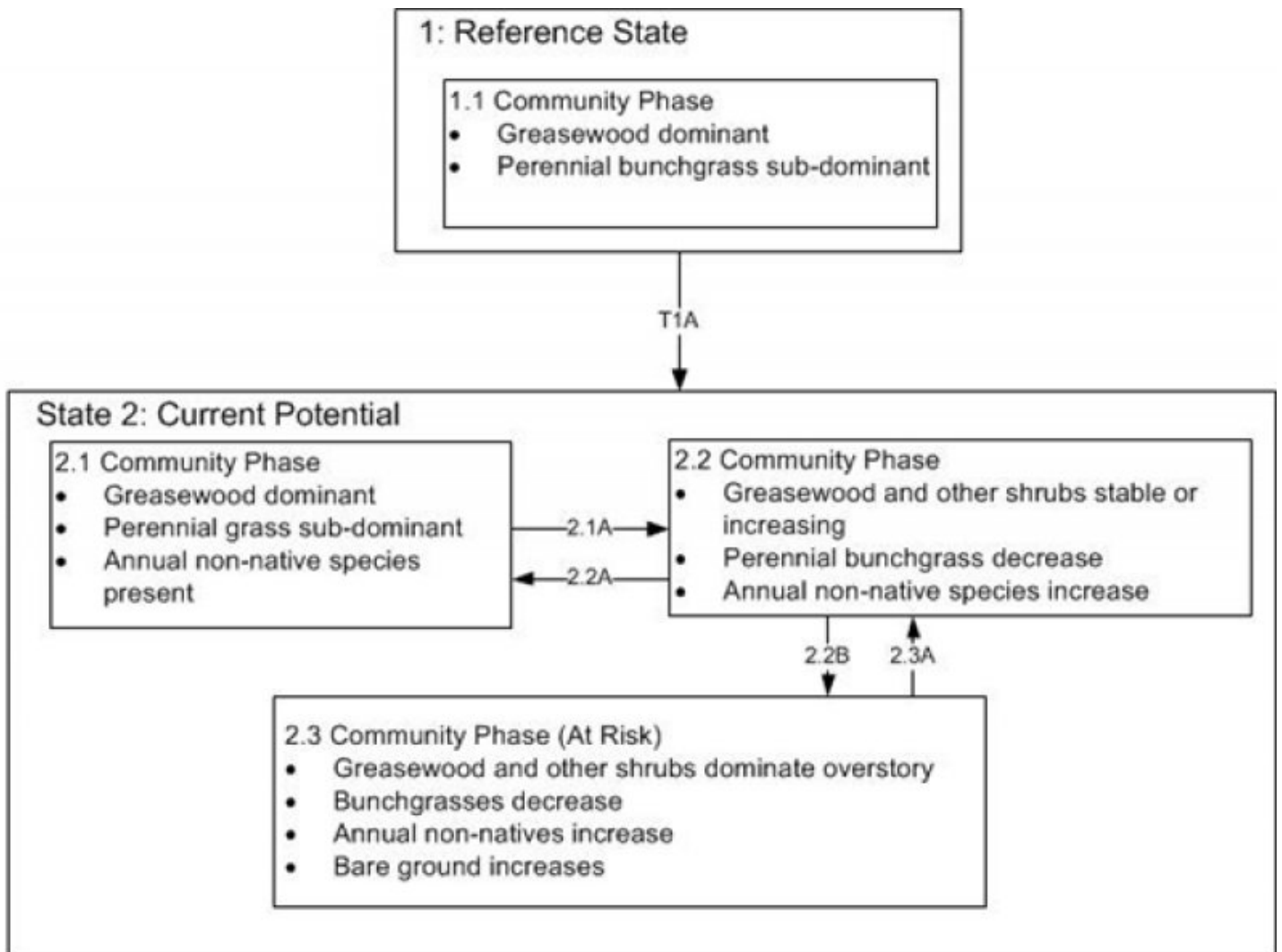


Figure 4. DRAFT STM

T1A: introduction of non-native species

2.1A: prolonged drought/ inadequate rest and recovery from defoliation

2.2A: rest and recovery

2.2B: prolonged drought/ inadequate rest and recovery from defoliation

2.3A: recovery or changes in management

Figure 5. DRAFT STM LEGEND

**State 1
Reference State**

**Community 1.1
Reference Plant Community**

The reference plant community is dominated by black greasewood and Indian ricegrass. Other important species on this site are needleandthread and fourwing saltbush. Potential vegetative composition is about 30% grasses, 10% forbs and 60% shrubs. Approximate ground cover (basal and crown) is 10 to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	101	202	336
Grass/Grasslike	50	101	168
Forb	17	34	56
Total	168	337	560

State 2

Current Potental State

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			56–101	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	50–84	–
	saltgrass	DISP	<i>Distichlis spicata</i>	6–17	–
2	Secondary Perennial Grasses			6–34	
	threeawn	ARIST	<i>Aristida</i>	2–10	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	2–10	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	2–10	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	2–10	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	2–10	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	2–10	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	2–10	–
Forb					
3	Perennial			6–27	
	globemallow	SPHAE	<i>Sphaeralcea</i>	2–7	–
	princesplume	STANL	<i>Stanleya</i>	2–7	–
	threeawn	ARIST	<i>Aristida</i>	0–2	–
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	0–2	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	1–2	–
4	Annual			1–34	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	1–2	–
Shrub/Vine					
5	Primary Shrubs			123–245	
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	101–168	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	17–50	–
	shadscale saltbush	ATCO	<i>Atriplex confertifolia</i>	6–27	–
6	Secondary Shrubs			17–50	
	Parry's saltbush	ATPA3	<i>Atriplex parryi</i>	3–10	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	3–10	–
	Nevada jointfir	EPNE	<i>Ephedra nevadensis</i>	3–10	–
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa ssp. nauseosa var. nauseosa</i>	3–10	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	3–10	–
	desert-thorn	LYCIU	<i>Lycium</i>	3–10	–
	bud sagebrush	PIDE4	<i>Picrothamnus desertorum</i>	3–10	–
	Nevada dalea	PSPO	<i>Psoralea polydenius</i>	3–10	–
	horsebrush	TETRA3	<i>Tetradymia</i>	3–10	–

Animal community

Livestock Interpretations:

This site is suitable for livestock grazing. Grazing management should be keyed to 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. Saltgrass's value as forage depends primarily on the relative availability of other grasses of higher nutritional value and palatability. It can be an especially important late summer grass in arid environments after other forage grasses have deceased. Saltgrass is rated as a fair to good forage species only because it stays green after most other grasses dry. Livestock generally avoid saltgrass due to its coarse foliage. Saltgrass is described as an increaser under grazing pressure. 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. 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. Shadscale is a valuable browse species, providing a source of palatable, nutritious forage for a wide variety of livestock. Shadscale provides good browse for domestic sheep. Shadscale leaves and seeds are an important component of domestic sheep and cattle winter diets.

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:

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. 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. 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. Indian ricegrass is eaten by pronghorn in moderate amounts whenever available. 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. 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. Saltgrass provides cover for a variety of bird species, small mammals, and arthropods and is on occasion used as forage for several big game wildlife species.

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 none to rare. Pedestals are common with occurrence due to wind scouring. Gullies are rare. Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., Indian ricegrass] slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and accumulation on site.

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

The leaves, seeds and stems of black greasewood are edible. 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. Seeds of shadscale were used by Native Americans for bread and mush. Indian ricegrass was traditionally eaten by some Native Americans. The Paiutes used the seed as a reserve food source.

Other information

Black greasewood is useful for stabilizing soil on wind-blown areas. It successfully revegetates eroded areas and sites too saline for most plant species. 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. Given its extensive system of rhizomes and roots which form a dense sod, saltgrass is considered a suitable species for controlling wind and water erosion.

Type locality

Location 1: Lincoln County, NV	
Township/Range/Section	T3N R55E S27
General legal description	Approximately 3 miles west of NvHwy 375. Sand Spring Valley area near Rachel, Lincoln County, Nevada.

Other references

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

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

Contributors

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
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.

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2. **Presence of water flow patterns:** Water flow patterns none to rare.

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3. **Number and height of erosional pedestals or terracettes:** Pedestals are common with occurrence due to wind scouring.
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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 \pm 70%; surface rock fragments less than 5%; shrub canopy 15 to 20%; basal area for perennial herbaceous plants <5%.
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5. **Number of gullies and erosion associated with gullies:** Gullies are rare.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Slight to moderate wind scouring.
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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) is expected to move unsheltered distance during heavy wind. Persistent litter (large woody material) will remain in place except during intense summer storms.
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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 4 on the sandy 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 structure is typically single grain. Soil surface colors are light and are typified by an ochric epipedon. Organic carbon of the surface 2 to 3 inches is typically 1 to 1.5 percent dropping off quickly below. Organic matter content can be more or less depending on micro-topography.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Perennial herbaceous plants (especially deep-rooted bunchgrasses [i.e., Indian ricegrass] slow runoff and increase infiltration. Shrub canopy and associated litter break raindrop impact and provide opportunity for snow catch and accumulation on site.
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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
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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: Reference Plant Community: Tall shrubs (black greasewood & fourwing saltbush) > deep-rooted, cool season, perennial bunchgrasses. (By above ground production)
- Sub-dominant: Associated, low-statured, shrubs > rhizomatous grasses = shallow-rooted, cool season, perennial

grasses = deep-rooted, perennial, forbs = fibrous, shallow-rooted, cool season, perennial forbs = annual 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 40% of total woody canopy; some of the mature bunchgrasses ($\pm 25\%$) have dead centers.
-
14. **Average percent litter cover (%) and depth (in):** Between plant interspaces ($< 5\%$) and depth of litter is $\pm \frac{1}{4}$ inch.
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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 May) ± 300 lbs/ac; Spring moisture significantly affects total production.
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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:** Cheatgrass; Douglas' rabbitbrush; horsebrush, snakeweed; halogeton; Russian thistle; annual mustards, annual kochia, bassia
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17. **Perennial plant reproductive capability:** All functional groups should reproduce in average (or normal) and above average growing season years.
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